

INDUSTRY STRUCTURE AND CEO CHARACTERISTICS: AN EMPIRICAL STUDY OF SUCCESSION EVENTS

DEEPAK K. DATTA^{1*} AND NANDINI RAJAGOPALAN²

¹*School of Business, University of Kansas, Lawrence, Kansas, U.S.A.*

²*Marshall School of Business, University of Southern California, Los Angeles, California, U.S.A.*

Based on 134 CEO succession events in nondiversified, manufacturing firms, this study examines the relationships between industry structure and the characteristics of CEO successors. The paper also explores the performance implications of the fit between industry structure and CEO successors. Results indicate that industry structure plays an important, but not pervasive, role in explaining variations in newly selected CEOs. Specifically, the higher the level of industry product differentiation, the lower the organizational tenure, the higher the educational level and the greater the likelihood of a nonthroughput background in the CEO successor; the higher the industry growth rate, the lower the organizational tenure and age of the CEO successor. However, findings provide very limited support for the normative view that firms which match CEO successor characteristics to industry structure realize better postsuccession performance than those with lower levels of fit. © 1998 John Wiley & Sons, Ltd.

INTRODUCTION

The selection of a CEO successor represents a critical organization decision, one that has attracted considerable research attention. The focus on CEOs is not surprising—organizations are often seen as a reflection of their top managers and the decisions they make (Chaganti and Sambharya, 1987; Hambrick and Mason, 1984). In most organizations the CEO is typically viewed as the ultimate decision-maker and is often the person with absolute authority (Brady and Helmich, 1984). The critical importance of the CEO succession event was also emphasized in a recent review of the executive succession literature by Kesner and Sebor (1994). They described CEO succession as ‘an important, unique and very visible event’, one that often has a profound impact on the organization by trig-

gering other executive changes and resulting in shifts in strategic direction.

Not surprisingly, CEO selection decisions have been extensively studied in the areas of organization theory (e.g., Dalton and Kesner, 1983, 1985), strategic management (e.g., Boeker and Goodstein, 1993; Cannella and Lubatkin, 1993; Datta and Guthrie, 1994) and strategic human resource management (e.g., Guthrie and Olian, 1991). This interest has peaked in recent years as is evident from the number of articles published on the topic (Kesner and Sebor, 1994). While much of the research has focused on the issue of CEO origin (typically the question of insider vs. outsider succession), some researchers (e.g., Datta and Guthrie, 1994) have also examined a broader set of successor CEO characteristics.

The review by Kesner and Sebor (1994), however, highlights an important gap in the CEO succession literature. With relatively few exceptions (e.g., Pfeffer and Leblebici, 1973; Guthrie and Olian, 1991) past research has virtually ignored the *industry context* in studying CEO selection decisions. In another in-depth assess-

Key words: industry structure; CEO characteristics; succession

* Correspondence to: Deepak K. Datta, School of Business, University of Kansas, Summerfield Hall, Lawrence, KS 66045-2003, U.S.A.

ment of this literature, Finkelstein and Hambrick (1996) also note that almost no empirical research has examined the relationships between factors external to the firm (particularly industry characteristics) and CEO successors. Further, no study has examined the performance implications of matching CEO successors to industry conditions. Yet, as the strategic management and industrial organization literatures (Harrigan, 1981; Porter, 1980, 1981; Scherer, 1980; Schmalensee, 1985) have often emphasized, industry conditions constitute a very important context within which organizational decisions (including the choice of the chief executive) get framed and executed. This study seeks to address these critical gaps in the empirical literature on CEO succession by examining the effects of industry antecedent conditions on a variety of CEO successor characteristics and, further, exploring the performance implications of matching CEO successors to their industry environments.

The paper is structured as follows. First, we provide a brief review of past empirical research that has examined the role of the environment in explaining variations in CEO characteristics. Second, we develop a contingency-based theoretical framework to study industry–CEO successor characteristics and use this framework to develop specific research hypotheses. Third, we detail the research methods, including sample selection, measures, and data sources. Fourth, we present the data analytic methods and results. Finally, we discuss the contributions and implications of our study and identify limitations and directions for future research.

PAST EMPIRICAL RESEARCH: INDUSTRY AND CEO CHARACTERISTICS

The literature exploring the relationships between *organizational* factors and CEO successor characteristics is quite extensive. This literature has examined the relationships between CEO characteristics and a broad array of organizational antecedents including firm size (e.g., Dalton and Kesner, 1983; Datta and Guthrie, 1994), performance (e.g., Cannella and Lubatkin, 1993; Schwartz and Menon, 1985; Friedman and Singh, 1989), and firm R&D intensity (e.g., Datta and Guthrie, 1994). In direct contrast, very few studies have

examined the relationships between *industry* (or environmental) conditions and top management characteristics, especially in the context of succession. Pfeffer and Leblebici (1973) examined the associations between industry concentration, growth rate and technological change and CEO age at the time of succession through zero-order correlations. Guthrie and Olian (1991), on the other hand, examined the effect of industry stability on divisional general managers' organizational tenure and age at the time of succession. Both these studies, however, offer only limited insights into industry–CEO successor relationships for the following reasons. First, while industry growth/stability was examined in both these studies, neither study examined the effects of other industry conditions such as product differentiation and capital intensity. Second, Pfeffer and Leblebici (1973) used bivariate analytic methods and Guthrie and Olian (1991) looked at a single industry antecedent, both of which serve to limit the generalizability of their findings.

More recently, Rajagopalan and Datta (1996), using a sample of 410 CEOs drawn from three different time periods, examined the relationships between industry structure and CEO characteristics. They found that industry conditions exercised limited influence on incumbent CEO characteristics in that only seven out of eighteen hypothesized effects were statistically significant. However, their study examined such relationships under equilibrium conditions (with CEOs having been in their positions for at least two years) and not in the context of CEO succession. This distinction is important because it is quite likely that, over time as industry conditions change, the fit between industry structure and CEO characteristics unravels, contributing to the relatively weak findings noted in their study. Misfits, if any, are likely to be corrected at the time of new CEO selection (the focus of the current study). Further, while Rajagopalan and Datta's (1996) study controlled for the effects of firm size and sales growth rate, it did not control for other significant influences on CEO characteristics such as firm-level strategy (e.g., Chaganti and Sambharya, 1987; Thomas, Litschert and Ramaswamy, 1991) and board power (Zajac and Westphal, 1996). Past research highlights that these firm-level factors can play a significant role in the CEO selection process. Hence, the theoretical model tested in our study controls not only for firm size

and sales growth rate but also past performance, firm-level strategy and board power.

In summary, an examination of the past research supports our contention that we have only a very limited understanding of the role played by industry conditions in the CEO selection process, and virtually no evidence on the performance implications of matching new CEOs to industry conditions. These constitute major gaps in the CEO succession literature especially given the extensive attention paid to industry-level phenomena in the wider strategy literature. This literature (e.g., Porter, 1980; Dess, Ireland, and Hitt, 1990) suggests that industry structure has a strong influence on the competitive rules within an industry. Industry has been consistently identified as a critical contingency in firms' strategic choices and as an important determinant of firm performance (Barney and Ouchi, 1986; Hansen and Wernerfelt, 1989). While firms have significant scope for deviating from industry norms and practices (Child, 1972), the underlying structural characteristics of an industry can often serve to restrict the range and types of competitive actions that are undertaken by the firm's top managers (Hambrick and Finkelstein, 1987; Rajagopalan and Datta, 1996). Further, the fit between a firm's strategy and its industry structure can significantly affect its overall performance (Porter, 1980).

The importance of matching managers to industry conditions is also acknowledged in the broader organization theory literature. Thompson (1967), for example, has argued that firms will choose leaders who are likely to be effective in dealing with its critical contingencies, including those posed by the industry context. In a similar vein, Pfeffer and Salancik (1978: 242) postulated that the 'organizational context tends to encourage the selection of administrators appropriate for coping with that context'. A strong endorsement of the contingency role of the industry was also offered by Hambrick and Mason (1984) when they posited that the appropriateness of certain managerial characteristics for effective firm performance is likely to be contingent upon industry conditions. More recently, Gupta (1988: 165) stated that 'the utility of executive leadership characteristics is likely to be equally contingent on organizational environments and organizational strategies.' The theoretical importance of the industry-CEO relationship coupled with the lack of systematic

empirical research in this area served as the primary motivation for the theoretical framework and research hypotheses developed in the following section.

THEORETICAL FRAMEWORK AND RESEARCH HYPOTHESES

While industry structure has been defined along a variety of dimensions in prior literature, we focus on those three characteristics which, from a theoretical standpoint, can be related directly to variations in the types and range of competitive actions pursued in an industry, namely, the degree of capital intensity, product differentiability, and growth rate¹ (Bain and Qualls, 1987; Hay and Morris, 1979; Porter, 1980). Each of these three industry characteristics poses contingencies in terms of the types and range of competitive actions pursued in different contexts. First, *ceteris paribus*, industries which are highly differentiated tend to offer more avenues for competition than industries which are less differentiated. Typically, an undifferentiated product requires firms to attend primarily to cost and efficiency factors (Porter, 1980), restricting the type and the range of competitive actions. In contrast, in industries characterized by high differentiation the means-ends linkages are relatively more complex, thereby offering a wider range of potential options to individual firms (Rajagopalan and Prescott, 1990). Second, industry growth rates influence the availability of opportunities for market expansion, new product introduction and overall levels of competitive variation (Anderson and Zeithaml, 1984; Hambrick and Lei, 1985). High-growth industries are characterized by unprogrammed decision making and poorly understood means-ends linkages (Hambrick and Abrahamson, 1995), again resulting in a wider variety of competitive

¹ Industry concentration has been identified as another key aspect of industry structure in prior literature (e.g., Porter, 1980). However, the theoretical effect of concentration on competitive actions is ambiguous. While managerial discretion theorists (e.g., Hambrick and Finkelstein, 1987) have related lower levels of concentration to greater range of competitive behaviors, at the lowest levels of concentration (e.g., perfect competition) economic theory postulates very little scope for managerial discretion. Prior empirical research here (e.g., Rajagopalan and Datta, 1996) has also yielded mixed findings into the effects of concentration, indicating that research findings may depend upon the observed range of this variable.

behaviors. Finally, under *ceteris paribus* conditions, the greater the degree of capital intensity, the greater the emphasis on efficient asset management and cost control. A firm in a capital-intensive industry is generally committed to a course of action as capital intensity often creates rigidity in production processes such that new products and markets cannot be accommodated without incurring high costs (Ghemawat, 1991; Hambrick and Lei, 1985). Thus deviations from past practices are much lower in capital-intensive industries, often restricting the range of competitive actions pursued to those primarily used in the past (Hambrick and Finkelstein, 1987). Further, capital-intensive industries are more likely to value efficiency-oriented competitive behaviors because cost control often is a key success factor in such contexts (Porter, 1980).

The types and range of competitive actions required in different industries, in turn, have important implications for the cognitive attributes and the type of knowledge desired in the incoming CEO. The cognitive attributes of an individual influence how that individual perceives any situation and chooses between various alternatives (March and Simon, 1958). Specifically, these attributes affect (1) how information is gathered and processed (Finkelstein and Hambrick, 1996), (2) the breadth of problem framing and alternative identification (Dearborn and Simon, 1958), and (3) the willingness to undertake change (Hambrick, Geletkancyz, and Fredrickson, 1993). The type of knowledge possessed by an individual can also serve to restrict his/her information processing, alternative framing and choice behaviors. The more specialized the knowledge base, the greater the likelihood that the individual will view problem situations from a narrow, specialized perspective and make choices consistent with the specialized knowledge. In contrast, the broader the knowledge base the wider the range of options likely to be explored. Overall, then, variations in the cognitive attributes and type of knowledge possessed by the CEO are likely to manifest themselves in variations in their strategic choices and, hence, the types and range of competitive actions pursued by them.

Consistent with Hambrick and Mason's (1984) recommendations, past CEO research has typically used observable demographic characteristics such as age and organizational tenure, as proxies for underlying cognitive attributes. While we

recognize that demographic variables are perhaps weak proxies for the underlying cognitive dimensions of interest, they have several advantages from a research perspective. First, data can be readily obtained from unobtrusive, secondary sources. Hence, from a practical standpoint, they can be used more readily for executive selection and competitor analysis (Gupta, 1988). Second, they permit ready comparisons across different studies and, hence, cumulative theory building. Moreover, some demographic attributes, such as functional background, do not even have comparable psychological measures (Finkelstein, 1988). Third, demographic characteristics can be obtained more easily for large samples. In contrast, cognitive measures require personal involvement from top managers and could yield very small samples with limited statistical power and generalizability.

The above arguments lead to our overall theoretical framework (see Figure 1) which adopts a contingency perspective and argues that variations in industry structure (along the dimensions of product differentiation, growth rate, and capital intensity) will affect the types and range of competitive actions considered appropriate in different contexts and will, therefore, affect the cognitive attributes and type of knowledge desired in the top decision-maker. Moreover, based on prior CEO demography literature (Finkelstein and Hambrick, 1996), we argue that variations in cognitive attributes can be captured by four key demographic attributes of the CEO successors: organizational tenure, age, educational level, and functional background. Next, we use this framework to develop specific research hypotheses.

Industry product differentiation and CEO successor characteristics

In differentiated industries there are typically multiple ways in which firms can choose to create and maintain competitive advantage (Porter, 1980; Rajagopalan and Prescott, 1990). Such industries provide a wider latitude for strategic choice and greater possibilities for breaking from past practices and norms—deviations from the past are less likely to be prohibitive due to lower sunk costs (Sutton, 1991). Consequently, in differentiated industries knowledge of historical factors and events may be less relevant to current decisions than in undifferentiated industries. How-

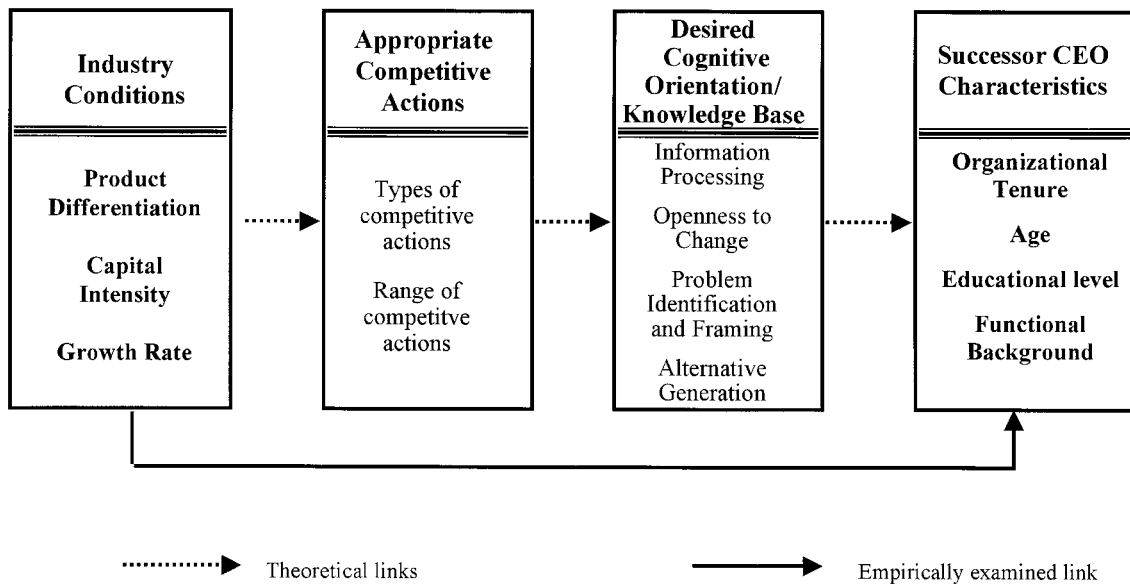


Figure 1. Research framework

ever, the availability of multiple options and less continuity of past practices also implies that cause-effect relationships cannot be as easily understood in such industries. Hence, the ability to deal with ambiguity, to pursue novel options and to assess information and alternatives from a variety of perspectives become valued cognitive traits in top executives.

The desired cognitive attributes in highly differentiated industries implies that both age and organizational tenure are less likely to be valued in such contexts. Greater organizational tenure is likely to be accompanied by narrower past experience and knowledge base. As such, there is a greater likelihood that such executives will have restricted information sources and engage in less information gathering and analysis (Miller, 1991; Tushman and Romanelli, 1985). Moreover, executives with high levels of organization-specific experience are more likely to frame problems and identify alternatives based on their past experience with that firm (Finkelstein and Hambrick, 1996). These arguments are consistent with empirical evidence that has found positive relationships between executives' organizational tenure and commitment to status quo (Hambrick *et al.*, 1993) and negative relationships between organizational tenure and the likelihood of strategic change (e.g., Bantel and Jackson, 1989; Finkelstein and Hambrick, 1990). The effects for

age are similar to those found for organizational tenure. Past work (Bantel and Jackson, 1989; Hambrick *et al.*, 1993; Wiersema and Bantel, 1992) has associated age with commitment to status quo, less likelihood of strategic change, and limited exploration of new alternatives. These attributes are more suited to industries exhibiting greater commitment to past strategies and may not be consistent with the cognitive requirements posed by highly differentiated environments.

In contrast, research suggests that industries which offer greater scope for product differentiation are likely to value higher levels of education in their top managers. Based on the premise that formal education reflects an individual's cognitive ability, particularly 'open-mindedness,' researchers have found that education is associated with greater receptivity to innovation (Becker, 1970; Kimberly and Evanisko, 1981; Rogers and Shoemaker, 1971). Positive associations between executive education levels and organizational innovation have been observed in samples of commercial banks (Bantel and Jackson, 1989), computer firms (Thomas, Litschert, and Ramaswamy, 1991), and diversified firms (Wiersema and Bantel, 1992). In a more direct examination of the link between education and cognitive attributes, Wally and Baum (1994) found a strong positive relationship between educational levels and a measure of cognitive

complexity, the ability to discern patterns, and distinguish among objects. All these studies support the view that higher levels of education are associated with the cognitive attributes considered desirable in highly differentiated industries.

Finally, differentiated environments are more likely to value output-oriented functional backgrounds such as marketing and product R&D (Hambrick and Mason, 1984) than throughput-oriented functional backgrounds (such as production and process R&D) in view of past research that has found positive relationships between executives' output-related backgrounds and product differentiation/innovation strategies. Chaganti and Sambharya (1987), for example, found that companies which had a product differentiation strategy in the tobacco industry had proportionately more executives with marketing and product R&D (i.e., output-oriented) backgrounds and fewer with throughput-oriented backgrounds (such as manufacturing, process R&D, and accounting). Thomas *et al.* (1991) also found significant positive relationships between product differentiation and innovation strategies and output-oriented functional backgrounds in CEOs; in contrast, CEOs in firms pursuing efficiency-oriented, nondifferentiated strategies were primarily from throughput-oriented functions.

The arguments presented above lead to the first set of research hypotheses:

Hypothesis 1a: Industry product differentiation will be negatively related to the successor CEO's organizational tenure.

Hypothesis 1b: Industry product differentiation will be negatively related to the successor CEO's age.

Hypothesis 1c: Industry product differentiation will be positively related to the successor CEO's educational level.

Hypothesis 1d: Industry product differentiation will be negatively associated with the likelihood of the successor CEO having a throughput functional background.

Industry growth rate and CEO successor characteristics

The contingencies posed by industry growth also influence the desired cognitive attributes in incoming CEOs. Industry growth is typically

associated with change and the availability of multiple options. Rapid growth tends to attract new industry entrants (Sutton, 1991) who often tend to pursue strategies different from those of incumbent firms in order to stake out their competitive positions. A rapidly changing set of industry participants (whose competitive behaviors cannot be easily predicted), in turn, can contribute to causal ambiguity and uncertainty about the future. In such contexts, the ability to adapt quickly to emerging conditions is crucial—such environments are likely to value innovation and change rather than adherence to the status quo. Moreover, the types of information that need to be processed in high-growth environments are also likely to be more complex than in relatively more stable, low-growth environments (Kotter, 1982). In other words, high-growth environments are likely to value cognitive attributes such as the ability to explore and evaluate multiple options, deal with causal ambiguity, and greater propensity for risk-taking.

Based on arguments similar to those presented in the context of industry differentiation, it is likely that both organizational tenure and age are not likely to be valued as much in high-growth industries as they are in low-growth environments. In addition, Miller (1991) offers evidence that older executives and those with higher organizational tenures might be 'stale in the saddle,' i.e., inertia accompanies long tenure and age. Such executives are more likely to be characterized by greater cognitive rigidity and display greater psychological commitment to the status quo (Hambrick *et al.*, 1993)—attributes not likely to be valued in industries which require constant adaptation and realignment due to growth. Executives with high levels of firm-specific specialization are also likely to be more focused, with a greater propensity to reinforce stable processes and structures even in threatening conditions (Staw, Sandelands, and Dutton, 1981), a factor which makes high levels of firm experience less desirable in high-growth environments.

High educational levels are likely to be desirable in high-growth environments given that education is generally associated with openness to change, greater tolerance for ambiguity, and increased ability to process multiple alternatives (Becker, 1970; Dollinger, 1984). Consistent with this premise, Norburn and Birley (1988) found a positive relationship between educational levels

of top executives and company growth in three of the five industries they studied. Additionally, Guthrie, Grimm, and Smith (1991) also found a positive relationship between industry rate of change and educational levels in the top managers.

Finally, nonthroughput/output functional backgrounds of successor CEOs rather than throughput backgrounds are more likely to be valued in high-growth industries. Such industries are likely to emphasize innovation and change, increasing the desirability of output functional backgrounds (Chaganti and Sambharya, 1987; Thomas *et al.*, 1991). In contrast, low-growth environments are likely to value throughput functional backgrounds, given the need to emphasize cost-cutting and other efficiency measures to maintain profit levels (Harrigan, 1981). Indirect support for the expected relationship between functional background and industry growth rate also comes from the study by Gupta and Govindarajan (1984). They found a positive relationship between the number of years that general managers had spent in marketing and sales (nonthroughput functions) and their tolerance for ambiguity. Because managers in high-growth environments have to deal with more exogenous, uncontrollable factors, they are likely to benefit from higher tolerance for ambiguity and, hence, output-related functional backgrounds.

The arguments and research evidence discussed above lead to the next set of research hypotheses:

Hypothesis 2a: Industry growth rate will be negatively related to the successor CEO's organizational tenure.

Hypothesis 2b: Industry growth rate will be negatively related to the successor CEO's age.

Hypothesis 2c: Industry growth rate will be positively related to the successor CEO's educational level.

Hypothesis 2d: Industry growth rate will be negatively associated with the likelihood of the successor CEO possessing a throughput functional background.

Industry capital intensity and CEO successor characteristics

Capital intensity tends to constrain individual firms' competitive behaviors in several ways.

First, firms in capital intensive industries are generally committed to a course of action due to the high investment in fixed assets (Ghemawat, 1991; Harrigan, 1981). This, in turn, leads to a high degree of continuity of past practices and decisions in the present are often constrained by past resource commitments. Second, the efficient management of assets is very critical in such environments and novel strategies (characterized by greater experimentation and higher risk of failure) are less likely to be valued. Third, knowledge of what worked and did not work in the past (in the industry as well as in the particular firm) is crucial to avoiding costly mistakes. Overall, in terms of desired cognitive attributes and knowledge in the incoming CEO, capital intensity is associated with greater relevance of past knowledge, lower need for experimentation and innovation, and higher need for specialized knowledge.

In terms of implications for desired demographic attributes, the contingencies posed by high capital intensity suggest that older CEOs and CEOs with more firm-specific experience are likely to be valued. Support for these arguments comes from studies by Chaganti and Sambharya (1987) and Thomas *et al.* (1991), who found that executives with higher levels of firm tenure tended to pursue stability and efficiency-oriented strategies. Additionally, Gupta (1984) has argued that CEOs with greater organizational familiarity (due to longer tenures) are more likely to be knowledgeable about options to achieve greater efficiency in an organization. Similarly, past work has associated age with greater conservatism and less risk-taking (Child, 1974; Hart and Mellons, 1970) and greater commitment to the status quo (Hambrick *et al.*, 1993)—attributes likely to be valued in more capital-intensive contexts. While age and high levels of firm-specific experience may result in restricted information processing and less openness to change, the context associated with high capital intensity often reduces the need for change and the necessity for a broader perspective on the part of the CEO. Capital intensity, primarily because of asset intensity, also enhances the desirability of functional experience and backgrounds oriented towards efficiency and cost-cutting. Hambrick and Mason (1984) associate throughput-oriented functional backgrounds with increased emphasis on the efficiency of the transformation process. Con-

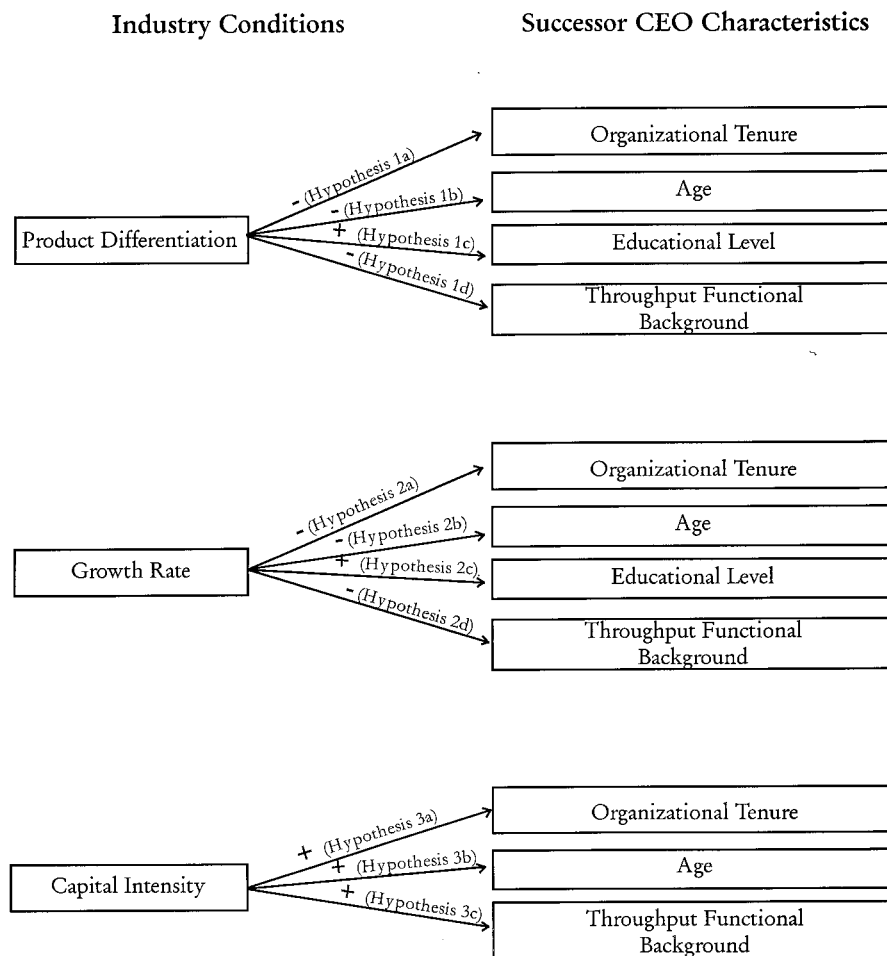


Figure 2. Industry conditions and CEO characteristics: Hypothesized relationships

sistent with their theoretical argument, Chaganti and Sambharya (1987) found significant positive relationships between top managers' throughput functional experience and efficiency-oriented strategies. These arguments lead to the next set of hypotheses tested in our study:²

Hypothesis 3a: Industry capital intensity will be positively associated with the organizational tenure of the successor CEO.

Hypothesis 3b: Industry capital intensity will be positively associated with the successor CEO's age.

Hypothesis 3c: Industry capital intensity will be positively associated with the likelihood of the successor CEO having a throughput functional background.

The relationships described in Hypotheses 1–3 are illustrated in Figure 2. Figure 2 also identifies the direction of the hypothesized association between each industry variable and relevant successor CEO characteristic.

Performance implications of matching successor CEO's characteristics to industry structure

The contingency framework presented in Figure 1 and the research hypotheses developed from this framework reflect an underlying normative

² In the absence of compelling theoretical arguments no relationship is postulated for the CEO successor's educational level.

assumption: Firms match CEO successors to industry structure because CEO characteristics are likely to influence their choices in terms of the types and range of competitive actions and these choices, in turn, will affect the overall performance of the firm. Hence, firms that successfully match their new CEOs to the contingencies posed by industry structure should realize better performance than firms which achieve less of a fit between industry and CEO characteristics. In other words, in the postsuccession period, we should expect the hypothesized relationships between industry and the characteristics of CEO successors to be supported more strongly for high-performing firms than for low-performing firms.

Consistent with the above arguments, we posit the following final hypothesis:

Hypothesis 4: In the postsuccession period, high-performing firms will be characterized by a stronger fit between industry conditions and CEO characteristics than low-performing firms.

METHODS

Sample and time frame

The sample for this study was derived from CEO successions in nondiversified U.S. manufacturing firms during the 1977–87 time period. Several criteria were used in sample selection. First, in order to be included in the sample, each firm had to derive at least 70 percent of its sales from a single 4-digit manufacturing industry in the year of succession and in each of the preceding 5 years. Data to assess the firms' sales compositions for these years were collected from Compustat Business Segment tapes, annual 10k reports and *Ward's Directory of the Largest U.S. Public Corporations*. Nondiversified firms were chosen because relationships between industry characteristics and the presuccession experience of CEOs can be more directly assessed for nondiversified firms. As argued by Gupta (1988), industry-specific skills and experience of the CEO become more relevant for firms competing primarily in a single business. Second, we limited the sample to relatively large (sales revenues greater than \$100 million) firms since relationships between industry structure and individual firms' behaviors

are likely to be most pronounced for the principal firms in an industry (Williamson, 1963). Third, the firms had to be publicly traded so that comparable data on organizational variables and CEO characteristics could be obtained from published sources. Fourth, given the various differences between manufacturing and service firms (Nayyar, 1992), we restricted the sample to manufacturing firms in order to minimize heterogeneity in operating contexts which stems from factors other than the industry characteristics considered in the study. These selection criteria and data availability on all study measures resulted in a final sample of 134 CEO successions over the 1977–87 time period. These 134 succession events occurred in a sample of 119 firms—104 of these experienced only one succession during the study time period and the remaining 15 experienced two successions each. These 119 firms represented 40 4-digit manufacturing industries³—the number of successions in each industry varied from a minimum of 3 to a maximum of 12 with an average of approximately 3.5 successions per 4-digit industry.⁴

Measures and data sources

Independent variables

The three industry antecedent variables were defined as follows. *Capital intensity* was defined as the ratio of the industry's gross book value of assets to value of annual shipments (Lawless and Teagarden, 1991). For this measure, the most recent available data⁵ were obtained from the *U.S. Census of Manufactures*. *Industry growth rate* was defined as the average annual growth

³ The 4-digit industries in the sample came from a wide variety of industries such as food products, paper products, chemicals, petroleum refining, machinery, electronic equipment, transportation equipment, measuring instruments, games, and toys. A complete list of 4-digit SICs included in the sample can be obtained from the authors.

⁴ We reran the regressions subsequently reported after dropping the industries with minimum and maximum number of successions and the results did not change—this indicates that the results reported in this study are not affected by under- or over-representation of particular industries.

⁵ Whereas value of shipments data are available on an annual basis, gross book value of assets data are only provided at intervals of 5 years in this data base. Hence, the data available for the year closest to the year of succession had to be used. Corresponding to the time period chosen for this study, these data were available for 1977, 1982, and 1987.

rate in value of shipments in the 3 years preceding the year of succession (Hambrick and Abrahamson, 1995; Rajagopalan and Datta, 1996). The value of shipments data was adjusted for inflation using GDP implicit price deflators (*Economic Report of the President, 1993*). Finally, *product differentiation* was operationalized as the degree of advertising intensity in the industry and defined as advertising expenses as a percentage of sales (Rajagopalan and Prescott, 1990); this measure was obtained from the *Troy Almanac of Key Business and Industrial Financial Ratios*. The average value for the 3 years prior to succession was used.

Control variables

Based on prior CEO succession literature seven control variables were defined as follows. First, *industry concentration* was defined as the 4-firm concentration ratio (Bain and Qualls, 1987; Harigan, 1981) and data for this measure were obtained from *U.S. Census of Manufactures* (again, since these data are only available at 5-year intervals, the year closest to the year of succession was used). Second, several firm-level controls were defined and data to compute these measures were obtained from *Annual Compustat* tapes. *Firm size* was operationalized as the natural logarithm of the average number of employees in the 3 years prior to succession (e.g., Dalton and Kesner, 1983; Guthrie and Olian, 1991). Past performance was defined as *relative firm performance* and measured as the average of the ratio of the firm's return on assets (ROA) to industry ROA for the 3 years prior to succession in order to control for interindustry variations in performance (Finkelstein and Hambrick, 1990). Firm ROA was obtained from Compustat tapes and industry ROA was obtained from *Dun & Bradstreet's Industry Norms and Key Business Ratios*. Corresponding to the three industry antecedent variables, *relative firm capital intensity* was defined as firm capital intensity divided by industry capital intensity; *relative firm advertising intensity* was defined as firm advertising intensity divided by industry advertising intensity, and *relative firm sales growth rate* was measured as firm growth rate divided by industry growth rate. All these measures were again averaged for the 3 years prior to succession. Relative measures rather than absolute measures were used in order

to control for interindustry variations in firm-level factors and to permit the pooling of these measures into a single sample (Finkelstein and Hambrick, 1990). Finally, given that past research (Zajac and Westphal, 1996) highlights the importance of corporate governance mechanisms in CEO selection process, we control for board power. Two different measures of board power were obtained from annual corporate proxy statements for the 3 years prior to succession—percentage outsiders on the board (Zajac and Westphal, 1996) and percentage of the firm's total equity held by outside board members (Hoskisson, Johnson, and Moesel, 1994). Both these measures were standardized and summed to yield a composite measure of *board power* (Zajac and Westphal, 1996). The inclusion of firm-specific correlates for each industry variable and board power also makes the theoretical model tested in this study more completely specified than Rajagopalan and Datta's (1996) recent study of incumbent CEOs.

Dependent variables

Organizational tenure of the CEO successor was measured as the number of years the CEO had served in the firm prior to the year of succession (Singh and Harianto, 1989). The CEO successor's *age* was measured as the number of years from the year of birth to the year of succession. CEO *educational level* was measured on a 7-point scale based on the highest degree earned by the CEO (Finkelstein, 1988) as follows: 1 = high school, 2 = some college, 3 = undergraduate degree, 4 = some graduate school, 5 = masters degree, 6 = attended doctoral program and 7 = doctorate degree. Following Hambrick and Mason (1984), *functional backgrounds* of newly selected CEOs were classified into 'throughput' or 'nonthroughput' categories. More specifically, executives with dominant functional experience in production and operations, process R&D, and accounting were categorized as having 'throughput' functional backgrounds and those with dominant functional experiences in all other functional areas were categorized as having 'nonthroughput' functional backgrounds.⁶ Data on all CEO successor charac-

⁶ Our definition of nonthroughput functional backgrounds includes Hambrick and Mason's 'output-oriented' functions (marketing, merchandising, and product R&D) and their 'per-

teristics were collected from *Dun & Bradstreet's Reference Book of Corporate Management* and *Who's Who in Finance and Industry*. These four variables served as the dependent measures to test Hypotheses 1–3.

Finally, in order to test Hypothesis 4, the dependent measure was defined as the post-succession improvement in firm performance and measured as average relative firm ROA in the 3 years following succession minus average relative firm ROA in the 3 years prior to succession. Return on assets has been widely used in the literature as a measure of firm performance (Hill and Snell, 1988) and averaging ROA provides a more accurate picture of firm performance than would ROA from a single year (Zajac, 1990). We used the change in firm performance rather than an absolute measure as the dependent variable because the change in performance can be more directly related to the succession event; in contrast, absolute measures of postsuccession performance are more likely to reflect enduring performance effects carried over from the pre-succession period.

DATA ANALYSIS AND RESULTS

Table 1 presents the means, standard deviations and zero-order correlations among all study variables. The average values for successor CEO age (50.5 years), organizational tenure (14.6 years), and educational levels (at least graduate-level education) are very comparable to the statistics reported in other studies on CEO succession (e.g., Forbes and Piercy, 1991) in manufacturing firms. Also, consistent with the nature of the sample (only manufacturing firms), most CEOs had throughput functional backgrounds (72%) as opposed to nonthroughput functional backgrounds (28%). Average values and standard deviations on the measures of industry characteristics indicate reasonably high variance in the underlying sample, indicating that the sample does not reflect idiosyncratic industry conditions. The lack of high correlations ($r \geq 0.40$) between any of the independent or control variables indicates that multi-

collinearity did not pose a problem in these data. Further, it confirms this study's assumption that the underlying structural attributes of an industry do not covary significantly and their effects need to be assessed independently.

Two types of data analytic methods were used. For the continuous dependent measures of organizational tenure, educational level, and age, ordinary least-squares (OLS) regressions were estimated. For the categorical dependent measure of functional background, logistic regression was estimated (Aldrich and Nelson, 1984), where the dependent measure took a value '1' if the CEO successor was categorized as having a throughput functional background and '0' otherwise. For each of the four dependent CEO variables two stepwise regression models were estimated. The first model (Model I) included only the control variables (industry concentration, firm size, relative firm performance, firm growth rate, firm capital intensity, firm advertising intensity, and board power). The second model (Model II) added the three hypothesized industry effects (product differentiation, growth rate, and capital intensity) to the control variables model.

The results of the OLS and logistic regressions used to test research Hypotheses 1–3 are presented in Table 2. The table also reports the statistics used to assess the significance of the incremental variance explained by the hypothesized industry effects.

The first overall conclusion that can be drawn from Table 2 is that the hypothesized industry effects explained a significant portion of the variance for each of the four dependent CEO measures even after controlling for several firm-level effects. For CEO organizational tenure the incremental R^2 between Model II (full model) and Model I (control variables only) was 9.7% ($p < 0.01$), for CEO educational level it was 5.3 percent ($p < 0.05$), and for CEO age it was 5.1 percent ($p < 0.05$). For throughput background, the change in chi-square from Model I to Model II was significant at $p < 0.05$. Findings for specific hypotheses are discussed next.

Three out of four hypothesized effects for industry product differentiation (measured as advertising intensity) were statistically significant. As hypothesized, industry advertising intensity was negatively associated ($p < 0.01$; incremental $R^2 = 3.57\%$) with the successor CEO's organizational tenure (Hypothesis 1a), positively

ipheral' functions (law and finance) as well. In our sample, 24 percent of CEO successors had output backgrounds and only 4 percent belonged to the peripheral category, indicating that they could be combined into a single category.

Table 1. Means, standard deviations, and correlations ($N = 134$)

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. CEO organizational tenure	14.60	12.24	–												
2. CEO throughput background	0.72	0.35	0.03	–											
3. CEO educational level	3.85	1.37	–0.21**	–0.36***	–										
4. CEO age	50.56	7.03	0.34***	0.04	–0.08	–									
5. Industry concentration	39.73	15.49	0.13	0.10	–0.01	0.21**	–								
6. Industry capital intensity	32.70	23.34	0.14	0.06	0.02	0.12	0.13	–							
7. Industry advertising intensity	1.25	1.40	–0.21**	–0.19*	0.21**	–0.07	–0.20**	–0.05	–						
8. Industry growth rate	5.54	14.22	–0.14	–0.02	0.01	–0.25**	–0.01	–0.20**	0.01	–					
9. Firm size	6.55	1.96	0.42***	–0.06	0.03	0.52***	0.10	–0.07	–0.17*	0.06	–				
10. Firm relative capital intensity	0.87	0.88	0.02	0.01	0.07	0.11	0.18*	0.29***	–0.11	0.09	0.09	–			
11. Firm relative advertising intensity	0.34	0.44	–0.28***	–0.02	0.15	–0.17*	–0.09	–0.04	0.24**	0.04	0.32***	–0.06	–		
12. Firm relative growth	–0.12	10.42	0.05	–0.06	–0.09	0.03	0.05	0.07	0.04	0.12	0.05	0.09	0.01	–	
13. Firm relative past performance	0.79	1.19	0.08	–0.02	0.09	–0.13	–0.12	0.00	0.05	0.01	–0.03	–0.13	0.12	–0.04	–
14. Board power	–0.03	1.46	–0.08	–0.23**	0.04	–0.09	0.01	0.01	0.04	0.03	0.21**	0.10	0.07	–0.03	0.26**

Significance levels: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Table 2. Results of regression^a analysis: pooled sample ($N = 134$)

Variables	Organizational tenure		Age		Educational level		Throughput background	
	Model I	Model II	Model I	Model II	Model I	Model II	Model I	Model II
Intercept	-2.718 (3.575)	1.145 (4.635)	40.447*** (2.016)	36.709*** (2.016)	3.231*** (0.455)	2.321*** (0.640)	0.373 (1.020)	2.028 (1.313)
<i>Controls</i>								
Industry concentration	0.146** (0.057)	0.141** (0.057)	0.073* (0.034)	0.079* (0.034)	0.004 (0.007)	0.004 (0.007)	0.029† (0.017)	0.024 (0.017)
Firm size	2.953*** (0.475)	3.035*** (0.457)	1.583*** (0.284)	1.496*** (0.279)	0.087 (0.062)	0.120* (0.060)	-0.085 (0.121)	-0.137 (0.129)
Relative firm performance	0.735 (0.798)	0.652 (0.755)	-0.481 (0.467)	-0.182 (0.461)	0.076 (0.096)	0.077 (0.095)	0.131 (0.232)	0.186 (0.259)
Relative firm capital intensity	0.251 (0.417)	0.134 (0.415)	0.210 (0.231)	0.220 (0.241)	0.014 (0.049)	0.016 (0.052)	0.065 (0.098)	0.076 (0.096)
Relative firm advertising intensity	-3.458** (1.055)	-2.430* (1.038)	-0.387 (1.029)	-0.634 (1.039)	-0.201 (0.127)	-0.135 (0.131)	-0.434 (0.397)	-0.275 (0.364)
Relative firm growth rate	0.001 (0.004)	0.001 (0.004)	-0.001 (0.041)	-0.001 (0.040)	0.0009* (0.0004)	0.0008* (0.0004)	0.002 (0.008)	0.002 (0.008)
Board power	-0.315 (0.657)	-0.165 (0.622)	-0.217 (0.367)	-0.229 (0.355)	0.071 (0.080)	0.064 (0.079)	-0.445* (0.216)	-0.443* (0.215)
<i>Industry effects</i>								
Advertising intensity		-1.719** (0.664)		-0.147 (0.377)		0.197* (0.081)		-0.345* (0.155)
Growth rate		-0.158** (0.059)		-0.119* (0.059)		-0.002 (0.007)		-0.011 (0.016)
Capital intensity		0.030 (0.037)		0.036 (0.023)		0.006 (0.005)		0.017† (0.009)
<i>F</i> -value ^b	9.743***	8.582***	6.781***	5.658***	1.920†	1.878*	12.590†	21.600*
Model R^2	0.318	0.415	0.283	0.334	0.088	0.141	N.A.	N.A.
Change ^c in R^2	—	0.097**	—	0.051*	—	0.053*	—	9.010*

^aUnstandardized coefficients (standard errors in parentheses) are provided based upon OLS regressions for all CEO successor characteristics except CEO 'throughput background' for which logistic regression is provided.

^bModel chi-square is reported (instead of *F*-value) only for 'throughput background'.

^cChange in model chi-square is assessed for 'throughput background.'

Significance levels: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.10$

associated ($p < 0.05$; incremental $R^2 = 3.89\%$) with his/her educational level (Hypothesis 1c) and negatively associated ($p < 0.05$; incremental chi-square = 4.25) with the likelihood of a throughput functional background (Hypothesis 1d). Two out of four hypothesized effects were supported for industry growth rate. Industry growth rate was negatively associated with the CEO successor's organizational tenure ($p < 0.01$; incremental $R^2 = 3.98\%$) and age ($p < 0.05$; incremental $R^2 = 3.82\%$), which supported Hypotheses 2a and 2b, respectively. In contrast, only one out of the three hypothesized effects received any support for industry capital intensity.

In the regressions for CEO successor's organizational tenure and age (Hypotheses 3a and 3b), the coefficients associated with industry capital intensity were not significant. Hypothesis 3c received weak support (at $p < 0.10$; incremental chi-square = 3.25) with industry capital intensity being positively associated with the likelihood of the CEO successor having a throughput functional background. In sum, five out of 11 hypothesized relationships were strongly supported ($p < 0.05$ or $p < 0.01$) and one effect was marginally ($p < 0.10$) significant.

To test Hypothesis 4, we divided the total sample into two subgroups based on a median

Table 3. Results of regression^a analysis: High performers vs. low performers ($N = 134$)

Variables	Organizational tenure		Age		Educational level		Throughout background	
	High performers	Low performers	High performers	Low performers	High performers	Low performers	High performers	Low performers
Intercept	-10.562 (7.208)	10.356 (7.755)	38.292*** (4.700)	38.589*** (4.407)	2.464* (0.977)	1.684† (0.894)	3.286 (2.215)	2.456 (2.124)
<i>Controls</i>								
Industry concentration	-0.001 (0.105)	0.166† (0.091)	0.042 (0.067)	0.104† (0.054)	-0.008 (0.015)	0.020* (0.010)	-0.004 (0.030)	0.020 (0.026)
Firm size	3.604*** (0.731)	3.131*** (0.801)	1.674*** (0.478)	0.893† (0.469)	0.233* (0.105)	-0.064 (0.089)	-0.052 (0.223)	0.034 (0.214)
Relative firm capital intensity	0.060 (0.447)	-0.282† (0.148)	0.316 (0.288)	0.105 (0.854)	-0.019 (0.059)	0.485** (0.164)	0.035 (0.118)	0.624† (0.355)
Relative firm advertising intensity	-2.576* (1.262)	2.978 (2.894)	-0.347 (3.108)	0.629 (1.431)	0.448 (0.644)	-0.092 (0.137)	-0.463 (1.585)	0.233 (0.426)
Relative firm growth rate	-0.001 (0.004)	0.026 (0.087)	-0.000 (0.103)	0.019 (0.047)	-0.001 (0.001)	0.035 (0.060)	-0.010 (1.023)	-0.009 (0.052)
Board power	-0.672 (1.465)	0.411 (0.761)	-0.826 (0.945)	-0.120 (0.398)	-0.089 (0.192)	0.052 (0.082)	-0.374 (0.435)	-0.201 (0.208)
<i>Industry effects</i>								
Advertising intensity	-1.822† (0.996)	-1.719 (1.158)	-0.418 (0.580)	0.002 (0.653)	0.303** (0.118)	0.154 (0.125)	-0.489† (0.269)	-0.296 (0.250)
Growth rate	-0.137** (0.066)	-0.309† (0.166)	-0.262** (0.101)	0.045 (0.093)	-0.301 (0.118)	0.024 (0.018)	-0.029 (0.044)	-0.046 (0.040)
Capital intensity	0.117 (0.060)	-0.057 (0.065)	0.019 (0.043)	0.062 (0.039)	0.004 (0.008)	0.008 (0.008)	0.036† (0.019)	0.019 (0.015)
<i>F</i> -value ^b	4.966***	3.448**	3.535**	1.840†	2.522*	1.753†	15.907†	8.475
Model R^2	0.482	0.392	0.409	0.278	0.345	0.243	N.A.	N.A.

^a Unstandardized coefficients (standard errors in parentheses) are provided based upon OLS regressions for all CEO successor characteristics except CEO 'throughput background,' for which logistic regression is provided.

^b Model chi-square is reported (instead of *F*-value) only for 'throughput background.'

Significance levels: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.10$.

split on the measure representing improvement in firm ROA (between the pre- and postsuccession time periods). The full model presented in Table 2 (i.e., Model II) was then estimated for each of the two subgroups and differences in beta coefficients for each of the three hypothesized industry variables were assessed through *t*-tests following the procedure outlined in Arnold (1982). Table 3 presents the results of the subgroup analysis which indicate that, in general, firms that realized greater postsuccession performance improvement appeared to match CEO successor characteristics more closely to industry conditions than the firms with lower levels of performance improvement.⁷ Consistent with the

pattern of significant effects found in the pooled sample, in the high-performing subgroup, industry advertising intensity was negatively associated with organizational tenure ($p < 0.10$) and throughput functional background ($p < 0.10$) and positively associated with educational level ($p < 0.01$). Similarly, industry growth rate was negatively associated with organizational tenure ($p < 0.01$) and age ($p < 0.01$) and capital intensity was positively associated with throughput functional background ($p < 0.10$). In contrast, only one of the industry effects identified in Hypotheses 1–3 was significant for the low-performing subgroup, with industry growth rate being negatively ($p < 0.10$) associated with organizational tenure. However, of the 11 *t*-tests conducted to assess if the differences in individual beta coefficients between the two subgroups were statistically significant, only one (the difference

⁷ The weaker levels of statistical significance may be attributed to the significantly smaller sample sizes in the subgroups compared to the full sample.

between the industry growth rate coefficients in the two regressions for CEO successor age) was significant ($p < 0.05$).

DISCUSSION

This study was motivated by the need to address two key gaps in prior empirical literature on CEO succession, namely, the influence of industry structure on the choice of CEO successors and the performance implications of matching CEOs to industry structure. As recent reviews of the CEO succession literature by Kesner and Sebor (1994) and Finkelstein and Hambrick (1996) indicate, there have been a number of studies which have focused on the organizational antecedents to CEO succession. In contrast, there is very little empirical research on the role of industry structure in CEO succession and virtually no research on the performance implications of matching successor CEOs to industry structure.

Contributions and implications

In addressing these key gaps in extant literature we make a number of contributions. First, while prior literature (e.g., Pfeffer and Salancik, 1978; Thompson, 1967) has emphasized the theoretical importance of the industry-successor CEO relationship, we develop a more elaborate framework which identifies the underlying theoretical links in this relationship. This framework identifies the contingencies posed by each of three key industry structure characteristics and relates these contingencies to desired cognitive attributes in the incoming CEO. In the process, we address two important theoretical questions: (1) How do industry conditions operate in the CEO succession process? and (2) Why do organizations seek to match their CEOs to industry conditions?

Second, from an empirical perspective, our major contribution is that we specify and test a more completely specified model of the antecedents to CEO succession than most prior work in this area. While the primary focus of our study is on industry effects we also control for various firm-level influences including size, past performance, firm-level strategy and board power. These controls not only provide a more rigorous test of the research hypotheses but also enable a more meaningful comparison of our findings with those

of prior research that has addressed primarily firm-level antecedents. Third, the careful sample selection procedure employed (nondiversified, manufacturing firms only) is also a strength of our study because it enhances confidence in the internal validity of our findings (unlike diversified firms, industry structure is the salient environment for nondiversified firms and the primary context for such firms' strategic choices). In addition, the use of a multi-industry sample serves to enhance the generalizability of our study's findings.

Overall, the results of our study lend support to Gupta's (1988) contention that environmental contingencies are not likely to be isomorphic with firm-level contingencies. Even after controlling for salient firm-level influences, we found several significant effects for industry conditions. Industry product differentiation and growth, in particular, appear to play important roles in explaining variations in CEO successors. Industry product differentiation was a significant determinant in three out of four CEO successor characteristics and industry growth rate was significant in two out of the four successor characteristics. Consistent with our theoretical arguments, firms in differentiated industries tend to value high educational levels and output functional backgrounds in their new CEOs but do not value high levels of firm-specific experience. Similarly, firms in high-growth industries appear to value cognitive orientations generally associated with openness to change and, consequently, tend to favor the selection of younger CEOs and CEOs with lower levels of organizational tenure. These findings are also consistent with Rajagopalan and Datta's (1996) findings in the context of incumbent CEOs: they reported negative effects of industry differentiation and growth rates on CEO organizational tenure, positive effect of industry differentiation on educational level, and negative effect of industry differentiation on CEO throughput functional background.⁸ The consistency of these findings across studies with entirely different samples and different model specifications further increases our confidence in their generalizability.

Our analysis also indicates the powerful influence exercised by firm size in the CEO selection process. Consistent with prior research (e.g., Dal-

⁸ Since Rajagopalan and Datta (1996) did not examine CEO age our findings for successor CEO age cannot be compared with their study's findings.

ton and Kesner, 1983; Tushman and Romanelli, 1985) we found several significant effects for firm size: the larger the firm, the older the successor CEO ($p < 0.001$), the higher his/her organizational tenure ($p < 0.001$) and the higher his/her educational level ($p < 0.05$). However, as previously discussed, stepwise regressions used to assess the percentage of variance explained by industry factors after partialling out the firm-level effects found that industry effects did explain a significant portion of the variance even after controlling for several firm-level effects.

Taken together, the number of significant industry effects (five of the hypothesized 11 effects were strongly supported) and the variance explained by industry factors lead to one overarching conclusion; industry structure plays an important, but limited, role in explaining variations in CEO successor characteristics. This conclusion is again consistent with Rajagopalan and Datta, who found support for less than 40 percent of their hypothesized industry effects leading them to conclude that 'industry factors might be less salient than firm-specific factors in explaining variations in CEO characteristics' (1996: 212). However, the finding that industry effects are not as pervasive as *a priori* hypothesized does not justify the lack of prior empirical research in this area. To the contrary, these findings suggest that, taken together, firm- and industry-level factors jointly contribute to our understanding of variations in CEO characteristics and help us move towards developing and testing a more completely specified theoretical model of the antecedents and consequences of CEO succession.

Our findings, however, provide very limited support for the normative view that firms that achieve a closer fit between the successor CEO's characteristics and industry structure will realize higher improvement in postsuccession performance. Consistent with normative predictions, the significant effects observed in the pooled sample also held in the subgroup of high performers but not in the subgroup of low-performing firms. However, statistical differences between high and low performers were practically nonexistent. From a methodological standpoint, the lack of significant differences between the beta coefficients in the two subgroups may be a result of the restricted sample sizes in the subgroups. As argued by Arnold (1982), it is very difficult to identify significant statistical effects in subgroups

with small samples. While our careful selection of the sample (nondiversified, manufacturing firms only) enhanced the internal validity of our findings it may have hampered our ability to find stronger performance effects afforded by a larger sample. From a theoretical standpoint, an alternative explanation may well be that CEO characteristics, *per se*, do not contribute significantly to firm performance (Zajac, 1990). Top managers primarily affect firm performance through their strategic choices (manifested in firm-level strategies) and, consequently, direct relationships between CEO demographic characteristics and firm performance may be rather tenuous. Overall, our study offers stronger evidence for contingency theory's descriptive rather than prescriptive validity in the context of CEO succession.

From the standpoint of practising managers, the observed relationships between industry conditions and the desired demographic characteristics in CEO successors have some important implications for career planning. As findings highlight, the value of certain career experiences (in the context of being chosen as the CEO) may be contingent on the nature of the industry. To managers aspiring to become CEOs, these findings highlight the costs and benefits of matching their experience to the contingencies posed by the industry environment. In other words, managers need to recognize that certain types of presuccession experiences might even serve to limit future career options and interindustry mobility. For example, while longer organizational tenures may be valued in highly capital-intensive, or low-growth or less differentiated industries, such experience may be more negatively viewed in rapidly growing or highly differentiated industries. Thus, executives with significant firm-specific experience in capital-intensive and low-growth industries may actually find it difficult to transfer their experience and skills to more dynamic industries. Such constraints become particularly salient when industry conditions change for the worse as is typical in many mature and declining industries (Harrigan, 1981).

Limitations and directions for future research

The findings of this study need to be viewed in the context of certain limitations which, in turn,

suggest some interesting directions for future research. First, the nature and size of the sample utilized in this study might have been salient factors in the lack of support for certain hypothesized effects. While we decided to limit the study sample to nondiversified, manufacturing firms in order to maximize the internal validity of our findings, this might have inadvertently contributed to the restricted variance (and, hence, lack of support for several hypothesized effects) in successor CEOs' functional backgrounds (most new CEOs had a throughput functional background). In order to address this limitation, future research needs to examine these relationships in different samples of firms (e.g., firms from service industries and, possibly, more diversified firms). Sample size limitations may have also resulted in the failure to identify significant performance effects of matching new CEOs to industry structure. Second, with the sample being limited to relatively large firms, the findings may not be fully generalizable to smaller firms. Future research which examines whether industry effects are less or more pronounced in relatively smaller firms will help address this limitation. The performance effects of matching CEOs to industry conditions may also be more salient for smaller firms than for larger firms. In the case of large firms it is likely that the CEO, *per se*, has very limited direct effect on firm performance. Third, the use of demographic variables as proxies for underlying cognitive orientations means that the study may not have fully captured the cognitive variables of interest. While researchers such as Finkelstein (1988) and Pfeffer (1983) strongly advocate the use of demographic data in view of the advantages of objectivity and data availability, future research which replicates this study with clinical and psychometric data will enable us to further assess the validity of the theoretical arguments presented in this paper. Fourth, consistent with our focus on nondiversified firms, we conceptualized the firm's environment in terms of industry structure. However, a broader conceptualization of the environment (such as the one developed in Dess and Beard, 1984) may be needed to examine CEO-environment relationships in more diversified firms.

Finally, from a more organizational perspective, the observed patterns between industry structure and CEO characteristics also raise some important issues (and associated research questions) related

to the ability of organizations to adapt as industry conditions change. The need to counter organizational inertia might result in firms replacing existing CEOs who are highly specialized with individuals whose more diverse experience might facilitate deviations from the status quo. It will be interesting to examine if changes in industry conditions do manifest themselves in changes in top managers and, further, if firms that change their CEOs in response to changes in their industry environment outperform firms that do not. In order to meaningfully examine these questions, however, we will need to use samples that include firms that underwent CEO succession as well as firms that did not change their CEOs when faced with similar environmental changes.

Understanding how organizations seek to match their top managers to environmental contingencies has been a key gap in the empirical literature on CEO succession. While this study has taken the first steps in addressing this gap, as discussed above, there still remain many fruitful avenues for future research. As noted by Kesner and Sebor (1994: 327), 'when it comes to executive succession, there is little that we know convincingly, much that we do not know because of mixed results and even more that we have not yet studied.' The findings of this study and related directions for future research should, hopefully, be valuable to others interested in the topic of CEO succession.

ACKNOWLEDGEMENTS

The authors are very grateful to two anonymous SMJ reviewers and Associate Editor, Ed Zajac, for suggesting significant improvements to the manuscript. They also wish to thank Josh Mann, Mridu Vashist, and David Alpern for valuable research assistance. This research was partially funded by grants from the Leadership Institute of the University of Southern California and the General Research Fund of the University of Kansas.

REFERENCES

- Aldrich, J. H. and F. D. Nelson (1984). *Linear Probability, Logit, and Probit Models*. Sage, Beverly Hills, CA.

- Anderson, C. R. and C. P. Zeithaml (1984). 'Stage of the product life cycle, business strategy, and business performance', *Academy of Management Journal*, **27**, pp. 5–24.
- Arnold, H. J. (1982). 'Moderator variables: A classification of conceptual, analytic, and psychometric issues', *Organizational Behavior and Human Performance*, **29**, pp. 143–174.
- Bain, J. S. and P. D. Qualls (1987). *Industrial Organization: A Treatise*. JAI Press, Greenwich, CT.
- Bantel, K. and S. Jackson (1989). 'Top management and innovations in banking: Does the composition of the top team make a difference?', *Strategic Management Journal*, Summer Special Issue, **10**, pp. 107–124.
- Barney, J. B. and W. G. Ouchi (1986). *Organizational Economics*. Jossey-Bass, San Francisco, CA.
- Becker, M. H. (1970). 'Factors affecting diffusion of innovations among health professionals', *American Journal of Public Health*, **60**, pp. 294–304.
- Brady, G. F. and D. L. Helmich (1984). *Executive Succession*. Prentice-Hall, Englewood Cliffs, NJ.
- Boeker, W. and J. Goodstein (1993). 'Performance and successor choice: The moderating effects of governance and ownership', *Academy of Management Journal*, **36**, pp. 172–186.
- Cannella, A. A., Jr. and M. Lubatkin (1993). 'Succession as a sociopolitical process: Internal impediments to outsider selection', *Academy of Management Journal*, **36**, pp. 763–793.
- Census of Manufactures* (various volumes). Department of Commerce, Washington, DC.
- Chaganti, R. and R. Sambharya (1987). 'Strategic orientation and characteristics of upper management', *Strategic Management Journal*, **8**(4), pp. 393–401.
- Child, J. (1972). 'Organizational structure, environment and performance: The role of strategic choice', *Sociology*, **6**, pp. 1–22.
- Child, J. (1974). 'Managerial and organizational factors associated with company performance', *Journal of Management Studies*, **11**, pp. 13–27.
- Dalton, D. R. and I. F. Kesner (1983). 'Inside/outside succession and organizational size: The pragmatics of executive replacement', *Academy of Management Journal*, **26**, pp. 736–742.
- Dalton, D. R. and I. F. Kesner (1985). 'Organizational performance as an antecedent of inside/outside chief executive succession: An empirical assessment', *Academy of Management Journal*, **28**, pp. 749–762.
- Datta, D. K. and J. Guthrie (1994). 'Executive succession: Organizational antecedents of CEO characteristics', *Strategic Management Journal*, **15**(7), pp. 569–577.
- Dearborn, D. C. and H. A. Simon (1958). 'Selective perceptions: A note on the departmental identification of executives', *Sociometry*, **21**, pp. 140–144.
- Dess, G. G. and D. Beard (1984). 'Dimensions of organizational task environments', *Administrative Science Quarterly*, **29**, pp. 52–73.
- Dess, G. G., R. D. Ireland and M. A. Hitt (1990). 'Industry effects and strategic management research', *Journal of Management*, **16**, pp. 7–27.
- Dollinger, M. J. (1984). 'Environmental boundary spanning and information processing effects on organizational performance', *Academy of Management Journal*, **27**, pp. 351–368.
- Dun & Bradstreet (various volumes). *Reference Book of Corporate Managements*. Dun & Bradstreet, Parsippany, NJ.
- Dun & Bradstreet (various volumes). *Industry Norms and Key Business Ratios*. Dun & Bradstreet, Parsippany, NJ.
- Finkelstein, S. (1988). 'Managerial orientations and organizational outcomes: The moderating roles of managerial discretion and power', unpublished doctoral dissertation, Columbia University.
- Finkelstein, S. and D. C. Hambrick (1990). 'Top-management-team tenure and organizational outcomes: The moderating role of managerial discretion', *Administrative Science Quarterly*, pp. 484–503.
- Finkelstein, S. and D. C. Hambrick (1996). *Strategic Leadership: Top Executives and Their Effects on Organizations*. West Publishing Company, St. Paul, MN.
- Forbes, J. B. and J. E. Piercy (1991). *Corporate Mobility and Paths to the Top: Studies for Human Resource and Management Development Specialists*. Quorum Books, New York.
- Friedman, S. D. and H. Singh (1989). 'CEO succession and stockholder reaction: The influence of the organizational context and event content', *Academy of Management Journal*, **32**, pp. 718–744.
- Ghemawat, P. (1991). *Commitment: The Dynamic of Strategy*. Free Press, New York.
- Gupta, A. K. (1984). 'Contingency linkages between strategy and general manager characteristics: A conceptual examination', *Academy of Management Review*, **9**, pp. 399–412.
- Gupta, A. K. (1988). 'Contingency perspectives on strategic leadership: Current knowledge and future research directions'. In D. C. Hambrick (ed.), *The Executive Effect: Concepts and Methods for Studying Top Managers*. JAI Press, Greenwich, CT, pp. 147–178.
- Gupta, A. K. and V. Govindarajan (1984). 'Business unit strategy, managerial characteristics, and business unit effectiveness at strategy implementation', *Academy of Management Journal*, **27**, pp. 25–41.
- Guthrie, J. P. and J. D. Olian (1991). 'Does context affect staffing? The case of general managers', *Personnel Psychology*, **44**, pp. 263–292.
- Guthrie, J. P., C. M. Grimm and K. G. Smith (1991). 'Environmental change and management staffing: An empirical study', *Journal of Management*, **17**, pp. 735–748.
- Hambrick, D. C. and E. Abrahamson (1995). 'Assessing the amount of managerial discretion in different industries: A multi-method approach', *Academy of Management Journal*, **38**, pp. 1427–1441.
- Hambrick, D. C. and S. Finkelstein (1987). 'Managerial discretion: A bridge between polar views on organizations'. In L. L. Cummings and B. M. Staw (eds.), *Research in Organizational Behavior*, Vol. 9. JAI Press, Greenwich, CT, pp. 369–406.

- Hambrick, D. C. and D. Lei (1985). 'Toward an empirical prioritization of contingency variables for business strategy', *Academy of Management Journal*, **28**, pp. 763–788.
- Hambrick, D. C. and P. A. Mason (1984). 'Upper echelons: The organization as a reflection of its top managers', *Academy of Management Review*, **9**, pp. 193–206.
- Hambrick, D. C., M. A. Geletkancyz and J. W. Fredrickson (1993). 'Top executive commitment to the status quo: Some tests of its determinants', *Strategic Management Journal*, **14**(6), pp. 401–418.
- Hansen, G. S. and B. Wernerfelt (1989). 'Determinants of firm performance: The relative importance of economic and organizational factors', *Strategic Management Journal*, **10** (5), pp. 399–411.
- Harrigan, K. R. (1981). 'Barriers to entry and competitive strategies', *Strategic Management Journal*, **2**(4), pp. 395–412.
- Hart, P. and J. Mellons (1970). 'Management youth and company growth: A correlation?', *Management Decision*, **4**(1), pp. 50–53.
- Hay, D. A. and D. J. Morris (1979). *Industrial Economics: Theory and Evidence*. Oxford University Press, Oxford, U.K.
- Hill, C. W. L. and S. Snell (1988). 'External control, corporate strategy, and firm performance in research intensive industries', *Strategic Management Journal*, **9**(6), pp. 577–590.
- Hoskisson, R. E., R. A. Johnson and D. D. Moesel (1994). 'Corporate divestiture intensity in restructuring firms: Effects of governance, strategy, and performance', *Academy of Management Journal*, **37**, pp. 1207–1251.
- Kesner, I. F. and T. C. Sebor (1994). 'Executive succession: Past, present and future', *Journal of Management*, **20**, pp. 327–372.
- Kimberly, J. R. and M. J. Evanisko (1981). 'Organizational innovation: The influence of individual, organizational, and contextual factors on hospital adoption of technological and administrative innovations', *Academy of Management Journal*, **24**, pp. 689–713.
- Kotter, J. P. (1982). *The General Manager*. Free Press, New York.
- Lawless, M. A. and L. F. Teagarden (1991). 'A test of performance similarity among strategic group members in conforming and non-conforming industry structures', *Journal of Management Studies*, **28**, pp. 645–664.
- March, J. and H. Simon (1958). *Organizations*. Harper & Row, New York.
- Marquis Who's Who (various volumes). *Who's Who in Finance and Industry*. Macmillan Directory Division, Wilmette, IL.
- Miller, D. (1991). 'Stale in the saddle: CEO tenure and the match between organization and environment', *Management Science*, **37**, pp. 34–52.
- Nayyar, P. R. (1992). 'Performance effects of three foci in service firms', *Academy of Management Journal*, **35**, pp. 985–1009.
- Norburn, D. and S. Birley (1988). 'The top management team and corporate performance', *Strategic Management Journal*, **9** (3), pp. 225–237.
- Pfeffer, J. (1983). 'Organizational demography'. In L. L. Cummings and B. M. Staw (eds.), *Research in Organizational Behavior*, Vol. 5. JAI Press, Greenwich, CT, pp. 299–357.
- Pfeffer, J. and H. Leblebici (1973). 'Executive recruitment and the development of interfirm organizations', *Administrative Science Quarterly*, **18**, pp. 449–461.
- Pfeffer, J. and G. R. Salancik (1978). *The External Control of Organizations: A Resource Dependence Perspective*. Harper & Row, New York.
- Porter, M. E. (1980). *Competitive Strategy*. Free Press, New York.
- Porter, M. E. (1981). 'The contributions of industrial organization to strategic management', *Academy of Management Review*, **6**, pp. 609–620.
- Rajagopalan, N. and D. K. Datta (1996). 'CEO characteristics: Does industry matter?', *Academy of Management Journal*, **39**, pp. 197–215.
- Rajagopalan, N. and J. E. Prescott (1990). 'Determinants of top management compensation: Explaining the impact of economic, behavioral and strategic constructs and the moderating effects of industry', *Journal of Management*, **16**, pp. 515–538.
- Rogers, E. M. and F. Shoemaker (1971). *Communication of Innovations*. Free Press, New York.
- Scherer, F. M. (1980). *Industrial Market Structure and Economic Performance*. Rand-McNally, Chicago, IL.
- Schmalensee, R. (1985). 'Do markets differ much?', *American Economic Review*, **75**, pp. 341–351.
- Schwartz, K. B. and K. Menon (1985). 'Executive succession in failing firms', *Academy of Management Journal*, **28**, pp. 680–686.
- Singh, H. and F. Harianto (1989). 'Top management tenure, corporate ownership structure and the magnitude of golden parachutes', *Strategic Management Journal*, Summer Special Issue, **10**, pp. 143–156.
- Staw, B., L. Sandelands and J. Dutton (1981). 'Threat-rigidity effects in organization behavior: A multi-level analysis', *Administrative Science Quarterly*, **31**, pp. 439–469.
- Sutton, R. (1991). *Sunk Cost and Industry Structure*. MIT Press, Cambridge, MA.
- Thomas, A., R. J. Litschert and K. Ramaswamy (1991). 'The performance impact of strategy-manager coalignment: An empirical examination', *Strategic Management Journal*, **12**(7), pp. 509–522.
- Thompson, J. A. (1967). *Organizations in Action*. McGraw-Hill, New York.
- Troy, L. (various volumes). *Almanac of Key Business and Industrial Financial Ratios*. Prentice-Hall, Englewood Cliffs, NJ.
- Tushman, M. L. and E. Romanelli (1985). 'Organizational evolution: A metamorphic model of inertia and reorientation'. In B. Staw and L. Cummings (eds.), *Research in Organization Behavior*, Vol. 7. JAI Press, Greenwich, CA, pp. 171–222.
- Wally, S. and R. J. Baum (1994). 'Personal and structural determinants of the pace of strategic decision making', *Academy of Management Journal*, **37**, pp. 932–956.
- Wiersema, M. F. and K. A. Bantel (1992). 'Top management team demography and corporate strategic

- change', *Academy of Management Journal*, **35**, pp. 91–121.
- Williamson, O. E. (1963). 'Managerial discretion and business behavior', *American Sociological Review*, **53**, pp. 1032–1057.
- Zajac, E. J. (1990). 'CEO selection, succession, compensation and firm performance: A theoretical integration and empirical evidence', *Strategic Management Journal*, **11**(3), pp. 217–230.
- Zajac, E. J. and J. D. Westphal (1996). 'Who shall succeed? How CEO/board preferences and power affect the choice of new CEOs', *Academy of Management Journal*, **39**, pp. 64–90.