Strategic Management Journal
Strat. Mgmt. J., **24**: 1107–1129 (2003)
Published online 11 August 2003 in Wiley InterScience (www.interscience.wiley.com). DOI: 10.1002/smj.343

STRATEGIC DECISION SPEED AND FIRM PERFORMANCE

J. ROBERT BAUM[1]* and STEFAN WALLY[2]
[1] *Robert H. Smith School of Business, University of Maryland, College Park, Maryland, U.S.A.*
[2] *Argyros School of Business and Economics, Chapman University, Orange, California, U.S.A.*

This 4-year study examines the effect of strategic decision speed upon subsequent firm performance and identifies environmental and organizational characteristics that relate to decision speed. We draw upon strategic decision-making theory and organization theory to propose that strategic decision speed mediates the relation between environmental and organizational characteristics and performance. Measures of business environment, organization structure, strategic decision speed, and firm performance (growth and profitability) were collected from 318 CEOs from 1996 to 2000. Structural equation modeling confirmed that fast strategic decision-making predicts subsequent firm growth and profit and mediates the relation of dynamism, munificence, centralization, and formalization with firm performance. Copyright © 2003 John Wiley & Sons, Ltd.

Academic interest in the association between strategic decision-making speed and firm performance emerged initially when Bourgeois and Eisenhardt (1988) identified a positive association between fast strategic decision-making and firm performance. There have been few subsequent empirical studies of strategic decision speed; however, management advisors have repeatedly prescribed fast decision-making as a source of competitive advantage (Jones, 1993), and practitioners claim they increasingly make strategic decisions in less time (Ancona, Okhuysen, and Perlow, 2001; Kepner-Tregoe, 2001).

Eisenhardt (1989) conducted an inductive study of eight high-tech firms, and she observed that the fastest strategic decision-makers had the best sales and profitability. Extending this research to 32 firms in three industries, Judge and Miller (1991) examined the association between strategic decision-making speed and firm performance. They found no association, except among firms in biotechnology ($n = 10$), a high-velocity industry. Thus, both Eisenhardt (1989) and Judge and Miller (1991) found that in fast-moving environments firms with better performance made faster strategic decisions. In contrast, Forbes (2001) studied decision speed in 83 young Internet companies and found no effect upon firm performance.

Our purpose is (1) to clarify the relationship between strategic decision speed and firm performance and (2) to better understand the forces that impact strategic decision speed. To guide our understanding of these factors, we draw upon strategic decision process theory's proposition that decision-makers' cognitions are motivated and constrained by their business environment, organization structures, and resources, as well as their personal experiences and perceptions. In an earlier study, Wally and Baum (1994) explored personal, organizational, and industry causes of decision

Key words: strategic decision-making; decision speed; performance
*Correspondence to: J. Robert Baum, Smith School of Business, University of Maryland, Van Munching Hall, College Park, MD 20742-1815, U.S.A. E-mail: jrbaum@rhsmith.umd.edu

Received 19 February 2002
Final revision received 29 March 2003

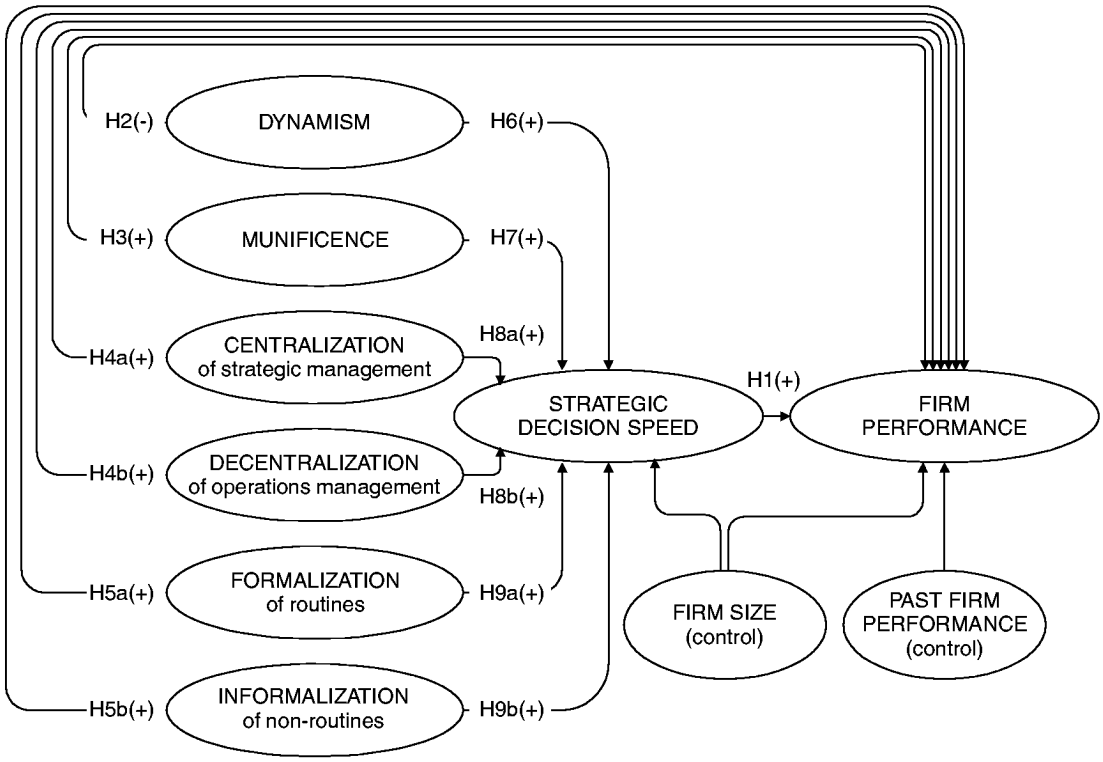

Figure 1. Strategic decision-making speed: theoretical model with environmental and organizational antecedents

speed with emphasis on personal characteristics; however, they did not study the relation of speed and performance. In this study, we concentrate on the effects of environmental and organizational factors on firm performance.

As shown in Figure 1, our theoretical model proposes that strategic decision-making speed mediates the relationships of dynamism, munificence, centralization, and formalization with financial performance. Researchers have found that these representative environmental and organizational concepts influence firm performance (Glick, Miller, and Huber, 1993; Judge and Miller, 1991; Priem, Rasheed, and Kotulic, 1995; Slevin and Covin, 1995). We also study dynamism as a moderator of the decision speed to financial performance relationship, because Judge and Miller found that environmental velocity moderated the relation between decision speed and performance. (Dynamism (unpredictability) is a component of environmental velocity (unpredictability and rapid growth).)

We extend empirical research about the causes and effects of strategic decision speed to a large sample of heterogeneous firms. This is the first study about decision speed to include multiple dimensions of organization structure. We assess the importance of decision speed for the relation between organization structure/business environment and firm performance by examining the direct effects of organization structure and business environment upon firm performance and their indirect effects with firm performance through strategic decision speed. By isolating the effects of decision speed, we provide a richer view of the importance of the decision speed variable. Results may help academics and practitioners evaluate strategic decision practices in terms of two types of performance (growth and profitability) and three types of strategic decisions (merger and acquisition, product introduction, and technology adoption).

STRATEGIC DECISIONS: CONTENT AND PROCESS

Studies of strategic decision-making range widely from those that examine an individual decision-maker's agenda-setting process to decision formulation and implementation processes in complex

organizations (Rajagopalan, Rasheed, and Datta, 1993). From the perspective of the strategist, or managerial decision-maker, the deliberate rational decision-making process involves five intertwined cognitive stages: (1) give attention to a problem or opportunity; (2) collect information; (3) develop an array of options; (4) value the options using expected costs and benefits; and finally (5) select the option with the greatest utility (Fredrickson, 1984; Mitchell and Beach, 1990).

Many decision researchers claim that this synoptic explanation is an incomplete description of real decision processes (Bargh and Chartrand, 1999; Beach, 1993). For example, Kahneman, Slovic, and Tversky (1982) found decision mistakes that are caused by misunderstood probabilities, personal biases, and failures of memory. Other researchers point to the importance of intuitive, 'automatic,' or a-rational decision-making (Barnard, 1938; Fiske, 1992; Isenberg, 1986); these latter unintended decision-making processes involve experience-based mental routines that happen in a flash, producing an answer without apparent rational thought. However, these fast processes may be reflections of past rational processes which included comprehensive fact-finding and evaluation (Isenberg, 1986).

Whether strategic decision-making is conceived as rational, non-rational, or a-rational, social psychologists agree that business settings are powerful determinants of business decisions. That is, environmental and organizational constraints and motivations, such as the decision factors that we focus on in this study, affect all levels of managerial attention, use of experience-based memory, fact-finding, and perceptions of freedom of action (Beach, 1993; Hambrick and Finkelstein, 1987).

HYPOTHESES

We begin with a test of the direct relationship between strategic decision-making speed and firm performance (Hypothesis 1). We explore two additional research questions: 'Do dynamism (Hypothesis 2), munificence (Hypothesis 3), centralization (Hypotheses 4a and b), and formalization (Hypotheses 5a and b) relate directly with subsequent firm performance?' and 'Do these environmental and organizational characteristics relate with strategic decision-making speed (Hypotheses 6, 7, 8a and b, and 9a and b)?' The mediation hypothesis (Hypothesis 10) is tested by comparing the effects of adding Hypotheses 6, 7, 8a and b, and 9a and b to the direct effects test of Hypotheses 1, 2, 3, 4a and b, and 5a and b (Baron and Kenny, 1986).

Strategic decision speed and firm performance

The empirical evidence for our hypothesis that decision speed affects firm performance rests with Eisenhardt (1988, 1989) and Judge and Miller (1991). Judge and Miller's *positive* findings were in high-velocity environments; they had negative findings for the speed-to-performance relationship in low-velocity environments (hospitals and textiles). Thus, to challenge our general hypothesis that speed predicts performance, we test for moderation of the speed-to-performance relationship by environmental dynamism. Nevertheless, the direct and indirect predictor effects of dynamism upon speed and performance are a primary focus of this study.

Fast decision speeds may improve competitive performance across environments because fast strategic decisions lead to (1) early adoption of successful new products or improved business models that provide competitive advantages (Jones, Lanctot, and Teegen, 2000), (2) early adoption of efficiency-gaining process technologies even in established industries (Baum, 2000), and/or (3) preemptive organization combinations that enable economies of scale and knowledge synergies. In short, decision speed may enable firms in dynamic and not-dynamic environments to exploit opportunities before they disappear (Stevenson and Gumpert, 1985).

Fast decision-making may produce bad decisions and bad performance if comprehensive information gathering is sacrificed to gain speed (Kahneman *et al.*, 1982). Indeed, Fredrickson (1984) found a positive relation between comprehensive decision processes (exhaustive and integrative) and performance in stable environments. In contrast, Fredrickson found a negative relation between comprehensiveness and performance in unstable environments. However, Eisenhardt (1989) discovered that fast decision-making does not necessarily signal cursory processing; indeed, she found that decision-making in the most successful companies was fast *and* comprehensive. Other researchers also find that decision-makers may 'keep up with' fast-moving environments as they

engage in comprehensive scanning, research, and analysis to yield high performance (Glick *et al.*, 1993; Priem *et al.*, 1995).

Fast decision-making is appropriate in situations where delay does not yield useful information. For example, prediction of market behavior may be futile in unresolved or technologically disrupted new markets. In these disequilibrium situations, it may be more appropriate to 'just decide' and to maintain organizational flexibility to enable quick redirection of a firm that faces a 'bad guess' outcome. Even in markets where market behavior appears to be random, fast decisions and adoption may yield valuable organizational learning (Eisenhardt, 1989; Mosakowski, 1997). We believe that decision speed is linked with performance in most organizational settings; thus we hypothesize:

Hypothesis 1: The faster the strategic decision-making, the better the firm performance in terms of growth and profitability.

Environmental characteristics and firm performance

Background

A rich literature about the impact of business environments upon firm performance exists (see, for example, Ketchen, Thomas, and Snow, 1993; McGahan and Porter, 1997). We chose two environmental concepts for study—dynamism and munificence—because each has appeared repeatedly (or been suggested for future study) in research and theory about business environments and empirical studies of strategic decision processes (Child, 1972; Dess and Beard, 1984; Priem *et al.*, 1995). Each concept has also appeared as a significant determinant of firm performance in empirical research (Bantel, 1998; Keats and Hitt, 1988).

Dynamism and firm performance

Dynamism (instability or turbulence) refers to the level of environmental *predictability*; it is manifested in the variance in the rate of market and industry change and the level of uncertainty about forces that are beyond the control of individual businesses (Aldrich, 1979; Dess and Beard, 1984). Dynamic environments are similar to, but not the same as, 'high-velocity' environments (Eisenhardt, 1989; Judge and Miller, 1991). High-velocity environments involve fast-paced changes in demand, competition, and technology which may result in instability, turbulence, and unpredictability. Thus, high-velocity environments involve the first and second derivatives of firm outcomes, whereas dynamism involves only the second derivative. Even low-growth industries may be 'dynamic,' if the low growth rate variance is high.

Nevertheless, dynamism and velocity are closely related in practice. As shown in Table 3, the rate of change in firm sales and the rate of change of the rate of change of firm sales are highly associated across 10 GSIC sectors. Furthermore, both velocity and dynamism are important concepts in strategic decision research because they are interpreted (and determined) according to their impact upon the predictability of the environment. In other words, it is the second derivative that matters most for decision researchers in both concepts. In part, we chose to study dynamism *and munificence*, rather than velocity alone, because we wanted to study a more fine-grained representation of the environment than is provided by velocity alone. (Munificence may be measured as the first derivative of sales.)

Researchers point to the importance of configurations of strategy and structure for conclusions about the effects of environment upon firm performance. For example, organic firms (informal, adaptable, loosely controlled) have better performance in dynamic environments than mechanistic firms depending upon strategy, and mechanistic firms have better performance in stable environments than organic firms depending upon strategy (Slevin and Covin, 1995). Nevertheless, stable environments are easier to navigate for firms with all levels of organicity (Keats and Hitt, 1988), and we expect that dynamism will be negatively related to firm performance.

Hypothesis 2: The greater the environmental dynamism, the lower the firm's performance in terms of growth and profitability.

Munificence and firm performance

Munificence (capacity) refers to the environment's support for organizational growth, and it is manifested in high industry sales growth (Dess and Beard, 1984). Munificent environments support growth of resources within firms, providing a reserve against competitive and environmental threats. Furthermore, munificent environments enable firms to access external resources for

support during periods of internal and external problems (Hambrick and Finkelstein, 1987).

Environments with low munificence reduce strategic decision-makers' degrees of freedom. Indeed, researchers point to heightened risks of failure when firms have few resources because some options cannot be afforded; thus, the importance of the 'right choice' is raised (Slevin and Covin, 1995). However, some firms that can focus on niche markets or limit their growth may survive in low-munificence environments. The general effect is that munificence enhances firm performance (Bantel, 1998; Beard and Dess, 1981).

Hypothesis 3: The greater the environmental munificence, the higher the firm's performance in terms of growth and profitability.

Organizational characteristics and firm performance

We study the direct effects of organization structure upon strategic decision speed because we seek to understand general direct relationships with performance and strategic decision speed. We study 'centralization' and 'formalization' because of their fundamental importance in the study of firm performance (Slevin and Covin, 1995).

Centralization and firm performance

Centralization refers to the concentration of authority and power in a firm (Jung and Avolio, 1999). The more centralized, the less widespread is decision-making power with regard to policy and task performance. We study two types of organizational centralization covering the decisions from the 'front line' to decisions by the CEO and in terms of (1) strategic decision-making and (2) operations decision-making.

As regards strategic process centralization, past research about management team function (Smith *et al.*, 1994) and strategic decision-making (Forbes, 2001) has studied 'centralization' as a characteristic within the top management team and only with regard to strategic, not operational, decisions. For example, Eisenhardt labeled autocratic CEO decision-making 'centralized' and decision processes that included the management team, plus expert advisors, 'decentralized.' Thus, low strategic centralization (decentralization) would involve widespread employee participation in strategic decisions, even at the front lines. Further, we characterize Eisenhardt's 'low centralization', which involves the executive team plus advisors in strategic decisions, as 'high strategic centralization.' Similarly, low operational centralization (decentralization) involves behaviors usually associated with self-managed teams. This bifurcated treatment of centralization is consistent with Adler and Borys' (1996) 'enabling bureaucracy' wherein middle managers and front-line employees participate in management of operations (decentralized), but strategic management is the purview of the executive team (centralized).

The beneficial effects of decentralization of operations management have received attention from leadership and organization theorists (Adler and Borys, 1996; Jung and Avolio, 1999). Sims (1996) suggested that decentralization of operations management through self-managed work teams inspires employee motivation, loyalty, and creativity. Decentralization of hiring, promotion, and control of production processes to the department level improves financial performance and responsiveness to market conditions (Schminke, Ambrose, and Cropanzano, 2000). Researchers also point to benefits of participative work practices for top management policy-makers in terms of *availability of improved environmental information from employees* who know they are valued by employers (Manz and Sims, 1990; Mitchell and Beach, 1990).

Although operational decentralization appears to improve firm performance, researchers also point to the benefits of centralized strategic management. For example, employees value strong strategic leadership (Adler and Borys, 1996). Firm performance improves when leaders clearly define business strategy and resolve power and communication hierarchies (Jung and Avolio, 1999; Kirkman and Rosen, 1999; Locke and Latham, 1990). Recent studies reveal that corporate boards believe that centralized strategic guidance by skilled top management teams produces higher firm performance than widely dispersed strategic management (Phan, 2000). We expect that firm performance is enhanced when strategic management is centralized and operations management is decentralized. Thus, we hypothesize:

Hypothesis 4a: The greater the firm's centralization of strategic management, the higher

the firm's performance in terms of growth and profitability.

Hypothesis 4b: The greater the firm's decentralization of operations management, the higher the firm's performance in terms of growth and profitability.

Formalization and firm performance

Formalized organization structures are characterized by explicitly articulated and written firm policies, job descriptions, organization charts, strategic and operational plans, and objective-setting systems. In highly formalized systems, little flexibility exists to determine who may decide or act or even how to decide or act. The effects of formalization are complex. A meta-analysis of studies of small firms found that formalized planning enhanced performance (Schwenk and Shrader, 1993). Other researchers suggest that formalization detracts from organization performance across industries because it inhibits adaptability, open communication, and rapid competitive response (Khandwalla, 1977). Dynamic and/or high-velocity environments may enhance the negative relation between formalization and performance (Fredrickson and Iaquinto, 1989) or they may not (Slevin and Covin, 1995).

We follow the evidence that indicates that performance is better when managers formalize routine organization practices and leave non-routine practices informal (Adler and Borys, 1996). In a study of the effects of 'restructuring' and 'bureaucracy busting' upon firm performance, Adler and Borys found that elimination of formal organization structures eliminated organization memory, systems for application of important management skills, and the benefit of experience formalized in systems—even in dynamic environments. Other researchers agree that much is lost when formal structures are removed (Brockner *et al.*, 1992; Shah, 2000); indeed, TQM programs, such as ISO 9000, increase formalization of routine tasks and relationships, increasing firm performance (Adler, 1999). Adler and Borys (1996) conclude that organizations benefit from formalization of *routine* tasks. Considering all these findings, we propose:

Hypothesis 5a: The greater the firm's formalization of organizational routines, the higher the firm's performance in terms of growth and profitability.

Hypothesis 5b: The greater the firm's informalization of non-routines, the higher the firm's performance in terms of growth and profitability.

Environmental characteristics and strategic decision-making speed

Since the introduction of systems theory into organizational research and the emergence of the strategy–structure–performance paradigm in strategic management, conceptualizations of organizational environments have informed researchers. We study the effects upon decision speed of two fundamental environmental constructs: dynamism and munificence.

Dynamism and strategic decision-making speed

Dynamism (instability or unpredictability) has been cited as an important challenge in the strategic decision-making process because it increases the difficulty of understanding supplier and customer markets (Priem *et al.*, 1995). Thus, valuation of strategic options is difficult because there are many options with low probabilities, and risk is high because sufficient resources are required to sustain firms during the down side of large operating variances (Bourgeois, 1980).

Thus, in dynamic settings, decision-making may be fast because time-consuming comprehensive research and discovery have little value. Decision-makers may use more intuition drawn from experience because little useful information is available.

Furthermore, many dynamic markets are caused by new technologies (Dodge, Fullerton, and Robbins, 1994) and new business models, and the first-mover advantages that arise in these dynamic markets (Smith *et al.*, 1991) may require fast decision-making to capture what may be a fleeting advantage. Although fast decisions may be appropriate in unpredictable new businesses, managers must be aware that they may create unsustainable businesses and products for inadequate markets; thus, they should act experimentally, monitoring the unfolding action, and they should move quickly to abort unsatisfactory ventures.

Eisenhardt (1989) and Judge and Miller (1991) found that fast-paced settings with rapid changes in demand and discontinuous outcomes drove

fast decision-making. In summary, we hypothesize that strategic decision-makers in dynamic environments will move quickly because the decision-makers want to be first-movers, and they spend less time on tedious research about markets because little benefit is obtained.

Hypothesis 6: The greater the environmental dynamism, the faster the strategic decision-making.

Munificence and strategic decision-making speed

Decision-making in munificent environments is less challenging than decision-making in low-munificence environments because the risk, or penalty, for choosing the 'wrong' option may be lower. Thus, munificent environments may inspire less research and may build decision-makers' confidence, which suggests that decision speeds may be faster in munificent environments. Dess and Beard (1984) noted that munificent environments help firms build slack resources, which, in turn, aid conflict resolution. Also, Eisenhardt (1989) found that conflict resolution was important for fast decision-making. However, Hambrick and Finkelstein (1987) suggest that reduced needs for fast response may reduce the motivation for fast decision speeds.

Nevertheless, we expect that decision-makers' reduced motivation to be the first-mover will be dominated by the time gained because of reduced survival concerns. That is, reduced survival concerns should reduce information gathering about 'alternative generation' and 'alternative valuation'. Thus, we hypothesize:

Hypothesis 7: The greater the environmental munificence, which is manifested in fast market growth, accumulation of resources, and decision-maker confidence, the faster the strategic decision-making.

Organizational characteristics and strategic decision-making speed

Background

Organization theorists, organization psychologists, and strategic management researchers propose that organization characteristics affect decision-making behavior (Fredrickson, 1986; Sheppard, Lewicki, and Minton, 1993; Sutcliffe and McNamara, 2001). Organization characteristics are most frequently studied in terms of centralization, formalization, and complexity (Fredrickson, 1986; Pugh *et al.*, 1968;). We focused on centralization of strategic management and operations management, and we also studied formalization of routine and non-routine organization policies, processes and relationships. We controlled decision speed and firm performance for firm size, a surrogate for organizational complexity.

Centralization and strategic decision-making speed

Reporting structures that centralize strategic decision-making authority within a top management team probably promote faster decisions by minimizing time-consuming negotiation and other political behaviors designed to achieve consensus. When the potential for conflict is low, strategic decision-makers can probably move through the 'attention,' 'option-generating,' and 'option-valuing' phases more quickly than they would otherwise. Furthermore, executives may be more willing to use intuition and other experience-based fast-thinking processes when they do not have to justify personal thought processes beyond top management (Isenberg, 1986).

Decentralized operations management yields front-line environmental information that may be useful in strategic decisions. The importance and accuracy of this information are not universally held, and it may be displaced by information available from modern ERP and CRM systems. Nevertheless, decentralized operations management is seen as a positive force for strategic decision speed because decentralization frequently provides employee motivation and efficiency, which enables predictable and quick implementation of strategic decisions (Duhaime and Schwenk, 1985). Thus we hypothesize:

Hypothesis 8a: The greater the firm's centralization of strategic management, which reduces negotiation and communication, the faster the strategic decision-making.

Hypothesis 8b: The greater the firm's decentralization of operations management, which improves front-line information and employee

motivation, the faster the strategic decision-making.

Formalization and strategic decision-making speed

We elaborated the definition of 'formalization' to involve only 'formalization of routine organization policies processes and networks' because there is evidence that formalization of routines *without formalization of non-routine policies, processes, and networks* enhances firm performance (Adler and Borys, 1996). Similarly, we believe that formalization of routines speeds strategic decision-making and that maintaining informal non-routine policies, processes, and networks enhances the use of fast a-rational processes (Fiske, 1992).

Theorists point to possible negative effects of widespread formalization upon strategic decision speed through prescriptions for multi-department approvals and comprehensive information gathering (Simon, 1976). Comprehensive formalization of all organizational structures with rigid limits upon freedom of action may slow the 'option-generating' and 'option-valuing' phases of strategic decision-making by encouraging the collection of much data, stifling innovative out-of-boundary information gathering and communication and requiring extremely thorough analyses of alternatives (e.g., Fredrickson and Iaquinto, 1989).

However, we believe that formalized routines may increase information flows throughout the organization, including information to strategic decision-makers, and thereby speed strategic decisions. Employees who have formalized work routines probably work more efficiently because of resolved power relationships and work practices. Some theorists propose that employee participation in determination of their work routines may motivate employees to share information throughout the organization. Furthermore, modern formalized enterprise management information systems provide instant comprehensive market-sensing cues and information about unfolding action to strategic decision-makers.

Formalization of organization routines may speed strategic decision-making by helping decision-makers understand existing organizational constraints, resources, and processes—including routine processes for effecting change (Adler and Borys, 1996). Finally, we believe that informality in the strategic decision-making process enhances creativity and the opportunity for decision-makers to use fast intuitive (automatic, a-rational) thinking processes such as tacit knowledge (Berman, Down, and Hill, 2002; Fiske, 1992; Isenberg, 1986). Thus we hypothesize:

Hypothesis 9a: The greater the firm's formalization of organizational routines, which improves information flows to strategists, the faster the strategic decision-making.

Hypothesis 9b: The greater the firm's informalization of non-routines, which aids the use of the fast decision processes such as intuition and tacit knowledge, the faster the strategic decision-making.

Strategic decision-making speed is a mediator

We expect the direct effects of environmental and organizational characteristics upon firm performance (Hypotheses 2, 3, 4a, 4b, 5a, and 5b) to be diminished when the indirect effects of these characteristics upon strategic decision-making speed are also considered (Hypotheses 6, 7, 8a, 8b, 9a, and 9b). This condition will confirm that the performance effects of organizational and environmental forces are mediated by decision speed (Baron and Kenny, 1986).

Hypothesis 10: The significance of the direct effects of dynamism, munificence, centralization, and formalization upon firm performance is reduced when the indirect effects of dynamism, munificence, centralization, and formalization through strategic decision-making speed are included in a total effects model.

METHODOLOGY

The nine hypothesized relationships shown in Figure 1, plus the mediation hypothesis (Hypothesis 10), were tested with measures derived from the literature and a pilot study. Data were collected in questionnaires from 318 CEOs in 1997 and 2001. The CEOs managed firms that operate in all 10 Global Industry Classification Standard sectors (GICS). In part, CEO data were validated with reports from 122 associates, Standard & Poor's Compustat (1998–2001), and Dun & Bradstreet (1997, 2001). The validity of the

measurement model and fit of the data with the theoretical model were tested with structural equation modeling.

Field study participants

CEOs of the 846 York County, PA, industrial companies with more than five employees in 1996 comprised the population for the study (York County Industrial Directory (s), 1996–2001). York County is an established manufacturing center with a growing complex of technology-oriented software and hardware companies and industrial service companies. The largest firm in the population had 3200 employees with sales of $380 million and the smallest had five employees with sales of $300,000. As shown in Table 1, the Spearman rank correlation of the percentage of employees per Global Industry Classification Standard (GICS) sector for 1999 indicated that the York County industrial employment distribution is representative of the Pennsylvania industrial population (rho = 0.818, $p < 0.01$) and the United States industrial population (rho = 0.964, $p < 0.01$) (See Table 1 data citations). In 1996, following promotion in a York County industrial publication and a newsletter, CEOs of all firms with at least five employees were sent a series of introductory letters explaining the research project and its benefits for the York County economy.

The CEOs were asked (1) to return a response card if they were willing to participate, (2) to indicate the preferred questionnaire format (Internet or hard copy), and (3) to identify a subordinate employee with whom they worked directly and who could participate in the study. After follow-up requests emphasizing the importance of participation, 376 CEOs (44%) and 145 employee participants (17%) agreed to participate.

Pilot study

Thirteen CEOs agreed to participate in a pilot study involving structured interviews to guide development of test measures for a questionnaire. Forty candidate measures of dynamism, munificence, centralization, and formalization in Likert response format (LRF) were tested. Prior to the pilot study, the 13 CEOs had been asked to identify strategic decisions in which each had participated during the past 5 years. Six strategic decisions were selected for the pilot study on the basis of CEO experience (technology adoption (13/13 CEOs had experience), new product introduction (12/13), merger and acquisition (10/13), 'restructuring' (9/13)), radical change in the executive incentive compensation plan (5/13), and CEO succession planning (4/13). The first author wrote the decision scenarios following a review of the structure and content of scenarios used in Duhaime and Schwenk (1985) and Hitt and Tyler (1991). Two pilot study CEOs reviewed and revised the author's draft scenarios for inclusion in the pilot study. The 13 pilot study CEOs evaluated the scenarios in terms of realism for (1) York County industries, (2) current issues, and (3) their own businesses. To provide additional guidance for formulation of a questionnaire, pilot study CEOs were asked to disclose sales, employment, and profit data in two experimental formats.

Table 1. Similarity test: 1999 employment percentage by GICS sector for U.S., Pennsylvania, and York County, PA[a]

Sector	U.S.	PA	York County, PA
Consumer Discretionary	33	28	39
Materials	4	14	4
Telecom Service	4	1	2
Industrials	23	14	29
Financials	8	6	3
Energy	2	6	1
Health Care	6	9	6
Consumer Staples	9	9	8
Utilities	2	2	1
Info Tech.	9	11	7

	U.S.–York	PA–York
Spearman rank correlation	0.964	0.818
Probability	<0.01	<0.01

[a] Data sources: U.S. Department of Labor and Industry, Bureau of Labor Statistics (2000); Commonwealth of Pennsylvania, Department of Labor and Industry, Office of Employment Security, Bureau of Research and Statistics (2000); York County Economic Development Corporation (2001)

Questionnaire

In 1997, we mailed a questionnaire to each of the 376 CEOs and 145 associates who agreed to participate. (Data from associates were used to verify CEO self-reports using LISREL MSA

(multiple sample analysis).) Data were collected to measure the four hypothesized antecedents of strategic decision-making, decision speed, firm sales, employment, total assets, and pretax net profit for 1995 and 1996. Associates were not asked to report performance data. We received 361 CEO responses (43% of the population) and 131 associate responses after persistent follow-up phone calls. To test whether the 361 CEO respondents were representative of the population of 846 companies and to determine whether there was significant statistical bias, we performed z-tests of the mean number of employees and mean sales volume of the respondents and the population. The tests showed that the difference was not significant between the (1) mean number of employees ($z = 0.24$; $p < 0.41$), or (2) mean sales volume ($z = 0.95$; $p < 0.17$).

A second questionnaire was mailed in 2001 to collect 2000 performance data and repeated responses about organizational and environmental characteristics. Responses were eliminated if (1) data from either the 1997 or the 2001 surveys were incomplete or not available (36 1997 respondent firms did not exist in 2001), or (2) 2001 responses about organizational and environmental characteristics were not consistent with 1997 responses (seven failed LISREL MSA). Thus, we used 318 CEO responses (37% of the population) with 122 matching associate responses (38% of the net qualified CEO sample). The average associate had worked with their CEO for 4 years.

Measures

Table 2 shows the 10 measurement model concepts: firm performance (growth and profit), decision speed, dynamism, munificence, centralization, mdecentralization, formalization, informalization, firm size, and past firm performance (growth and profit). Table 2 also shows the number of measurement items, format, LISREL 8.3 composite reliability (CR), and research source for each concept. CR is conceptually similar to alpha; it should exceed 0.60 for exploratory model testing (DeVellis, 1991). (The lowest CR for the measures used herein was CR > 0.71; alpha > 0.73.)

Firm performance

Initially, we intended to study firm performance as an amalgamation of three important firm outcomes: sales growth, employment growth, and pretax net profit percentage of total assets (Zahra and Bogner, 2000). However, the CR for the three-item latent concept was substandard (CR < 0.42). Factor analysis indicated that the two measures of growth and the measure of profit were distinct. Thus, we decided to analyze the data with two types of firm performance: growth and profit.

Table 2. Measurement model

Concept	# items	Format[a]	CR/alpha[b]		Research source
Firm performance					
Sales and employment growth	2	[(2000/1996) − 1.0]/4	0.96	—	Low and MacMillan (1988)
Profit % of assets	1	(1998 + 1999 + 2000)/3	1.00	—	Low and MacMillan (1988)
Decision speed	3	Scenarios[c]	0.78	0.79	Pilot study
Dynamism	5	LRF[a]	0.88	0.89	Priem *et al.* (1995)
Munificence	5	LRF[a]	0.85	0.87	Hambrick/Finkelstein (1987)
Centralization of strategy	4	LRF[a]	0.71	0.73	Khandwalla (1977)
Decentralization of operations	4	LRF[a]	0.73	0.81	Khandwalla (1977)
Formalization of routines	3	LRF[a]	0.73	0.76	Khandwalla (1977)
Informalization of non-routines	4	LRF[a]	0.83	0.84	Khandwalla (1977)
Firm size (control)	1	Log # employees	1.00	—	Pugh *et al.* (1968)
Past performance (control)					
Sales and employment growth	2	(1996/1995) − 1.0	0.92	—	Low and MacMillan (1988)
Profit % of assets	1	1996	1.00	—	Low and MacMillan (1988)

[a] LRF, Likert response format (5-point: 1 = strongly disagree to 5 = strongly agree (see Appendix 2).
[b] CR, composite reliability, an indication of internal consistency, is the sum of the square roots of the item squared multiple correlations, squared, and divided by the same quantity plus the sum of the error variances (Werts, Linn, and Joreskog, 1974). Alpha, Cronbach's alpha (*Psychmetrika* 1951; **16**: 297–334).
[c] Scenarios, three scenarios were presented with follow-up questions (see Appendix 1).

Growth was measured with two items: (1) the percentage change in annual sales from 1996 to 2000 ((2000/1996)—1.0) and, (2) similarly, the percentage change in year-end employment from 1996 to 2000. Profit was measured with one item, the average annual 'pretax net profit % of assets' for 1998, 1999, and 2000. Self-reported objective measures were used rather than subjective measures (e.g., respondents' reports about performance relative to competitors'), because objective measures are more fine-grained (Chandler and Hanks, 1993). Furthermore, we believed that participants would report actual financial data because: (1) many respondents had participated in a 1992 survey of York County industrial companies and had been pleased with the results, and (2) we could also promise confidentiality because we used a university data service that is independent of the researchers.

Despite follow-up efforts, 32 of the entrepreneur/CEOs who qualified for the sample in all other respects had incomplete 1996 data. Twenty-six of these cases were completed with data supplied by Dun & Bradstreet (1997), and the five remaining cases were omitted from the sample. Similarly, follow-up phone calls and Dun & Bradstreet (2001) reports were used to get 2000 performance data for 16 firms and three were deleted because data were not available. (These deletions were included above: $n = 318$.)

The accuracy of the self-reported raw performance data was evaluated by checking the agreement of a random sample of 20 of the sample firms with Dun & Bradstreet (1997) reports about 1996 performance. Results of the correlation and t-tests reveal high correlation (sales: $r = 0.95$, $p < 0.001$; employment: $r = 0.91$, $p < 0.001$; profit: $r = 0.78$, $p < 0.01$) and insignificant means differences (sales: $t = 0.31$, $p < 0.39$; employment: $t = 0.50$, $p < 0.31$; profit: $t = 0.95$, $p < 0.18$). (Dun & Bradstreet reports were not used as the sole performance data source because of cost constraints.)

Decision speed

As shown in Appendix 1, three decision scenarios were used to measure decision speed: (1) an acquisition decision, (2) a new product introduction decision, and (3) a technology adoption decision. The three scenarios were selected because prior academic studies had identified the importance of the topic and the 13 pilot study CEOs had indicated their experience with the issue and had evaluated the scenarios highly for relevance in York County businesses, current issues, and their own businesses. Acquisition scenarios had been used successfully in research by Duhaime and Schwenk (1985) and Hitt and Tyler (1991), and new product introduction is the focus of strategic management research (see, for example, Bowen *et al.*, 1994). Researchers in multiple fields have pointed to the importance of technology adoption for firm performance (Zahra and Covin, 1993; Jones *et al.*, 2000; Klein, Conn, and Sorra, 2001).

Decision speed was measured as the average of three items (one for each of three scenarios) (alpha = 0.79): (1) 'Circle the approximate # of days it would take your organization to decide whether or not to invest significant time in pursuit of a merger with the Mills company (2, 5, 10, 20, 30, 60, 90, 120, 150, 180, more).' (2) 'Circle the approximate # of days it would take you/your organization to decide whether or not to proceed with a commitment to develop and introduce this new product (2, 5, 10, 20, 30, 60, 90, 120, 150, 180, more).' And (3) 'Circle the approximate # of days it would take you/your organization to decide whether or not to proceed with a full commitment to new ERP software (2, 5, 10, 20, 30, 60, 90, 120, 150, 180, more).'

Dynamism, munificence, centralization, and formalization

As shown in Table 2, research sources guided formation of items for measurement of the environmental and organizational concepts studied. Additionally, pilot study participants responded to 40 Likert response format items that were candidates for measurement of the organization and environment predictor concepts. Follow-up discussion led to elimination of items that were difficult to understand. The 36 remaining items were included in the questionnaire, and we used a statistical routine to maximize Cronbach's alpha to select items to measure the six decision factors studied (Norusis, 1990); the items selected are shown in Appendix 2, and the CR and alpha are shown for each in Table 2. The measurement item reflections of the latent variables were weighted as part of the SEM optimizing process. The 'good' reliabilities achieved suggest that each item was an important measure.

We used subjective measures of environmental and organizational factors (CEO perceptions)

Table 3. Similarity test: CEO reports of dynamism and munificence compared with S & P sales variance and growth by GICS category[a]

Sector	Dynamism indices		Munificence indices	
	CEOs[a]	S & P[b]	CEOs[c]	S & P[d]
Consumer Discretionary	0.15	0.17	0.07	0.11
Materials	0.11	0.12	0.10	0.08
Telecommunications	0.26	0.29	0.13	0.18
Industrials	0.13	0.16	0.08	0.11
Financials	0.32	0.32	0.20	0.21
Energy	0.14	0.16	0.13	0.12
Health Care	0.24	0.22	0.24	0.16
Consumer Staples	0.14	0.11	0.07	0.07
Utilities	0.34	0.30	0.22	0.24
Information Technology	0.26	0.25	0.16	0.17
Spearman rank correlation	0.952		0.818	
Probability	<0.01		<0.01	

Standard & Poor's Compustat. 1998–2001 (60 months: 1996 to 2000 net sales by GISC category.
[a] Respondents' LRF average response transformed to fit the mean and range of[b].
[b] The variance of 5 years of the S & P category monthly net sales divided by the average net sales for the same period.
[c] Respondents' LRF average response transformed to fit the mean and range of[d].
[d] The average annual growth rate by GISC category 1996 to 2000.

because this study of decision speed is built upon person-centered strategic decision process theory (Priem *et al.*, 1995); however, as shown in Table 3, we calculated the 60-month (to December 2000) GISC sector revenue variance to yield an index of dynamism and compared this with a transformation of the average LRF score for each GISC sector in our sample. As shown in Table 3, the CEO reports and S & P data yielded similar evaluations of dynamism using the Spearman correlation of ordinal ranking (rho = 0.952, $p < 0.01$). Furthermore, we calculated the GISC sector revenue growth rate with the same objective data and compared it with a transformation of the average LRF self-reported 'munificence' score from our sample (Priem *et al.*, 1995). The two rankings were similar (rho = 0.818, $p < 0.01$).

Controls

We included two controls to clarify the relations among environmental and organizational characteristics, decision speed, and subsequent firm performance. (1) Firm size was controlled in terms of both decision speed and performance because hundreds of studies have found that size can systematically influence organizational practices and because it is a surrogate for organization complexity. We measured firm size with the log transform of the number of full-time equivalent employees at the end of 1996. (2) Past firm performance (in terms of sales/employment growth and profitability) was controlled to provide a baseline for analysis of the effects on the performance variables. Past growth was measured as: (1) the percentage change in annual sales from 1995 to 1996 (1996/1995) − 1.0, and (2) similarly, the percentage change in year-end employment from 1995 to 1996. Past profit percentage of total assets was measured as 1996 pretax net profit percentage of assets.

RESULTS

LISREL 8.3 and PRELIS 2 were used to (1) evaluate concept validity (i.e., 'composite reliability' (including dual-source similarity), convergent, and discriminant validity), (2) perform confirmatory factor analysis (CFA) to verify the validity of the proposed configuration of causal concepts, and (3) test the hypotheses (Joreskog and Sorbom, 1993). We used the following indices to guide conclusions about the measurement model and to indicate the fit of data to hypotheses: (1) The χ^2 probability should be larger than <0.05: however, when n is large, as it is in this study, significant χ^2 are typical. (2) The goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), and comparative fit index (CFI) should be near or better than 0.90. (3) The standardized root mean square residual (SRMR) should be less than 0.050. And (4) the root mean square error of approximation (RMSEA) should be less than 0.080 (Joreskog and Sorbom, 1993; Medsker, Williams, and Holohan, 1994).

Univariate homogeneity testing (PRELIS 2 HT) and multiple sample analysis (LISREL MSA) confirmed the similarity of the distributions of the self-reported responses of the 122 CEO–associate pairs (that is, the 122 CEOs for which we had associate data), as well as the distributions of the 'CEOs with associates' ($n = 122$) and 'CEOs without associates' ($n = 196$). Thus, we found that CEOs with

associates were not rationalizing their own performance, and this validity extended to the full CEO data set ($n = 318$).

As shown in Table 2, the measurement model had four scale concepts with alpha > 0.80 and three with alpha between 0.70 and 0.79. All measure coefficients were significant ($t > 2.0$; $p < 0.05$); thus, convergent validity is supported. There were three statistical indications that the measurement model had discriminant validity: (1) We subjected the organization and environment scale items to a principal components analysis using varimax rotation (Harman, 1967). From this exploratory factor analysis, six factors emerged with average item loading >0.75 (The factors represented dynamism, munificence, centralization of strategy, centralization of operations, formalization of routines, and informalization of non-routines). The remaining measurement model items were objective (firm size, sales, profits) or scenario based (decision speed). (2) For each latent variable, the average variance extracted by the latent variable's measures was larger than the latent variable's shared variance with any other latent variable (Fornell and Larcker, 1981). Discriminant validity is also supported because no bivariate correlations in excess of 0.40 exist between predictor concepts except between the two centralization concepts and the two formalization concepts (see Table 4) (Jones *et al.*, 2000). Common source bias was checked with LISREL confirmatory factor analysis by linking a common latent variable with all of the measures. The resultant coefficient lambda = 0.07 ($t = 0.28$, $p < 0.89$) indicated that common variance was less than 2 percent. Thus, there appears to be no threat that relationships were inflated because one person provided information for all of the concepts. In summary, the measurement model exhibited reliable measurement of the latent concepts, convergence of the measures of each concept, and divergence of the concepts.

The descriptive statistics (means, standard deviations, and polychoric correlations) of the study variables are shown in Table 4. The structural equation results for the four SEMs are shown in Table 5. The fit statistics of all four SEMs are acceptable. The best model is the indirect effects model with firm growth; it has χ^2 (545) = 1089.88; GFI = 0.96; AGFI = 0.93; CFI = 0.98; SRMR = 0.045; RMSEA = 0.058. Both indirect effects models are superior to their matching direct effects model. The poorest model is the direct effects model for firm profits, and its fit is: χ^2 (519) = 1240.37; GFI = 0.89; AGFI = 0.86; CFI = 0.92; SRMR = 0.058; RMSEA = 0.080. Thus, we are able to draw conclusions from the standardized lambda coefficients shown in Table 5.

As shown in Figure 2 the lambda coefficients confirm Hypothesis 1 in part. That is, strategic decision speed predicts subsequent firm growth in both direct and indirect models; however, speed predicts higher profit for indirect effects alone in the profit model. (This supports our view that speed is a partial mediator of organizational and environmental concepts.) Our hypothesis that dynamism had a negative effect upon performance (Hypothesis 2) was supported in both the direct and indirect profit models, but there were no significant effects in either growth model. As hypothesized, positive munificence, centralization of strategy, and decentralization of operations predicted subsequent positive performance in all four models (Hypotheses 3, 4a, and 4b). Formalization of routines and informalization of non-routines predicted performance in both profit models and in the direct growth model, but only informalization of non-routines was a significant predictor of performance in the indirect growth model (Hypotheses 5a and 5b). Dynamism, munificence, centralization of strategy, decentralization of operations, formalization of routines, and informalization of non-routines related positively with strategic decision speed (Hypotheses 6, 7, 8a, 8b, 9a, 9b).

The conditions of mediation were met in terms of the significance and direction of change of 38 of the 40 coefficients; a strict interpretation would require that dynamism be a direct predictor of firm growth and strategic decision speed a direct predictor of profit. Nevertheless, when indirect paths through decision speed were established between the environmental and organizational predictors and performance, all of the direct predictor relationships were diminished, and the relationships between speed and performance were significant. This points to the significance of strategic decision speed as a mediator of the four environmental and organizational predictors and firm performance (Baron and Kenny, 1986).

We also tested the possibility that dynamism moderated the speed to performance relation. We ran a regression of sales/employment growth on speed and 'speed times dynamism' and found weak significance for the product term (sales/employment growth = 0.482 ($t = 7.390$;

Table 4. Means, standard deviation, and correlations

Concept	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Growth	0.06	0.20											
2. Profit	0.08	0.77	0.13*										
3. Decision speed	46	32	0.19**	0.12*									
4. Dynamism	2.87	0.81	−0.06	−0.26***	0.20**								
5. Munificence	3.73	0.51	0.31***	0.15*	0.11	0.14*							
6. Centralization of strategy	3.22	0.34	0.18**	0.23**	0.27***	0.15*	0.09						
7. Decentralization of operations	3.10	0.30	0.16**	0.19**	0.23**	0.17**	0.10	0.51***					
8. Formalization of routines	2.70	0.36	0.12*	0.17**	0.13*	0.08	0.13*	0.36***	0.29***				
9. Informalization of non-routines	2.95	0.41	0.13*	0.18**	0.12*	0.02	0.18**	0.42***	0.36***	0.54***			
8. Firm size (log)	6.58	3.74	−0.09	0.06	−0.16**	−0.10	0.04	−0.07	−0.06	0.10	0.10		
9. Past growth	0.03	0.15	0.18**	0.20**	0.18**	0.04	0.22**	0.12*	0.13*	0.02	0.04	0.16**	
10. Past profit	0.06	0.61	0.07	0.30***	0.04	−0.10	0.21**	0.17**	0.18**	0.07	0.04	0.14*	0.07

$n = 318$
* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

Table 5. Structural equation results

Predictor	Outcome	Growth model		Profit model	
		Direct	Indirect	Direct	Indirect
Decision speed	Performance	0.18*	0.27*	0.06	0.11*
Dynamism	Performance	−0.03	−0.09	−0.31*	−0.23*
Munificence	Performance	0.29*	0.21*	0.18*	0.12*
Centralization of strategy	Performance	0.22*	0.19*	0.26*	0.22*
Decentralization of operations	Performance	0.19*	0.16*	0.22*	0.18*
Formalization of routines	Performance	0.14*	0.09	0.21*	0.14*
Informalization of non-routines	Performance	0.18*	0.14*	0.24*	0.16*
Firm size	Performance	−0.05	−0.04	0.10	0.07
Past performance	Performance	0.15*	0.15*	0.30*	0.30*
Dynamism	Decision speed		0.28*		0.09*
Munificence	Decision speed		0.12*		0.11*
Centralization of strategy	Decision speed		0.30*		0.15*
Decentralization of operations	Decision speed		0.28*		0.14*
Formalization of routines	Decision speed		0.11*		0.13*
Informalization of non-routines	Decision speed		0.16*		0.16*
Firm size	Decision speed		−0.13*		−0.14*
Fit statistics					
χ^2		1153.07	1089.88	1240.37	1064.11
Degrees of freedom		552	545	519	512
GFI		0.92	0.96	0.89	0.94
AGFI		0.89	0.93	0.86	0.91
CFI		0.93	0.98	0.92	0.96
SRMR		0.049	0.045	0.058	0.047
RMSEA		0.066	0.058	0.080	0.062

$N = 318$
* $t > 2.0$ ($p < 0.05$)
Parameter estimates are from a completely standardized solution.

$p < 0.000) + 0.106$ ($t = 1.628$; $p < 0.105$). In a parallel test with profit percentage of assets as the dependent variable, the results were not significant for the product term (profit % of assets $= 0.186$ ($t = 2.31$; $p < 0.022) + 0.073$ ($t = 1.028$; $p <$ 0.305). Thus, in our data drawn from 10 industrial settings, there is evidence that dynamism is a weak moderator of the speed-to-growth relation but not the speed to profit relation.

DISCUSSION AND CONCLUSION

Speed and firm performance

Important aspects of this paper are that (1) it offers large sample support of a theory begun by Eisenhardt (1989) and Judge and Miller (1991) that decision speed affects firm performance, and (2) it extends the positive findings across companies that represent all 10 GSICs. We also expanded strategic decision speed research by identifying a more elaborate set of factors that affect decision speed. Utilizing decision-making theory, we adopted the viewpoints of CEO decision-makers who must draw upon their perceptions of organizational and external conditions in making strategic decisions. We found that decision speed affected subsequent 4-year 'sales and employment growth' and 'profit % of assets' and that dynamism, munificence, centralization, and formalization speed decision-making.

Nevertheless, the causal link between decision speed and subsequent performance is not assured. It may be that CEOs who lead fast strategic decision processes tend to be energetic, smart, proactive leaders who also get high growth from their companies through other processes. Also, it may be that business decisions take place in stochastic environments wherein delay yields little that improves decisions so that the early actors we studied simply get early gains from early decisions. Whatever the relationships of the personal characteristics of strategic decision-makers or the

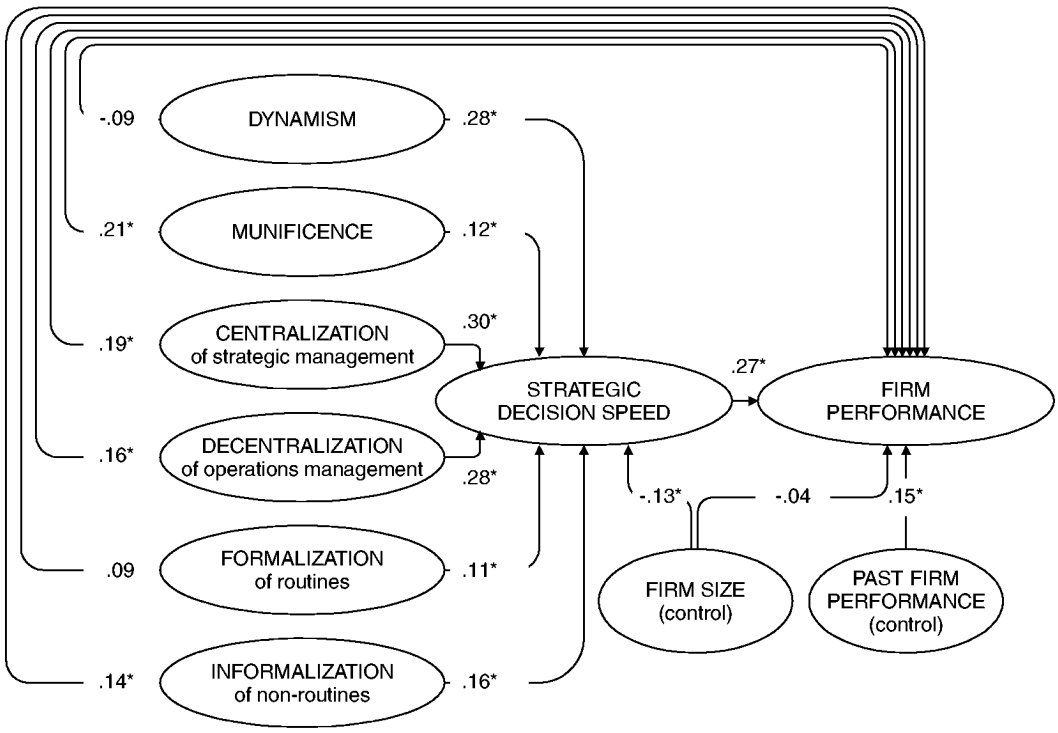

Figure 2. Results: growth model with indirect effects

characteristics of the unique business processes/industry, the longitudinal design of our study combined with controls for past performance and firm size offer plausibility for a causal interpretation: fast decision-making is a predictor of subsequent firm growth.

Furthermore, strategic decision speed mediates the relation of organizational and environmental factors with firm performance, which also supports a causal argument for decision speed. That is, the relationships between dynamism, munificence, centralization of strategy and operations, and formalization of routines and non-routines and firm performance were diminished when their relation with decision speed was included, and total 'variance explained' increased in the indirect effects model. This points to the impact of decision-making in general and to decision speed in particular for firm performance.

Our findings can also be interpreted as an indication that CEOs who report slower decision processes run companies that have slower (but not negative) growth and unchanged (but not negative) profitability. These conditions fit the traditional description of mature, bigger firms, and we did find a significant negative correlation between firm size and decision speed (see Table 4). However, we have controlled for size in our analyses.

The finding that fast decision-making does not precede improved profits in the direct effects model and that the relation with profits in the indirect model is borderline is interesting. One might expect that early decisions would improve efficiency and, thereby, profits. For example, process technology adoption is motivated by expected cost savings (Baum, 2000), so that early adoption may produce early profits. However, growing companies sacrifice current profits as they bear the expense of organization for increased scale, and investment in improvements may impact firm profits negatively (Dowling and McGee, 1994).

Environmental and organizational factors of performance and decision speed

We found that dynamism impacted the profits of our heterogeneous sample negatively. This supports our view that overall it is more difficult to manage successfully in unpredictable environments. We also found negative coefficients between dynamism and growth, but these were not significantly different from zero. The finding that

dynamism is significantly related with fast decision speeds, which in turn is related with improved growth, supports the findings of Eisenhardt (1989) and Judge and Miller (1991) that fast decision-making enhances performance in 'high-velocity' markets.

We found a weak moderation effect ($p < 0.11$) for environmental dynamism in the relation between decision speed and firm growth. That is, the effect of speed upon growth is stronger in dynamic environments. (We found no moderation effect upon profit.) This finding offers support for Judge and Miller's (1991) conclusion that the effects of decision speed depend upon context; however, the result does not diminish our findings that fast decision-making has positive effects across environments and that dynamism is an antecedent of decision speed. Indeed, our findings suggest that the more general environmental concept, dynamism (unpredictability), may have more general effects beyond those found in 'high-velocity' settings (unpredictability and rapid growth).

Taken together, our findings suggest that fast decision-making is beneficial, even given the negative force of environmental dynamism upon performance. It may be that fast decision-making and subsequent fast adoption are more useful in dynamic markets because (1) more options exist (Hambrick and Abramhamson, 1995) and (2) early 'trial and error' action may provide useful information for effective secondary action. Our results for munificence provided no surprises. In short, munificence enhances growth and profits, and it relates positively with decision speed.

We adopted a definition of centralization that distinguishes strategic and operational processes because we think that both realms affect strategic decision speed. Our study confirms the prescription of Adler and Borys (1996) that a combination of strategic process centralization and operational decentralization produces the best results. Researchers who study the effects of centralization across multiple within-organization realms may uncover interesting organization design prescriptions for practitioners.

Our finding that centralized strategic decision-making with decentralized operational decision-making contributes to higher firm performance may also shed light on the conflict between traditional contingency theory and Eisenhardt's (1989) findings. Contingency theory suggests that firms in more uncertain environments should decentralize in order to make speedier decisions and be more responsive to markets (Lawrence and Lorsch, 1967; Scott, 1992). In contrast, Eisenhardt suggested that the ability to make faster decisions when authority is concentrated may outweigh the perceived advantages of additional information from decentralized organization. Our study supports Eisenhardt and lends credence to our challenge to those who call for front-line employees to provide strategic information. That is, we believe that modern information systems and 'walking around' permit centralized strategic decision-makers sufficient information to be confident in their decisions and that workers who participate in decentralized operational decision-making are motivated to contribute to new strategic initiatives.

Our finding that centralization enhances strategic decision speed is also consistent with Scott (1992), who suggested that CEOs in centralized firms execute speedier strategic decisions because they conduct more efficient information processing; this may also be due to reduced political activity (Bourgeois and Eisenhardt, 1988). That strategic decision speed mediated the important relationships between centralization and performance is fully supportive of Judge and Miller (1991) and Eisenhardt (1989), who found that faster deciding was associated with better-performing firms in rapidly changing environments; however, this study extends these conclusions to a heterogeneous sample.

We studied and measured formalization in two organization realms: routines and non-routines. As with our dual realm definition of 'centralization,' we found that firms that formalized routine structures and systems while leaving non-routines unstructured performed best in terms of growth and profit. This may be because the firms that maintain routine structures, memory, and systems do not lose valuable learning when employees change or markets shift. In terms of strategic processes, which are not routine, firms that permit informalization reap the benefit of unconstrained thinking, which may impact performance.

Limitations and future study

This research focused on a characteristic of decision-making (speed) rather than on subsequent implementation (Dooley, Fryxell, and Judge, 2000). Thus, better understanding of the decision

to performance process may be gained through exploration of implementing processes. For example, fast decisions may enable a preemptive merger or acquisition activity or exploitation of market opportunities before others. Fast decisions may lead to faster growth because firms adopt process technologies that improve product/service appeal in the marketplace. Fast decision-making may simply expose CEOs and their organizations to learning situations more quickly than competitors.

Fast decision-making may be a behavior of CEOs who are effective because of other behaviors, so future studies may identify and test CEO behaviors that associate with fast decision-making. Indeed, future studies ought to extend past research about CEO personal characteristics and decision speed (Wally and Baum, 1994). It may be helpful to go beyond the CEO-centered processes that we envisioned here to include team dynamics and effects (Winch, 1995).

We studied acquisition, product development, and technology adoption strategic decisions. Future research ought to study other types of strategic decisions. Furthermore, the scenarios that we used presented opportunity-motivated decisions. It may be that CEOs decide differently when faced with decisions that are motivated by goals that require *search* for options.

Although we took care to produce relevant scenarios in terms of current business issues and respondents' experience, we measured decision speed with fictitious decision scenarios and associated the responses with real firm financial performance, Thus, responses may be affected by social bias including reports about processes that are more rational and behaviors that are more decisive than experienced in real life. The commitment of real firm resources in real political environments may produce different results than CEOs reported. This shortcoming could be minimized in future studies that study real decisions. Nevertheless, social bias appears across the sample, so individual response differences should have yielded meaningful data.

Our strategic decision-making model involved linear equations rather than multiple order equations because structural equation modeling is not well suited to testing non-linear equations. Nevertheless these possible failures to specify the optimal concepts and the exact form of the relationships in our study do not diminish the value of the primary finding—that organizational and environmental concepts relate with fast decision-making which, in turn, affects firm performance.

This study drew upon a heterogeneous sample in order to extend past research beyond its narrow environment settings. However, future researchers may wish to study decision speed within respondent categories such as (1) basis for competition (relationship, efficiency, marketing, or product innovation) (Shane and Venkataraman, 2000), (2) age, or (3) form of ownership (public or private).

Conclusion

This longitudinal study of strategic decision speed extends and refines extant theory about strategic decision speed. Its findings provide a more complete picture for teachers of the environmental and organizational factors that impact decision speed. For managers, it is apparent that advances in communication and information-processing technologies have produced business environments that appear to be changing at an ever more rapid rate, which makes maintenance of competitive advantage through proprietary assets or knowledge more difficult. Thus, more firms may need to master fast decision-making. Also, our results suggest that aspects of organization design and environmental selection that are within managerial control are capable of influencing the speed with which strategic decisions can be made. The finding that decision speed matters for firm growth may comfort those energetic, impatient, focused CEOs who value decision celerity.

REFERENCES

Adler PS. 1999. Building better bureaucracies. *Academy of Management Executive* **13**(4): 36–46.

Adler PS, Borys B. 1996. Two types of bureaucracy: enabling vs. coercive. *Administrative Science Quarterly* March: 61–89.

Aldrich HE. 1979. *Organizations and Environments*. Prentice-Hall: Englewood Cliffs, NJ.

Ancona DG, Okhuysen GA, Perlow LA. 2001. Taking time to integrate temporal research. *Academy of Management Review* **26**: 512–529.

Bantel KA. 1998. Technology-based, 'adolescent' firm configurations: strategy identification, context, and performance. *Journal of Business Venturing* **13**: 205–230.

Bargh JA, Chartrand TL. 1999. The unbearable automaticity of being. *American Psychologist* **54**: 462–479.

Barnard CI. 1938. *The Functions of the Executive*. Harvard University Press: Cambridge, MA.

Baron RE, Kenny DA. 1986. The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology* **51**: 1173–1182.

Baum JR. 2000. A longitudinal study of the causes of technology adoption and its effect upon new venture growth. *Frontiers of Entrepreneurship Research* 1–12.

Beach LR. 1993. *Making the Right Decision: Organizational Culture, Vision, and Planning*. Prentice-Hall: Englewood Cliffs, NJ.

Beard DW, Dess GG. 1981. Corporate-level strategy, business-level strategy and firm performance. *Academy of Management Journal* **24**: 663–688.

Berman SL, Down J, Hill CWL. 2002. Tacit knowledge as a source of competitive advantage in the National Basketball Association. *Academy of Management Journal* **45**(1): 13–31.

Bourgeois LJ. 1980. Strategy and environment: a conceptual integration. *Academy of Management Review* **5**: 25–39.

Bourgeois LJ, Eisenhardt K. 1988. Strategic decision processes in high velocity environments: four cases in the microcomputer industry. *Management Science* **34**: 816–835.

Bowen HK, Clark KB, Holloway CA, Wheelwright SC (eds). 1994. *The Perpetual Enterprise Machine*. Oxford University Press: New York.

Brockner J, Grover S, Reed T, DeWitt RL. 1992. Layoffs, job insecurity, and survivors' work effort: evidence of an inverted-U relationship. *Academy of Management Journal* **35**: 413–425.

Chandler GN, Hanks SH. 1993. Measuring the performance of emerging businesses: a validation study. *Journal of Business Venturing* **8**: 391–408.

Child J. 1972. Organization structures, environment, and performance: the role of strategic choice. *Sociology* **6**: 1–22.

Commonwealth of Pennsylvania, Department of Labor and Industry, Office of Employment Security, Bureau of Research and Statistics. 2000. *Pennsylvania Civilian Labor Force Series*. Commonwealth of Pennsylvania Printing Office: Harrisburg, PA.

Dess GD, Beard DW. 1984. Dimensions of organizational task environments. *Administrative Science Quarterly* **30**: 52–73.

DeVellis RF. 1991. *Scale Development: Theory and Applications*. Sage: Newbury Park, CA.

Dodge HR, Fullerton S, Robbins JE. 1994. Stage of the organizational life-cycle and competition as mediators of problem perception for small businesses. *Strategic Management Journal* **15**(2): 121–134.

Dooley RS, Fryxell GE, Judge WQ. 2000. Belaboring the not-so-obvious: consensus, commitment, and strategy implementation speed and success. *Journal of Management* **26**(6): 1237–1257.

Dowling MJ, McGee JE. 1994. Business and technology strategies and new venture performance: a study of the telecommunications equipment industry. *Management Science* **40**(12): 1663–1677.

Duhaime IM, Schwenk CR. 1985. Conjectures on cognitive simplification in acquisition and divestment decision making. *Academy of Management Review* **10**: 287–295.

Dun & Bradstreet. 1997/2001. *Corporate Organization and Financial Profiles*. Dun & Bradstreet: New York.

Eisenhardt KM. 1988. Agency and institutional theory explanations: the case of retail sales compensation. *Academy of Management Journal* **31**: 488–511.

Eisenhardt KM. 1989. Making fast strategic decisions in high-velocity environments. *Academy of Management Journal* **27**: 299–343.

Fiske ST. 1992. Thinking is for doing: portraits of social cognition from daguerreotype to laserphoto. *Journal of Personality and Social Psychology* **63**: 877–889.

Forbes DP. 2001. The performance implications of strategic decision-making: evidence from a new venture context. Presented at 2001 Academy of Management Meeting, Washington, DC.

Fornell C, Larcker D. 1981. Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research* **18**: 39–50.

Fredrickson JW. 1984. The comprehensiveness of strategic decision processes: extension, observations, future directions. *Academy of Management Journal* **27**: 445–466.

Fredrickson JW. 1986. The strategic decision process and organization structure. *Academy of Management Review* **11**(2): 280–297.

Fredrickson JW, Iaquinto AL. 1989. Inertia and creeping rationality in strategic decision processes. *Academy of Management Journal* **32**: 543–576.

Glick WH, Miller CC, Huber GP. 1993. The impact of upper echelon diversity on organizational performance. In *Organizational Change and Redesign: Ideas and Insights for Improving Performance*, Huber GP, Glick WH (eds). Oxford University Press: New York; 176–214.

Hambrick DC, Abrahamson E. 1995. Assessing managerial discretion across industries: a multimethod approach. *Academy of Management Journal* **38**: 1427–1441.

Hambrick DC, Finkelstein S. 1987. Managerial discretion: a bridge between polar views of organizational outcomes. In *Research in Organizational Behavior*, Cummings LL, Staw BM (eds). JAI Press: Greenwich, CT; 369–406.

Harman HH. 1967. *Modern Factor Analysis* (2nd edn). University of Chicago Press: Chicago, IL.

Hitt MA, Tyler BB. 1991. Strategic decision models: integrating different perspectives. *Strategic Management Journal* **12**(5): 327–351.

Isenberg DJ. 1986. Thinking and managing: a verbal protocol analysis of managerial problem solving. *Academy of Management Journal* **29**: 775–788.

Jones GK, Lanctot A, Teegen HJ. 2000. Determinants and performance impacts of external technology

acquisition. *Journal of Business Venturing* **16**: 255–283.
Jones JW. 1993. *High Speed Management: Time-Based Strategies for Managers and Organizations*. Jossey-Bass: San Francisco, CA.
Joreskog KG, Sorbom D. 1993. *LISREL 8: User's Reference Guide*. Scientific Software International: Chicago, IL.
Judge WQ, Miller A. 1991. Antecedents and outcomes of decision speed in different environmental contexts. *Academy of Management Journal* **34**: 449–463.
Jung DI, Avolio BJ. 1999. Effects of leadership style and followers' cultural orientation on performance in group and individual task conditions. *Academy of Management Journal* **42**: 208–218.
Kahneman DD, Slovic P, Tversky A. 1982. *Judgment Under Uncertainty: Heuristics and Biases*. Cambridge University Press: New York.
Keats BW, Hitt MA. 1988. A causal model of linkages among environmental dimensions, macro organizational characteristics, and performance. *Academy of Management Journal* **31**: 570–598.
Kepner-Tregoe G. 2001. Hurry up and decide! *Business Week* **14**: May 34–35.
Ketchen DJ, Thomas JB, Snow CC. 1993. Organizational configurations and performance: a comparison of theoretical approaches. *Academy of Management Journal* **36**(6): 1278–1313.
Khandwalla PN. 1977. *The Design of Organizations*. Harcourt Brace Jovanovich: New York.
Kirkman BL, Rosen B. 1999. Beyond self-management: antecedents and consequences of team empowerment. *Academy of Management Journal* **42**: 58–74.
Klein KJ, Conn AB, Sorra JS. 2001. Implementing computerized technology: an organizational analysis. *Journal of Applied Psychology* **86**: 811–824.
Lawrence PR, Lorsch JW. 1967. *Organization and Environment: Managing Differentiation and Integration*. Harvard University Press: Boston, MA.
Locke EA, Latham GP. 1990. *A Theory of Goal Setting and Task Performance*. Prentice-Hall: Englewood Cliffs, NJ.
Low MB, MacMillan IC. 1988. Entrepreneurship: past research and future challenges. *Journal of Management* **14**: 139–151.
Manz CC, Sims HP. 1990. *Superleadership*. Prentice-Hall: New York.
McGahan AM, Porter ME. 1997. How much does industry matter, really? *Strategic Management Journal*, Summer Special Issue **18**: 15–30.
Medsker GM, Williams LJ, Holohan PJ. 1994. A review of current practices for evaluating causal models in organization behavior and human resources management research. *Journal of Management* **20**: 439–448.
Mitchell TR, Beach LR. 1990. '... Do I love thee? Let me count ...' Toward an understanding of intuitive and automatic decision making. *Organizational Behavior and Human Decision Processes* **47**: 1–20.
Mosakowski E. 1997. A resource based perspective on the dynamic strategy–performance relationship: an empirical examination of the focus and differentiations strategies in entrepreneurial firms. *Journal of Management* **19**: 819–839.
Norusis MJ. 1990. *SPSS/pc + Statistics 4.0*. SPSS: Chicago, IL.
Phan PH. 2000. *Taking Back the Boardroom: Better Directing for the Millennium*. McGraw-Hill: Singapore.
Priem RL, Rasheed AMA, Kotulic AG. 1995. Rationality in strategic decision processes, environmental dynamism and firm performance. *Journal of Management* **21**: 913–929.
Pugh DS, Hickson DJ, Hinings CR, Turner C. 1968. An empirical taxonomy of structures of work organizations. *Administrative Science Quarterly* **14**: 115–126.
Rajagopalan N, Rasheed AMA, Datta DK. 1993. Strategic decision processes: critical review and future directions. *Journal of Management* **19**: 349–384.
Schminke M, Ambrose ML, Cropanzano RS. 2000. The effect of organizational structure on perceptions of procedural fairness. *Journal of Applied Psychology* **85**: 294–304.
Schwenk CR, Shrader CB. 1993. Effects of formal strategic planning on financial performance in small firms: a meta-analysis. *Entrepreneurship Theory and Practice* **17**(3): 53–64.
Scott WR. 1992. *Organizations: Rational, Natural, and Open Systems* (3rd edn). Prentice-Hall: Englewood Cliffs, NJ.
Shah PP. 2000. Network destruction: the structural implications of downsizing. *Academy of Management Journal* **43**: 101–112.
Shane SA, Venkataraman S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review* **25**(1): 217–226.
Sheppard BH, Lewicki RJ, Minton JW. 1993. *Organizational Justice: The Search for Fairness in the Workplace*. Lexington Books: New York.
Simon HA. 1976. *Administrative Behavior* (3rd edn). Free Press: New York.
Sims HP. 1996. *Businesses Without Bosses*. Wiley: New York.
Slevin DP, Covin JG. 1995. Entrepreneurship as firm behavior. In *Advances in Entrepreneurship, Firm Emergence, and Growth*, Vol. 2, Katz JA, Brockhaus Sr RH (eds). JAI Press: Greenwich, CT; 175–224.
Smith KG, Grimm CM, Gannon MJ, Chen M. 1991. Organization information processing, competitive responses, and performance in the U.S. domestic airline industry. *Academy of Management Journal* **34**: 60–85.
Smith K, Smith K, Olian J, Sims H, O'Bannon D, Scully J. 1994. Top management team demography and process: the role of social integration and communication. *Administrative Science Quarterly* **39**: 412–438.
Standard & Poor's Compustat. 1998–2001. *NetAdvantage Version 7.6*. Research Insight/McGraw-Hill: New York.

Stevenson H, Gumpert D. 1985. The heart of entrepreneurship. *Harvard Business Review* **63**(2): 85–94.
Sutcliffe KM, McNamara G. 2001. Controlling decision-making practice in organizations. *Organization Science* **12**: 484–501.
U.S. Department of Labor and Industry, Bureau of Labor Statistics. 2000. *BLS Annual Report on Employment, Hours and Earnings*. U.S. Government Printing Office: Washington, DC.
Wally S, Baum JR. 1994. Personal and structural determinants of the pace of strategic decision making. *Academy of Management Journal* **37**: 932–956.
Werts CE, Linn RL, Joreskog KG. 1974. Interclass reliability estimates: testing structural assumptions. *Educational and Psychological Measurement* **34**: 25–33.
Winch GW. 1995. Developing consensus: reflections on a model-supported decision process. *Management Decisions* **33**(6): 22–31.
York County Economic Development Corporation. 2001. *York County Industrial Directory(s), 1996–2001* . York County Economic Development Corporation: York, PA.
Zahra SA, Bogner W. 2000. Technology strategy and software new venture performance: the moderating effect of the competitive environment. *Journal of Business Venturing* **11**: 189–219.
Zahra SA, Covin JG. 1993. Business strategy, technology policy, and firm performance. *Strategic Management Journal* **14**(6): 451–478.

APPENDIX 1: THREE STRATEGIC DECISION SCENARIOS

[R] indicates reverse scoring

Strategic decisions are important decisions that involve commitment of significant resources and that impact long-term profitability and growth. Please read the three strategic decision scenarios and answer the questions that follow:

#1. Acquisition decision

Assume that your company is one of four important competitors in your market. You believe that the Mills company has 10% of the market, you have 30% and the third and fourth companies also have 30% each. The Mills company has grown rapidly because their product has a feature that is technologically superior. The Mills company typically charges 10% more than your company charges for similar products. Of the remaining competitors, your quality is best and your price is highest. Your sales have been stagnant. Apparently, the Mills product advantage is not protected legally, but your efforts to duplicate the product have been unsuccessful.

You have just learned that the CEO of the Mills company has been authorized to talk to you to propose that your company acquire the Mills company for an amount that is 40% of your company's net worth.

Assume: (1) that your company does not have a policy that prevents growth through acquisition, (2) that you have not collected detailed information about the Mills company, and (3) that the CEO of the Mills company is a cooperative negotiator who has a normal level of self-interest.

Circle the approximate **# of days** it would take your organization to decide whether or not to invest significant time in pursuit of a merger with the Mills Company:

2 5 10 20 30 60 90 120 150 180 more [R]

#2. New product introduction decision

Assume that your company has just discovered a new way to enhance the value of one of your products. Unfortunately, there is little available information about the likelihood of its acceptance in the market place. None of your competitors has a similar product. There is a rumor that the Jones company has uncovered a similar enhancement, but they may not be big enough to bring it to market quickly. If you proceed with a full commitment to develop and introduce this new product, you will probably invest an amount equal to 20% of your annual sales. Assume that you have sufficient research, prototype, and production resources to proceed with the new product introduction.

Circle the approximate **# of days** it would take you/your organization to decide whether or not to proceed with a commitment to develop and introduce this new product:

2 5 10 20 30 60 90 120 150 180 more [R]

#3. Technology adoption decision

Enterprise resource planning software (ERP) is designed to enhance the efficiency, effectiveness, and coordination of production, purchasing, shipping, inventory control, and cost accounting. Assume that a new version of ERP has just been released and you think it may help you

manage your business; however, you know that it will affect every department and every employee. Business-as-usual will be interrupted. In fact, you have a peer who said that he would never go through it again because implementation required the interaction and retraining of almost every employee. You have discovered that the investment amounts to 1/3 of your expected profits for 2002, not counting the internal expenses of the interruption. The ERP vendor said they had talked to one of your competitors.

Circle the approximate **# of days** it would take you/your organization to decide whether or not to proceed with a full commitment to new ERP software:

2 5 10 20 30 60 90 120 150 180 more [R]

APPENDIX 2: MEASURES

[R] indicates reverse scoring

Please indicate how strongly you disagree or agree with each statement by circling the appropriate number.

Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
1	2	3	4	5

Dynamism

Our firm must frequently change its products and practices to keep up with competitors.

Products/services quickly become obsolete in our industry.

Actions of competitors are quite easy to predict. [R]

Consumer tastes are fairly easy to forecast in our industry. [R]

Technology changes more quickly in our industry than in the healthcare industry.

Munificence

There are few external threats to the survival and well-being of our firm.

Our markets are rich in investment capital.

Economic development programs offer sufficient support for our business community.

Our markets are rich in profitable opportunities.

Our firm operates in a threatening business environment. [R]

Centralization

Consider the difference between operational and strategic decisions when you answer the next set of questions. Operational decisions involve day-to-day processes and procedures that impact one part of a company, whereas strategic decisions are more long-term and have a more global impact.

Centralization of strategic management

Front line employees participate in the strategic decision process. [R]

Circle the approximate number of people who are primarily responsible for strategic decisions in your company (1, 2, 3, 4, 5, 7, 10, 20 more). [R]

Our top management team determines our strategic plan alone.

We try to achieve consensus in this company about major strategic changes. [R]

Centralization of operational management

Our top management is involved is optimizing day-to-day operations. [R]

We give front-line employees freedom to make operational decisions about production, service, and customer-oriented problems.

The strategic decision team and I make day-to-day decisions about front-line operations. [R]

Our front-line employees would say they are free to change things to get better products/services for customers.

Formalization

Consider the difference between routine and non-routine tasks in your company as you answer the following questions. Routine tasks occur repetitively and non-routine tasks are unusual.

Formalization of routines

Our company has highly formalized channels of communication for routine processes and practices.

Our standard operating procedures (SOP) manual helps us deal with routine problems.

Our front-line people are 'on their own', even with routine tasks. [R]

Informalization of non-routines

Personnel must follow formal procedures for non-routine processes. [R]

I can get the information that I need when I face unusual problems without going through channels.

There are no written instructions for doing non-routine tasks.

Front-line employees are allowed to figure out the best way to complete non-routine tasks.