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1996, Vol. 39, No. 2, 368–396.

DOES DECISION PROCESS MATTER? A STUDY OF STRATEGIC DECISION-MAKING EFFECTIVENESS

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This study examined whether strategic decision-making processes are related to decision effectiveness, using a longitudinal field study design. We studied 52 decisions in 24 companies to determine if procedural rationality and political behavior influence decision success, controlling for the favorability of the environment and decision implementation. Our results indicate that decision-making processes are indeed related to decision success. Results are discussed in terms of the importance of strategic choice in organizations.

Strategic decision making has long been a topic of great interest in both organization theory and strategic management. Although many studies (e.g., Hart, 1992; Quinn, 1980) have described and explained strategic decision making (SDM), there is limited evidence that strategic decision-making processes influence decisions' effectiveness—that is, the extent to which they result in desired outcomes (Eisenhardt & Zbaracki, 1992). This paper explores the question of whether the success of strategic decisions depends on the steps managers use to make them (cf. Hitt & Tyler, 1991). This question is fundamental to organization theory, as strategic decision making is a key element of management-centered conceptions of organizations (Astley & Van de Ven, 1983). Moreover, the assumption that strategic outcomes stem from managerial actions is the very raison d'être of the field of strategic management.

Research at the individual level has linked cognitive processes to decision outcomes (e.g., Bazerman, 1990). For example, decisions suffer if people use cognitive anchors (Tversky & Kahneman, 1974) or try to justify previous choices (Staw, 1981). Group decision-making processes also influence performance (Guzzo, 1986; Hackman, 1991). Janis (1982) demonstrated how processes such as rationalization threaten decision success, and Delbecq, Van de Ven, and Gustafson (1975) used nominal group methods to improve decision-making performance.

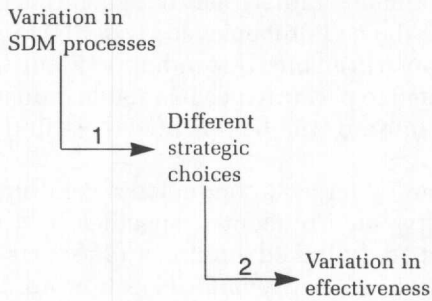
We would like to thank Terry Amburgey, Sidney Barton, James Fredrickson, Charles Snow, James Thomas, Ann Welsh, and this journal's reviewers for their helpful comments on earlier drafts of this article.

The link between *strategic* decision processes and effectiveness has not yet, however, been so convincingly demonstrated, and substantial discussion in the literature has focused on the question of whether managerial choice processes matter (e.g., Hitt & Tyler, 1991). The argument that they do rests on two assumptions: (1) that different *processes* lead to different *choices*, which is to say that SDM processes influence the choices organizations make, and (2) that different *choices* lead to different *outcomes*—that all choices are not equally good. For the SDM process-effectiveness link to exist, both assumptions must be true (see Figure 1).

The first assumption is that decision processes are related to strategic choices. Although this assumption may appear intuitively obvious, it should be seen in light of the observation that environmental constraints play a role in determining choices and thus reduce the importance of choice processes (e.g., Aldrich, 1979; Pfeffer & Salancik, 1978). Many scholars have argued, however, that even in the context of constraints, managers retain a substantial degree of control over strategic choices (e.g., Child, 1972; Miles, 1982). One argument made in favor of this position is that some managers make very poor strategic choices, with devastating consequences for their firms, while others in very similar circumstances make much better choices (e.g., Bourgeois, 1984). Such variation could not exist if constraints alone were driving strategic decisions. Indeed, the likelihood that managers will make viable choices may well be a function of the decision process followed.

The second assumption underlying the purported relationship between strategic decision-making processes and effectiveness is that choices relate to outcomes. Once again, there can be little doubt that external forces also influence SDM effectiveness (Hitt & Tyler, 1991; Pfeffer & Salancik, 1978). Changes in competitor strategies or customer tastes can turn strategic coups into disasters, or vice versa. But it seems unlikely that the influence of external forces eliminates the impact of strategic choice on effectiveness, as it is hard to imagine a decision in which all potential choices will be equally successful or unsuccessful. Making or abandoning a potential acquisition? Remaining in or exiting from an industry? SDM processes that allow decision

FIGURE 1
Assumptions Underlying the Strategic Decision-Making Process–Effectiveness Relationship



makers to accurately anticipate external factors and make choices in light of these factors should be more successful than those that do not do so.

Thus, our two assumptions appear plausible, which suggests that it is reasonable to expect SDM processes to influence strategic decision effectiveness. More specifically, the role of managerial choice appears to be one of attempting to identify viable courses of action in the face of environmental constraints (Burgelman, 1991; Hitt & Tyler, 1991; Pfeffer & Salancik, 1978). As Aldrich (1979: 160) indicated, however, the importance of managerial decisions in determining organizational outcomes is ultimately an empirical question. In this spirit, let us examine the empirical literature on the connection between SDM processes and effectiveness.

STRATEGIC DECISION-MAKING EFFECTIVENESS

The largest body of empirical literature on this topic deals with strategic planning, which is generally not explicitly portrayed as decision making (e.g., Ramanujam, Venkatraman, & Camillus, 1986; Robinson & Pearce; 1983). This literature demonstrates relationships between aspects of strategic planning and firm performance. Although some studies have found support for such relationships, this literature has often been criticized on methodological grounds (e.g., Boyd, 1991). In particular, the direction of causality between strategic planning and organizational performance (Armstrong, 1982) and the failure to take contextual influences into account (Pearce, Freeman & Robinson, 1987) have been called into question.

A second stream of research deals with the impact of structured conflict on performance. Two techniques—devil's advocacy (Cosier & Rechner, 1985) and dialectical inquiry (Mason & Mitroff, 1981)—have been found to result in better decisions than consensus methods (Schwenk, 1988). But studies in this vein do not demonstrate that, despite environmental forces, SDM processes influence decision success. Most have been done in the laboratory, where environmental factors are not an issue, and the few field studies that have been done have not attempted to assess actual decision outcomes (Schweiger, Sandberg, & Rechner, 1989).

Fredrickson and his colleagues (Fredrickson, 1984; Fredrickson & Iaquinto, 1989; Fredrickson & Mitchell, 1984) also investigated the impact of SDM methods. This research has looked at prototypical (assessed by response to a scenario) rather than actual decision-making processes and related them to firm performance rather than to specific decision outcomes. These studies found that the comprehensiveness of SDM processes is negatively related to performance in an unstable industry (Fredrickson & Mitchell, 1984) and positively related to performance in a stable industry (Fredrickson, 1984). Fredrickson and Iaquinto (1989) replicated these findings in a longitudinal study.

Finally, Eisenhardt and Bourgeois conducted several studies on decision making in high-velocity environments, specifically, in eight microcomputer firms. The first study linked a number of aspects of the SDM process, including procedural rationality and delegation, to firm performance

(Bourgeois & Eisenhardt, 1988). In the second study, political behavior within top management teams was found to relate to poor firm performance (Eisenhardt & Bourgeois, 1988). In the third study (Eisenhardt, 1989; cf. Judge & Miller, 1991), fast strategic decision making was related to both firm performance and decision performance, measured by management team members' support of the decision and by whether the decision was implemented and similar decisions subsequently made.

These studies all suggest some relationship between SDM processes and decision effectiveness. Considering their findings as a whole, however, one would be reluctant to conclude that a relationship between decision process and effectiveness has been clearly established, for at least two reasons. First, the theories tested in the literature have generally not focused on decision effectiveness per se (Eisenhardt, 1989), but rather, on overall firm performance. This focus is problematic because firm performance is a function of a diverse array of factors, which may mask the effect of decision processes. Also, firm performance may influence as well as be influenced by decision-making processes. For example, successful firms may have resources that allow them to make decisions differently (Fredrickson & Mitchell, 1984).

Second, and perhaps more important, the strategic decision effectiveness models tested in these studies have not incorporated the role of the environment. The necessity of doing so stems from the theoretical discussion above, which notes that the contexts in which strategic decision processes operate often play a role in shaping their outcomes. Along these lines, Romanelli and Tushman concluded from a study that "environments and strategic choice may interactively determine courses of organizational evolution" (1986: 618). Burgelman (1991) argued for studies of strategic decision-making processes under differing environmental conditions. Such studies have thus far been slow to appear.

In summary, the theoretical literature suggests that both decision processes and environmental factors shape strategic decision effectiveness. To date, however, empirical studies have not provided a conclusive test of the influence of decision processes in the context of environmental forces. In the next section, we describe a model of SDM effectiveness that takes environmental factors into account. We then describe the study we conducted to test this model.

A MODEL OF STRATEGIC DECISION-MAKING EFFECTIVENESS

In view of our discussion above, it is clearly necessary that we frame our model at the decision level of analysis, rather than at the overall firm-performance level. Doing so avoids the problem of ambiguity of causal ordering—the question of whether success is the cause or the effect of the decision process—that would accompany the choice of firm performance as a focus. Our choice of a decision-level focus also provides for a tight link between the decision process and its outcome, which is necessary in light of the many exogenous effects on firm performance (Pearce et al., 1987).

The focus of our model is *strategic decision effectiveness*, defined as the extent to which a decision achieves the objectives established by management at the time it is made. Effectiveness as perceived by external constituencies may of course differ from management's perceptions (Friedlander & Pickle, 1968). As our intent, however, was to examine managers' capacity to influence organizational outcomes through strategic choice, our conceptualization of effectiveness had to be based on their goals. Examining the relationship between SDM processes and an external constituency's perception of effectiveness could be confounded by differences in objectives.

Finally, although there is no inherent reason why decision effectiveness must be conceptualized in terms of goals established at the time decisions are made (March & Olsen, 1976), it seems appropriate to do so, as managers' aspirations may change as decision outcomes become clear (March & Simon, 1958). Relating decision processes made at one time to goal statements that have been revised at a later time can introduce an element of self-serving bias into a study.

Decision Process Constructs

An important issue in developing a model of SDM effectiveness is the selection of the constructs used to represent the strategic decision-making process. We used three criteria in making this choice. First, the constructs must be central to the decision-making literature. Using constructs peripheral to the literature would not constitute a fair test of the research question, as important facets of the SDM process might be overlooked. Second, the constructs must be logically and empirically distinct. Third, they must be theoretically consistent with our conception of strategic decision processes as taking place in the context of environmental constraints and having an impact through the choices to which they lead.

Two concepts—procedural rationality and politics—easily meet these criteria. These constructs have clearly played central roles in the organizational decision-making literature (e.g., Allison, 1971; Carter, 1971; Cyert & March, 1963; Eisenhardt & Bourgeois, 1988; Eisenhardt & Zbaracki, 1992; Fredrickson & Iaquinto, 1989; Hart, 1992; March & Simon, 1958; Mintzberg, Raisinghani, & Théorêt, 1976; Pettigrew, 1973; Pfeffer, 1981). In fact, Eisenhardt and Zbaracki (1992) specifically recommended studying the outcomes of decisions that vary in terms of rationality and politics. If decision process as conceived in the literature actually influences SDM outcomes, these constructs should capture its influence.

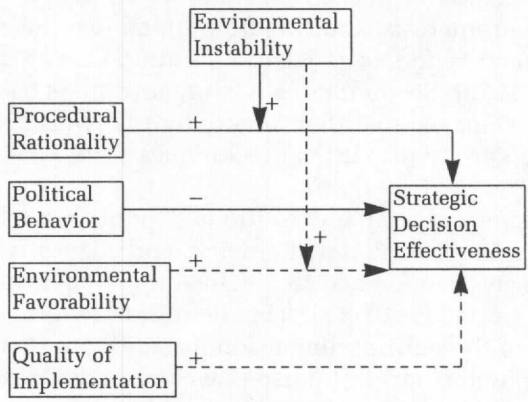
Our second criterion was that the constructs chosen be logically and empirically distinct, with one not a subset or opposite of the other. Recent research has demonstrated that procedural rationality and politics are distinct dimensions of the strategic decision-making process (Dean & Sharfman, 1993a). Decision processes thus may be rational but not political, political but not rational, both rational and political, or neither. Thus, our choice of constructs meets this criterion as well.

Our third criterion was that the constructs should be theoretically consistent with the conception of the SDM process described above. We argued above (see Figure 1) that decision processes influence decision effectiveness by influencing choices made amidst constraints. Pfeffer and Salancik argued that, for a decision to be successful, "Information about the environment and possible consequences of alternative actions must be acquired and processed" (1978: 266). Therefore, in order for a decision process to result in an effective choice, it must be (1) oriented toward achieving appropriate organizational goals, (2) based on accurate information linking various alternatives to these goals, and (3) based on an appreciation and understanding of environmental constraints. The discussion below will make clear how the constructs we have chosen meet our criteria.

The first element in the model (see Figure 2) is *procedural rationality,* defined as the extent to which the decision process involves the collection of information relevant to the decision and the reliance upon analysis of this information in making the choice (Dean & Sharfman, 1993b). The term "procedural" is used to focus on the decision-making process and to distinguish this construct from more global conceptions of rationality that have overtones of decision-maker omniscience (Simon, 1978). In an earlier work (Dean & Sharfman, 1993b: 588–589), we discussed the evolution of the rationality concept in psychology, economics, and organization theory.

In view of the theoretical considerations listed above, we expected procedural rationality to lead to strategic decision effectiveness. To begin with, procedurally rational decisions are generally oriented toward organizational goals, as it is difficult to mount extensive data collection and analysis efforts in the service of goals with little legitimacy (Langley, 1989). Hitt and Tyler described rational strategic decision making as "a series of . . . analytical processes whereby a set of objective criteria are used to evaluate strategic

FIGURE 2
Strategic Decision–Making Effectiveness Model[a]



[a] Dotted lines indicate control variables.

alternatives" (1991: 329). This orientation toward organizational goals makes it more likely that procedurally rational decision processes will be effective.

Rational decisions are also likely to involve relatively complete information and knowledge of constraints, our second and third theoretical considerations. Executives who collect extensive information before making decisions will have more accurate perceptions of environmental conditions, which has been shown to relate to firm performance (Bourgeois, 1985). Perhaps this relationship is based on managers' better identifying the set of environmentally viable choices available to them.

Thus, it seems likely that managers who conduct and rely upon analysis in making their choices—those who use more rational processes—will be more likely to develop effective plans for reconciling their organizations with environmental reality. As Bourgeois and Eisenhardt put it, rational processes allow people to "form theories regarding which strategies will succeed" (1988: 827). Our discussion is quite consistent with Pfeffer and Salancik's portrayal of how a manager who is responsive to environmental constraints "assesses the context, determines how to adapt the organization to meet the constraints of the context, and implements the adaptation" (1978: 265).

Although there is considerable research on the descriptive adequacy of the rational model of decision making, evidence of the relationship between rationality and decision-making effectiveness is very limited (Bell, Raiffa, & Tversky, 1988). Janis's (1989) case studies suggested that public policy decisions that used rational methods were more successful than those that did not, and Bourgeois and Eisenhardt (1988) found that successful firms used rational methods more than unsuccessful firms.

Hypothesis 1: Procedural rationality will be positively related to strategic decision-making effectiveness.

Political behavior has long been recognized as an aspect of organizational decision making (e.g., Allison, 1971; Pettigrew, 1973). Two key ideas underlie the political dimension of decision making. First, people in organizations have differences in interests resulting from functional, hierarchical, professional, and personal factors (e.g., Hickson, Butler, Cray, Mallory, & Wilson, 1986; Pettigrew, 1973). Second, people in organizations try to influence the outcomes of decisions, so that their own interests will be served, and they do so by using a variety of political techniques (e.g., Bacharach & Lawler, 1980; Pfeffer, 1981).

From among several similar definitions of politics, we have chosen one stated by Allen, Madison, Porter, Renwick, and Mayes, who saw politics as "intentional acts of influence to enhance or protect the self-interest of individuals or groups" (1979: 77). This definition, which captures both of the core aspects of the politics dimension, is similar to Pfeffer's conception of politics as "activities taken [to] use power and other resources to obtain one's preferred outcomes in a situation in which there is uncertainty or dissensus about choices" (1981: 7). It also parallels Bacharach and Lawler's

definition of politics as "efforts of interest groups to influence decisions that affect their positions in the organization" (1980: 79).

Given the theoretical considerations addressed above, we expected political behavior in the strategic decision-making process to reduce the effectiveness of strategic decisions. First, we had argued that effective decisions must be based on organizational goals. Political decision processes, however, are organized around the self-interests of individuals or groups (Pettigrew, 1973; Pfeffer, 1981). If these interests are in conflict with those of the organization, successful political activity will make it less likely that a decision will serve organizational interests.

Second, effective decisions are based on complete and accurate information about the likely relationship between choices and outcomes. Burgelman argued that "an atmosphere in which strategic ideas can be freely championed and fully contested by anyone with relevant information . . . may be a key factor in . . . generating viable organizational strategies" (1991: 252). Based on this criterion, political behavior has the potential to undermine effectiveness, because it often involves distortion (Cyert & March, 1963) and restriction (Pettigrew, 1973) of information flow. In other words, managers who are pursuing their own interests are unlikely to tell the whole, unvarnished truth to one another. This behavior could lead managers to make choices based on inadequate or incorrect information, which could lead to disappointing outcomes.

Third, effective decisions are based on a recognition and understanding of environmental constraints. Political processes are likely to undermine effectiveness in two ways related to this consideration. First, in political processes, attention is focused inside the organization, toward the mixture of interests, power bases, and positions, rather than on what is feasible given current environmental forces (Hickson et al., 1986). Decisions that result from such processes are thus less likely to be informed about environmental constraints. Second, political processes may introduce additional constraints on possible solutions (Nutt, 1993). For example, a course of action that is promising in light of the environment may be eliminated because of the opposition of a powerful individual. Thus, political processes may rule out viable choices, further reducing the likely success of the strategic decisions they produce.

In summary, political decision processes are not oriented toward organizational goals, are unlikely to produce complete and accurate information, and do not focus on environmental constraints. For all of these reasons, they are likely to be associated with less effective decisions. Studies by Janis (1989), Eisenhardt and Bourgeois (1988), Ford (1989), and Nutt (1993), as well as an interpretive study by Voyer (1994), have suggested a link between politics and unsuccessful decisions.

Hypothesis 2: Political behavior will be negatively related to strategic decision-making effectiveness.

Our earlier discussion of the influence of the environment centered on the need for decision processes to deal effectively with environmental

constraints. A second aspect of the environment that plays a role in shaping decision effectiveness is *environmental instability,* which is the extent to which market demand and technology are rapidly changing in a given industry (Dess & Beard, 1984; Sharfman & Dean, 1991). When instability is high, demand fluctuates dramatically, and new technologies are introduced at a rapid pace. When an industry is characterized by low instability, neither demand nor technology changes much over time. We expected environmental instability to moderate the relationship between process rationality and decision effectiveness.

Because it is fundamentally a means of processing information about environmental changes (Aharoni, Maimon, & Segev, 1978), procedural rationality will be most important in unstable environments (Aguilar, 1967). In such environments, top managers who fail to systematically collect and analyze information about environmental trends and constraints will be much more likely to lead their organizations in nonviable strategic directions. Managers in stable settings will already have an experience-based understanding of their environment and thus will have less need to engage in information collection and analysis in order to make effective choices.

This prediction is consistent with Bourgeois and Eisenhardt's (1988) finding that successful firms in high-velocity environments use rational methods. It also bears out findings that successful firms are more likely than unsuccessful firms to collect additional information when environments are uncertain (Daft, Sormunen, & Parks, 1988) and to conduct more analysis when environments are dynamic (Miller & Friesen, 1983). It is also consistent with Priem, Rasheed, and Kotulic's (1992) finding of a strong relationship between rational processes and performance in highly turbulent environments, but not in less turbulent environments.[1]

Hypothesis 3: Environmental instability will moderate the relationship between procedural rationality and decision-

[1] This hypothesis appears to conflict with the results of the Fredrickson studies discussed above (Fredrickson, 1984; Fredrickson & Iaquinto, 1989; Fredrickson & Mitchell, 1984), which found comprehensiveness to be positively correlated with firm performance in a stable environment (the paint and coatings industry) and negatively correlated with firm performance in an unstable environment (the forest products industry). To the extent that procedural rationality is equivalent to comprehensiveness, these findings are inconsistent with our hypothesis. But although both constructs are derived from the rational model of decision making, they are quite different. Procedural rationality focuses on the collection and use of information in decision making, which, as we have indicated, is more necessary in unstable, changing environments. Comprehensiveness is defined as "the extent to which an organization attempts to be exhaustive or inclusive in making and integrating strategic decisions" (Fredrickson & Mitchell, 1984: 40–42). Exhaustiveness in making, and particularly in integrating, strategic decisions is an aspect of comprehensiveness that would indeed be problematic in unstable industries. It would slow decision making and force consistency among decisions made at different times and thus (given a changing environment) in different circumstances. Exhaustiveness, however, is not included in the procedural rationality construct, so the inconsistency between our hypothesis and Fredrickson's results is not as substantial as it appears.

making effectiveness; this relationship will be stronger in unstable environments than in stable ones.

External Factors

As our discussion to this point has indicated, our main concern in this study was determining whether decision processes have any impact on strategic decision effectiveness. We have discussed hypotheses concerning two direct relationships between decision process and effectiveness and one moderated relationship. In order to more fully specify our model of strategic decision effectiveness, however, we also needed to include both the impact of the environment and the impact of the implementation of strategic decisions. In the absence of these constructs, we could not conduct a valid test of the efficacy of SDM processes. These clearly should be considered as controls, however, external to the main focus of our work, as the dotted lines in Figure 2 indicate.

As discussed above, environmental factors outside the control of managers influence the success of strategic decisions (March & Olsen, 1976; Pfeffer & Salancik, 1978). The list of factors that could influence decision effectiveness is very long, but could include the economic health of a firm's customer base, competitor behaviors, decisions by regulators, and new technology development. Such factors may either help or hurt performance. For example, the success of a decision to acquire a small high-tech firm will be influenced by the number of other firms that enter the market and by whether emerging industry standards support the firm's products.

Our literature review concluded with an observation of the need to control for such environmental factors in examining the impact of SDM processes. We thus attempted to capture the influence of the environment on SDM effectiveness with the construct *environmental favorability,* defined as the extent to which environmental conditions subsequent to a decision favor the choice that was made. When environmental favorability is defined in this manner, it clearly functions as a control for our model, and therefore no hypothesis is provided. It is included to accurately assess the effect of SDM processes on decision outcomes and to build a more complete model of the forces that influence success.

This relationship between environmental favorability and effectiveness is likely to be moderated by the instability of the environment. In stable environments, conditions are well understood and can easily be factored into decisions. In the paint and coatings industry, for instance, neither demand nor competitors are likely to change much, and industry standards are long-established. A discontinuous change would strongly affect the success of decisions in the industry, but such changes occur rarely in stable industries. Compare this situation to that in the microcomputer industry, where discontinuous changes occur regularly, making or breaking strategic decisions, and with them entire organizations (Bourgeois & Eisenhardt, 1988). In unstable industries, therefore, the potential for environmental conditions to influence the success of strategic decisions is much greater. This moderat-

ing relationship is included in our model, but because it concerns a control variable, no formal hypothesis is provided.

The final construct in the model is *quality of decision implementation,* defined as the competence with which the steps are taken to execute the strategic decision. To complete our model of strategic decision effectiveness, we needed to also include how well decisions are implemented, because of the potentially significant influence of implementation on the final effectiveness of strategic decisions (Bourgeois & Brodwin, 1984; Nutt, 1993). If decision implementation is not controlled for in an empirical study of decision effectiveness, it is impossible to know whether an unsuccessful decision was poorly conceived (indicating a faulty decision process) or just poorly implemented. Thus, quality of decision implementation must be included in our model. Although the importance of implementing strategic decisions is generally appreciated, very little research has been done on the topic (Freeman & Boeker, 1984; Skivington & Daft, 1991).

Strategic decisions create waves of subdecisions and tasks (Mintzberg et al., 1976) that must be performed effectively for a decision to be successful. For example, a firm that decides to introduce a new product needs to select product configurations and prices and to effectively manufacture and promote the product. Depending on the nature of the decision, successful implementation may involve communicating effectively with the workforce, the financial community, or customers. It may involve negotiating favorable terms with suppliers or partners. The successful implementation of some strategic decisions may even require changes in organizational structure and culture (Bourgeois & Brodwin, 1984; Skivington & Daft, 1991). The particulars of implementation vary widely from decision to decision, but virtually all decisions require effective implementation to be successful.

In summary, we have predicted that successful strategic decisions will be positively related to procedural rationality and negatively related to political behavior. We have also discussed the need to control for environmental favorability and quality of implementation. Furthermore, the impact of procedural rationality and environmental favorability are seen as being moderated by environmental instability.

Although the arguments in our model may appear relatively straightforward, they conflict to some degree with several prominent ideas in the literature. For example, the idea that managerial decision processes matter little in the face of external constraints (e.g., Hannan & Freeman, 1989; Pfeffer & Salancik, 1978), which is clearly in opposition to our model, has already been discussed.

In terms of specific decision processes, organizations researchers have, since at least Cyert and March (1963), come to regard rational decision making as a kind of theoretical fiction, rather than as a measurable dimension of SDM processes that may be associated with real strategic outcomes. Writers such as Feldman and March (1981) and Langley (1989) have treated process rationality as an essentially political and institutional phenomenon with little connection to substantive outcomes. Politics, in contrast, has often been

treated as a inevitable aspect of strategic decisions (e.g., Pettigrew, 1973; Pfeffer, 1981) that may be neutral *or even positive* in its effects (e.g., Pfeffer, 1981; Huff, 1988). Thus, our model represents several positions about which there is substantial disagreement in the literature, and our empirical study should shed some light on several important theoretical issues.

METHODS

In order to conduct a valid test of the research questions, a study of strategic decision-making effectiveness would need to incorporate several methodological features. First, it would have to be a field study of real strategic decisions, as laboratory studies are ill-suited to assessing the impact of SDM processes and environmental factors in complex organizational settings. Second, the study should use a large enough sample of firms and decisions to produce statistically valid conclusions. Third, the study should be longitudinal, in order to provide enough time for the effects of the decisions to be observed and to increase confidence in the causal interpretation of the findings (Chakravarthy & Doz, 1992; Hart & Banbury, 1994). We have incorporated these features into our study.

Research Sites

We selected firms for the study from manufacturing industries such as electronics, steel, apparel, footwear, paint and coatings, and chemicals, as defined by four-digit Standard Industrial Classification (SIC) codes. These industries were selected to ensure substantial variance in environmental instability, and they included companies in both consumer and industrial markets and in both growing and mature industries. Published databases, including *Standard & Poors Directory,* were used to identify firms in each industry. We contacted the top manager of each business first by letter, then by telephone, and later in person to secure participation. A total of 24 firms in 16 industries participated. Participating firms had annual sales ranging from $1.5 million to over $3 billion and numbers of employees ranging from 50 to 6,600.

Unit of Analysis

The unit of analysis is the strategic decision. We used decisions, rather than organizations, as the unit because previous research (e.g., Hickson et al., 1986) has demonstrated that decision processes within a given organization often vary substantially. We selected the decisions to study in each firm according to the following criteria. First, the decisions had to be defined by the firm as strategic—as determining the overall direction of the firm (Quinn, 1980). Second, decisions had to be sufficiently recent that the firm as yet knew little or nothing about their effectiveness but would see clear outcomes within one to two years.

Strategic decisions have been described as committing substantial resources, setting precedents, and creating waves of lesser decisions (Mintzberg et al., 1976); as ill-structured, nonroutine, and complex (Schwenk, 1988); and

as substantial, unusual, and all-pervading (Hickson et al., 1986). Although researchers have not reached consensus as to what constitutes a strategic decision, managers had no trouble in identifying them. In this regard, it is important to recognize that types of decisions that are clearly strategic in one industry may be less so another (Hickson et al., 1986). Table 1 summarizes the types of strategic decisions in our sample, which are similar to the types addressed by Mintzberg and colleagues (1976) and Hickson and colleagues (1986).

Data Collection

All data except those on environmental instability were collected in two waves of structured interviews with high-level managers who were actively involved in making the decisions studied. Among our respondents, 24 percent were at the highest level in their organizations (e.g., presidents), 34 percent were one level from the top (e.g., vice presidents), 25 percent were two levels from the top (e.g., directors), and the remaining 17 percent were three or more levels from the top. In the first wave of interviews, we collected

TABLE 1
Types of Strategic Decisions in Sample

Decision Type	Examples	Number	Percent
Restructuring	Shut down major part of steel business Close overseas electronics manufacturing plant	10	19.2
New product	Adopt steel-toed athletic shoe in footwear company Adopt manufacturing cell controller in electronics company	10	19.2
Organization change	Create divisional structure in lighting company Reorganize around customers in electronics company	9	17.3
New process technology	Adopt state-of-the-art scanning equipment in publishing company Adopt advanced information system in chemical company	6	11.5
Marketing strategy	Establish private-label business in clothing company Emphasize new market segment in publishing company	4	7.7
Geographic expansion	Paint company moves into Latin American market Lighting company creates European office	4	7.7
Diversification	Electronics company moves into photolithography Chemical company enters sealants business	3	5.8
New facility	Chemical company constructs new plant Lighting company constructs Caribbean plant	3	5.8
Human resource strategy	Adopt new compensation system in electronics company Adopt company-wide worker involvement program in paint company	2	3.8
Quality	Develop total quality effort in chemicals company	1	1.9

data on procedural rationality and political behavior and created frameworks for subsequent measurement of environmental favorability, quality of implementation, and decision effectiveness (see below). Data on these three latter variables were collected in the second wave.

Following the advice of Huber and Power (1985) and Golden (1992), we tried to reduce any potential error from the use of retrospective reports. As Huber (1985) found that moderate amounts of elapsed time do not affect the stability of retrospective reports, and Golden (1992) found that retrospective accounts collected after two years are often incorrect, we conducted the first wave of interviews as soon as possible after each decision was made. The second wave was conducted one to two years later, after sufficient time had elapsed to allow assessment of the decisions' effectiveness.

Following suggestions by Huber and Power (1985) and Golden (1992) to interview the most knowledgeable persons, we interviewed those who were most deeply involved in each decision. We also attempted—still following the suggestions of these authors—to minimize the effect of any particular perspective through triangulation: an average of 3.4 people per decision were interviewed in the first wave and 2.5 in the second wave. (The decrease in the second wave is the result of people's transferring, leaving the company, and the like.) Finally, we tried to motivate the participants to provide valid information (Golden, 1992) by guaranteeing them confidentiality and by providing them with information comparing them to other organizations, information that would be meaningless in the absence of accurate data.

We collected data on 61 decisions, with each company providing data on between one and three decisions. To increase the validity of the results, we have included in the analysis only those decisions for which we had at least two informants. This exclusion reduced the final sample of decisions to 52.

Measures

As we could not find acceptable scales for measuring *procedural rationality* and *political behavior* in the literature, we designed scales specifically for this study. Our first step was to identify the major themes in the research on these constructs. For procedural rationality, we consulted March and Simon (1958), Cyert and March (1963), Allison (1971), Mintzberg et al. (1976), Feldman and March (1981), Fredrickson (1984), Hickson et al. (1986), Bourgeois and Eisenhardt (1988), and Langley (1989). For politics, we consulted Allison (1971), Pettigrew (1973), Allen et al. (1979), Bacharach and Lawler (1980), Pfeffer (1981), and Eisenhardt and Bourgeois (1988). This search led to a list containing nine 7-point Likert-style scale items for rationality and five for politics. Preliminary interviews led to a rewording of several of the items, to increase their face validity. Table 2 provides the sources in the literature of each of our items. Appendixes A and B give the texts and response anchors for all scales.

Once the data had been collected, we calculated coefficient alphas to determine the reliability of the two scales. In both cases, items that did not

TABLE 2
Sources for Procedural Rationality and Political Behavior Items

Items	Sources
Procedural rationality	
How extensively did the group look for information in making this decision?	Cyert & March (1963), Hickson et al. (1986), Langley (1989)
How extensively did the group analyze relevant information before making a decision?	Allison (1971), Mintzberg et al. (1976), Bourgeois & Eisenhardt (1988)
How important were quantitative analytic techniques in making the decision?	March & Simon (1958), Mintzberg et al. (1976), Langley (1989)
How would you describe the process that had the most influence on the group's decision?	Mintzberg (1973), Fredrickson (1984)
In general how effective was the group at focusing its attention on crucial information and ignoring irrelevant information?	Simon (1978), Feldman & March (1981)
Politics	
Were group members primarily concerned with their own goals, or with the goals of the organization?	Allison (1971), Allen et al. (1979), Bacharach & Lawler (1980), Pfeffer (1981)
To what extent were people open with each other about their interests and preferences in the decision?	Pettigrew (1973), Pfeffer (1981), Eisenhardt & Bourgeois (1988)
To what extent was the decision affected by the use of power and influence among group members?	Pettigrew (1973), Allen et al. (1979), Bacharach & Lawler (1980), Pfeffer (1981)
To what extent was the decision affected by negotiation among group members?	Allison (1971), Pfeffer (1981)

correlate well with the scale as a whole had to be dropped. This left a total of five items for procedural rationality ($\alpha = .80$) and four for politics ($\alpha = .66$). Procedural rationality items include the degree to which decision makers collected and analyzed information and used quantitative analytic techniques. Politics items include the extent to which decision makers sought to maximize their own interests, had hidden agendas, and employed power and negotiation in making decisions.

To create values for each construct for each decision, we calculated item means across the informants on each team, which were averaged across items to form scales. (For convenience, we will use the term "team" to indicate the set of people interviewed about a particular decision.) We factor-analyzed the scales using principal components and varimax rotation to test for unidimensionality and found both to be unidimensional and independent of one another. (Unidimensionality was operationally defined as having only one factor with an eigenvalue greater than 1.0, with all items loading on that

factor at .40 or higher. For details on this analysis, see Dean and Sharfman [1993a].)

Environmental favorability was measured separately for each decision using information from managers, rather than archival sources, because the range of issues that influenced the success of decisions was vast, differed greatly from decision to decision even within a firm, and was often unavailable in published sources. Favorability was measured as follows: During the first round of interviews, informants were asked to suggest environmental factors that would influence the effectiveness of the strategic decision in question. Informants were then asked to identify the best and worst (realistically) possible values of each environmental factor for the next one- to two-year period. For example, if the factor were aggregate demand for the industry's products, the best (worst) outcome might be a sales increase (decrease) of 10 percent. Informants were also asked to allocate 100 points among the factors according to their importance to the decision's success. These weights were averaged across respondents to use in constructing the overall favorability score.

In the second wave of interviews, informants on each team were asked what had happened with each of the environmental factors (those identified by informants on *their* teams) in the time since the decision had been made. Specifically, they were asked how favorable each factor had been to the success of their decision. These evaluations were made using seven-point response scales anchored by the best and worst values taken from the first interviews. Environmental favorability scores for each individual were calculated as follows:

$$\sum_{i=1}^{n} \left((W_i / \Sigma W_i) \times E_i \right), \tag{1}$$

where

W_i = the total weight given to the ith environmental factor,

E_i = favorability of the ith environmental factor,

and

n = the number of different environmental issues mentioned by all informants from a team in the first interview.

Individual scores were then averaged to form decision-level scores. Table 3 provides some examples of the types of environmental factors raised by our respondents, as well as examples of effectiveness criteria and implementation issues.

To create the *quality of implementation* score, we asked informants during the first interview to identify issues that would be important in implementing the strategic decision. All issues mentioned by informants on a given team were included in the questionnaire used for that team in the second wave. Two questions using seven-point scales were posed for each issue. The first asked how well the issue had been addressed during implementation (quality, Q); the second asked how important the issue had been

TABLE 3
Examples of Operationalization of Constructs for Specific Decisions

Type of Firm	Decision	Environmental Favorability	Quality of Implementation	Decision Effectiveness
Semiconductor manufacturer	Adoption of new technology	Tenacity of competitors	Taking sufficient time	Profit margins
		Decline in military contracts	Selecting right equipment	Approval for military use
Men's suits manufacturer	Redesign of customer service function	Market demand and stability	Change management	Profit increase
		Dollar value of imports	Personnel selection	Improving image to customers
			Training	Increase internal coordination
Publisher	Introduction of new scientific journal	Competing journals	Maintain editorial quality	Profit targets
		Development of scientific area	Meet schedules	Presence in scientific area
		Research funding in area	Project management	Image with parent corporation
Canned vegetable producer	New approach to packaging	Raw material price	Meeting deadline	Payback period
		Competitor entry	Keeping package secret	Capacity utilization
		Changes in consumer tastes	Timing	Market penetration

for the success of decision (importance, I). (The latter question was held until the second interview because we felt that managers would be unable to estimate a priori the importance of various implementation issues.) These questions allowed us to create an index of implementation quality weighted by importance, which was divided by seven to create a range consistent with the other scales. These scores were averaged across informants to attain a score for the decision as a whole. The formula for implementation quality for each informant was:

$$\sum_{i=1}^{n} \Big((Q_i \times I_i)/7 \Big)/n, \tag{2}$$

where

Q_i = the quality of implementation for the ith issue,

I_i = the importance of the ith issue,

and

n = the total number of implementation issues mentioned by all informants on a team during the first wave of interviews.

The rationale for measuring *decision effectiveness* instead of organizational effectiveness was outlined above: the former is more closely linked to the actual decision process and is less susceptible to problems of ambiguous causal ordering. Although this choice necessarily introduces a certain amount of subjectivity into these measures, Dess and Robinson (1984) argued in favor of the acceptability of subjective measures in situations such as these. It should be noted, however, that we went to great lengths to make the measurement of strategic decision effectiveness as objective as possible.

The decision effectiveness measure was similar in construction to the measure of environmental favorability. The use of multiple informants guaranteed that we would not be accepting one person's idiosyncratic view of the success of a strategic decision. During the first interview, informants were asked to identify objectives for the strategic decision and to allocate 100 points among these objectives in terms of their importance. This process guarded against the potential tendency of decision makers to identify objectives and their relative importance post hoc in a way that would put the decision in the best light possible. Informants were also asked to specify complete success and complete failure for each objective, with answers to be used as scale anchors in the second interview (see Appendix B). Thus, the range of effectiveness-ineffectiveness for each objective was established before the decision makers knew what the actual outcomes of the decisions would be.

In the second interview, the total list of objectives generated by a team in the first interview was presented to informants, who were asked to assign a number between 1 (complete failure) and 7 (complete success) to measure the extent to which each objective had been attained. The formula for calculating effectiveness was:

$$\sum_{i=1}^{n} \left((W_i / \sum_{i=1}^{n} W_i) \times O_i \right), \quad (3)$$

where

W_i = the total weight for the ith objective,

O_i = the degree of attainment of the ith objective,

and

n = the total number of different objectives mentioned by all informants on a team during the first interview.

The score for each decision was the average score across informants.

Would there have been any way to make the measure of decision effectiveness more objective? Perhaps we could have used minutes of company meetings or stories from the *Wall Street Journal* to independently establish the effectiveness of the decisions. But these sources are no less subjective than the assessments of top managers (if for no other reason than because top managers are generally the sources for both). In many cases, unless we were given access to raw company data, there would have been no way to measure the effectiveness of these decisions with complete objectivity. Moreover, some of the outcomes are almost purely perceptual, as is the case with questions like, Does the new organization structure allow us to run the company better? Does the new information system provide us with better information? Finally, the approach to measurement we used allowed for a common framework for assessing effectiveness across all types of decisions. Using a variety of sources of independent data would have introduced significant complexity (and error) in terms of integration and weighting. Taking all of these factors into consideration, we consider our approach to measuring effectiveness a viable if imperfect approach to a very complex problem.

Environmental instability, measured following our earlier approach in Sharfman and Dean (1991), encompasses both market and technological instability. The market component is based on *Census of Manufactures* data on value of shipments and number of employees, replicating Dess and Beard's (1984) measure. The technological component was assessed by the number of patent applications filed within the SIC code associated with each industry, the idea being that patent applications represent new and potentially destabilizing technologies. We created the overall instability score by standardizing and summing the two components (see Appendix B for details).

Table 4 presents variable means, standard deviations, correlations, and (as appropriate) coefficient alphas and interrater agreement statistics. The interrater agreement statistic (IRA, James, Demaree, & Wolf, 1984, 1993) was used to assess the convergence of responses among informants with respect to a particular decision. The alphas and IRAs demonstrate good reliability across items and informants, respectively.

RESULTS

The hypotheses were tested using multiple regression analysis. The first analysis (see Table 5) tests Hypotheses 1 and 2, which deal with the effects

TABLE 4
Descriptive Statistics and Correlations

Variable	Mean	s.d.	Alpha	IRA	1	2	3	4	5
1. Procedural rationality	4.66	0.74	.80	.85					
2. Political behavior	2.87	0.76	.66	.71	.00				
3. Environmental favorability	4.54	1.39		.70	.23	−.06			
4. Quality of implementation	3.84	1.24		.90	.20	.27	.30*		
5. Decision effectiveness	4.32	1.69		.88	.35**	−.04	.53***	.58***	
6. Environmental instability	−0.01	0.96			−.03	−.09	.13	.08	.10

* $p < .05$
** $p < .01$
*** $p < .001$

of procedural rationality and political behavior on strategic decision effectiveness, while controlling for environmental favorability and quality of implementation. The model as a whole is very effective in predicting decision effectiveness. The regression F is significant ($F = 14.40$, $df = 4,51$, $p < .001$), and the variance accounted for is substantial ($R^2 = .55$, adjusted $R^2 = .52$).[2]

Both hypotheses are confirmed, as the coefficients are all significant and in the predicted direction. Procedural rationality (Hypothesis 1) is positively related to decision effectiveness ($t = 2.30$, $p < .05$), and political behavior (Hypothesis 2) is negatively related to effectiveness ($t = -2.03$, $p < .05$). The control variables were also significant, as expected. Environmental favorability ($t = 3.09$, $p < .01$) and quality of implementation ($t = 4.54$, $p < .001$) are both positively related to strategic decision effectiveness.

The issue of the moderating effects of environmental instability on the strength of these relationships was tested by hierarchical regression analysis. The model whose results are presented above represented the first step in this analysis. We entered environmental instability at the second step, so that its direct effect would be controlled for before entering the interaction terms. As it turned out, instability had no direct effect ($t = .01$, n.s.). In the third step, the cross-product of instability with either procedural rationality (Hypothesis 3) or environmental favorability was added.

Hypothesis 3 predicts that procedural rationality will have a greater influence in unstable than in stable environments. This prediction was not confirmed, as the relevant cross-product was insignificant ($t = .14$, n.s.). We also predicted (but without a formal hypothesis) that environmental favorability would have a greater influence on decision effectiveness in unstable than in stable environments. This was confirmed, as the cross-product of instability and favorability was significant ($t = 2.24$, $p < .05$). Although there was no increase in the variance explained for the equation

[2] In an additional analysis, we included organization size and type of ownership as control variables in the regression model. Neither of these variables had any influence on strategic decision effectiveness.

TABLE 5
Results of Multiple Regression Analysis of Strategic Decision Effectiveness

Variable		*b*	s.e. (*b*)	β	*t*	Significance of *t*
Procedural rationality		.547	.238	.239	2.30	.026
Political behavior		−.477	.235	−.214	−2.03	.048
Environmental favorability		.398	.129	.327	3.09	.003
Quality of implementation		.665	.146	.489	4.54	.000
R^2	55.1%					
Adjusted R^2	51.5%					
Regression F (df = 4,51)	14.40					
p	.000					
Test for moderating effect of instability on rationality-effectiveness relationship						
Step 2						
Instability		.002	.177	.009	0.01	.992
Step 3						
Rationality/instability interaction		.032	.223	.088	0.14	.887
R^2	55.1%					
Adjusted R^2	49.1%					
Regression F (df = 6,45)	9.20					
p	.000					
Test for moderating effect of instability on favorability-effectiveness relationship						
Step 2						
Instability		.002	.177	.009	0.01	.992
Step 3						
Environmental favorability/ instability interaction		.451	.201	1.381	2.24	.029
R^2	59.6%					
Adjusted R^2	54.2%					
Regression F (df = 6,45)	11.06					
p	.000					

with the rationality interaction, the variance explained by the model with the environmental favorability interaction increased to 59.6 percent (adjusted R^2 = .54).

DISCUSSION

The primary finding of our study is simply that decision processes influence strategic decision-making effectiveness. Even when both environmental favorability and quality of implementation were included in our regression model, procedural rationality and political behavior were significantly re-

lated to effectiveness. Managers who collected information and used analytical techniques made decisions that were more effective than those who did not. Those who engaged in the use of power or pushed hidden agendas were less effective than those who did not.

Beyond confirming the importance of strategic decision-making methods, our study reconfirms that environmental instability and quality of decision implementation play important roles in influencing decision effectiveness. Future researchers attempting to evaluate the effect of decision processes on decision effectiveness would be well-advised to control for these variables. Finally, our findings indicate that environmental instability plays an important role in moderating the effects of environmental favorability on decision effectiveness.

Theoretical Implications

From a theoretical standpoint, the obvious implication of our study is that decision process matters. Managers have the power to influence the success of strategic decisions, and thus the fortunes of their organizations, through the processes they use to make key decisions. In effect, this finding supports the validity of the two assumptions discussed at the beginning of the article. Decision processes influence the strategic choices managers make, which in turn influence the outcomes affecting a firm. Theories that concern how the fortunes of organizations—their competitiveness and chances of survival—are determined should be formulated to take these results into account.

The moderating effect of environmental instability also has ramifications for organization theory. The influence of environmental favorability on decision effectiveness is stronger in unstable environments than in stable environments, indicating that decision processes have more influence relative to environmental factors in stable environments than in unstable ones. Although these findings are more suggestive than conclusive, if they are replicated, perhaps separate theories of strategic decision effectiveness are warranted for stable and unstable environments. On the other hand, our results show that some of the findings of Eisenhardt and Bourgeois (1988) and Bourgeois and Eisenhardt (1988) extend beyond unstable environments to include stable ones as well. Comparing the results of our study to those findings is also interesting because two research teams using different methods (multiple case studies versus large-sample quantitative analysis) arrived at similar findings. This similarity should probably be seen as increasing confidence in both sets of studies.

More broadly, these findings enrich the discussion on the relative importance of strategic choice and external control by suggesting that the importance of various influences on decision effectiveness varies across environments. Although we have focused here on environmental instability, other environmental dimensions, including competitive threat and complexity (Dess & Beard, 1984; Sharfman & Dean, 1991), may be equally (or even more) important. This direction should be pursued in future research.

Limitations of the Study

As noted at several points in this article, we designed the study very carefully to provide valid results concerning the existence of a relationship between strategic decision processes and decision effectiveness. We are not aware of any existing studies of strategic decision-making effectiveness that have used a longitudinal design, measured actual decision outcomes, and controlled for environmental and implementation effects. These were important methodological safeguards, serving to reduce possible alternative explanations for the influence of decision making on effectiveness.

To some extent, however, the way these safeguards were included limits our ability to assess the *relative* impacts of SDM processes, the environment, and implementation on decision effectiveness. The informants described their decision-making methods when they had no knowledge of the outcomes of the decisions they described. Although they identified, provided anchors for, and weighted environmental factors with no knowledge of outcomes, they reported on their favorableness after outcomes were known. And although they identified implementation factors with no knowledge of outcomes, they provided both weights and evaluations after outcomes were known. Thus, the possibility exists that relationships are artificially inflated for the environment and implementation, but not for decision processes. Although this aspect of the design strengthens our case with respect to the decision-making findings, it reduces our ability to comment on whether decision making is more or less important than other variables.

Another potential limitation of the study is that perceptual measures were used for many variables, effectiveness in particular. An alternative explanation for our results is that managers have an implicit theory of successful decision making similar to ours and that their perceptions of effectiveness were driven more by their memory of the process (i.e., how rational or political it was) than by the actual evidence of success. The force of this alternative explanation is diminished considerably by a number of factors, however. First, the delay between waves of data collection would tend to dull the informants' memories of the process by the time the effectiveness data were collected. Second, informants were not asked for their general impressions of decision effectiveness, but rather for factual information (e.g., What is your market share?) corresponding to criteria established at the time the decision was made. Third, the use of multiple informants for each decision and the high interrater reliabilities for all variables make it less likely that individual perceptions are a major source of error in the data.

Finally, the two variables we chose to represent strategic decision making—procedural rationality and political behavior—are, although very much in the mainstream of decision-making theory, relatively simple. Much more elaborate conceptions and measures of the SDM process have been proposed (e.g., Eisenhardt, 1989; Hickson et al., 1980; Quinn, 1980). Our constructs served us well for a large-sample, structured-interview-based study designed to investigate the importance of strategic decision making as a theoretical

construct. It is possible, however, that more elaborate conceptions of the SDM process, and even of our rationality and politics constructs, would produce even stronger results if they could be used within the framework of the methodological safeguards used in this study.

Future Research

Given this observation, one clear opportunity for future research is in more complex conceptualizations of decision making, implementation, and environmental effects. Formulating these would probably require conducting case study research, so as to disentangle the complex strands of influence on decision effectiveness in any setting. Such research would be less suited to demonstrating empirically that these variables have an effect, but better suited to explaining how their influences play out.

We could not fail to notice in assessing the success of strategic decisions that future events could still influence their success. Although for practical reasons a study like this one "has to draw the line somewhere," it would be interesting to observe how the effectiveness of strategic decisions evolves over even longer periods of time. It might be that the relationships uncovered in this study would become stronger or weaker as effectiveness was traced (if this were possible) over a period of years.

A third area for future research suggested by this study is a more detailed look at decision implementation. As discussed above, we operationally defined quality of implementation essentially as a control variable, but the strength and pervasiveness of its relationship with effectiveness suggest that further study may be warranted. At a minimum, implementation appears to have been largely overlooked as a managerial degree of freedom in influencing decision-making effectiveness.

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APPENDIX A
Measures of Procedural Rationality, Political Behavior, Environmental Favorability, and Quality of Implementation

Procedural Rationality

1. How extensively did the group look for information in making this decision? (1 = not at all, 7 = extensively)
2. How extensively did the group analyze relevant information before making a decision? (1 = not at all, 7 = extensively)
3. How important were quantitative analytic techniques in making the decision? (1 = not at all important, 7 = very important)
4. How would you describe the process that had the most influence on the group's decision? (1 = mostly analytical, 7 = mostly intuitive; reverse-scaled to limit response bias)
5. In general how effective was the group at focusing its attention on crucial information and ignoring irrelevant information? (1 = not at all effective, 7 = very effective)

Political Behavior

1. Were group members primarily concerned with their own goals, or with the goals of the organization? (1 = own goals completely, 7 = organizational goals completely; reverse-scaled in analysis)
2. To what extent were people open with each other about their interests and preferences in the decision? (1 = not at all, 7 = completely; reverse-scaled in analysis)
3. To what extent was the decision affected by the use of power and influence among group members? (1 = not at all, 7 = completely)
4. To what extent was the decision affected by negotiation among group members? (1 = not at all, 7 = completely)

Environmental Favorability

1. Using the scale, please describe what has happened with (*each environmental factor*) in the period since the decision was made (1 = worst possible outcome [as specified in first interview], 7 = best possible outcome [as specified in first interview]).

Quality of Implementation

1. How well has (*each implementation task*) been done? (1 = very poorly, 7 = very well)
2. How important has (*each implementation task*) been for this decision? (1 = not at all important, 7 = very important)

APPENDIX B
Measurement of Strategic Decision Effectiveness and Environmental Instability

Strategic Decision Effectiveness

"During the first set of interviews, I was told about a variety of objectives that the company was trying to accomplish with this decision. For each of these objectives I need to get an idea of the degree to which the company was successful in attaining it. Please look at the range of

success and failure and tell me what happened" (1 = complete failure [as specified in the first interview], 7 = complete success [as specified in the first interview]).

An example of calculating the strategic decision effectiveness score: This decision, to invest in a new business, was made by a semiconductor firm. There were two informants, and two objectives—profit (weighted 95) and market share (weighted 105). (The weights for these objectives had been established in the first interviews.) The first informant rated the attainment of the profit objective a 1 and the market share objective a 5. The second informant rated profit a 3 and market share a 6. The calculation of the overall effectiveness score for this decision was as follows:

For informant 1, $[(95/200) \times 1] + [(105/200) \times 5] = .48 + 2.62 = 3.10$.

For informant 2, $[(95/200) \times 3] + [(105/200) \times 6] = 1.42 + 3.15 = 4.57$.

The mean of these two scores is then taken: $(3.10 + 4.57)/2 = 3.84$, which is the effectiveness score for this decision.

Environmental Instability

The total value of shipments instability (VSI) was calculated as the standard error of the regression slope of value of shipments over the years 1973–82, divided by the mean of the value of shipments (source: U.S. Bureau of the Census, *1982 Census of Manufactures*).

The number of employees instability (NEI) was calculated in the same manner, using the number of employees data from the same source.

Technological instability (TI) was the average number of patents granted in the industry from 1973 through 1982 (source: *Invention Summaries*, U.S. Patent Office, 1984).

Environmental instability was calculated as $Z(\text{VSI} + \text{NEI}) + Z(\text{TI}) + 10$. The constant was added to prevent the calculation of negative numbers. *Z*-scores were used to ensure that all scale values were on the same metric.

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