

## RESEARCH NOTES AND COMMUNICATIONS MANAGEMENT AND ORGANIZATIONAL CHANGE: A NOTE ON THE RAILROAD INDUSTRY

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*Hypotheses which relate top-level managers' age, years of company and industry service, and education to strategic change are studied with a sample of 855 managers from 27 railroads. Results generally support hypotheses that younger managers and those with less experience are more likely to alter their strategies with changing environmental conditions.*

### LITERATURE REVIEW AND HYPOTHESES

A fundamental premise in the strategic management literature is that as the environment changes so should the firm's strategy (Thompson, 1967). Indeed, in our previous research we identified a number of railroads which changed their strategy with environmental change (Smith and Grimm, 1987). Notably, railroads which changed their strategy outperformed those that did not. While this finding was considered significant in demonstrating the importance of strategic change, it was limited in that it did not explain why some firms were capable of changing strategies while others were not. This note extends our previous research by linking strategic change to management characteristics. The argument is that certain types of managers are more capable of changing strategy than others.

Many strategic management authors have theorized about the link between the characteristics of managers who make the firm's strategic choices and the firm's strategy (Andrews, 1971; Barnard, 1938; Hambrick and Mason, 1984;

Leontiades 1982; Selznick, 1957; Szilagyi and Schweiger, 1985; and Wissema, Van-der-Pol and Messer, 1980). Further, empirical research has shown promising results in this area. For example, Miller, Kets de Vries, and Toulouse (1982) related the top-level leader's locus of control to strategy. They found that leaders with an internal locus of control tended to pursue more risky strategies than leaders with an external locus of control. In addition, Gupta and Govindarajan (1982) concluded that firms which pursue build strategies as opposed to harvest strategies are managed by leaders with a greater propensity to take risk.

Researchers have also linked strategy to observable top-level management characteristics such as age, industry and organizational experience, functional background, and education level (Hambrick and Mason, 1984). Chaganti and Sambharya (1986) found top-level management's functional background and insider/outsider orientation to be related to strategy in a study of three tobacco companies. In addition, Norburn (1986) found a relationship between different management characteristics such as age, education level, and tenure and organizational performance in a multiple industry study.

The present research focused on the relationship between management characteristics, such

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as age, years of company and industry service, and education level and strategic change. The ultimate purpose is to explain why some firms changed strategy while others did not.

## TOP-LEVEL MANAGEMENT CHARACTERISTICS AND STRATEGY CHANGE

Early writers such as Andrews (1971), Child (1972) and March and Simon (1958) theorized that a firm's strategy is a function of choices or trade-offs made by top-level managers within the firm. Consistent with this 'strategic choice' perspective, many writers have stressed the importance of the characteristics of the decision maker in explaining strategy. For example, Andrews cogently argued that 'there is no way to divorce the decision determining the most sensible economic strategy for a company from the personal values of those who make the choice' (Andrews, 1971: 34). Similarly, March and Simon (1958) contended that each decision maker brings a unique knowledge base (a set of assumptions about alternatives and consequences) to the administrative situation. This knowledge base influences strategic choice by filtering the decision maker's perceptions during the strategy formulation process. The key point made by these authors is that it is impossible to explain strategy without considering the personality, values, or characteristics of the decision maker. Presumably, these personal factors affect the way the decision maker perceives and analyzes information and problems, ultimately influencing strategic choice. We now turn to specific hypotheses relating managers' age, years of industry and company service and education to strategic change.

### Age

Drawing largely from the research of Child (1974), Chown (1960) and Taylor (1975), Hambrick and Mason (1984) argued that a manager's age is an indicator of individual flexibility and risk-taking propensity. It is generally accepted that as people grow older, they become more inflexible to change and take fewer risks. Hambrick and Mason contended that because younger managers are more likely to seek growth, they would

attempt to pursue novel, more innovative strategies and be more likely to change their firm's strategy to seize perceived opportunities. In contrast, older managers would be more committed to the *status quo*. For example, in the railroad industry, *status quo* has generally meant a lack of aggressive strategic behavior.

*Hypothesis 1: Top-level managers from firms that change their strategy will be younger than top-level managers from firms that do not change their strategy.*

### Years of industry and company service

Hambrick and Mason argued that years of industry and company service may be an indicator of a manager's experience. Although years of experience may be an important success factor in stable environments (e.g. the railroad industry before deregulation), it may act as a roadblock to organizational change in unstable environments (e.g. the railroad industry after deregulation). Employing theory originally developed by Cyert and March (1963), Hambrick and Mason (1984) contended that if top managers have spent their careers in the industry and/or the organization, they will have a limited knowledge base from which to conduct a strategic search for new opportunities and would not be likely to pursue new ideas outside this limited knowledge base. This may be particularly true of railroad managers, who have often been criticized for their lack of innovation and for strategic complacency (Wyckoff, 1976).

*Hypothesis 2: Top-level managers from firms that change their strategy will have fewer years of industry and company service than top-level managers from firms that do not change their strategy.*

### Education

According to Hambrick and Mason, education may be an indicator of a manager's knowledge and skill base. The proper strategic management of a firm requires considerable skill. Not only do managers need to be knowledgeable of their organization's key resource strengths and

weaknesses, but they must also possess the skill to manipulate those resources to seize opportunities, to ensure their organization's survival. Thus, since strategic management is both a logical and intellectual process (Andrews, 1971), it seems reasonable to expect that greater levels of education would be associated with strategic change, especially when change is required by the environment.

*Hypothesis 3: Top-level managers from firms that change their strategy will have more years of education than top-level managers from firms that do not change their strategy.*

## METHODOLOGY

### Assessment of strategic change

As noted, the strategic changes of 27 class-I railroads from our previous research were used in the present study. In our past research industry experts were used to identify strategy change. The methodology used to identify these changes will be summarized briefly; a full explanation is provided in Smith and Grimm (1987). First, a mail survey was administered to 180 of the largest railroad customers in the nation. The approach was to translate the extensive knowledge railroad customers hold about important product and service dimensions into insights regarding railroad strategy. Regular, large, industrial customers are in an excellent position to objectively evaluate a firm's behavior. Each of the 180 customers was requested to evaluate separately the principle railroads providing his/her firm with service. 104 shippers responded for a 58 percent response rate. The final sample consisted of 245 usable responses on 27 railroads (approximately nine responses per railroad). These responses were aggregated to compute organizational scores for each railroad.

The questionnaire asked experts to rate each railroad on a scale of 1 to 5 on a number of strategic dimensions both prior to and after deregulation of the rail industry. This 'then/now' retrospective questionnaire technique has been found to be accurate when assessing change in conjunction with an important referenced event. The Staggers Act of 1980 was the referenced event in this research.

A cluster analysis was run with a data set which combined both pre and post deregulation assessments to classify the 27 railroads into strategic groups. In other words, each of the 27 railroads were considered as if it were two firms and clustered with a set of 54 data points (27 observations prior to deregulation and 27 observations after deregulation). Combining the data from both time periods provides a unique method of identifying strategic change. If the same firm was found to be in two different clusters it would mean that the firm is more similar to another group of firms than to itself and that it changed its strategy. Firms clustered into the same strategic group at both pre and post periods presumably did not change their strategy.

### Management characteristics

A random sample of 855 top-level managers from the 27 railroads that had previously been identified was selected from the 1977 and 1985 editions of *Who's Who in Railroading and Rail Transit*. Data were collected on age, industry and company years of service, and education of these managers:

1. Age: *Who's Who* provided a birth date for each manager listed, and the editor of *Who's Who* was consulted to determine the date that the data was obtained. Each managers' age was then determined.
2. Company and Industry Service Time: Since a manager's career history was listed in *Who's Who*, it was clear how long a manager had been with his/her current railroad and in the railroad industry. (A manager from a firm that participated in rail consolidation was not considered to have moved from one railroad to another.)
3. Education: *Who's Who* lists each manager's education history. Managers were classified into one of six categories and assigned an estimated number of years of education. The six categories, with estimated years of education in parentheses, are as follows: No College (12); Some College (14); Bachelor's Degree (16); Master of Business Administration (MBA) (18); Other Graduate Degree (18); and Ph.D. (21). This classification allowed a calculation of years of education,

as well as information on the incidence of MBAs.

To test the validity of the *Who's Who* data we randomly selected 10 executives and compared these data to published 10 K annual reports. The data proved to be 100% accurate.

## RESULTS

A significant finding in our past study was that those firms that changed their strategy with changing environmental conditions outperformed those firms that did not change their strategy. These firms exhibited significantly higher rates of return on equity. As discussed previously, firms that changed strategy were identified by investigating whether their location in strategic clusters changed before and after deregulation. Overall, 15 firms out of 27 (56%) changed their strategy between the two time periods.

Table 1 reveals that average age for managers in firms which changed strategies is 2.3 years younger than for firms which did not change strategies. This difference was statistically significant ( $t = 3.45$ ;  $p = 0.001$ ). Further, managers from firms which changed their strategy have 2.2 years fewer years of industry service ( $t = 2.50$ ;  $p = 0.01$ ). Years in the company is unrelated to strategic change ( $t = 1.39$ ;  $p = 0.17$ ). In reference to education, there is no statistical

relationship between education level and strategic change ( $t = 0.93$ ;  $p = 0.35$ ), but firms which changed their strategy had a greater percentage of MBAs than did firms which did not change their strategy ( $\chi^2 = 2.80$ ;  $p = 0.09$ ).

## DISCUSSION

The results of this study demonstrate the important link between the characteristics of top-level managers and strategic change. Most importantly, managers' age and years of industry service were found to be associated with strategic change. Knowing when to change strategy and being capable of implementing strategic change are vital qualities of any top-level manager. Younger managers apparently are more flexible and willing to sustain the risk of change. Conversely, age and years of industry service may be important barriers to change. Older, more experienced managers may be reluctant to alter strategy because they have a narrower and more limited knowledge base from which to conduct a strategic search for new opportunities. It is well recognized that managers must be prepared to change their strategy to fit new, dynamic environments. Despite this recognition, however, the literature is replete with examples of bankrupt companies which struggled with changing environments and failed to adapt. Organizations which are preparing to change their

Table 1. Characteristics of top managers by change in strategy vs. no change in strategy

	Managers in firms which did not change strategies ( $N = 183$ )		Managers in firms which did change strategies ( $N = 675$ )
Average age	52.7		50.4
Years of company service	24.7	$t = 3.45$ ( $p = 0.001$ )	23.3
Years of industry service	27.5	$t = 1.39$ ( $p = 0.17$ )	25.3
Years of education	15.5	$t = 2.50$ ( $p = 0.01$ )	15.6
Percent of top managers with MBA		$t = 0.93$ ( $p = 0.35$ )	
MBA	5.5		9.8
Other	94.5		90.2

Note: Chi-square = 2.80, 1 d.f. ( $p = 0.09$ ).

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strategies or which are struggling to implement change might look to the age and experience levels of their top-level management teams.

Years of education, on the other hand, does not appear to be important to strategy change. However, it is notable that managers with MBA degrees were associated with strategic change. MBA programs have been criticized for producing managers who are risk-averse (Harris, 1984; Hayes and Abernathy, 1980). In addition, Hambrick and Mason (1984) point out that business schools are not equipped to develop risk-taking tendencies. The fact that MBAs were found to be related to strategic change may be reflective of the increasing focus of MBA programs on environmental analysis and the importance of maintaining a fit between the environment and the firm's strategy. Further, the finding is consistent with those linking strategic change to younger managers having less industry experience, since it is younger managers who are more likely to hold MBA degrees. Thus, this research provides some of the first evidence for the positive impact of the MBA degree. This is important because there has been copious criticism of MBA programs and degree-holders but little quantitative research. These findings have significant implications for strategic change research. Specifically, they indicate that characteristics such as age, industry tenure and type of education have a discernible impact on the propensity to change strategy over time. As such, the research has made a contribution in explaining why some firms are capable of changing their strategy while others are not.

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