

CEOS WHO HAVE COOS: CONTINGENCY ANALYSIS OF AN UNEXPLORED STRUCTURAL FORM

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We use contingency theory to examine, for the first time, the incidence and effectiveness of CEO/COO duos. We argue that industry dynamism, extraordinary organizational task demands, and the CEO's own professional limitations will influence the decision to have a COO, as well as its effect on performance. Based on a large 10-year sample, we find some support for the contingency view in explaining the presence of COOs; we particularly find that CEOs who lack experience in operational activities and in managing the focal firm are relatively likely to have COOs. We find, however, essentially no support for the contingency view in explaining when COOs are most beneficial. Instead, we find strong evidence of a very substantial negative main effect: CEOs who have COOs deliver lower organizational performance than those who do not.

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The idea of a ‘second-in-command’ is commonplace and ages old. For instance, country presidents have vice presidents, generals have chiefs of staff, and university presidents have provosts. Among these examples, however, only the latter begins to approximate the phenomenon found in some contemporary corporations—a CEO who focuses primarily on external and strategic activities while a COO focuses on internal operating matters. In such cases, the CEO expressly delegates oversight—not of a subunit or specific functional area—but of essentially the whole organization; moreover the CEO assigns to the COO a significant part of the role set usually associated with the CEO position, including the roles of directing and coordinating (Gulick, 1937), disturbance handler, and resource

allocator (Mintzberg, 1973), and, it might be said, even the leadership role itself (Mintzberg, 1973; Bass, 1985).

The decision to have a COO, or for there to be what we will call a ‘CEO/COO duo,’ has received no attention by researchers. This omission is noteworthy, since the decision to have a COO represents a major structural choice: it explicitly divides between two people a set of top-level roles that are typically fulfilled by one person; it draws a structural distinction between strategy formulation and implementation; it adds an organizational layer; and it adds a highly paid executive position to the organization’s costs. Whether the CEO/COO duo is a structural choice of the same significance as, say, the divisional (Chandler, 1962) or matrix structure (Davis and Lawrence, 1977) no one can reasonably say, because no research has been done.

Practical observers have not been as silent about the COO position, although they are far from unanimous about its implications. Heenan and Bennis assert that COOs represent a healthy antidote to

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the trend they observe toward imperial, celebrity CEOs; they also argue that CEO/COO duos fit the maxim 'Two heads are better than one' (Heenan and Bennis, 1999: 257). Charles Wang, chairman of Computer Associates, similarly favors having an alter ego: 'We do things together ... he'd probably tell you that he can run the company better than I can' (Abelson, 1999: D1). But, Lawrence Bossidy, former CEO of Allied Signal, argues, 'This notion of CEO and COO ... is awful. It's a bad thing ... because it separates two jobs that should be joined' (Abelson, 1999: D1). And consultants Charan and Colvin (1999) argue that the best CEOs are those who are adept at internal leadership, and such executives do not put COOs between them and their organizations.

We conduct the first systematic exploration of the CEO/COO duo. In line with a long tradition of inquiry into alternative structural arrangements (e.g., Lawrence and Lorsch, 1967), we draw upon contingency theory. We start by arguing that situational, or contingency, factors will affect the likelihood that the CEO will need a COO. Specifically, we propose that CEOs will have COOs to the extent that they (1) face extraordinary task demands arising from industry dynamism, (2) face extraordinary demands arising from the organization, and (3) have repertoires which limit their capabilities to oversee internal operational affairs. Next, we turn to the performance implications of having a COO. We identify the potential benefits and costs of having a COO and then pose a research question, without taking a stance: Which are generally greater, the benefits or the costs? Namely, is there a main effect on performance? Then, returning to our contingency perspective, we propose that, beyond any main effects, CEO/COO duos will be more beneficial (or less harmful) to organizational performance under the contingency conditions identified earlier: heavy environmental task demands, heavy organizational task demands, and a CEO who is not well equipped to manage operational matters. We then present our empirical project, discuss our results, and propose future research.

Our interest is in the presence of the COO role, in which an executive other than the CEO has been assigned to oversee all, or essentially all, internal and operational (i.e., shorter-term) affairs. We are not interested in the presence of the COO title, per se. As we shall discuss, sometimes the COO title is used to anoint an heir apparent, who typically

does not serve the type of role we envision. And sometimes an executive who is assigned our focal COO role has the title 'president' (usually, but not always, with the COO title also). We will discuss these distinctions in our methodology section and control for them in the empirical analysis. (See Appendix 1 for brief background on executive titles in American corporations.)

BACKGROUND ON THE CEO/COO DUO

Although the origins of the COO position in American corporations are not clear, at least one account traces its creation to Peter Drucker's (1954) book, *The Practice of Management*, in which he argued that the duties of a modern CEO are simply too much for one person (Murray, 2000). A similar view later arose from open systems theorists, who argued that the executive task of adapting the organization to the external environment is just as important, or even more so, than simply maintaining the organizational system (Katz and Kahn, 1966). In their *Handbook of Leadership*, Bass and Stogdill were explicit about how executive attention to strategy and the environment leads logically to the COO position:

Top corporate managers have to free themselves from these day-to-day operations and short-term goal orientations to focus more attention on long-term threats and opportunities ... Larger organizations establish a Chief of Organizational Operations [sic] to relieve the CEO of these day-to-day burdens. (Bass and Stogdill, 1990: 405)

The COO position is a recent organizational development. For instance, no mention of such a position exists in any of these major pre-1975 works on executive roles and responsibilities: Barnard, 1938; Simon 1945; Mintzberg, 1973; Drucker, 1974. At the same time, however, the COO position is not ubiquitous. As we will report, only a minority of companies—albeit a significant minority—have a COO at any given time.

Because there is so little formal knowledge about COOs, we sought to ground our research by interviewing executives about the position. We interviewed eight CEOs who (at the time of the interviews) had COOs, their COOs, and five CEOs who did not have COOs. Our chief objective in the interviews was to validate and clarify our understanding of the COO position and how CEO/COO

duos operate. Thus, we use the interview data only to add accuracy to our portrayal of this position, not to suggest or support any theoretical arguments. The interviews are described in more detail in Appendix 2.

The interviews verified the common depiction of the COO as responsible for internal operations, while the CEO focuses on external and longer-term issues. All of the duos we studied divided their responsibilities in this way. In every case, 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.

Describing the CEO/COO task division merely as ‘external vs. internal,’ however, amounts to an oversimplification of the tasks conducted by top executives. In order to systematically portray this task division, it is useful to draw upon Mintzberg’s (1973) widely noted framework of 10 managerial roles. He divided the 10 roles into three categories: interpersonal, informational, and decisional. The roles also can be categorized, using Mintzberg’s definitions, according to whether they deal with external or internal matters. As Table 1 portrays, the Liaison, Spokesperson, and Negotiator roles are primarily externally oriented. Conversely, the Leader, Disseminator, and Disturbance Handler roles are internally focused. The remaining four roles—Figurehead, Monitor, Entrepreneur, and Resource Allocator—involve combinations of external and internal work.¹

Drawing upon our field work and prior portrayals (e.g., Vancil, 1987), we extend Table 1 to show how CEOs who have COOs typically divide roles. CEOs reserve for themselves the three primarily external roles (Liaison, Spokesperson, and Negotiator); they take responsibility for the external aspects of the Figurehead and Monitor roles; and they handle those aspects of the Entrepreneur and Resource Allocator roles that involve major, quantum initiatives, such as large acquisitions. COOs are expected to handle the internal roles (Leader, Disseminator, and Disturbance Handler); the internal aspects of the Figurehead and Monitor roles; and the more incremental aspects of the

Entrepreneurial and Resource Allocator roles, such as reviewing and approving budgets. Some CEOs and COOs may divide tasks somewhat differently, but we believe this portrayal to be generally applicable.

It is important to distinguish our interest in the CEO/COO duo from the significant stream of research that has examined a somewhat related arrangement—the combination (or separation) of the roles of CEO and board chairman (Finkelstein and D’Aveni, 1994; Ward, 1997; Dalton *et al.*, 1998). Whereas both CEOs and COOs clearly engage in executive tasks and divide top management tasks between them, the role of board chairman is generally considered to be non-executive in nature—one of oversight of management, as distinct from involvement in management (Lorsch, 1989; Ward, 1997). It is precisely because board chairmen are supposed to fulfill this oversight responsibility that agency theorists and governance reformists argue for the separation of the chairman and CEO roles (Lorsch, 1989; Ward, 1997). A meta-analysis of prior research, however, concludes that there is no association between the separation of the CEO and chairman roles and corporate performance (Dalton *et al.*, 1998). Although all available portrayals indicate that board chairs (who are not CEOs) operate in a largely non-executive capacity (Vancil, 1987; Lorsch, 1989; Ward, 1997), we can envision that separate board chairs engage in some representational activities (especially Mintzberg’s Figurehead and Liaison roles), thus relieving the CEO of some of these responsibilities. We will include this possibility in our hypotheses and analysis.

WHO NEEDS A COO? A CONTINGENCY PERSPECTIVE

We pose two overarching questions. One seeks predictive insights, the other prescriptive insights: Why do some CEOs have COOs while others do not? And when is it most beneficial to performance to have a COO?

Originating with Burns and Stalker (1961) and Lawrence and Lorsch (1967), contingency theory is based on the premise that the suitability of a structure depends on the situation (Donaldson, 2001), including environmental conditions (Burns and Stalker, 1961), organizational size (Child, 1975), and strategy (Chandler, 1962; Miles and

¹ We rely upon Mintzberg’s definitions of his terms, while recognizing that the general connotation of the term ‘Leader’ encompasses relations with external constituencies; in addition, one can envision an internal ‘Spokesman’ role; and so on.

Table 1. Conceptualizing the CEO/COO task division

Mintzberg's 10 managerial roles arrayed according to their main locus—external or internal						CEOs who have COOs typically establish this division of roles		
	Decisional	Informational	Decisional		Interpersonal	Informational	Informational	Decisional
External	<i>Liaison</i> : 'maintains ... network of outside contacts'	<i>Spokesperson</i> : 'transmits information to outsiders ...'	<i>Negotiator</i> : 'represents the organization at major negotiations ...'	'CEO roles'	<i>Liaison</i>	<i>Spokesperson</i>		<i>Negotiator</i>
Both	<i>Figurehead</i> : 'performs a number of routine duties of a legal or social nature ...'	<i>Monitor</i> : '... seeks and receives wide variety of information ...'	<i>Entrepreneur</i> : 'searches organization and its environment for opportunities ...'		<i>Figurehead</i> —Externally	<i>Monitor</i> —Externally	<i>Entrepreneur</i> —Quantum	<i>Resource allocator</i> —Quantum
				<i>Resource allocator</i> : 'responsible for allocation or resources of all kinds ...'	<i>COO</i> roles	<i>Figurehead</i> —Internally	<i>Monitor</i> —Internally	<i>Entrepreneur</i> —Incremental
								<i>Resource Allocator</i> —Incremental
Internal	<i>Leader</i> : 'responsible for the motivation and activation of subordinates ...'	<i>Disseminator</i> : '... transmits information ... to members of the organization'	<i>Disturbance handler</i> : 'responsible for correcting organizational problems ...'		<i>Leader</i>	<i>Disseminator</i>		<i>Disturbance handler</i>

Adapted from Mintzberg (1973, 92–93).

Snow, 1978). A contingency perspective has been applied to explain a wide array of organization design variables, but it is most often associated with explaining organizational structure, such as the adoption of the divisional form, structural differentiation, formalization, and decentralization (reviewed in Donaldson, 2001).

The logic of contingency theory is one of instrumental utility, or the premise that decision-makers rationally strive to align their organizations with situational conditions, and that their organizations benefit to the degree the alignment is achieved (Lawrence and Lorsch, 1967; Donaldson, 2001). Thus, the contingency view differs from some other well-known perspectives on organizational choice, including the idea that managers imitate others (DiMaggio and Powell, 1983); that managers act on the basis of their filtered and biased understanding of their situations and available options (Hambrick and Mason, 1984); and that managers, to the extent they are allowed, take actions that serve their personal aims rather than shareholders (Jensen and Meckling, 1976). To maintain our theoretical focus, we set these alternative views aside for now. However, we will later return to these other vantages for possible insight.

We present hypotheses regarding three sets of contingency conditions that affect the incidence of the COO position: industry dynamism, organizational task demands, and the CEO's own limitations. For each of these broad constructs, our selection of specific dimensions is guided by two considerations. First is the centrality of the dimension as a determinant of the CEO's workload and his or her ability to carry that load. Second is the amount of attention that executives or journalists have given to specific conditions as rationales for the CEO/COO arrangement. Our set of variables is thus jointly grounded in prior literature on top management work, as well as in the specifics of the espoused aims of the CEO/COO structure.

Our interviews consistently indicated that the decision to have a COO (or not) is largely up to the CEO. Neither the CEOs who had COOs, nor those who did not, reported pressure from their boards regarding their decision. (In contrast, boards often actively advocate the appointments of heirs apparent.) Thus, in portraying the contingency conditions that influence the decision to have a COO, we can generally say that it is the CEO who is making this choice.

Industry dynamism

Conditions in the environment can create considerable task demands on a CEO (Lawrence and Lorsch, 1967; Henderson and Fredrickson, 1996). Highly dynamic industries are particularly taxing, due to large information-processing demands (Galbraith, 1973) and the potential need for quantum changes in strategy (Hamel and Prahalad, 1994). Dynamic industries include those that are high-growth, uncertain, and technology-intensive. In these contexts, the CEO may conclude that the stakes associated with external matters are so great that his or her efforts on those fronts must be maximized. Indeed, some of the most vivid, well-known portrayals of current-day CEO/COO duos are in companies in highly dynamic industries (e.g., Intel, Sun Microsystems, Oracle), where there appears to be a crucial need for external vigilance and periodic strategy reshaping (e.g., Greene, 2000).

When demand is growing rapidly, in a young industry, there are various types of uncertainty—in technological viability, customer preferences, competitive profiles, and distribution/service infrastructure (Hofer, 1975; Porter, 1980). Additionally, industry growth generates an abundance of ambiguous information that must be processed quickly (Eisenhardt and Bourgeois, 1988), and there is a need for frequent strategic adjustments (Porter, 1980). As the industry matures, product features, competitive profiles and customer preferences all become more stable.

Some industries are highly uncertain, not because of growth but because of the unsteadiness, or volatility, of growth (Dess and Beard, 1984). When demand swings widely, decision-making becomes difficult to program, and market positions can shift considerably. Demand instability creates large, non-routine information-processing requirements and represents another instance of high external task demands, in which the CEO may conclude that his or her attention must be devoted to external matters and strategy design, rather than to internal matters.

Finally, technological intensity is another industry characteristic that may cause CEOs to devote themselves to external, strategic roles. Two inter-related factors may lead CEOs in technology-intensive industries to have COOs. First, the information-processing requirements are large. Technology breakthroughs, new competitive developments, and new customer preferences abound

in these industries (Henderson and Fredrickson, 1996; Tushman and Anderson, 1986), creating large amounts of external information that must be processed and acted upon. Second, just as external task demands are great in technology-intensive industries, so too are internal demands. New products, new applications, and new production processes must frequently be developed, each of which is inherently disruptive to organizational routines (Schoonhoven and Jelinek, 1990). These developments require intensive coordination and mutual adjustment of multiple functional areas, all on a recurring basis. Thus, companies in technology-intensive industries face a combination of extraordinary external and internal top management task demands. We can expect that the appointment of a COO is a common way to deal with these pressures.

Hypothesis 1: The degree of industry dynamism will be positively associated with the likelihood that a CEO will have a COO. Dynamic industries include those that exhibit rapid growth, unstable growth, and technological intensiveness.

Organizational task demands

The characteristics of the organization also affect the nature and magnitude of the CEO's workload in ways that can lead to the decision to have a COO. First and most obvious is organizational size, a prominent variable in prior contingency studies (Child, 1975). Size causes complexity, which may necessitate managerial task division and specialization (Donaldson, 2001). Moreover, although large organizations are relatively secure in their environments (Stinchcombe, 1965), they are also highly visible, with attendant obligations and vulnerabilities to external constituencies. Large companies may carry the lion's share of responsibility for lobbying, trade association leadership, and influencing public opinion (Pfeffer and Salancik, 1978). This abundance of explicitly external tasks, when coupled with the inherent scale and complexity of size, will prompt CEOs of large firms to have COOs.

The firm's diversification profile will also influence the decision to have a COO. A well-established construct in the contingency literature, diversification strategy has been found to influence the adoption and effectiveness of structural

arrangements (e.g., Rumelt, 1974), managerial compensation policies (e.g., Balkin and Gomez-Mejia, 1990), and managerial staffing (Michel and Hambrick, 1992). Related diversification particularly creates high executive task demands. Here, the firm is active in an array of product/markets that all share one or more strategic elements (e.g., common customers, technologies, or production processes). Under this profile, each business unit has its own set of external constituents (customers, suppliers, and regulatory authorities), and the most powerful of these constituents expect to be courted by, and have access to, the firm's CEO rather than to deal only with the business unit general manager (Mintzberg, 1973; Pfeffer, 1981). Therefore, external demands on the CEO can be considerable. At the same time, however, internal top management challenges in the related diversified firm are also sizeable. Strategic resource-sharing creates the need for intensive coordination and internal negotiations, often requiring the involvement of the company's top-most executives (Hill, Hitt, and Hoskinsson, 1988).

In contrast, single-business and vertically integrated firms also have need for internal orchestration, but their environments are relatively homogeneous. At the other extreme, unrelated diversified firms have the same environmental heterogeneity as related diversified firms; but, because their business units are non-interdependent, top managers are able to rely on financial control systems, with minimal intervention and orchestration among units (Hill *et al.*, 1988). These corporate profiles are less likely than the related diversified profile to necessitate a CEO/COO duo.

Another factor that shapes executive task demands is the company's reliance on acquisitions as a means of growth. In comparison to internal growth, the use of acquisitions involves quantum, large-stakes moves. An acquisition campaign requires the CEO's concerted involvement—to select targets, conduct negotiations, obtain approvals from the board and shareholders, and plan for integration. If the number or scale of acquisitions is large, the CEO may become almost fully occupied with them (Hampel and Jemison, 1991). In turn, he or she will have a COO to oversee internal, more incremental matters.

Finally, as noted earlier, CEOs who also serve as board chairs carry a heavier load than those who do not. Although the chair position is widely seen as non-executive in nature (Lorsch, 1989; Ward,

1997), it entails some significant responsibilities, including chairing and orchestrating the board's activities, chairing meetings of shareholders, and interacting with external parties ranging from creditors to regulatory bodies. Although there is no systematic evidence about how onerous these activities are, they are clearly nontrivial in the amount of time and attention they demand. Therefore, a CEO who is responsible for these chairman's tasks, on top of his or her executive responsibilities, may feel the need for help with the executive duties and thus have a COO.

Hypothesis 2: The degree of organizational task demands will be positively associated with the likelihood that a CEO will have a COO. Heavy demands exist in firms that are large, highly diversified in a related manner, heavily engaged in acquisitions, and when the CEO also serves as board chairman.

The CEO's limitations

In addition to environmental and organizational task demands, the CEO's own characteristics will affect his or her decision to have a COO. The finite capabilities of CEOs are reflected not only in their strategic choices (Cyert and March, 1963), but also in their basic interpretation and conduct of their tasks (Weick, 1969). We anticipate that CEOs strive to compensate for their limitations in how they staff and structure their senior executive cadre. Specifically, CEOs who are personally ill-equipped to manage internal operations will tend to have COOs to fulfill that role. CEOs can be at a comparative disadvantage in overseeing internal matters because they lack experience in line operating management or lack experience with the firm itself.

Some CEOs rise to their positions with far less operational expertise than others (Fligstein, 1987). Hayes and Abernathy commented on CEOs with primary experiences in finance, accounting, and law, asserting that they are without 'intimate hands-on knowledge of the company's technologies, customers, and suppliers' (Hayes and Abernathy, 1980: 74). Research has found that CEOs with primary experience in finance/law/accounting, or what Hambrick and Mason (1984) called 'peripheral functions,' tend to undertake actions that reflect their backgrounds, including making a large number of (especially

unrelated) acquisitions (Song, 1982; Hitt and Tyler, 1991). CEOs' experiences will also be reflected in their decisions about executive staffing, including the choice about having a COO. Those whose backgrounds are in peripheral functions will recognize their lack of expertise in operational matters and be inclined to appoint COOs.

Some CEOs have themselves been COOs, which directly confers firm-wide operational experience. Those who held the COO title as heirs apparent were expressly given firm-wide operational exposure as part of their grooming process (Cannella and Shen, 2001); those who served as part of a CEO/COO duo similarly have such experience. CEOs who have previously been COOs will be relatively comfortable with operational matters and hence less likely to need a COO. If this expectation is borne out, it will indicate a mechanism that prevents the COO position from becoming institutionalized in firms. That is, there may be a negative autocorrelation between successive CEOs' propensities to have COOs: a CEO who has a great deal of experience as COO will be less likely to need or want a COO, and vice versa.

CEOs also vary widely in their degree of familiarity with their companies. Some are long-term employees who have risen through the ranks, often with exposure to numerous units (Michel and Hambrick, 1992), while others are recent arrivals from the outside (Cannella and Lubatkin, 1993; Dalton and Kesner, 1985). Insiders are familiar with their companies' markets, technologies, and organizations; moreover, they have extensive internal networks (Gabarro, 1987). CEOs from the outside, however, are at a disadvantage in comprehending the inner workings of the firm—its people, culture, and processes. Even though their appointment may signal the board's desire for change, outsider CEOs—particularly those who are early in their tenures—may have difficulty undertaking initiatives that require intricate internal diagnosis, execution, or control (Gabarro, 1987; Vancil, 1987). Outsider CEOs, especially when new on the job, will tend to have COOs to compensate for their lack of familiarity with their firms' internal affairs.

Hypothesis 3: The extent to which an incumbent CEO has professional experiences that limit his or her ability to manage internal activities will be positively associated with the likelihood of having a COO. Limiting experiences include a

background in finance/law, no firm-wide operating experience (as COO), and recent arrival from outside the firm.

Implications for firm performance

Although there is no systematic evidence as to the performance implications of the CEO/COO duo, many managers, consultants, journalists, and board members have strong convictions about the general effect—both positive and negative. We begin by identifying the benefits and costs envisioned by the two camps.

The dominant theme of supporters of the CEO/COO duo is that this arrangement acknowledges the difficulty faced by a single individual in running a contemporary firm (Bass and Stogdill, 1990). According to the ‘two heads are better’ theory (Heenan and Bennis, 1999), a CEO who attempts to lead a company without a COO will be spread thin and do all aspects of the top job poorly. Advocates particularly emphasize that, with a COO, the CEO can spend more time crafting a vision and developing a strategic intent (Hamel and Prahalad, 1994). The CEO can devote more effort to scanning the environment (Aguilar, 1967), learning from outside parties (Granovetter, 1973), and securing and satisfying external resource providers (Pfeffer and Salancik, 1978). Moreover, with a COO, someone is dedicated to overseeing operational affairs, so the internal side of the top management job is conducted better as well—so the advocates say.

The reverse school argues that the costs of COOs generally outweigh the benefits. Some criticize the CEO/COO arrangement because it structurally separates strategy formulation and implementation, causing problems of accountability (Abelson, 1999). Some point to the fact that the insertion of a COO position into an organization adds a hierarchical layer and its attendant costs in time, bureaucracy, and salaries (Murray, 2000). Finally, some skeptics argue that the existence of the COO position signals that the CEO is neither adept at, nor interested in, the internal leadership role and that the organization will suffer as a result (Charan and Colvin, 1999).

Our contingency framework does not lead us to a particular stance in this debate about the main effects of COOs on corporate performance. Still, as the first systematic exploration of this structural arrangement, we will enter the debate by posing

a research question: *Do CEOs who have COOs perform better or worse than those who do not?*

Beyond any main effect, our contingency logic leads us to propose an interaction effect. Our first three hypotheses dealt with the descriptive association between contingency conditions and the incidence of COOs. However, the descriptive alignments we hypothesized will not be universally observed, which will allow us to test for the prescriptive implications of adherence to the contingency logic. We expect that, to the extent that CEOs face the three sets of contingency conditions outlined in Hypotheses 1, 2, and 3, they will perform better with COOs than without. By extension, CEOs who do not face the three sets of contingency conditions, but who choose to have COOs, unnecessarily incur the drawbacks noted above.

Hypothesis 4: To the extent that CEOs face industry dynamism and extraordinary organizational task demands, and have limited capabilities to manage internal operations, their organizational performance will benefit (or be harmed less) by having COOs.

SAMPLE AND METHOD FOR IDENTIFYING COOS

Sample and data sources

Sample selection began by using Compustat to identify all public corporations reporting at least \$200 million in sales for 1987. We identified the primary 2-digit SIC code for each company, and included in our sample any industry that had more than 20 such firms. A total of 21 industries fit this restriction. We used the *Dun & Bradstreet Reference Book of Corporate Management* (D&B) to collect demographic information about the CEOs, and 10K reports for company financial information and lists of officers and titles. These data were available in 1987 for a total of 404 firms in the 21 industries. We then collected annual data on these companies for 1987 through 1996, yielding an overall sample (after missing data and some company attrition) of 3168 firm-years.

Identifying the presence of a COO

Based upon our field interviews and archival research, we adopted the following operational definition of the presence of the COO role: whenever someone other than the CEO holds the

title COO and/or President, and the person is serving primarily as COO rather than as heir apparent. Our research consistently indicated that executives with the 'president' title generally function as COOs (often additionally holding that title). As evidence that president and COO titles are largely interchangeable, we observed only seven firm-years in our overall sample (out of a total of 3168) in which these two titles were held by different executives (other than the CEO).

It was important that we not consider heirs apparent to be in the COO role (even if they held the COO title), because the rationale for their appointment is very different than having an executive dedicated to internal operational activities; it represents a symbolic anointment and puts the person in place for developing a firm-wide perspective in preparation for becoming CEO, ironically often including a large dose of external activities (Cannella and Shen, 2001).

Although there is no airtight way to distinguish between those executives serving in the COO role and as heirs apparent, our research and several validity tests led us to the following approach: if someone other than the CEO held the title President or COO, and was no more than 4 years younger (or was older) than the CEO, we coded that person as a *COO*; if the person was *more* than 4 years younger than the CEO, we coded him or her as an *Heir Apparent*.

Our interviews and archival research guided us in making this COO vs. heir apparent distinction (Vancil, 1987; Cannella and Shen, 2001). Of our three interview cases in which there were clearly heirs apparent, all were at least 4 years younger than the CEO. As one CEO put it, 'No board would endorse the designation of a potential successor who can't serve at least four years.' Others with and without COOs agreed that a person holding the COO title who is within 4 years of the CEO's age, or older than the CEO, is serving as a COO and not as an heir apparent. The obverse, however, cannot be said as reliably. Executives with the COO title who are more than 4 years younger than their CEOs are not necessarily all heirs apparent. In our interviews, we had one case of a 56-year-old CEO who had a 48-year-old COO whom, they both agreed, was serving in what we think of as the COO role. Thus, treating relatively young COOs as heirs apparent will be largely accurate, but still may result in some misclassification. Our statistical analysis will control for this potential problem.

Although our interviews and prior accounts (e.g., Vancil, 1987) led us to our decision rule, we experimented extensively with other rules based on combinations of various age differentials and the CEO's age at the time of the COO's appointment. Our chosen approach performed best in three validity tests. First, when an exhaustive set of industry, firm, and CEO variables was used to predict the presence of an Heir Apparent vs. COO, the statistical discrimination was greatest with our simple 4-year age difference rule. Second, when we examined the eventual fates of variously defined Heirs Apparent and COOs, our chosen rule provided results most in line with the conceptual classifications. Specifically, of those executives we classified as Heirs Apparent, 68 percent became their company's next CEO; in contrast, of those we classified as COOs, only 20 percent became CEOs. Thus, our classification is highly consistent with the *ex post* fates of the executives. As a third validity check, we studied a random sample of 50 press releases announcing the appointments of executives with the COO or President title in our sample. The press releases did not always provide guidance as to whether the person was an heir apparent or not. However, 18 did specify that the person was slated for succession; in every case, the executive was more than 4 years younger than the CEO.

Beyond our efforts to make sure we were using the most valid decision rule, in our analyses we adopted the conservative approach of including a control variable to indicate the presence of an executive we had classified as an Heir Apparent. We also repeated all tests with Heirs Apparent excluded, with results very similar to those we present.

To test our hypotheses, we conducted three distinct sets of analyses. Two were used to test our descriptive hypotheses, seeking to explain the incidence of CEO/COO duos; the third analysis examined the performance implications of having a COO. Because these analyses called for the inclusion of somewhat different variables and data set-ups, we describe each of the three, their measures, and results in turn.

THE CEO'S ANNUAL PROPENSITY TO HAVE A COO: ANALYSIS AND RESULTS

Our first analysis assumes that the decision to have a COO (or not) is implicitly revisited annually.

We pooled all observations for our 10-year window ($n = 3168$) and used random effects logistic regression, where the dependent variable was the presence (1) or absence (0) of a COO for a given firm-year (t). All time-varying independent variables were updated each year, and their lagged values (for $t - 1$, except where noted) were used. To deal with autocorrelation, we used a set of Generalized Estimating Equations (GEE), as suggested by Liang and Zeger (1986a, 1986b). This analysis accounts for any serial correlation, increasing the efficiency of parameter estimates. We fit a GEE model of the following form: $\log(y_{it}/(1 - y_{it})) = x_{it}b$, using a random coefficients estimation procedure (Stata, 1999).

Independent variables

We used three indicators of industry dynamism, all calculated from firm-level data on the 21 industries in our sample. *Industry growth* was the median rate of sales growth (annualized) between $t - 2$ and t . Because industry demand can grow (or shrink) in an unpredictable manner, we also calculated *Industry instability* as the absolute difference in the industry growth rate from $t - 2$ to $t - 1$ vs. from $t - 1$ to t . For example, an industry that grew 2.00 percent between $t - 2$ and $t - 1$, and then shrank by 3.00 percent between $t - 1$ and t would receive an industry instability score of 5.00. *R&D intensity* was the median R&D/sales (for $t - 1$) of companies in the industry.

We used four variables to gauge organizational task demands. The first, *Sales*, was the log of company sales in $t - 1$ (other size indicators, such as assets and employees, yielded similar results). *Related diversification* was measured as by Palepu (1985), using an entropy measure based on the firm's dispersion of sales across 4-digit SICs (within the firm's 2-digit SICs). We experimented with the inclusion of unrelated and total diversification, with no significant effects observed and no changes in other results. Third, we measured the company's *Acquisition activity*, as a count of the number of acquisitions in $t - 1$ that were at least 2 percent of the size of the focal firm (drawn from Securities Data Corporation's Merger and Acquisition Database). We experimented with different size thresholds, counts, and dollar values of acquisitions, with no appreciable differences in results. Fourth, a dummy variable, *CEO is Chair*, was coded 1 if the CEO was board chairman in year t .

The measures used to describe the CEOs, drawn primarily from D&B and 10K reports, were largely time-invariant. When the CEO had spent more time in finance, accounting, or law positions (prior to becoming CEO), we coded *Finance/law CEO* to 1. We identified whether the CEO had held the title of COO or President (prior to being CEO), as an indicator of prior firm-wide operational experience. *CEO never COO* was coded 1 if the CEO lacked such experience. (We experimented with a continuous variable, number of years served as COO, and the results were not changed.) In keeping with prior research on CEO outsiders (e.g., Cannella and Lubatkin, 1993), we coded *Outsider* to 1 if the CEO joined the firm within 2 years of becoming CEO, and zero otherwise.

Control variables

We controlled for an extensive array of factors that might affect the propensity to have a COO but were outside our theoretical scope. We included a continuous *Year* variable (ranging from 1987 to 1996) to control for time trends in the incidence of CEO/COO duos. We also controlled for firm and industry performance in $t - 1$, in the event that CEO/COO duos were a response to poor (or good) performance. Firm performance was measured as return on assets (*ROA*) and market value of common equity divided by book value of common equity (*MTB*). *Industry ROA* and *Industry MTB* were the median values for each industry, also for $t - 1$. We also included the company's *Sales growth* between $t - 2$ and $t - 1$.

As noted earlier, we included a dummy variable coded to one if there was an executive in the firm whom we had classified as an *Heir apparent*. This was a way to mitigate the effects of any misclassifications of COOs and heirs apparent. We also conducted all analyses with heirs apparent completely excluded, and the results did not differ from those presented here.

Finally, we included a variable, *New CEO*, coded to 1 if the CEO was in the first 3 years of his or her tenure. This variable may be relevant in its own right, but we particularly needed it in order to test the hypothesis that Outsider CEOs who are early in their tenures will be likely to have COOs. We experimented with including CEO tenure as a continuous variable; it yielded weaker results in the interaction test just noted and had no effects on the other results.

Results

Table 2 presents descriptive statistics and correlations for all variables. All correlations are under 0.50, so multicollinearity is not a problem. The average incidence of COOs is 0.20. As Figure 1 shows, there was a gradual decline in the incidence of COOs during our timeframe.

Table 3 presents the pooled random effects LOGIT analysis. Model 1 includes only the control variables, several of which were significantly related to having a COO. Year was negatively related, indicating a downward trend in the incidence of COOs over our sample period (Figure 1). The presence of an heir apparent was negatively related to having a COO, which is expected since the two conditions are mutually exclusive. Industry ROA was negatively related to the incidence of COOs. Importantly, however, there was no indication that the firm's performance in $t - 1$ was an impetus for or against having a COO. Finally, new CEOs were relatively unlikely to have COOs. The base model with control variables is highly significant (Wald $\chi^2 = 212$; $p < 0.001$).

Model 2 adds the hypothesized variables, and the significance of the model is greatly increased (Wald $\chi^2 = 267$; $p < 0.001$). The industry variables, however, did not contribute to explained variance; none of the three was significant—not industry growth, instability, or R&D intensity. Among the firm-level predictors, both sales and CEO is Chair were significant in the hypothesized direction. Neither the company's level of related diversification nor its acquisition activity had any association with the incidence of COOs.

The CEO-level variables were all highly related to the presence of COOs. CEOs were more likely to have COOs if their backgrounds were in finance/law; if they had never served as COOs; and if they were outsider appointments. Model 3 adds the interaction of CEO Outsider times New CEO. As hypothesized, New CEOs who had arrived from the outside were relatively likely to have COOs to assist them.

In sum, the decision to have a COO was substantially influenced by the size of the firm, by whether the CEO was also Chairman, and by the CEO's own characteristics—particularly the degree to which the CEO lacked experience in operational activities and in managing the focal firm. The other hypothesized contingency variables did not affect the propensity to have a COO.

The absence of any industry effects was puzzling, in light of the well-established general relationship between environmental conditions and organizational structure (e.g., Lawrence and Lorsch, 1967).² As a way to explore further, we relaxed our search for specific environmental determinants of CEO/COO duos, and instead used a series of 20 dummy variables to designate the 21 industries. As Model 4 of Table 1 shows, all significant results obtained with Model 3 were evident again. To conserve space, we do not show all the industry dummy effects, but a number of them were significant.

² We experimented with a wide array of industry variables beyond those reported here, including measures of competitive volatility (measured as changes in market positions of member firms) and capital intensity. None yielded significant coefficients in any of the analyses we undertook.

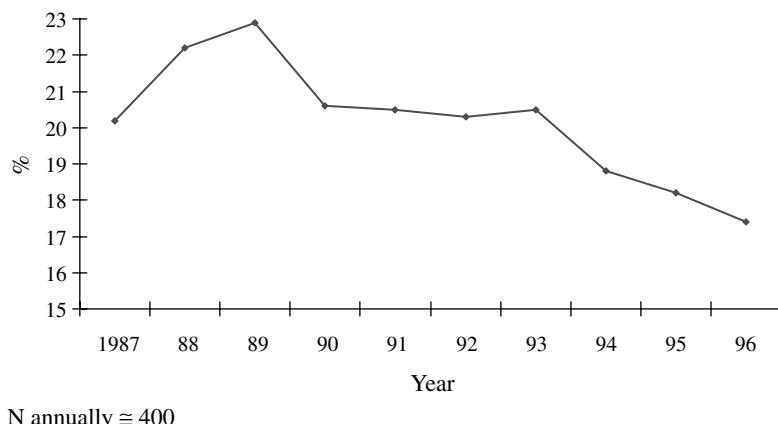


Figure 1. Annual incidence of COOs, 1987–1996

Table 2. Descriptive statistics and Pearson correlation coefficients

		Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	COO	0.20	0.40																		
2	Year	1991.68	2.80	-0.14	-0.03																
3	Heir apparent	0.25	0.43	-0.28	-0.28	-0.02															
4	CEO is Chairman	0.68	0.47	0.19	0.07	0.23															
5	New CEO	0.51	0.50	0.00	-0.10	-0.22	-0.16														
6	Sales growth	8.55	14.57	0.01	-0.02	0.00	-0.03	-0.04													
7	ROA ($t - 1$)	4.60	5.25	-0.04	-0.04	0.01	0.03	-0.04	0.17												
8	Industry ROA ($t - 1$)	3.63	1.49	-0.05	0.07	-0.03	0.00	0.03	0.14	0.36											
9	MTB ($t - 1$)	2.06	1.49	-0.02	0.16	-0.03	0.09	-0.04	0.10	0.42	0.21										
10	Industry MTB ($t - 1$)	1.74	0.45	-0.07	0.40	0.02	0.03	-0.04	0.06	0.21	0.47	0.36									
11	Industry growth	7.07	5.06	-0.03	0.08	0.01	0.00	-0.03	0.35	0.22	0.37	0.06	0.19								
12	Industry instability	4.09	3.87	-0.03	0.08	0.05	-0.01	-0.05	0.14	0.16	0.12	0.18	0.35	0.37							
13	Industry R&D intensity	1.26	1.95	-0.01	0.07	-0.03	0.05	0.03	0.00	0.10	0.13	0.16	0.38	0.17	0.33						
14	Log of sales	7.30	1.43	0.14	0.10	0.00	0.20	0.01	-0.05	0.00	0.04	0.15	0.08	0.03	0.06	0.03					
15	Related diversification	0.14	0.29	0.04	-0.03	-0.03	0.01	0.07	-0.01	0.01	0.08	0.03	0.02	0.07	0.17	0.08	0.19				
16	Acquisition activity	0.10	0.34	-0.01	0.04	0.00	0.03	0.00	0.12	0.05	0.06	0.08	0.11	0.04	0.06	0.06	0.05	0.01			
17	Finance/law CEO	0.18	0.39	0.10	-0.01	-0.01	0.06	-0.01	-0.02	-0.05	-0.07	-0.13	-0.03	-0.06	-0.08	0.00	-0.03	-0.02			
18	CEO never COO	0.68	0.47	0.08	-0.10	0.07	0.00	-0.09	0.03	0.00	-0.08	-0.04	-0.10	0.03	0.00	-0.10	0.00	-0.05	0.05		
19	Outsider CEO	0.14	0.35	-0.01	0.15	-0.03	-0.07	-0.10	0.02	-0.08	0.00	0.01	0.06	0.07	0.09	0.09	-0.09	-0.05	0.01	-0.11	0.00

n = 3168

Table 3. Pooled sample of all firm-years: random-effects logistic regressions. Dependent variable: presence of a COO (0/1)

	Model 1	Model 2	Model 3	Model 4
Intercept	201.65**	276.55***	314.26***	309.93***
Year	-0.11***	-0.14***	-0.16***	-0.13***
Heir apparent	-6.52***	-7.09***	-7.40***	-7.57***
New CEO	-0.43*	-0.46*	-0.78***	-0.88***
Sales growth	0.01	0.01	0.01	0.01
ROA ($t - 1$)	-0.00	0.01	0.01	-0.01
Industry ROA ($t - 1$)	-0.16**	-0.13*	-0.13*	
MTB ($t - 1$)	-0.06	0.02	-0.01	-0.08
Industry MTB ($t - 1$)	0.19	0.44	0.69*	
Industry growth		-0.01	-0.02	
Industry instability		-0.01	-0.01	
Industry R&D intensity		0.04	-0.01	
20 industry dummies				Included
Log of sales		0.38***	0.49***	0.55***
Related diversification		-0.21	0.05	-0.25
Acquisition activity		-0.24	-0.15	-0.15
CEO is chair		2.35***	2.17***	2.64***
Finance/law CEO		1.79***	1.95***	1.38***
CEO never COO		1.21***	1.07***	1.34***
Outsider CEO		0.23	-1.45**	-0.72
Outsider CEO \times New CEO			2.57***	2.39***
Wald χ^2	211.66***	266.77***	260.39***	258.16***
Log likelihood	-945.25	-906.49***	-895.56***	-879.59

N = 3168* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 4 reports the incidence of COOs by industry. Striking is the absence of any underlying pattern in the industry rankings. Not only were our hypothesized indicators of industry dynamism not evident in the rankings; but nor were any others—not capital intensity, degree of regulation, consumer vs. industrial products, or others. Perhaps industries develop inclinations, conventions, or traditions that take them in the direction of having COOs or not; but the incidence is not rooted in any discernible contextual conditions.

COO-PRONE VS. COO-AVERSE CEOS: ANALYSIS AND RESULTS

Our second analysis, following logically from the preceding results which showed that CEO characteristics play a major role in the decision to have a COO, assumes that a given CEO is either generally inclined to have a COO or is not. We identified those CEOs who, during their entire observed tenure in our data panel, never had a COO and compared them to those who had COOs for the majority of their observed tenures. To identify

Table 4. Incidence of COOs by industry

Industry	% Firm-years with COOs
General merchandise stores	48
Electric services	36
Chemicals	35
Grocery & convenience stores	35
Industrial machinery	33
Engineering & lab equipment	30
Iron & steel	28
Banks & S&Ls	26
Insurance	24
Pharmaceuticals	22
Pulp & paper	19
Motor vehicles & parts	18
Electrical equipment	17
Durable goods & parts	15
Metal cans & hardware	14
Asphalt & paving	12
Telephone services	12
Printing & publishing	12
Wholesaling	11
Food & kindred products	11
Personal and business credit (non bank)	10
Natural gas	9

these two extremes, we limited our scope only to CEOs who had 3 or more years of observed tenure (to ensure that a general propensity could be reliably gauged). Of the 525 CEOs who had sufficient tenures, 350 (67%) did not have a COO in any year of their tenures. These we call COO-averse CEOs. At the other extreme, 77 (15%) of CEOs had COOs for over 50 percent of their tenures, and we label them COO-prone. We experimented with other demarcations (including zero vs. 100%, dichotomizing at 50%, and zero vs. 75% or more; we also experimented with limiting the analysis only to CEOs with 4 or more years of tenure). All these variations yielded results highly consistent with those we will report. Additionally, there was no correlation between the CEO's number of observed years of tenure and the incidence of COOs; therefore, the requirement of a minimum of 3 years of observed tenure did not appear to impose a bias.

With the CEO's entire observed tenure as our unit of analysis, our independent variables needed to be adjusted. For time-varying variables, we calculated the average score over the CEO's observed tenure. These included industry growth, industry instability, industry R&D intensity, company sales, related diversification, and acquisition activity. For time-varying dummy variables (CEO is Chair and presence of an heir apparent), we calculated the percentage of years in which the condition existed. Fixed values for time-invariant measures were included (Finance/law CEO, CEO never COO, and Outsider CEO). We did not include any performance variables, because we would not have been able to disentangle whether performance was a cause or an effect of COO propensity.

As a control for temporal effects, we included a continuous variable to indicate the first year the CEO appears as CEO in our panel (e.g., 1993). We included the number of years observed as CEO to control for the possibility that CEOs who have COOs have relatively short or long tenures. Finally, we controlled for CEO tenure-stage effects by including a variable to indicate the CEO's tenure at the start of his or her observed appearance in our panel.

LOGIT results are shown as Table 5, generally corresponding with those found for the annual cross-sectional results reported above. The following hypothesized variables were strongly related to a CEO being COO-prone: Sales, CEO is Chair,

Table 5. COO-averse (0) vs. COO-prone (1) CEOs: logistic regression

	Model 1	Model 2
Intercept	299.41*	319.56*
First year as CEO	-0.15*	-0.16*
Number of years observed as CEO	-0.07	-0.09
CEO tenure at start	0.03	0.03
Heir apparent (%)	-3.87***	-4.14***
Industry growth (avg.)		-0.05
Industry instability (avg.)		0.02
Industry R&D intensity (avg.)		-0.10
Log of sales (avg.)		0.27**
Related diversification (avg.)		-0.18
Acquisition activity (avg.)		1.43
CEO is Chair (%)		2.55***
Finance/law CEO		0.70*
CEO never COO		1.17***
Outsider CEO		0.36*
Pseudo R^2	0.20	0.26
χ^2	92.77***	122.35***

n = 422

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

- COO-averse CEOs are those who never had a COO during their observed tenures (*n* = 350).
- COO-prone CEOs had a COO for more than 50% or more of their observed tenures (*n* = 77).
- 'Avg.' indicates a variable averaged over all years of the CEO's observed tenure.
- '%' indicates the percentage of all years of the CEO's observed tenure in which a condition existed.

Finance/law CEO, CEO never COO, and Outsider CEO. These results were also obtained when we substituted industry dummies for the (non-significant) industry dynamism variables.

PERFORMANCE: ANALYSIS AND RESULTS

In order to examine the performance implications of having a COO, we used the COO-prone vs. COO-averse set-up described above, in which we compared CEOs who had COOs for most of their observed tenure with those who never had COOs. The advantage of this approach is that it avoids the problem of trying to detect any immediate cross-sectional (or short-lagged) performance effects from having a COO; with adequate controls, it also avoids the inherent difficulty in interpreting any observed association as evidence of an effect rather than a cause.

For our performance measures, we used return on assets (ROA), a common accounting-based performance indicator, and market-to-book value of common equity (MTB), which reflects the stock market's assessment of the health and prospects of the firm. As Table 2 indicates, these two performance measures are not redundant ($r = 0.42$). We calculated the average performance of each COO-prone and COO-averse CEO across his or her entire observed tenure in our data panel. We used all the same independent and control variables as in the preceding analysis, and we added two other essential control variables. First was the performance (ROA or MTB) of the company in the year immediately prior to the start of the CEO's observed tenure. This controls for the firm's condition at the outset of the CEO's tenure and for the possibility that the use of a COO was a function of performance. Although not shown in a table, there was no correlation between prior performance and being COO-prone vs. COO-averse; this lack of association corroborates the same result observed in Table 3, in which we saw that the cross-sectional propensity to have a COO was not related to the prior year's performance. Namely, there was no evidence that the decision to have a COO, or not, was a response to low (or high) performance. We

also included the average performance (ROA or MTB) of the industry during the CEO's observed tenure, thus controlling for industry conditions.

We used ordinary least-square (OLS) regression for our analysis. We first included all hypothesized and control variables; next we added the COO-prone vs. COO-averse dummy variable; and then, to test for the hypothesized contingency effects, we alternately added the interaction of each contingency variable and the COO-prone dummy. Table 6 presents results from the first two of these steps, for both ROA (Models 1 and 2) and MTB (Models 3 and 4).

Model 1 shows the main effects of all hypothesized and control variables on ROA. Several were significant: prior ROA, industry ROA, number of years observed as CEO, industry growth, and outsider CEO (negative). The R^2 was 0.22. Model 2 adds the COO-prone (vs. COO-averse) dummy variable, yielding a significant ($p < 0.01$) negative sign, indicating that COO-prone CEOs had lower ROAs during their tenures than did the COO-averse CEOs. The R^2 for this model was 0.26, a significant increase. The coefficient of -1.01 indicates that the ROA differential between the COO-prone and COO-averse CEOs was about one percentage point; for a company with \$1 billion in

Table 6. Performance during CEOs' observed tenures: ordinary least-squares regression

	ROA		MTB	
	Model 1	Model 2	Model 3	Model 4
Intercept	0.11	-0.33	-0.88	-0.77
Prior performance (ROA or MTB)	0.04***	0.04***	0.64***	0.64***
Industry avg. performance (ROA or MTB)	1.35***	1.33***	0.53***	0.51***
First year observed as CEO	-0.01	-0.01	0.00	0.00
Number of years observed as CEO	0.12*	0.10*	0.03*	0.02*
Tenure at start of observation	0.04	0.05	0.00	0.00
Heir apparent (%)	0.66	0.25	-0.23*	-0.37**
Industry growth	0.07	0.07	0.04*	0.04*
Industry instability	0.02	0.02	0.01	0.01
Industry R&D intensity	0.09	0.09	0.05*	0.05*
Log of sales	-0.16	-0.14	0.06*	0.07*
Related diversification	-0.40	-0.42	0.01	0.01
Acquisition activity	-1.90	-1.69	0.21	0.26
CEO is Chair (%)	0.13	0.42	0.19	0.29
Finance/law CEO	-0.74	-0.65	-0.10	-0.07
CEO never COO	-0.13	-0.02	-0.16	-0.11
Outsider CEO	-1.38*	-1.41*	-0.04	-0.05
COO-prone CEO		-1.01**		-0.34***
R^2	0.22***	0.26***	0.30***	0.36***

$N = 405$

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

assets, this would mean a \$10 million annual profit impact.

Model 3 presents the base model for MTB. Several variables were significant: prior MTB, industry MTB, number of years observed as CEO, industry R&D, sales, industry growth, and heir apparent (negative). The R^2 is 0.30. Model 4 adds the COO-prone variable, and, as with ROA, the result is a significantly ($p < 0.001$) negative effect. The R^2 is 0.36. The coefficient of -0.34 indicates that, on average, COO-prone CEOs experienced an MTB that was 34 percentage points lower than for COO-averse CEOs. In sum, across both performance measures, and after controlling for the CEO's starting performance, industry performance, and numerous other factors, there was evidence of a substantial performance penalty associated with COO-prone CEOs, as compared to COO-averse CEOs.

Next we tested for the contingency interactions. We examined the interactions between COO-prone CEOs and each of the hypothesized contingency variables by alternately adding them to Models 2 and 4 (in Table 6), for ROA and MTB, respectively. We do not present a table with these 20 additional regression models, both because of the space required and because there is little meaningful to report. Of the 20 contingency tests, only one interaction was significant: The interaction of COO-prone with company sales was positively related—as hypothesized—to ROA. There were no other significant contingency effects, which indicates that there were no performance benefits from having a COO under any of the other hypothesized contextual conditions—not under high levels of industry dynamism, not under high levels of internal task demands, and not when the CEO had limited operational experience. The strong negative main effect of CEO/COO duos on company performance was, by and large, not offset under the contingency conditions we examined.

The isolated significant interaction effect from COO-prone CEOs times Sales (on ROA) warrants some detail. The coefficient for the interaction term was 0.88, and the coefficient for COO-prone was a sharply negative -7.91. When combined, these coefficients indicate a very severe performance penalty for small and mid-sized firms that had COOs, but also allow us to calculate the only instance of beneficial effects from COOs: Namely, companies with sales above \$9 billion had higher ROAs (on average) with COOs than

without. About 90 percent of all firms in our sample were smaller than \$9 billion in sales, however, thus accounting for the overall negative main effect of COOs on ROA. Since the inclusion of this interaction term added only about one point to R^2 , and there was no similar effect on MTB, we treat this interaction effect as a minor and suggestive finding. Still, advocates of the COO position may find some hope in this result.

DISCUSSION AND SUMMARY

In this initial investigation of the CEO/COO duo, we drew upon contingency theory to develop a rationalist, instrumental argument for the occurrence and effectiveness of this structural form. According to the contingency view, certain task conditions logically call for having a COO; when CEOs face these conditions, their performance will be enhanced by having a COO. Our results, however, provide only partial support for the contingency argument.

Limited explanation from contingency theory

Some, but not all, of the contextual conditions we examined were associated with the incidence of the COO position. In line with the expectation that extraordinary organizational task demands will prompt a CEO to have a COO, we found a strong effect from company size. Prior research has indicated that organizational size brings about structural differentiation and specialization (Donaldson, 2001); our result shows that this phenomenon occurs at the highest executive level. We also found that CEOs are more likely to have COOs when they are also board chairman. We are not aware of evidence indicating the magnitude of the chairman's task in contemporary public corporations, but it may be very substantial (Ward, 1997). CEOs who fulfill these two role sets—as top executive and board chair—may feel the need for assistance from COOs.

Also significant in predicting the presence of a COO were variables indicating the professional limitations of the CEO. CEOs were more likely to have COOs if their own backgrounds were in finance and law; if they lacked firm-wide operating experience as COOs themselves; and if they were hired from the outside and were early in their tenures. To our knowledge, this is the first study

to examine how CEOs structure their executive cadres in ways to complement their own repertoires.

Other hypothesized factors were not associated with the presence of a COO. There was no evidence that highly diversified companies, or companies actively engaged in acquisitions, were inclined to have COOs. Perhaps most notably, there was no evidence that industry dynamism (operationalized in multiple ways) was related to the presence of COOs. This absence of an effect from industry dynamism may have been due to the restricted range of industries we sampled. Perhaps inclusion of newer industries, such as biotechnology or Internet firms, would have yielded an effect for industry dynamism.

A number of the control variables were significantly related to the presence of a COO. However, even when they are factored in, our overall model had an R^2 of only 0.26, indicating that the COO role occurs, or does not occur, largely for reasons beyond our scope. It particularly appears that CEO/COO duos exist for reasons other than instrumental task conditions.

Other potential explanations

If contingency theory provides only a limited explanation of COOs, where else might we turn? First, we could draw upon institutional theory (e.g., DiMaggio and Powell, 1983), particularly the idea that decision-makers in uncertain situations look to others for signs of what works. In partial support of such a view, we found modest evidence (in analyses not shown) that a firm was more likely to have a COO if the biggest firms in its industry had COOs in the 3 prior years ($p < 0.10$); there was no similar imitation of the most profitable firms, however.³ Although this result was weak, it is in line with our finding that industries differ in their inclinations toward COOs (see Table 4). The lack of any apparent pattern in the underlying characteristics of the industries that were COO-prone suggests that symbolic isomorphism may be at work, in which visible adopters are superstititiously imitated (DiMaggio and Powell, 1983).

³ To conduct this analysis, we constructed a variable that counted the number of years, among the prior 3 years, that each of the three biggest firms in the industry had had CEO/COO duos; thus, the variable ranged from zero to nine. We did the same based upon the three most profitable (ROA) firms.

Another explanation for the presence of a COO is that the position becomes institutionalized in the firm (Carroll and Hannan, 2000). Even though some well-known companies have entrenched traditions of CEO/COO duos (e.g., General Motors, as described in Pfeffer and Salancik, 1978), we found no evidence of intra-firm persistence. For instance, we found (in analyses not shown) that the presence of a COO in the firm 5 years prior was unrelated to the presence of a COO in the focal year. If anything, our results point to a negative autocorrelation, insofar as CEOs who had not served as COOs were relatively likely to have COOs, and vice versa. This finding indicates that CEOs have COOs to offset their own limitations, which takes us to a third possible explanation of the decision to have a COO: CEO bias and preference.

Almost 30 years ago, Mintzberg noted, '[the manager's] values, his personality, and his style all contribute to the determination of the work he does' (Mintzberg, 1973: 118). In line with Mintzberg's assertion, we found that CEOs tended to have COOs as a function of their own repertoires. We emphasized an instrumental logic in this association, arguing that CEOs would rationally strive to find ways to offset their own weaknesses. However, other, less instrumental forces may also be at work. It may be that CEOs will have COOs to the extent that they are personally attracted to certain executive roles and wish to avoid others. Accordingly, perhaps the decision to have a COO is rooted in the CEO's self-concept (Wylie, 1974), or deeply held convictions about the kind of manager he or she is.

For instance, CEOs with intensive operating experience may come to see themselves—convincingly and proudly—as 'hands-on managers.' In this vein, one of the CEOs we interviewed, an executive with considerable operational experience himself, said, 'CEOs who have COOs lose touch with their organizations.' Conversely, some CEOs may conceive of themselves as strategists. One CEO commented, 'I'm a big-picture person. I like thinking out big complex puzzles. I'm not good at the nitty-gritty or details; I need a COO for that.' Further, some CEOs may see themselves primarily as members of the business elite, with attendant external obligations and opportunities. Considering the terms commonly used in our interviews and in press accounts to describe the work of COOs—'nitty-gritty', 'nuts and bolts',

'grubby'—it is easy to imagine that some CEOs with high social status or a certain type of self-concept would be unwilling to devote themselves to such affairs. If so, such CEO characteristics as social status (e.g., Palmer and Barber, 2001) and personality (Miller and Droege, 1986) may be important for explaining the decision to have a COO.

Performance implications

Our most notable result is the evidence that CEOs who have COOs deliver lower performance than those who do not. Across two widely accepted and complementary measures (ROA and MTB), and after controlling for prior performance, industry performance, and other factors, we found that CEOs who had COOs showed substantially lower performance. Our data indicate that COO-prone CEOs did not, however, start their tenures with low performance. So, unless CEOs took on COOs because they anticipated future difficulties, we are left with two possible explanations for this negative effect: the CEO/COO duo is an inferior structural form and/or it is a sign of, a proxy for, an inferior CEO.

Critics of the COO position primarily emphasize the drawbacks of the design itself: it formally separates strategy formulation and implementation, which creates problems of accountability and coordination (Abelson, 1999); it adds an organizational layer, which in turn adds cost and bureaucracy, and sends the wrong signal to the rest of the organization about the same (Murray, 2000); and it encourages, almost impels, the CEO to focus on external activities, while minimizing internal activities, thus diminishing his or her effectiveness as organizational leader (Mintzberg, 1973; Charan and Colvin, 1999).

What has not been considered is the possibility that CEOs who choose to have COOs are those who feel most overwhelmed by the CEO job. It may be, for instance, that CEOs who choose to have COOs are not adept at or comfortable managing the internal organization. But, as Mintzberg's (1973) 10 managerial roles (Table 1) suggest, this is basically half of what CEOs are expected to do. Similarly, it may be that CEOs who choose to have COOs are unsure of their ability to manage the job alone; they may subconsciously want a ready scapegoat if things turn bad (Boeker, 1992). These interpretations are speculative and cannot

be explored with our data. But the highly adverse effect we found for CEO/COO duos suggests that future research should address the possibility that it is lesser CEOs who feel the need to have COOs.

Contingency theory did not receive support from our performance findings. Aside from limited evidence that very large firms have higher ROAs if they have CEO/COO duos, there was no indication that CEOs who faced the contingency conditions we examined fared better with COOs than without—not under conditions of industry dynamism, extreme organizational task demands, or limitations of the CEO. Although our selection of contingency variables was guided by prevailing rhetoric about the conditions that favor having a COO, it is possible that important contextual conditions eluded our attention. There may be situations, other than those we studied, in which there are significant benefits from having a COO.

It may also be that the benefits from COOs only present themselves when there are certain combinations of contingency conditions. For instance, perhaps a combination of a high level of acquisition activity and a CEO whose background is finance/law will benefit from having a COO. To explore for such possibilities, we examined over 30 three-way interactions (COO-prone CEO times contingency variable A times contingency variable B), particularly focusing on those variables that had positive coefficients in the simpler two-way interaction tests described earlier. None of these combinations yielded significant results across both performance measures; nor did any yield R^2 increases of more than 0.01. Thus, after comprehensive search, we have been unable to find any combination of conditions in which the CEO/COO form is positively and robustly associated with company performance.

CEOs who have COOs: An agency problem?

If having a COO generally hurts performance, then why do CEOs do it? The answer might be—as the old saw goes—because they can. CEOs derive benefits from having COOs, and they may seize upon these benefits to the extent that agency conditions allow.

The advantages to the CEO in having a COO are potentially numerous and should be explored in future research. Having a COO lightens the CEO's load and may particularly relieve him or her from the more mundane parts of the job. Having a COO

allows the CEO to spend more time externally, often with high-status parties, engaged in endeavors which, while perhaps of some benefit to the firm, also confer significant benefit to the CEO personally, in terms of contacts, status, and stimulation. It may also be that CEOs who have COOs are paid more than those who do not (which is ironic, because they are sharing their job), inasmuch as the COO adds one more executive level that the CEO must be paid above (Simon, 1957). Finally, it may be that COOs provide CEOs with ready scapegoats if performance problems arise (Boeker, 1992).

If having a COO amounts to CEO self-dealing, then we might anticipate that COOs will be found in situations where agency problems exist—when there are few outsiders on the board, when outside directors own few shares, and when shares are widely dispersed without any major blockholders (e.g., Walsh and Seward, 1990). Similarly, the COO position might be expected when the CEO has insignificant shareholdings in the company and/or derives compensation largely from salary or other quasi-guaranteed elements, rather than from incentive pay tied to company performance (e.g., Jensen and Meckling, 1976).

An alternative view, however, is that advocates of the COO position have been so persuasive that the business community has come to believe there are genuine benefits, or at least no major penalties, in having COOs. The management knowledge community consists of consultants, academics, journalists, and gurus who can have profound effects on business practices (Eccles and Nohria, 1992). If someone as eloquent as Peter Drucker advocates top-level job-sharing, and journalists and consultants chime in repeatedly, sometimes invoking vivid cases of successful CEO/COO duos, then the bandwagon is rolling and the COO position becomes highly legitimized (Abrahamson, 1991). It may be that investors, directors, and CEOs are unaware of the drawbacks of the CEO/COO arrangement, which in turn would mean that even vigilant boards are not resistant to it. Perhaps, however, the downward trend in the incidence of COOs over our study period is a sign that executives and directors have recently become more skeptical about the COO position.

This study indicates that the decision to have a COO is a structural choice of considerable consequence. Our use of contingency theory to

explain the incidence of the COO position, however, yielded only limited predictive power. CEOs have COOs either for instrumental reasons that fell outside our scope, or for non-instrumental reasons, such as imitation, personal preference, or self-dealing. A wide array of research opportunities exist to learn more about the determinants and consequences of the CEO/COO arrangement. More generally, our study signals a great need to understand the implications of a host of other top-executive staffing arrangements which, so far, have escaped attention; these include co-CEOs, vice chairmen, predecessor CEOs who remain on the board, interim CEOs, and others.

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APPENDIX 1

Background on executive nomenclature in American corporations

Contemporary U.S. corporations sometimes have elaborate executive structures. For instance, titles of chairman, CEO, president, COO, and vice chairman are all to be found. It is helpful to briefly reconcile the COO position among these various

posts. We refer here strictly to U.S. corporations, since companies in other countries have widely differing executive structures and nomenclatures.

The chief executive officer (CEO) is ‘the executive who has overall responsibility for the conduct and performance of an entire organization, not just a subunit’ (Finkelstein and Hambrick, 1996). In the vast majority of cases (about 70–80%), the CEO is also the chairman of the board (Dalton *et al.*, 1998). Where there is a separate chairman, he or she is usually the former CEO, rather than an independent non-executive director (Vancil, 1987). The title of ‘vice chairman,’ not common, often designates a senior staff executive or trusted advisor to the CEO; it is also occasionally used to bestow status on the former CEO of a large acquisition (Hambrick and Cannella, 1993).

The title of ‘president,’ once universal in American companies, is now used selectively and in multiple ways. Frequently, the CEO will expressly hold the president title (especially if there is a separate chairman). When someone other than the CEO will hold the president title, our research indicates that he or she generally functions as a COO (often additionally holding the COO title), focusing on internal matters while the CEO focuses primarily externally.

APPENDIX 2

Description of Field Interviews

Because there is little formal knowledge about COOs, we sought to ground our research by interviewing executives about the position. We interviewed eight CEOs who (at the time of the interviews) had COOs, their COOs, and five CEOs who did not have COOs. The CEOs were all contacted after participation in senior executive education programs (at which the topic of COOs was not discussed), and they arranged for interviews with their COOs. The executives were from a wide array of industries, including financial services, building products, and technology consulting. The companies, all publicly held, ranged in size from 2000 to 30,000 employees. Interviews were typically 1 hour long and covered a number of issues pertaining to the COO position, most notably: the division of tasks between CEO and COO, the impetus for having a COO (or not), and the role of the board (vs. the CEO) in that decision.

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