Current and Future Research Methods in Strategic Management

MICHAEL A. HITT
JAVIER GIMENO
Texas A&M University

ROBERT E. HOSKISSON
University of Oklahoma

Early work in strategic management emphasized single case studies, followed by research on corporate diversification strategy, firm heterogeneity, strategic groups, and generic business strategies. Intermediate work added the foci of environmental determinants and strategic choice, often using secondary data from large, multi-industry firm samples. Recently, the most prominent new theoretical paradigm is the resource-based view of the firm, using smaller sample studies. Future research is likely to integrate and contrast multiple theories and to develop more fine-grained and complex models. Quantitative research will emphasize longitudinal data, dynamic analysis, and greater focus on specific strategic decisions/actions. Future research will use more specialized tools such as panel data analysis, dynamic models of partial adjustment, logistic and Poisson regression analyses, event history analysis, network analysis, and structural equation modeling. Nontraditional research designs will also gain popularity, such as combined qualitative/quantitative data approaches and comparison of outliers.

During the past two decades, there have been significant developments in the field of strategic management. The significance of knowledge application in the field has also grown as exemplified by the importance of such topics as strategy at both corporate and business levels, corporate governance through the lens of agency theory (Eisenhardt, 1989a; Jensen, 1986), strategic leadership (Finkelstein & Hambrick, 1996), and the changing competitive landscape (Bettis & Hitt, 1995; D'Aveni, 1994), among others. The increasing importance of strategic management issues in business practice has been accompanied by a similar development in the academic field of strategic management. We have observed dramatic developments of both theory and method in strategic management research. Furthermore, the volume and quality of research in this field has continued to grow. For example, a new journal that focused on strategic management topics, the *Strategic Management Journal*, was initiated in 1980 with

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significant success and now publishes 12 issues annually. Additionally, the Business Policy and Strategy Division has the second largest membership among the divisions of the Academy of Management. A significant number of manuscripts are submitted to Academy journals reporting on strategic management research, and for the past several years, the Business Policy and Strategy Division has received the largest number of manuscript submissions for the annual Academy of Management Program.

Although the strategic management field has enjoyed significant popularity and growth, and substantive theory and methods development, such developments have not been fully chronicled in other publications. In particular, there has been little emphasis on strategic management research methodology in the published literature. Yet, given the importance of the field and its theoretical evolution, strategic management methodology and future trends in these methods should be captured to foster further development. Thus, the purpose of this work is to examine the research methodologies applied in the development of the strategic management field. This work also examines the tools and methods used in current strategic management research and offers concise explanations of methods that are likely to become important in future research.

Our journey begins with a description of early work and developments in strategic management, mainly in the 1970s, followed by what we refer to as intermediate developments (both in theory and research methodologies) in the 1980s. Afterwards, we emphasize more recent research in strategic management, with specific focus on empirical tests and methodology. Finally, we end with projections for future strategic management research and a description of important tools and methods for such research.

Early Work in Strategic Management

Early research and teaching in the field we now call strategic management focused on business policy and general management. This emphasis came out of the tradition established at the Harvard Business School whereby general management was thought to be critical to the success of the firm. In fact, the general management faculty at Harvard was probably one of the more powerful groups within the business school in the 1960s and 1970s.

During this time, the primary emphasis in terms of research and teaching was on single case studies (firm and industry). It is interesting that many of those who worked in this field (then referred to as business policy) did not have specific education or training in this area. Those working in the area came from diverse disciplines such as economics and other business disciplines and also included retired executives from the private and public sectors. As a result, much of the writing and research in this area was informed by the "best practices" of top managers rather than by generalizable theories. Business policy focused on the practice of top management.

In 1972, Schendel and Hatten proposed the development of strategic management as a broader view of business policy, emphasizing the development of new theory that could derive empirically testable hypotheses:

> The selection of the research situation and the methodologies to be used would be more often based on the premise that the research should seek cause and effect

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> relationships. Hard empirical data is needed so that legitimate scientific tests to reject or develop the hypothetical constructs can be used. (p. 102)

This manifesto, together with simultaneous research efforts at Harvard and Purdue, initiated the empirical tradition in strategic management.

In the early 1970s, two research groups at Harvard were developing dissertations that began to change the field. Under the influence of Bruce Scott and Alfred Chandler, a set of dissertations focused on the relationship between corporate diversification strategy, organizational structure, and firm performance in different countries (e.g., the United States, Great Britain, France, etc.). The most prominent of these dissertations, and the one with the greatest effect on the field, was conducted by Rumelt (1974). Using a thorough and rigorous process, Rumelt analyzed the corporate diversification strategies and categorized them into single business, dominant business, related constrained, related linked, and unrelated diversification (actually, Rumelt developed a more precise, nine-category classification scheme of corporate strategy). Perhaps the most important finding from Rumelt's research was that the relatedness between different businesses and the ability to capture the potential synergy from these related businesses were closely associated with a firm's financial performance. The impact of Rumelt's work can be seen even today through the citations of his original work. Simultaneously, a set of dissertations were developed in the business economics group at Harvard that focused on the concept of "strategic groups" counter to the intraindustry homogeneity assumptions of prior research in industrial organizations economics (Hunt, 1972; Newman, 1973; Porter, 1973).

Concurrent to these developments, Arnold Cooper and Dan Schendel at Purdue University began offering the first doctoral program in "strategic management," with an emphasis on empirical research. Several important methodological themes in strategic management were developed by that group. Hatten's (1974) dissertation explored the dangers of assuming a homogeneous functional specification for firms that are otherwise heterogeneous. By dividing a sample of breweries into more homogeneous sets ("strategic groups"), Hatten showed that the statistical relationships that held for the overall sample did not effectively represent the individual groups. These findings underscored the importance of understanding differences among firms and avoiding overreliance on cross-sectional methods to study heterogeneous firms. Patton's (1976) dissertation, also in the brewing industry, explored the causal structure and tradeoffs among strategic objectives by using a simultaneous equation modeling methodology.

The transformation of this field was marked by an influential book published in 1979 and edited by Schendel and Hofer. There were a number of prominent scholars in the field who contributed to this edited work that has been credited with changing the name of the field from business policy to strategic management. The book not only focused on the relevant theoretical issues at the time but also dedicated several chapters to methodological issues such as philosophy of science (by J-C. Spender), qualitative methods (by Robert Duncan), and quantitative methods (by Kenneth Hatten). This book helped redirect the field from the overreliance on general or top management of the firm toward more analytical rigor in strategic management research.

Although these works ushered in a new era of empirical research, more theory development was also slowly emerging (Dubin, 1978). It entailed both inductive and deductive theory building. However, much of the theory had been borrowed from other

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fields such as economics (e.g., industrial organization economics, transactions cost theory), marketing, and organization theory (Jemison, 1981). The emphasis on theory development increased at a later point in time as we discuss in another section herein. Next, we focus on some of the major foci and methods that developed from these early transforming works in the strategic management field.

Intermediate Work in Strategic Management

A new stage in the theoretical and empirical development of the strategic management field began with the publication of Porter's (1980) now classic book on competitive strategy. In this book, Porter developed a model of the industry environment with clear predictions for strategy and performance and explained several generic strategies and the conditions under which they should be employed to maximize firm performance. This work by Porter—coupled with work by Miles and Snow (1978), also focused on generic strategies (albeit a different set of such strategies)—ushered in a new era of research on business-level strategy. As a result, there were a large number of studies done on the efficacy of Porter's and Miles and Snow's generic strategies during the 1980s. Although there have been refinements and continued developments, Porter's generic strategies live on today in both the academic and the practitioner worlds, signifying the important impact his work has had on the field. The related research stream on strategic groups also reached its methodological maturity in the 1980s with the dissertations of Cool (1985) and Feigenbaum (1986), which used multivariate tests and cluster analysis to determine the internal structure of the pharmaceutical and insurance industries, respectively.

In addition to the research on business-level strategy, the 1980s were replete with studies that largely revolved around one of three themes: (a) the effects of the environment on strategy (deterministic), (b) the importance of the fit between strategy and the environment (strategic choice), and (c) the effects of strategy and structure on performance. The research examining the effects of the environment on strategy grew out of two deterministic traditions in separate disciplines—organization theory and industrial organization economics.

The effects of the environment on organizations can be traced in the organization theory literature back to the 1960s (Thompson, 1967) and are exemplified by the research by Lawrence and Lorsch (1967). Their research suggested that environmental uncertainty was linked to internal organizational characteristics. In particular, firms that existed in highly uncertain environments required more internal differentiation to effectively deal with these environments and simultaneously required more integration to operate effectively. Aldrich's (1979) book built on this tradition by identifying six major characteristics of environments that had important effects on organizations. Thus, Aldrich expanded the environmental characteristics and further developed the deterministic view of the environment affecting firm characteristics and operations. Dess and Beard (1984) empirically identified and integrated Aldrich's six dimensions into three: environmental munificence (availability of resources), environmental dynamism (amount of change and uncertainty), and environmental complexity (number and diversity of environmental elements). Dess and Beard's work facilitated further research on the environment-firm strategy linkage, as we explain later.

The deterministic view also grew out of the industrial organization economics framework. This view is well articulated and summarized by Caves (1984). However,

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the person most responsible for introducing the ideas of industrial organization economics to the field of strategic management is Porter in his classic books, *Competitive Strategy* (1980) and *Competitive Advantage* (1985). In particular, Porter emphasized the characteristics of the industry environment to include the threat of new entrants, power of suppliers, power of buyers, product substitutes, and intensity of rivalry. He argued that executives should analyze their industry environment on the basis of these five characteristics and developed generic strategies for stages of the industry life cycle and competitive strategies for engaging rivals. The 1980s saw substantial empirical testing of concepts related to this view such as entry and exit barriers (Harrigan, 1980, 1981), the competitive effects of the learning curve (Lieberman, 1987), and the effects of market share (Rumelt & Wensley, 1981; Woo, 1987), among others.

Growing out of the work of Child (1972), the notion that firms and executives exercised strategic choice began to develop. This stream of work is related to the idea of equifinality (from systems theory), that there are multiple ways to achieve an appropriate end result, suggesting that the environment does not necessarily determine a single best strategy. A stream of research that integrates both the environmental determinism and the strategic choice perspectives focused on the fit between the strategy and the environment. This work is exemplified by the research by Miller and Friesen (1984) in the early and middle 1980s. They published a series of articles detailing research on firms in which they examined the fit between a firm's strategy and its environment, along with other important firm-level (e.g., structure, performance) and individual-level (e.g., executive personality) characteristics. One of the interesting attributes of the Miller and Friesen work is that most of it used an idiosyncratic sample of small Francophone firms. Thus, some have questioned the generalizability of their work, even though it has been highly cited. Another example of this research that focuses on corporate-level strategy is the work by Keats and Hitt (1988). They examined the relationship between the external environment, corporate strategy, and structure and firm performance. They used the Dess and Beard (1984) environmental dimensions of munificence, dynamism, and complexity and examined their relationship to a firm's diversification strategy and multidivisional structure in a causal model. The relationships between strategy and structure and firm performance (using both market- and accounting-based measures of performance) were examined in the same causal model. They found environmental instability (change, a dimension of dynamism) to be the key environmental factor. Furthermore, they found that structure affected the diversification strategy and that diversification strategy was related to firm performance but differentially to separate measures of performance (market-based versus accounting-based performance). The work of Keats and Hitt also spans the boundaries of the third research focus—the relationship between strategy and performance.

As explained earlier, Rumelt (1974) served as a primary catalyst for research examining the relationship between strategy and performance, with a special focus on corporate strategy. This tradition was continued by a number of others, to include Christensen and Montgomery (1981), Palepu (1985), and Grant, Jammine, and Thomas (1988). In 1990, Hoskisson and Hitt provided a primary review of the research on corporate product diversification. They concluded that product diversification was probably the single most researched topic in the strategic management field at the time.

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They also found that the research examining the relationship between strategy and performance had produced inconsistent and inconclusive results. In particular, their review concluded that one of the major problems with this research stemmed from the methodology, and the differences in findings could partially be attributed to different methods used to study the concepts and relationships.

In addition to the work on strategy and performance, there was a significant amount of research examining the relationship between strategy, structure, and performance. The impetus for this research came from the classic work of Chandler (1962) and Williamson (1975). Both proposed that the multidivisional structure was a significant administrative innovation that resolved difficulties of the functional structure for large diversified firms, thereby improving their performance. Hill and Hoskisson (1987), however, argued that the types of diversification strategy may affect performance differentially when the multidivisional structure is implemented. Evidence supporting this hypothesis was found in longitudinal empirical work by Hoskisson (1987). Furthermore, work by Hoskisson and Hitt (1988) suggested that each type of strategy and structural control system creates different risk-taking incentives for division and corporate managers. Extending this work, Hill, Hitt, and Hoskisson (1992) found that the multidivisional structure (M-form) must be adapted to each strategy for best performance. For example, they found that a cooperative M-form structure produced best performance in firms using a related constrained strategy, whereas a competitive M-form structure produced higher performance in firms using an unrelated diversification strategy. The strategy-structure-performance research stream was reviewed by Hoskisson, Hill, and Kim (1993). They suggested that more comprehensive and dynamic studies were warranted.

Most of the research in the three foci/paradigms described above involved large sample studies using secondary data (often the PIMS and COMPUSTAT databases). During this time, standard multiple regression became the dominant statistical technique used in strategic management research, whereas the use of correlations and analyses of variance (ANOVAs) (as the primary statistical tool) decreased over time (Finkelstein & Hambrick, 1996). Many studies used a cross-sectional design with static specifications of the relationships under examination. Camerer and Fahey (1985) severely criticized the "regression paradigm" that was taking hold in strategy research for "its failure to specify alternative theories prior to empirical testing" and its weakness in establishing causation and disequilibrium effects. The methodological admonitions voiced in that seminal work continue to be accurate for much of the current research in the field. Finally, many studies in this period did not include an effective set of control variables (e.g., Govindarajan, 1988; Lamont & Anderson, 1985). Thus, although Keats and Hitt (1988) used a causal modeling approach with longitudinal (time-ordered) data, such methods were uncommon in strategic management research during the 1980s.

As research in strategic management continued to develop, new scholars entered the field with better research, theory, and statistical method training, and as new and better sources of data and understanding of the field developed (including theoretical development), more and better research was designed and implemented. For example, Finkelstein and Hambrick (1996) chronicled the increase in longitudinal, dynamic studies in the early 1990s. Thus, we now discuss more recent research in strategic management.

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Recent Research in Strategic Management

Recent research in strategic management has emphasized increasing content specialization and focus. For example, we see increasingly specialized research in areas such as strategic leadership (Finkelstein & Hambrick, 1996), competitive dynamics (Grimm & Smith, 1997), cooperative strategies (Osborn & Hagedoorn, 1997), and restructuring (Hoskisson & Hitt, 1994; Johnson, 1996), among others. In addition, substantial cross-fertilization is occurring with other related disciplines and subdisciplines. For instance, research on global strategies (Bartlett & Ghoshal, 1991) integrates international management with strategic management, whereas research on competitive strategy is increasingly influenced by ecological theories and methods (Barnett & Burgelman, 1996; Baum & Korn, 1996).

In terms of research methods, the 1990s began with explicit conversations about philosophy of science in the context of strategic management (Godfrey & Hill, 1995; Montgomery, Wernerfelt, & Balakrishnan, 1989, 1991; Seth & Zinkhan, 1991). These articles emphasized the importance of theory in the generation of testable hypotheses (even when relevant theoretical constructs are empirically unobservable) and the focus on strong tests that can falsify those hypotheses. Research practice at this stage also became more sophisticated, with a systematic drive toward longitudinal research, causal modeling, and consideration of alternative explanations.

Perhaps the most important recent development in the field has been the acceptance, integration, and application of the resource-based view of the firm (Wernerfelt, 1984). The resource-based view of the firm is not new, as it has its roots in the seminal work of Penrose (1959). Wernerfelt's (1984) award-winning article in the *Strategic Management Journal* introduced the resource-based view of the firm to the strategic management field. This prominent theoretical development for the strategic management field has been further specified and integrated into strategic management thinking by Barney (1991). Essentially, the resource-based view of the firm suggests that firms can achieve competitive advantage through the development and application of idiosyncratic firm resources. According to Barney, these resources must be valuable, rare, costly to imitate, and nonsubstitutable to provide a sustainable competitive advantage. Although the resource-based view of the firm is becoming increasingly accepted and integrated into strategic management thinking, it is a difficult theory to test empirically (Collis, 1994; Godfrey & Hill, 1995). In particular, it is difficult to operationalize and measure resources and capabilities that are specialized, unique, and idiosyncratic for each firm in the context of large sample studies.

Empirical research on this topic is beginning to develop, nevertheless. Most of the research on the resource-based view to date has used coarse-grained measures of firm resources. Although one can more easily measure tangible resources, such as financial resources and fixed assets (e.g., equipment, buildings, and land), most of these resources can be imitated and thus are rarely a source of sustainable competitive advantage. Rather, intangible resources are the primary source of sustainable competitive advantage. However, intangible resources are much more difficult to measure. Some strategic management scholars have used such variables as research and development (R&D) intensity, advertising intensity, and patents to proxy intangible resources (e.g., Almeida, 1996; Bierly & Chakrabarti, 1996; Chatterjee & Wernerfelt, 1991; Mowery, Oxley, & Silverman, 1996; Silverman, 1996). Others have also attempted to measure important resources such as human capital (Cooper, Gimeno, &

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Woo, 1991; Farjoun, 1994). For example, Kochhar, Hitt, and Bierman (1996) used human capital leverage (as suggested by Sherer, 1995) as a proxy for employee skills and capabilities. Also, to measure reputation, an intangible resource for law firms, Kochhar et al. used the number of large corporations from the top 250 firms that served as clients of the law firms (they also used a survey evaluating the reputation of the top 100 law firms to validate this measure of reputation). Kochhar et al. found both of these firm resources to play a critical role in the implementation of the diversification strategy of the firm. Specifically, they found the presence or absence of these resources to affect the relationship between diversification (both practice area or expertise and geographic market) and firm financial performance.

One of the more advanced empirical tests of the resource-based view of the firm conducted by Miller and Shamsie (1996) still used a coarse-grained measure as a proxy for firm resources. For example, in their study of movie studios, Miller and Shamsie used former investments in complex, large-skill film projects as a proxy for team, coordinative, and integrative knowledge-based resources. Although they built an effective case for the use of this proxy, it represents a coarse-grained measure for such a complex set of resources.

There are large, multi-industry studies focused on the resource-based view such as those conducted by Markides and Williamson (1994) and Robins and Wiersema (1995) and single-industry studies such as those conducted by Almeida (1996), Kochhar et al. (1996), and Miller and Shamsie (1996). Of course, both single-industry and multi-industry studies have a tradition in strategic management research as described earlier. With regard to the resource-based view, single-industry studies provide a particular and important context that offers benefits beyond those suggested by Dess, Ireland, and Hitt (1990) in research focused on other topics. Studies such as those conducted by Almeida on the semiconductor industry, Kochhar et al. on law firms, and Miller and Shamsie on movie studios allow tests that emphasize resources critical to the industries and markets these types of firms serve.

Empirical testing of the resource-based view faces significant challenges. The idiosyncratic nature of resources and capabilities makes multi-industry studies difficult, because operationalization of resources must be specific to the industry or even the firm. On the other hand, single-industry studies have limits on their generalizability. These empirical challenges have made the development of strong tests of the resource-based view particularly difficult. Although existing studies have produced results generally supporting the tenets of the resource-based view (such as evidence of diversification driven by human capital or technological capital capabilities), there have not been strong enough tests to potentially falsify some of the critical (but relevant) claims of this theory, such as the performance effect of idiosyncratic resources and capabilities. Later, we discuss several traditional and potentially new methodologies that could be helpful in testing the more relevant predictions of the resource-based view of the firm.

Central to the empirical difficulties of the resource-based view is its broad range of applicability. In the resource-based view, the locus of interests ranges from tangible and intangible resources (such as patents, brands, unique locations, or technologies) to idiosyncratic routines and organizational capabilities (such as manufacturing capabilities or product development routines). A recent theoretical development based on the resource-based view, often referred to as the knowledge-based view, explicitly focuses on the acquisition, internal development, accumulation, exploitation, and

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diffusion of knowledge-intensive organizational capabilities (Garud & Nayyar, 1994; Kogut & Zander, 1992; Lei, Hitt, & Bettis, 1996; Szulanski, 1996; Winter, 1987). Although this stream of work is at an early stage of development, empirical testing can be achieved by using proxies (e.g., patent information) for knowledge and interfirm knowledge transfer (Almeida, 1996; Mowery, Oxley, & Silverman, 1996; Stuart & Podolny, 1996) or by studying the determinants of internal transfer of knowledge (Szulanski, 1996; Zander & Kogut, 1995). A particularly interesting research design is exemplified in Szulanski's (1995) combination of in-depth interviews and surveys to provide a rich qualitative and quantitative picture of the impediments to internal knowledge transfer of 38 "best practices" inside eight firms.

Richer Empirical Studies of the Resource-Based View

Three recent studies have provided information relevant to a resource-based perspective. They involved a case study methodology but were generally more sophisticated than past case methodologies used in strategic management research. Below, we concisely describe each of these three studies. The first was conducted by Collis (1991) using a detailed, field-based case study of three firms in the worldwide bearings industry. His intent was to examine intangible resources such as knowledge and reputation and determine their linkage to firm outcomes. Collis focused on three primary concepts—core competence, organizational capability, and administrative heritage—that were compared to the current mainstream economic conceptions of strategy. Collis concluded that economic approaches (e.g., I/O economic) should be integrated with the resource-based view of the firm to provide a more complete understanding of strategies and global competitiveness. Collis's approach, although more sophisticated than many past case methodologies, is still steeped in the Harvard case-based tradition.

Using a different approach, Doz (1996) collected both archival and interview data from three sets of alliance partners (six firms). Doz used a theory-building as opposed to a theory-testing approach. A qualitative, theory-building approach has been uncommon in most strategic management research. Doz used the first case for theory development and cases 2 and 3 for theoretical replication and extension, a method similar to that recommended by Glaser and Strauss (1967). Doz had research associates collect data in the later two cases to avoid a confirmatory bias on the part of the author. The end result of this study was the development of a framework to analyze the evolution of cooperation in strategic alliances. Doz found that successful alliance projects went through a series of interactive cycles of learning, reevaluation, and readjustment. However, projects that failed were more inertial with very little or divergent learning. In these cases, expectations were largely unmet. Therefore, the grounded theory approach used by Doz allowed the development of a new framework by which to study the development of strategic alliances and their success or failure.

Kotha (1995) used an in-depth case study approach to examine the interrelationships between the development and implementation of technology and a firm's overall strategic positioning. Kotha collected data on a single firm through a series of semistructured interviews during an 18-month period. Many of these interviews were conducted with the firm's top executives. Because he studied the National Bicycle Industrial Corporation (NBIC) of Japan, he used two research assistants fluent in Japanese to facilitate the interview process. He also interviewed senior executives at

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Bridgestone Cycle Company, the primary competitive rival of NBIC, and Cat Eye Corporation, a leading supplier of bicycle parts. He gathered industry-related information through semistructured interviews with members of the Japan Bicycle Promotion Institute, a trade association. Finally, he collected archival data from the Japan External Trade Organization (JETRO). Emerging from Kotha's study is a linkage between the application of mass customization and a firm's competitive strategy. His case study provides an interesting examination of the interrelationships between technology and other resources, in particular the use of these resources (e.g., human capital) in implementing technology to provide a competitive advantage in the marketplace.

Although the theoretical idiosyncrasies of the resource-based and knowledge-based views have made them difficult to examine empirically for researchers armed with traditional deductive theory-testing tools, the studies described above provide richer and more informative empirical evidence on these views. In all cases, they provide conclusions useful in building theory relevant to the application of these views of the firm to competitive strategy. These studies also provide support for the resource-based view in ways that larger sample studies with more coarse-grained measures cannot, and they illustrate nontraditional methods for theory development and testing in the specific context of the resource-based and knowledge-based views of the firm.

Future Trends in Strategic Management Research

Strategic management research continues to develop and mature. Although it is impossible to predict with precision the new research designs and methods that will be required in future research, we can extrapolate from current theoretical and methodological trends and our research experience to discuss the tools that are likely to be most useful in future research. In this section, we examine future trends and recommendations regarding four important dimensions of the research process. First, we discuss how future researchers may use more robust processes for hypothesis generation and model specification thereby providing stronger causal tests of existing theories and richer feedback for new theory generation. Second, we consider the issues that are likely to be important in future quantitative research and explain some statistical methodologies that will help researchers cope with those issues. Third, we review several novel research designs and data collection methods that will serve researchers interested in studying the cognitive aspects of strategic decision making. Finally, we describe several qualitative methods and nontraditional research designs that may be useful in some research settings.

Hypothesis Generation and Model Specification

The first step in most empirical research involves the generation of hypotheses based on theory and the specification of the model used to test these hypotheses. Although most discussion of research methods focuses on statistical techniques, the choices made at the premethod stage are likely to enhance or limit the logical conclusions that can be drawn from the research. In particular, researchers need to consider (a) the specification of alternative, complementary, or competing explanations or theories for the phenomenon under study; (b) the generation of hypotheses (or "critical tests") that can differentiate among competing explanations; (c) the specifi-

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cation of fine-grained explanations through the use of mediator and moderator hypotheses; and (d) the appropriate selection of control variables for the research question. These issues are discussed next.

Strategic management phenomena are inherently complex and as a result can rarely be explained through the use of a single theory. In some cases, the integration of multiple theories can create more complex, yet accurate, models of strategic management phenomena than any single theory individually. Hitt, Hoskisson, and Kim (1997) exemplify the integration of multiple theories in building complex models. They integrated the resource-based view, transaction costs, and organizational learning theories to build a complex model of the effects of international and product diversification on firm innovation and performance. In other cases, multiple theoretical perspectives compete in explaining a strategic phenomenon. For instance, Hansen and Wernerfelt (1989) evaluated the relative influence of economic and organizational factors on organizational performance, and Amit and Wernerfelt (1990) tested the efficacy of several theories of firm risk. Similarly, Kochhar and David (1996) tested opposing theories of the effects of institutional investors on firm innovation. The consideration of alternative explanations or theories for the phenomenon under study often strengthens the logical conclusions of research.

When multiple theories are available to explain a given strategic management phenomenon, it is not uncommon for a particular hypothesis to be based on or explained by two different theories. In these situations, researchers can maximize the logical conclusion of their results by identifying a critical test of the theories. A critical test is a hypothesis in which two otherwise indistinguishable theories stand in direct opposition (Stinchcombe, 1968). Zajac and Kraatz (1993) used a critical test to examine the diametrically opposed predictions of organizational and environmental forces and counterforces on strategic change. Gimeno and Woo (1996) also used a critical test of strategic group and resource-based theories by studying their conflicting predictions about the effect of intramarket strategic similarity on the intensity of rivalry.

Strong tests of theories can also be achieved by developing fine-grained models that capture the causal structure of the theory and test the theoretically derived mediators and moderators. Even if support is found for the primary relationship predicted by a theory, the theory can be more conclusively tested by observing whether the relationship is stronger with theoretically supported moderation and/or mediation. An elegant application of this approach is presented in the test of transaction cost theory by Masten, Meehan, and Snyder (1991). Transaction costs economics (TCE) predicts that the level of human capital asset specificity associated with a given transaction has a positive effect on the likelihood of hierarchical governance over market governance. Moreover, TCE predicts that this effect is due to an increase in the costs of using market transactions. By using an innovative methodology, Masten and colleagues were able to separate out the effect of independent variables on the make or buy decision through the mediating effects of transaction costs and organizational costs. Although they found that human capital asset specificity was associated with hierarchical governance, their results suggest that the effect is due to lower organizational costs rather than higher transaction costs. This finding is contrary to TCE and supports the knowledge-based view suggesting that firms are an efficient context for the coordination of specialized knowledge resources. In another example, Gimeno

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(1994) developed a strong test of the mutual forbearance hypothesis by specifying that the relationship between multimarket contact and firm performance found in other studies is mediated by a reduction in the intensity of rivalry. He also tested the predictions of Bernheim and Whinston (1990), in a game theoretic model of multimarket competition, by examining through theoretically proposed moderator tests the strength of the relationship between multimarket contact and rivalry.

Finally, model specification can be strengthened by the appropriate selection of control variables. Critically relevant control variables have an association with the independent variable but are not caused by it and have an effect on the dependent variable. Ignoring such control variables can produce omitted variable bias in estimation. Thus, the selection of control variables should be guided by theory (J. A. Davis, 1985). For example, Gimeno and Woo (1994) theoretically argued that economies of scope and market structure dimensions should be controlled in tests of the mutual forbearance hypothesis, because omission of those variables would likely bias the findings.

Research Design and Quantitative Analysis

Perhaps the greatest methodological development in strategic management during the past decade has occurred in research design and quantitative analyses, a trend that will continue. In the 1980s, Camerer and Fahey (1985) criticized the regression paradigm prevalent in the literature, which focused on cross-sectional, static multiple regression for most hypothesis testing. These regression methods, however, are substantially ineffective for testing hypotheses in data that is nonexperimental and laden with nonrecursive relationships. Current research is moving beyond cross-sectional, multiple regression approaches to methods more attuned to the specific problems and issues likely to influence strategy research. For example, the sophisticated methodologies used by the finalists for the 1997 Free Press Dissertation Award from the Business Policy and Strategy Division of the Academy of Management reflects this trend. They include network analysis combined with Poisson/negative binomial regression with correction for unobserved heterogeneity bias (Ahuja, 1996), fixed effects panel data analysis with correction for sample selection bias (Kang, 1996), discrete time event history modeling (Leiblein, 1996), network analysis combined with path analysis (Madhavan, 1996), logistic regression and multinomial logit (Silverman, 1996), and structural equation modeling (Westphal, 1996). The use of these complex and sophisticated methodologies reflects the difficulties inherent in testing causal strategic relationships in nonexperimental data.

In this section, we identify several important trends in strategic management methodology and explore how they respond to the idiosyncratic problems of theory testing in strategic management. We also provide examples of the research designs and methods that researchers can use to overcome those difficulties. In particular, we forecast that future strategic management research will emphasize (a) methods appropriate for longitudinal or panel samples; (b) explicitly dynamic analytical methods; (c) methods appropriate for studying discrete strategic choices, behaviors, or actions; (d) methods that acknowledge the interdependence of firms with other firms or actors in their environment; (e) methods that explicitly account for the heterogeneity of firms; (f) methods that uncover the causal structure among and the endogeneity of variables;

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and (g) methods that account for the imperfect measurement of strategic constructs. These methods have been borrowed from related disciplines such as econometrics, structural sociology, marketing, and psychology, among others.

Methods appropriate for longitudinal or panel samples. In contrast to most behavioral research, strategic management research examines naturally occurring phenomena in nonexperimental samples. As such, the strategic management researcher cannot randomly assign strategies, environments, or resources to firms and observe the outcome. An implication of this limitation is that the researcher must be concerned with the possibility that other variables, not included in the analysis, spuriously explain the relationship between two variables. This concern is particularly relevant in cross-sectional designs because firms may differ in ways that are impossible to capture in the research. The differences across firms that are not captured by explicitly measured control variables are known as *unobserved heterogeneity*. For instance, an observed cross-sectional correlation between market share and profitability may be the result of a true causal effect of market share on profitability or may be due to the spurious effect of other unobserved variables, such as greater efficiency or environmental shocks that may affect both (Camerer & Fahey, 1985; Rumelt & Wensley, 1981). The implications for theory and practice of the two mechanisms are radically different. Thus, cross-sectional relationships (i.e., relationships that hold in comparisons across firms) between variables may or may not exist longitudinally (i.e., with multiple temporal observations in a firm). For this and other reasons, researchers are increasingly using samples of several firms across several years, or panel samples. If used appropriately, panel samples allow the researcher to control for unobserved heterogeneity across firms (i.e., other observations of the same firm become the control group) and focus on how variables covary longitudinally.

Although the use of panel samples has many advantages (Baltagi, 1995; Hsiao, 1986), it also presents some unique challenges. Because the sample contains multiple observations for each firm, it is likely that the disturbance term (which captures all unspecified variables having an effect on the dependent variable) contains firm-specific factors (i.e., unobserved heterogeneity). In these cases, ordinary least squares (OLS) estimation is subject to autocorrelation and heteroscedasticity. Some researchers have dealt with this problem by using generalized least squares (GLS) with a popular two-step transformation suggested by Parks (1967) and popularized by Kmenta (1986) (i.e., Chen & Miller, 1994; Hill & Hansen, 1991; Keck, 1997). Although the Parks-Kmenta transformation is a valid way of dealing with the problems caused by unaccounted and unobserved heterogeneity, it does not directly specify such heterogeneity in the model. Instead, users of the Parks-Kmenta transformation begin by implicitly assuming that a homogeneous functional specification and coefficients apply to all firms in the sample and then correct for the resulting autocorrelated or heteroscedastic residuals. In addition, Parks-Kmenta transformations require the estimation of many auxiliary parameters to account for autocorrelation and heteroscedasticy, which are estimated with some error. These coefficients are then inserted back into the model as "known" parameters, which leads to substantial underestimation of standard errors and statistical overconfidence (Beck & Katz, 1995).

Another family of methods, generally known as *panel data analysis* (Baltagi, 1995; Hsiao, 1986), explicitly models the problematic unobserved heterogeneity as part of the functional form. Two specifications are common. *Fixed effect intercept models*

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(also known as least squares dummy variables models) specify the unobserved heterogeneity by allowing each firm to have a different intercept that captures the cross-sectional differences among firms and estimating those intercepts together with the independent variables. The slope coefficients in fixed effects models do not reflect cross-sectional relationships; rather, they reflect how longitudinal variations in the levels of the independent variables for a firm are associated with longitudinal variations in the levels of the dependent variable for that same firm. *Random effect models* (or error component models) also specify that there are firm-specific intercepts, but instead of estimating each of those, it assumes that those intercepts were obtained from a normal distribution, the parameters of which are estimated. Furthermore, it assumes that those intercepts are statistically independent from the independent variables in the model. Slope coefficients in random effects models reflect a combination of the longitudinal and cross-sectional relationships of the variables of interest. A Hausman test can be used to determine whether the appropriate specification of the firm-specific intercepts is as fixed or random effects.

Although fixed effects models have the obvious disadvantage of consuming many degrees of freedom, they have the advantage over random effects models of allowing the possibility that the omitted variables captured in the firm-specific intercepts may be correlated with other independent variables in the model. For instance, firms may differ cross-sectionally in their (unobserved) market reputations, which are relatively stable over the period of study, and firms with better reputations may also be likely to have broader product lines. Assume that both market reputations and breadth of product line have independent positive effects on performance. In a panel data analysis of the relationship between breadth of product line and performance, a random effects model is likely to overestimate the effect of product line breadth by also assigning to it the effect of reputation. A fixed effects model, on the other hand, would adequately allocate the effects of reputation to the firm-specific intercepts and properly capture the independent effect of product-line breadth on performance. Thus, the fixed effects model can provide a more conservative test of hypotheses than the random effects model in situations in which the unmeasured effects are correlated with the independent variables.

Use of panel data methods, although still infrequent, is increasing. Westphal and Zajac (1995) used a random effects model to correct for firm-specific and time-specific effects in a panel data analysis of the effect of CEO-board similarity on CEO compensation. Likewise, Gimeno and Woo (1996) used a fixed effects model to account for differences across airlines, city-pair markets, and time periods in a study of multimarket contact and rivalry in the airline industry.

Repeated measures analysis is another approach for modeling longitudinal samples. Repeated measures research designs are adequate when subjects are measured two or more times on a dependent variable (Bergh, 1995). This methodology, which derives from analysis of variance methods, takes advantage of the repeated measures available from each subject by using time explicitly as an explanatory factor. Thus, researchers using repeated measures analysis can introduce direct time effects (to capture changes in the dependent variable) and interaction effects of time with other independent variables (to capture time-changing relationships between independent and dependent variables). This modeling tool is, therefore, well suited for analyzing how statistical relationships shift over time (Bergh, 1993a). It is important, however,

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to carefully control for violations in data assumptions, as lack of control can lead to incorrect empirical results (Bergh, 1995).

Explicitly dynamic analytical methods. With the increased use of longitudinal samples, more researchers have begun to use analytical methods with an explicitly dynamic specification. A *dynamic model* describes the time paths of change in phenomena (Tuma & Hannan, 1984, p. xii). Dynamic models focus on change by either using change variables as dependent variables or, alternatively, include lagged dependent variables as predictors. In contrast to static methods, which assume that a change in the independent variable is immediately followed by a change in the dependent variable thereby reaching a new equilibrium, dynamic methods explicitly model the temporal adjustment to a new equilibrium. Dynamic methods can also be used to describe how firms respond to changes in the variables that influence them. Bergh (1993a, 1993b, 1995) criticized the analytical approaches used by some strategic management researchers for not appropriately capturing the temporal dimension available in longitudinal data.

In contrast to the models that describe equilibrium relationships, dynamic models of change are more effective for obtaining evidence about the direction of causal relationships. For instance, a common problem in strategy research is that relationships are often nonrecursive: A variable X simultaneously causes Y and is caused by Y. However, for theory-testing purposes, the researcher may want to test explicit directional relationships among these variables. By determining whether lagged values of X predict current values of Y, after controlling for lagged values of Y, dynamic analysis can provide evidence in support of a proposed causal process and the direction of the effect. This condition of cross-lagged effects is known as the *Granger test* for causality in time series analysis (Granger, 1969). In addition, a dynamic test can more readily determine whether a relationship is causal or spurious. For instance, some researchers in strategic management have argued that CEO duality is associated with lower firm performance. Some longitudinal (but static) tests have even shown support for that relationship (Rechner & Dalton, 1991). However, Baliga, Moyer, and Rao (1996) explicitly focused on events of changes in CEO duality and found little evidence of subsequent changes in market or accounting performance as predicted by theory. This finding suggests that the relationship between CEO duality and performance may not be causal but spurious.

Event history analysis, an explicitly dynamic tool recently adopted by strategic management researchers, shows significant promise for future strategic management research. Event history analysis was developed in the social sciences and applied particularly in sociological research. As a result, it has been adopted by organization theorists (e.g., Dacin, 1997) but also is being applied in strategic management research (i.e., Blodgett, 1992; Mitchell, 1989; Zajac & Westphal, 1996). Event history analysis, also known as survival analysis, allows empirical tests of hypotheses concerning whether and when a subject is likely to undergo a particular discrete "event." Events in these cases represent discrete changes such as decisions to enter or exit a market, adopt a technology, or initiate or dismantle a joint venture. Researchers must identify the time when an observation is first "at risk" of experiencing the event and if and when the event occurred within the sampling window.

Blodgett used event history methodology to examine 1,339 separate joint venture contracts and the change in ownership structure of joint ventures over time. Alterna-

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tively, Zajac and Westphal (1996) used event history methodology to examine changes in CEO characteristics and CEO-Board influence over time. There are many different variations of event history analysis (continuous time, discrete time, parametric, semiparametric, nonparametric), as each of the studies identified above applied somewhat different approaches to the event history methodology. One of the specialized approaches is effectively described by Amburgey (1986). A more general description of event history methodology can be found in Allison (1984), Morita, Lee, and Mowday (1993), Tuma and Hannan (1984), and Yamaguchi (1991), and other examples of its application include Barnett and Hansen (1996), Ingram (1996), and Ravenscraft and Scherer (1991).

When the researcher is interested in dynamic changes in continuous dependent variables, different methods are appropriate. There has been a lot of discussion about the appropriate specification of change models (Cronbach & Furby, 1970; Menard, 1991). Some researchers use change scores (current minus past) as dependent variables, whereas others use the current value of the dependent variable while controlling for the lagged value of the dependent variable. There are two concerns with using change scores. First, it is critically important that the researcher controls for lagged values of the dependent variable, even if that variable is also part of the change score. The control is necessary because of the possibility of "regression to the mean" effects, in which large positive changes are due to below average prior values of the dependent variable and vice versa. Second, it is important to specify models that are consistent with some form of equilibrium. Thus, if it is specified that the level of X will affect the change in Y, with no correction for lagged Y, the model is implicitly suggesting that a change in X will lead to an infinite, long-term increase in Y, a possibly inaccurate specification.

Specifications are available for dynamic models with level dependent variables that are in agreement with processes that adjust to equilibrium and can provide a rich interpretation. One of the most effective is the *partial adjustment model* (Johnston, 1984; Tuma & Hannan, 1984). This approach specifies that the change in the dependent variable, $Y_t - Y_{t-1}$, is due to a gap between prior levels of the variable (Y_{t-1}) and the levels of an unobserved equilibrium level (Y^*_t), which is a function of independent variables (X_t), multiplied by a factor of adjustment. Mathematically, $Y_t - Y_{t-1} = r(Y^*_t - Y_{t-1})$. To avoid the well-known problems with change scores (Cronbach & Furby, 1970), the partial adjustment model is stated as $Y_t = a + bX_t + cY_{t-1}$, where the coefficients a, b, and c can be interpreted according to the adjustment process (for instance, coefficient c equals 1 minus the rate of adjustment r). This model is particularly useful for studying dependent variables that are slow to adjust to changes in the independent variables. Barnett, Greve, and Park (1994) used this method in their model of performance, and Gimeno (1997) used it to investigate the market share effect of different types of multimarket contacts, because market share is a variable that is relatively slow to adjust to changes in the independent variables. David, Hitt, and Gimeno (1997) extended the partial adjustment model by combining models to study the effect of intervention effects in time series (Cook & Campbell, 1979, pp. 261-265). The resulting model was able to test whether activism by institutional investors had a gradual but long-term effect on innovation outputs or an abrupt but temporary effect. The approach they used also allows a graphical depiction of the predicted effect of an event of institutional activism on innovation inputs over a span of years. A related method, the *dynamic adjustment model*, adds to the partial adjustment model an

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explicit control for autocorrelation in the errors of the partial adjustment equations across years (Greve, 1997).

Methods appropriate for studying discrete strategic actions. Another characteristic of current and future research is likely to be an emphasis on predicting discrete strategic actions. Strategy can be defined as a stream of actions or decisions rather than as a static position (Mintzberg, 1978). Thus, instead of predicting the degree of diversification, researchers are now more likely to predict the likelihood of individual diversification actions (Montgomery & Hariharan, 1991). Instead of predicting the structure or tenure of executives, research can now predict events of executive departures (Hambrick & Cannella, 1993) and discrete choices between internal or external replacements (Bartkus, 1997; Cannella & Lubatkin, 1993). In research on competitive strategy, more emphasis is given to the prediction of discrete actions and reactions (Baum & Korn, 1996; Chen & MacMillan, 1992; smith & Wilson, 1995). Part of this trend, we believe, is due to the increasing availability of databases with fine-grained data on strategic actions and developments in the methodologies to analyze those data.

Overall, the trend to analyze discrete behavior has had a direct effect on the methodologies used in strategy research. More researchers are using techniques for analyzing discrete or limited dependent variables. In particular, researchers are increasingly using logistic regression (Chen & MacMillan, 1992; Montgomery & Hariharan, 1991; Sharma & Kesner, 1996), multinomial logit models (Cooper, Gimeno, & Woo, 1994; Folta & Leiblein, 1994), and Poisson or negative binomial regression (David et al, 1997). In addition, more researchers are interested in evaluating the performance effects of discrete actions or decisions and use financial event studies to examine those effects.

Logistic regressions and *multinomial logit models* are methods for analyzing relationships in which the dependent variable has two (logistic) or more than two (multinomial) discrete categories. These methods are particularly popular in biostatistics (predictions of disease) and in labor economics and marketing (predictions of labor or consumer choices). Excellent reference sources for these methods include Maddala (1983), Hosmer and Lemeshow (1989), and Ben-Akiva and Lerman (1989). Simple logistic regression uses a categorical (0, 1) dependent variable. The application of logistic regression analysis in strategic management research is exemplified by Sharma and Kesner (1996) and Singh and Mitchell (1996). Singh and Mitchell used binomial logistic regression to examine the influences of collaborative relationships and other business characteristics to predict the survival of firms after dissolution of a collaborative venture. Similarly, Sharma and Kesner used a dichotomous dependent variable to measure survival (whether a parent firm exited an industry during the period of study). Their interest focused on the effects of whether entry into a market represented diversification and whether the extent of the relatedness of the new market to the firm's current core markets affected survival within that market.

Multinomial logit analysis is a technique designed to analyze data with multiple categorical dependent variables, assuming that these choices are not ranked with respect to the independent variables (i.e., different variables may predict different outcomes). The model estimates the likelihood of a given outcome occurring with respect to a reference outcome. Care must be taken with interpretation of coefficients because they do not represent marginal effects. Some researchers use elasticities

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(percentage change in the probability associated with a 1% change in the independent variable) to avoid interpretation problems. Cooper et al. (1994) used a multinomial logit model for analysis of the outcomes of failure, marginal survival, and growth of small entrepreneurial firms. They found that these outcomes were determined by different variables. Folta and Leiblein (1994) used multinomial logit analysis to examine the effect of transaction cost and option theory predictors on the governance choices of firms (acquisition, equity alliance, nonequity alliance).

Logistic regression and multinomial logit analyses belong to a family of models that use maximum likelihood estimation to link underlying processes to discrete observable outcomes. Other methods likely to be used in the future are ordered probits and logits, nested logits, and grouped data regression. These means of analysis can be found in Maddala (1983) and are readily available in the LIMDEP econometric package. Ordered logits and probits are useful to analyze ordinal data, such as multiple choices with an underlying ranking. Nested logits are helpful when discrete choices are nested within one another (e.g., a decision to force the current CEO to resign, followed by a decision of whether to hire an insider or outsider as the new CEO). Grouped data regression is useful for analyzing discrete, ordinal data that correspond to a continuous distribution with known bounds. For instance, many surveys do not ask for income per se but provide a multiple choice for incomes within ranges. Grouped data regression can be used to estimate continuous relations in that data without having to assume specific values for the variables (Gimeno, Folta, Cooper, & Woo, in press; Stewart, 1983).

Other methods likely popular in the future are *Poisson regression* and *negative binomial regression* (Barron, 1992). These are methods explicitly designed for calculating regression models when the dependent variable is a count of events (i.e, number of patents issued this year, number of firms entering the market, etc.). (Hausman, Hall, & Griliches, 1984; Henderson & Cockburn, 1994). Poisson regression analysis assumes that the count of events was generated from an underlying Poisson distribution, and it estimates the expectation of that distribution (the Poisson distribution by definition has its mean equal to its variance; it is a heteroscedastic distribution). Negative binomial regression analysis relaxes the assumption that the variance is equal to the mean and allows the distribution to be overdispersed (variance greater than the mean) or underdispersed. Henderson and Cockburn (1994) used these methods in the context of the effects of organizational capabilities on innovation outputs, whereas David et al. (1997) used Poisson regression to analyze the effects of institutional investor activism on innovation outputs. These methods are also readily available in the LIMDEP econometric program.

With the increased interest in strategic decisions and actions, financial event studies have become an important tool for strategic management scholars and have been a mainstay in research in the field of finance (Brown & Warner, 1985). Event studies are useful in examining the effects of major strategic actions on stock-market-based performance. These are exemplified in the research of Davidson and Worrell (1992) and Wright and Ferris (1997). Davidson and Worrell examined the effect of product recall announcements on shareholder wealth. Wright and Ferris (1997) examined the effect of divestment of South African business units on shareholder value. The event methodology requires that the precise timing (the day) of the announcement of a particular strategic action must be identified. Thereafter, the daily stock price data are collected for some event window before and after the event (usually a small window,

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particularly after the event to disallow other uncontrollable effects on stock price). Collecting data prior to the announcement is designed to control for potential leakage of information about a specific event. The intent is to measure abnormal returns—either positive or negative, relative to the average stock market value—that occur because of a specific strategic action/event. Event study methodology provides a relatively clean and simple means to examine the effects of major strategic actions on firm (shareholder) value without using accounting-based performance measures that can be biased by multiple events and accounting methods used. It allows researchers to identify the specific effects of a specific strategic action. Other studies using this methodology include Koh and Venkatraman (1991) and Madhavan and Prescott (1995).

The event methodology is based on assumptions about the information available on the stock market. Semistrong assumptions about the accuracy of market data have come under increasing scrutiny (Fama, 1991). For instance, Black (1986) and others have contested the accuracy of the market data and thereby event studies. There have also been criticisms from other finance researchers regarding specific types of event studies such as those examining acquisitions (Magenheim & Mueller, 1988), and it appears that management application of event studies may have been less rigorous than those in finance (McWilliams & Siegel, 1997). It is interesting that there have been some advances in this methodology that make it more useful in strategic management. Some studies are beginning to examine the market reaction of strategic actions on competitors' stock prices rather than focusing solely on the firm announcing the decision. For instance, Sundaram, John, and John (1996) examined the effects of announcements of competitive R&D expenditures on competitors' stock prices. Thus, they studied interdependent actions and reactions through event study methodology.

Methods for analysis of interdependence among firms. A conception of the environment of a firm as composed by other firms and external actors that influence and constrain the firm is based in industrial organization economics (Porter, 1980) and structural sociology (Burt, 1992; Gulati, 1993). Recently, researchers have become interested in disentangling the structure of the environment of a firm by examining the individual "ties" that link firms to other firms. These ties may be defined in terms of competitive relationships, buyer/supplier relations, cooperative relations, interlocking directorates, and others.

Network analysis is a standard tool for analyzing the constraints and influences that the environment exerts on a firm (Burt, 1992; Gulati, 1995; Kogut, Shan, & Walker, 1992; Provan, 1993). Network analysis allows the researcher to analyze a complete network of ties among firms and to produce a number of summary statistics about the overall network, the position of a focal firm in the network, and the relationship between two firms in the network. Marsden (1990), Tichy (1981), and Burt (1992) describe widely used network variables such as centrality, range, embeddedness, or multiplexity. These variables have been used to predict the likelihood that a firm takes a particular action, given the constraints on its environment (Ahuja, 1996; Gulati, 1995; Kogut et al., 1992), and to directly predict performance (Burt, 1992; Madhavan, 1996).

Another tool related to network analysis is *multidimensional scaling* (Kruskal, 1978), which uses interfirm distance measures (these measures may be obtained from a network analysis) to graphically represent the structure of the network. Multidimen-

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sional scaling is a tool of data reduction and depiction that has been used quite frequently in marketing research (Green, 1970); recently, however, this versatile analytical tool is being applied by organization theory and strategic management researchers (i.e., Hitt, Nixon, Hoskisson, & Kochhar, in press; Kotha, Dunbar, & Bird, 1995; Stuart & Podolny, 1996). Multidimensional scaling is used to assess the stability of positions (e.g., firms/groups) over time. For example, Kotha et al. (1995) examined the technological positions of firms at different times (1982, 1987, and 1992) using multidimensional scaling. Alternatively, Stuart and Podolny (1996) used multidimensional scaling to identify market niches and niche overlaps in the Japanese semiconductor industry over time. Hitt, Nixon et al. (in press) used this analytical tool to evaluate the stability of the positions of individuals within cross-functional teams with regard to perceptions of the team's environment (relative to others in the team) over time. Although traditionally it has not been used for theory testing, Denison and Fornell (1990) explain the use of multidimensional scaling as a confirmatory approach for structural modeling based on ordinal assumptions. They show that confirmatory multidimensional scaling and LISREL often produce similar results. Heiser and Meulman (1983) state that the prospects for the application of multidimensional scaling are bright, thereby suggesting that its use in strategic management is likely to increase in future years.

Although networks can be seen as structures that constrain and influence actions by firms within the network, they can also be the mechanisms that transfer information and moderate the actions between firms. Thus, networks of ties can be used for modeling the influence of actions by firms in a focal firm's environment on the focal firm. As mentioned earlier, analysis of actions and reactions has increased in strategic management (Chen & MacMillan, 1992; smith & Wilson, 1995; Young, Smith, & Grimm, 1996). These actions/reactions are part of a broader class of *diffusion models* that examine how previous actions by some firms influence subsequent actions by others. Diffusion models have been used by organizational theorists to examine the diffusion of poison pill mechanisms (G. Davis, 1991) or the size of acquisition premiums (Haunschild, 1994). This diffusion is found to be influenced by contacts with other firms through interlocking directorates. Although diffusion models have not yet been used extensively in strategy research, they offer substantial promise for studying external influences on strategic decisions. A recently developed analytical method known as the *heterogeneous diffusion model* (Greve, Strang, & Tuma, 1995; Strang & Tuma, 1993) combines the advantages of event history analysis and network analysis. This analytical approach allows a researcher to investigate the diffusion of a strategic action among a group of firms and test whether particular similarities or ties among companies influence the speed of diffusion. Greve (1995, 1996) used this methodology to study the diffusion of a strategy to adopt or abandon a particular radio format by firms in the U.S. radio industry. Given the current emphasis in strategic management on action and interdependence, this method is likely to become popular. The method can be estimated using the newest version of RATE.

Methods that explicitly account for firm heterogeneity. As mentioned earlier, one of the main methodological themes in strategic management since its beginnings is how firms differ, and in particular, whether functional relationships that apply to some firms also apply to others (Hatten, 1974; Hatten & Schendel, 1977). Pooling the slope coefficients for heterogeneous firms may produce meaningless results not applicable

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to individual firms. The problem, however, is that a number of observations assumed to be functionally homogeneous are required for estimation of coefficients.

Hatten (1974) solved this problem by dividing the industry into smaller groups of homogeneous firms and estimating different statistical relationships for each group. However, much of the earlier work on strategic groups, which is related to this question, was criticized by Barney and Hoskisson (1990) because it relied heavily on cluster algorithms without a strong theoretical base. More recently, this approach to defining firms with homogeneous strategies has evolved into *configurational research*. Meyer, Tsui, and Hinings (1993) argued the need for more configurational research. In fact, accurate representation of firm characteristics, strategy, and environments probably requires the use of more configurational approaches to reflect their interrelationship. Configurational research allows the researcher to investigate how strategy, structure, and environment interact in different (nongeneralizable) ways for different firms. Doty, Glick, and Huber (1993) provide an excellent example of the application of a configurational approach to the study of organizational effectiveness. Similar to Carter, Stearns, Reynolds, and Miller (1994), they examined the effects of strategic archetypes proposed by Mintzberg (1983) and Miles and Snow (1978) on organizational effectiveness. In particular, they provide a useful explanation of a methodology for using configurational approaches.

An alternative to assuming functional homogeneity among firms is to assume functional homogeneity across time periods for the same firm but heterogeneity between firms. This assumption is probably more attuned to the prescriptions of the resource-based view. Using longitudinal data, a researcher can calculate different effects for different firms and test whether those differ significantly (which can be done with a Chow test). Makadok (1997) provides an effective application. Using long time-series data of monthly frequency on 1,231 money market funds, Makadok estimated the different coefficients for the supply-and-demand functions for each firm and used those coefficients to predict a firm's use of strategic pricing.

Methods to uncover the causal structure of a theory. One method for exposing a theory to challenging tests is to unpack the causal structure of the theory in a system with mediator and moderator variables (noted earlier). Opening the fine-grained causal structure of the theory to empirical testing can provide greater insights (and greater likelihood of falsification) than solely focusing on coarse-grained predictions. Testing the causal structure involves the estimation of multiple equations with different dependent variables. Several techniques are available for that estimation, including path analysis, simultaneous equations, and structural equation modeling with latent variables.

When the relationships in the causal structure are recursive (i.e., when no variable in the system has an indirect causal path that leads back to itself), researchers can use *path analysis* to determine the different mediation relationships in a causal structure. Statistically, path analysis is a simple tool and can be pursued with ordinary regression analyses. Prescott, Kohli, and Venkatraman (1986) and Woo (1987) used path analysis to determine the effects of market share on profitability and business risk, respectively. In other cases, however, path analysis is not an appropriate tool because at least one of the relationships in the causal model is nonrecursive. In those situations, researchers can use simultaneous equation estimation or structural equation modeling to account for the recursiveness within the system of relationships.

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Simultaneous equation models were developed in econometrics for studying nonrecursive relationships, such as the relationship between supply and demand, but have not been commonly used in the strategic management field. In effect, this analytical tool allows the examination of simultaneous reciprocal effects of two or more variables. Such tools can be useful in helping to sort out such "chicken or egg" questions as, "does strategy lead to structure or structure lead to strategy?" (or, are there simultaneous effects of each on the other?). Although not common in past research (was used by Patton, 1976), its use is growing, as exemplified by Garud and Van de Ven (1992), Stiles (1992), and Kochhar and Hitt (in press). Researchers can estimate the simultaneous equations one by one, using a two-stage least squares method as exemplified by Garud and Van de Ven and Stiles. Alternatively, they can jointly estimate the whole system of equations by using three-stage least squares or maximum likelihood methods. Kochhar and Hitt used three-stage least squares to examine the potential simultaneous reciprocal effects of diversifying entries into markets, capital structure, and type of financing decisions. There are theoretical arguments to suggest that mode of financing as well as capital structure may lead to diversifying entries, as well as that the type of diversifying entry may require certain types of financing modes. The use of the simultaneous equation modeling allowed them to test both sets of theoretical arguments simultaneously. In effect, they found support for both sets of theoretical arguments, in that the variables had simultaneous reciprocal effects.

Another relevant simultaneous equation model is the *seemingly unrelated regressions estimation* (SURE) model (Zellner, 1963). This simultaneous equation estimation approach pools recursive equations that may share some common error effects, thus gaining efficiency over single-equation estimation. A particularly effective application of SURE was Rumelt and Wensley's (1981) test of the market share/return on investment (ROI) relationship. By estimating that equation jointly with an output equation, and allowing the error terms of both equations to be correlated, they found that the direct effect of market share on ROI disappeared. The authors interpreted the correlation between the errors as reflecting unobserved stochastic shocks and therefore supported their view that the market share/ROI relationship was due to unobserved random shock rather than a causal effect. Thus, SURE can be helpful when there are important variables that need to be controlled but no measures are available for those variables. More recently, Brush (1996) used SURE to estimate the effects of relatedness on business-unit competitive performance (market share). By jointly estimating the equations for 2 years, he was able to account for the possibility of correlated error (due, for instance, to unobserved heterogeneity) and test equality of parameters across periods.

Structural equation modeling with latent variables is another method for testing multiple equations simultaneously, including nonrecursive relationships. The main advantage of structural equation modeling with latent variables is that it allows for imperfect measurement of constructs. Thus, structural equation modeling is a simultaneous equation model of latent constructs, in which these latent constructs have been derived from a method akin to confirmatory factor analysis. Structural equation modeling with latent variables has been used frequently in behavioral research and has become more common recently in strategic management. Hoskisson, Hitt, Johnson, and Moesel (1993) have used the procedure to establish construct validity of an important measure of diversification. This approach to validation is more common in the behavioral sciences. Likewise, Hoskisson, Johnson, and Moesel (1994) used

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structural equations modeling to test a complex model of restructuring (divestitures) on firm outcomes. Gimeno and Woo (1994) used structural equation modeling to test a full mediation model between multimarket contact, rivalry, and performance. Additionally, Hitt, Hoskisson, Johnson, and Moesel (1996) used structural equation modeling to test a complex model of the effects of the market for corporate control on firm innovation. In particular, they examined the independent effects of acquisition intensity and divestiture intensity along with the mediating affects of strategic and financial controls on the development of internal firm innovation and the acquisition of external innovation.

Two other important methods used for examining the causal structure of theories are sample selection models and self-selection models. *Sample selection models* are concerned with situations in which the availability of an observation in the sample (a binary outcome) is endogenously determined by the variables in the model. For instance, models that evaluate the effects of independent variables on firm performance require that the firm be an existing and independent entity. Merged firms or firms that failed cannot be in the sample. Yet, there is a possibility that the merger or dissolution outcome is partly determined by the performance of the firm. In that case, the sample is not random but biased toward high-performance firms. Sample selection models control for the lack of randomness in the sample and can be estimated with a two-step Heckman correction or with a maximum likelihood estimation. Barnett et al. (1994) used the Heckman correction in their study of performance in a panel of Illinois banks. Gimeno et al. (in press) used a maximum likelihood procedure in their study of thresholds of performance among new entrepreneurial firms. Both studies concluded that lack of correction for sample selection can produce substantial biases in the estimated effects of independent variables on performance.

Self-selection models are used to evaluate the effects of discrete choices or actions, when those choices or actions are not random but are instead determined within a causal system. For instance, a researcher may be interested in the effects of a diversification move on the performance of a firm. In this case, both diversifying and nondiversifying firms are in the sample (i.e., there is no sample selection). However, it is unlikely that firms diversified randomly but instead were self-selected to do so because they had the required resources, the opportunity was ripe, or for other reasons. In that case, the binary independent variable representing diversification may also capture the effect of the diversification causes. Therefore, self-selection bias is likely to overestimate the true effect of the treatment (diversification), because the effect is based on those firms that self-selected and may not be representative of the effect that other firms would obtain from the same action if they had been randomly assigned to it. Self-selection bias can be minimized by using the *treatment effects model* (Greene, 1990, p. 747), which includes in the performance equation an estimate of the likelihood that a given firm will select the action, in a similar way to the Heckman two-step correction or alternatively by explicitly controlling in the model those variables that predict the selection of the treatment. Labor economists and public policy researchers have been particularly aware of the self-selection problem, because they assume that people self-select into jobs and into welfare programs.

Only a few strategic management researchers have attempted to control for self-selection bias. In their study of the consequences of product differentiation by HMOs, Wholey and Christianson (1994) used a treatment effects model to control for the likelihood of a particular firm adopting a product differentiation strategy. In their study

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of the consequences of institutional investor activism on innovation, David et al. (1997) included several control variables that predicted the likelihood of activism. Given the trend toward action-based research, it is important for future researchers to recognize the self-selected nature of most strategic actions. A good source of reference for models of sample selection and self-selection is Maddala (1983), and many of these models are available in the LIMDEP program.

Methods that account for imperfect measurement of strategic constructs. In contrast to behavioral researchers, strategic management researchers have shown surprisingly little concern about measurement problems. This may reflect the prevalence of secondary archival data sources in strategy research, in contrast to the use of survey data in the behavioral sciences. Nevertheless, attention to measurement concerns is important for the advancement of theory-testing efforts. *Exploratory and confirmatory factor analysis*, and structural equation modeling with latent variables (described above), can be used to account for imperfect construct measurement. These tools use multiple but imperfect indicators of an underlying construct to develop a latent variable that reflects common variance of these indicators but is not affected by the idiosyncratic measurement errors of each. For example, Hitt et al. (1996) used multiple measures of the primary constructs in their study. Acquisition intensity was measured through the use of the number of acquisitions undertaken and the percentage of total assets acquired. Furthermore, internal innovation was measured by the number of new products introduced to the market along with the financial resources invested in R&D. Using structural equations modeling to analyze the data facilitated the use of multiple indicators of each theoretical construct. Measurement concerns can also be minimized by replicating the research with alternative measures of the relevant variables, especially if these measures capture different dimensions of the underlying construct. For instance, Gimeno and Woo's (1996) study of the effects of strategic similarity on intensity of rivalry replicated the analysis with three different measures of similarity: similarity in size, similarity in age, and a multivariate strategic similarity measure. By comparing the predictive validity of these measures, the researchers were able to determine which dimensions of similarity had a greater influence on rivalry. Similarly, Gimeno's (1997) study of influence spheres in the airline industry defined them in terms of three different dimensions: market share dominance, market dependence, and resource centrality. The results suggest that some of the previous operationalizations of spheres of influence in terms of market share dominance do not have as high a predictive validity as the operationalization based on resource centrality.

Although researchers may be attentive to measurement issues, the methods described above are not easy to apply correctly in strategy research. Factor analysis and structural equations assume that the researcher has multiple indicators of an underlying construct. In survey research, multiple indicators are obtained often by asking the same question in different ways. Although well-developed instruments exist in the behavioral sciences, strategy researchers frequently use secondary archival data and determine the indicator by an exploratory analysis of the correlations among variables, with the interpretation of the underlying factor or latent variable determined ex-post. Additionally, multiple predictors may be mistaken for multiple indicators. For instance, Porter (1980) provided a list of factors that may produce high entry barriers and increase the intensity of rivalry. Yet, those factors are predictors, not indicators, of entry barriers or rivalry.

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Specialized Designs and Methods for Research on Strategic Decision Making

The cognitive models used by top executives in developing and implementing major strategies and specific strategic actions are of growing interest in the strategic management field. As such, there have been several specialized methods that have been developed and/or adapted from other fields to study the cognitive structures of and models used by top executives. Among these are the repertory grid, cognitive mapping, and policy capturing. Each of these is concisely described below.

The *repertory grid* developed outside of the field of strategic management and was first applied to the notion of strategic change by Ginsberg (1988, 1989). It has also been employed by others to help understand how managers group firms within industries (strategic groups) (Reger & Huff, 1993). Usually, the repertory grid is administered to managers through interviews and results in development of a data matrix for each individual displaying the importance of the constructs under study to that individual. In effect, the data matrix is used to proxy an individual schema for the constructs under study. For instance, if the research is examining strategic groups, the data matrix would represent the strategic constructs that make up the cognitive map for classifying the firms into strategic groups. Although an interesting and useful tool, it is difficult to aggregate at a collective level, such as for a top management team. Alternatively, it is an effective tool for developing a quantitative and descriptive managerial cognitive model for important strategic management concepts such as strategic groups.

Another potentially useful tool for measuring cognitive models is that of *cognitive mapping*. This analytical tool is designed to identify the cause-and-effect beliefs of individual managers. Huff (1990) presents an effective explanation of this approach, and Barr, Stimpert, and Huff (1992) provide a useful application of it in a research setting. Barr et al. (1992) used the tool to measure top managers' cognitive models following significant changes in the environment. In particular, they examined the relationship between changes in these cognitive models and organizational renewal actions initiated by the firms' top managers. They found that organizational renewal was largely related to top executives' ability to link environmental change to corporate strategy and to understand and modify that linkage over time. This methodology requires the construction of cause maps through content analysis of key assertions within documents that deal with causality, existence, and/or categorization of basic issues for strategic decision making. These assertions are mapped to develop a picture of changing managerial beliefs over time (Barr et al., 1992). In a variation of this approach, Markoczy and Goldberg (1995) developed a specific applied causal mapping technique to capture managerial beliefs. The steps in their technique include (a) development of a pool of potentially relevant constructs, (b) selection of the constructs most relevant to managers, and (c) identification of the influence relationships along with their strengths and direction. Their research on Hungarian managers concluded that without effective measurement, misattributions of managerial beliefs are likely. Although this approach may be complex and tedious, it shows promise for better understanding the cognitive models used by top executives and the effects of these models on strategic change.

The last analytical method we examine is that of *policy capturing*. Policy capturing has its roots in social psychology and specifically within the subdiscipline of social

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judgment analysis. It is based on the premise that to have an accurate understanding of individuals' cognitive models, one must examine theories in use (actual decision behavior) versus espoused theory (executive descriptions of their decisions) (Argyris & Schon, 1974). Although this data gathering and analytical method has a rich tradition in social psychology and micromanagement research (e.g., organizational behavior, human resource management), it has begun to be applied more recently in strategic management (i.e., Dacin, Hitt, & Levitas, 1997; Hitt, Dacin, Tyler, & Park, 1997; Hitt & Tyler, 1991; Tyler & Steensma, 1995). The intent of policy capturing is to obtain data on and analyze actual decisions made by managers to develop a quantitative decision model that reflects the decision criteria used and their respective weights assigned by the managers. It is based on the premise that individuals cannot verbally describe their cognitive model in that their model contains a partially subjective content. Hitt and Middlemist (1979) conducted post hoc interviews with superiors of the managers in their study and found that the policy-capturing models accurately represented these managers' actual decision-making behavior, thereby providing support for the external validity of this method. Hitt, Dacin et al. (1997) used a policy-capturing methodology to measure and compare the strategic orientations of U.S. and Korean executives. They found that the cognitive models reflecting the strategic orientations of these two groups of executives differed in theoretically predictable ways, based on the executives' cultural background, national policies under which they have worked, and their home country level of economic development (institutional context). For example, U.S. executives emphasized financial performance and a more short-term return orientation, whereas Korean executives placed heavier emphases on growth and expansion with a longer term return orientation.

Thus, these three methods show particular promise for developing a better understanding of top management team strategic orientations and actions than the more common methods of examining similarities and differences in top management team demographic characteristics.

Qualitative Research and Nontraditional Research Designs

Although the methods described above emphasize the trend in standard research designs and quantitative methodologies, an important recent trend is to integrate qualitative and quantitative research methods and/or use nontraditional research designs. Although some of these methods may be valuable for theory testing, they are also useful in theory generation.

Research projects may realize the benefits and advantages of both quantitative and qualitative research approaches by integrating them in a single project. For example, use of both approaches can achieve the advantage of developing specific measurable results that may be generalizable provided by the quantitative approach and the richness and potential greater understanding of the concepts and relationships being examined provided by the qualitative approach. This is exemplified in the work of Judge and Zeithaml (1992) who collected survey data (quantitative) and follow-up interview data (qualitative approach) in their study of board of directors' involvement in strategy formulation. Similarly, Hitt, Nixon et al. (in press) used multiple survey approaches (quantitative) along with in-person and telephone interviews and open-ended survey questions (qualitative) in their longitudinal case study of the activation and demise of a cross-functional new product design team.

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Bettis (1991) suggested that much strategic management research focused on outdated concepts, overemphasized multivariate statistical methodology, and often failed to provide relevant and practical conclusions for managers. He recommended that strategic management scholars employ more exploratory research and unstructured methods that focus on outliers rather than statistical averages and attempt to provide useful implications for practicing managers. Although this seems too extreme, from our perspective, his call to open up strategic management research is a worthy one. Below, we examine some research approaches that are in line with Bettis' recommendations.

Earlier, we described the creative use of longitudinal and historical case studies such as those employed by Collis (1991) and Doz (1996) to provide a richer and more in-depth understanding of firm-based idiosyncratic valuable resources. However, there are other methodologies that may be useful to study the resource-based view and other specialized topics in strategic management. Among those are the use of outlier samples integrated with longitudinal case studies and approaches to effectively analyze those cases, along with case survey methodologies. These are described in the following paragraphs.

Hitt, Harrison, Ireland, and Best (in press) used an outlier sample to study the characteristics of highly successful and unsuccessful acquisitions. From a large sample of mergers and acquisitions, they selected outliers on the basis of performance of the merged firm over time. They selected the highest performing and lowest performing firms in the large sample. They found only 12 firms from a sample of 191 mergers and acquisitions that had both a positive increase in return on assets and a positive increase in R&D intensity over a 3-year period after the year of the merger. To have a balanced sample, they then selected the 12 lowest performing firms from the larger sample (i.e., those with the largest negative change in return on assets and negative change in R&D intensity) over the 3-year time period after the year of the merger. These were, indeed, outlier samples with dramatic performance changes, relative to the other merged firms in the sample. After selecting the 24 merged firms to study, they collected all available published data on the 48 firms (target and acquiring firm) for 3 years prior to the year of merger and for the 24 merged firms for the year of the merger and 3 years thereafter. Thus, they collected 7 years of data on each merger or acquisition. By using published data on past acquisitions, they avoided retrospective perceptions from current executives and could collect data on a variety of mergers and acquisitions. Furthermore, they obtained data from a variety of perspectives, as opposed to focusing only on the executives in the firm, thereby allowing them to triangulate the results. Also, by using multiple sources, they avoided inadvertent biases that might occur with the data collected by Collis (1991), Doz (1996), and Kotha (1995) who used executive interviews. The two samples—positive and negative performance outliers—were analyzed in sequential fashion. Three of the coresearchers carefully analyzed first the positive performance outliers. The three scholars read and independently coded all data on each of the cases. They used a qualitative inductive approach as recommended by several scholars (e.g., Eisenhardt, 1989b; Miles & Huberman, 1984). Each tried to identify consistent themes related to the characteristics of the firms that led to their success. After each of three coresearchers independently read, analyzed and coded all of the data for distinctive characteristics, they compared and discussed their conclusions. Although they found considerable agreement, no characteristic was included unless all three of the coresearchers could agree on that characteristic after discussions.

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After identifying the characteristics of the successful acquisitions, three coresearchers independently analyzed the 7 years of data on all 12 of the unsuccessful acquisitions. In this case, one of the three researchers was new to guard against unintentional confirmatory biases that could extend from the first set of analysis of the high-performing firms (e.g., the reverse of the characteristics found for high-performing acquisitions). Because no characteristic could be included unless all three coresearchers agreed, the inclusion of the new researcher guarded against such biases. The end result of these analyses provided a set of characteristics of high-performing and low-performing acquisitions.

The use of a large set of secondary data provides access to many more researchers for the study of strategic management concepts. However, there are some potential limitations of this methodology. First, many positivist researchers might argue that this type of research (using outliers) samples on the dependent variable. This is an accurate observation. Although we recognize this potential limitation, we believe, as noted by Bettis (1991), that there are some rich and important conclusions that can be derived from studying outliers as opposed to statistical averages. For example, research has shown that a large number of acquisitions are not successful. By studying outlier high-performance acquisitions, we might better learn what firms can do to increase the probability of success. Another potential limitation of this type of research is that it is based on others' interpretation of information (secondary publications). Thus, the researchers have little control over the data that are obtained; they are limited to prior observations of firms' actions and characteristics. Alternatively, by using many sources, they have the opportunity to triangulate the data, thus providing some information on their reliability and validity.

Another methodology providing increased opportunities for strategic management researchers is the case survey methodology proposed by Larsson (1993). According to Larsson, the case survey methodology is an inexpensive but potentially powerful method of identifying and statistically testing patterns across studies. The basic approach involves selecting a group of existing case studies relevant to the research question, designing a coding scheme for systematically converting the qualitative case descriptions into quantified variables, using multiple raters to code the cases (and measure interrater reliability), and statistically analyzing the coded data. The case survey methodology has several advantages. It uses an organic, action-oriented approach, as opposed to a mechanistic, rigorous laboratory experiment (Argyris, 1980). It overcomes the major disadvantage of single case studies, mainly the inability to examine cross-sectional patterns and to generalize to large populations, because it pools relevant case studies into data sets sufficiently large for statistical testing. It capitalizes on the idiographic richness of case studies, thereby allowing the examination of more complex phenomena than the typical survey approach. Case studies can be replicated because their coding schemes and reports are available to other researchers. Through the inclusion of case studies from different time periods, the case survey methodology also allows a longitudinal examination of patterns of complex phenomena. Finally, the case survey methodology provides a bridge between traditional research gaps that occur with the use of quantitative or qualitative methods only (Larsson, 1993).

There also are some limitations of the case survey approach. The researcher does not have control of the data collection efforts nor is there a guarantee of an adequate number of case studies relevant to any specific research question. Also, by using case

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studies, the information available for the case survey is restricted to the available data that is collected by others. Finally, coding to quantify variables may unduly simplify complex phenomena being investigated (Larsson, 1993). In general, however, the case survey methodology presents opportunities for future strategic management research.

Conclusions

In the early 1970s, Schendel and Hatten (1972) called for the development of the strategic management discipline to build a conceptual body of knowledge by the systematic development and testing of theories. Today, strategic management research is beginning to mature in both theory and method, and the results of the theoretical development are visible in new textbooks (e.g., Hitt, Ireland, & Hoskisson, 1997). Our intent herein has been to provide a view of the historical development of this field, both in theory and method. As the theoretical frameworks have become more complex, so have the methodologies designed to test them. In fact, in some cases, the methods used have fostered better theory and associated tests. Currently, research is on the verge of providing some very important advances in our knowledge of strategic management in large complex organizations. The methods and tools used are becoming more sophisticated and valuable in helping to build a knowledge base of how to strategically manage business organizations.

Undoubtedly, however, there are more challenges to be managed both in the development of complex theoretical models and in their testing. Our intent has been to present a broad blueprint of current and future research in strategic management with the hope that it provides a map and directions for students and researchers to develop the necessary knowledge of appropriate methods and tools to continue improving their research and making important contributions to our knowledge of strategic management.

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Michael A. Hitt holds the Paul M. and Rosalie Robertson chair in business administration at Texas A&M University. He received his Ph.D. from the University of Colorado and currently is the immediate past president of the Academy of Management. His research interests focus on mergers and acquisitions, innovation process and performance, international diversification, international strategic alliances, and how firms effectively navigate in the evolving competitive landscape.

Javier Gimeno is an assistant professor of management at Texas A&M University. His research interests in strategic management include the study of competitive interaction in multimarket competition, competitive strategy in international contexts, and applications of industrial economics to strategic management. He has also researched the determinants of new venture success and growth. He has published in Administrative Science Quarterly, Organization Science, and the Journal of Business Venturing.

Robert E. Hoskisson is the Rath chair in strategic management at the Michael F. Price College of Business, University of Oklahoma. He received his Ph.D. from the University of California, Irvine. He teaches courses in strategic management at graduate and undergraduate levels. His research focuses on topics in technology strategy, international and product diversification, corporate restructuring and privatization, corporate governance, and cooperative strategy.

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