

MANAGING FIRM RESOURCES IN DYNAMIC ENVIRONMENTS TO CREATE VALUE: LOOKING INSIDE THE BLACK BOX

DAVID G. SIRMON
MICHAEL A. HITT
R. DUANE IRELAND
Texas A&M University

We address current criticisms of the RBV (oversight of dynamism, environmental contingencies, and managers' role) by linking value creation in dynamic environmental contexts to the management of firm resources. Components of the resource management model include structuring the resource portfolio; bundling resources to build capabilities; and leveraging capabilities to provide value to customers, gain a competitive advantage, and create wealth for owners. Propositions linking resource management and value creation are offered to shape future research.

Indeed, the heart of business management and strategy concerns the creation, evaluation, manipulation, administration, and deployment of unpriced specialized resource combinations (Lippman & Rumelt, 2003: 1085).

The primary pursuit of business is creating and maintaining value (Conner, 1991). The resource-based view (RBV) suggests that firms' resources drive value creation via the development of competitive advantage (Ireland, Hitt, & Sirmon, 2003). Specifically, the RBV suggests that possessing valuable and rare resources provides the basis for value creation. This value may be sustainable when those resources are also inimitable and lack substitutes (Barney, 1991). However, merely possessing such resources does not guarantee the development of competitive advantages or the creation of value (Barney & Arkan, 2001; Priem & Butler, 2001). To realize value creation, firms must accumulate, combine, and exploit resources (Grant, 1991; Sirmon & Hitt, 2003). Unfortunately, there is minimal theory explaining "how" managers/firms transform resources to create value (Priem & Butler, 2001). Therefore, the RBV requires further elaboration to explain the link between the management of resources and the creation of value. To fully understand this linkage, the ef-

fects of a firm's external environment on managing resources need to be examined (Bettis & Hitt, 1995). RBV research is essentially silent about these effects.

Resource management is the comprehensive process of structuring the firm's resource portfolio, bundling the resources to build capabilities, and leveraging those capabilities with the purpose of creating and maintaining value for customers and owners. Structuring the resource portfolio involves using processes (i.e., acquiring, accumulating, and divesting) to obtain the resources that the firm will use for bundling and leveraging purposes. Bundling refers to the processes (i.e., stabilizing, enriching, and pioneering) used to integrate resources to form capabilities. Leveraging involves the set of processes (i.e., mobilizing, coordinating, and deploying) used to exploit capabilities to take advantage of specific markets' opportunities. Thus, through an external orientation, the purpose of leveraging is to use capabilities to create solutions for current and new customers (Kazanjian, Drazin, & Glynn, 2002).

From the firm's perspective, value creation begins by providing value to customers. When the firm produces greater utility for customers than competitors do, it enjoys a competitive advantage. In turn, a competitive advantage contributes to increased owner wealth when the firm's long-term profit margin is positive (Hoopes, Madsen, & Walker, 2003; Powell, 2001). Thus, value creation occurs when a firm exceeds its competitors' ability to provide solutions to cus-

We gratefully acknowledge the helpful comments provided on earlier versions of this paper by Jeff Covin and Jeff Harrison and by colleagues in research seminars presented at INSEAD, Texas A&M University, and The University of Western Ontario.

tomers' needs, while maintaining or improving its profit margins. Value creation is optimized when a firm synchronizes the processes in and between each resource management component such that the difference between the firm's costs and the price paid by consumers is optimized.

Additionally, the processes involved in managing resources are affected by the environmental context in which the firm operates (Lichtenstein & Brush, 2001). Because of high environmental uncertainty and varying degrees of environmental munificence, sustaining a competitive advantage over time is unlikely, with the result that a firm instead will seek to develop a series of temporary competitive advantages (Morrow, Sirmon, Hitt, & Holcomb, *in press*). Creating a series of temporary advantages allows the firm to create new value while maintaining the value created in previous periods. Thus, effectively and efficiently managing resources within a firm's given environmental context ultimately determines the amount of value the firm generates and maintains over time (Ireland & Webb, 2006).

Our work enhances the knowledge about the RBV and contributes to research on its efficacy. Priem and Butler (2001) have argued that previous work on the RBV has not provided information on how resources are used to create a competitive advantage. Additionally, Barney and Arikan (2001) have suggested that past research on the RBV assumes that the actions necessary to exploit resources are self-evident when they are not. Thus, we develop a model depicting the process of managing resources with the intention of creating value. Another important contribution of this work is situating the management of resources within the environmental context, thereby integrating the RBV, which has been focused on internal firm attributes, with theories on a firm's competitive environment.

We organize the paper as follows. First, we integrate the RBV, contingency theory, and organizational learning theory to form the model's theoretical base. Using this base as a foundation, we then develop a theoretical model of the resource management process. Critical environmental conditions that affect the resource management process are examined. We then explore each of the resource management components' processes to develop propositions regarding the effects of environmental contingencies on the linkage between the processes and potential value creation. We conclude with

implications and recommendations for future research.

THEORETICAL BASE

Ricardo (1817) argued that superior production factors generate economic rents for their owners. His famous farmland example demonstrated that when resources have different production levels and the more productive resources are scarce, the owner generates abnormal profits. This logic provides the foundation of the RBV (Makadok, 2001). Additionally, based on the assumptions of heterogeneously distributed resources and imperfect resource mobility, valuable, rare, inimitable, and non-substitutable resources can lead to long-lasting competitive advantage (Barney, 1991; Peteraf, 1993). Empirical evidence supports this logic (see Barney & Arikan, 2001, for a review).

However, the processes by which firms obtain or develop, combine, and leverage resources to create and maintain competitive advantages are not well understood. For example, Barney and Arikan state that "resource-based theory has a very simple view about how resources are connected to the strategies the firm pursues" (2001: 174). Castanias and Helfat argue that "the skills of top management combined with other firm assets and capabilities jointly have the potential to generate rent" (2001: 665). These statements suggest that possessing valuable, rare, inimitable, and nonsubstitutable resources is a necessary but insufficient condition for value creation. Indeed, value is created only when resources are evaluated, manipulated, and deployed appropriately within the firm's environmental context (Lippman & Rumelt, 2003).

The importance of the environment for managing resources suggests that contingency theory logic should be integrated into our understanding of the RBV. Although research of this type has been completed, it has been focused, to date, on understanding when a resource is valuable (Priem & Butler, 2001). Miller and Shamsie (1996), for example, found that property-based resources are more valuable in stable environments, whereas knowledge-based resources are more valuable in uncertain environments. Brush and Artz (1999) discovered that the value of capabilities differs based on the services offered by the firm and the level of information asymmetries in the environment. Aragón-Correa and

Sharma (2003) argued that a firm's competitive context affects the value of its resources in developing proactive, natural environment strategies. While these results are informative, pursuing contingency theory's focus on the "fit" between environmental contingencies and internal configurations may lead to greater understanding of how resources can be managed to optimize value creation, because firms do not operate in a vacuum (for a review, see Donaldson, 2001).

Organizational learning is the "acquisition of new knowledge by actors who are able and willing to apply that knowledge in making decisions or influencing others in the organization" (Miller, 1996: 486). Organizational learning is especially important for the effectiveness and efficiency of resource management in dynamic environmental conditions. Organizational learning provides firms with a potential capacity for "strategic flexibility and the degrees of freedom to adapt and evolve" (Zahra & George, 2002: 185). Learning of this type is often termed *high-level learning* or *metalearning* (Fiol & Lyles, 1985). Metalearning considers previous action/results relationships (i.e., feedback) critical for creating and maintaining value through constant development (Lei, Hitt, & Bettis, 1996). In dynamic environments, learning can be of great importance in helping the firm adapt and maintain an acceptable fit with its environment while seeking to satisfy customers' needs (Luo & Peng, 1999). Organizational learning is even more critical in less munificent environments, because resource scarcity may prolong the effects of poor resource management choices. Thus, environmental munificence likely will have an effect on the amount of resources needed, as well as how those resources are acquired and leveraged (Keats & Hitt, 1988).

THE RESOURCE MANAGEMENT PROCESS

Resource management is critical to value creation because using resources is at least as important as possessing or owning them (Penrose, 1959). Furthermore, a firm's resource management process can produce different outcomes for organizations holding similar resources and facing similar environmental contingences (Zott, 2003). Therefore, heterogeneity in firm outcomes under similar initial conditions may result from

choices made in the structuring, bundling, and leveraging of resources.

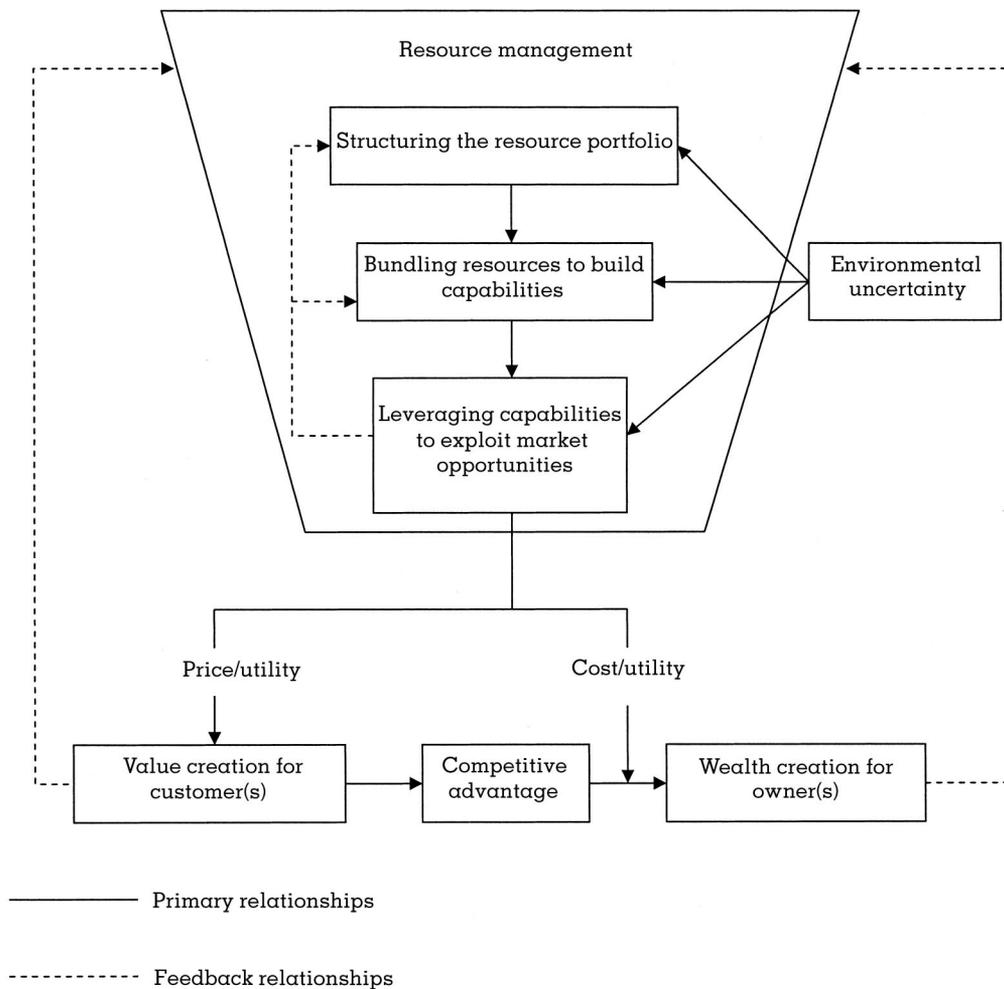
Figure 1 presents the causal flow of the resource management model. Based on processes, the model incorporates a temporal dimension. However, because the firm must have resources to bundle into capabilities and because capabilities must exist for leveraging to occur, the resource management process is at least partially sequential in nature. Furthermore, the model incorporates feedback loops allowing continuous adaptation for synchronization and fit with the environment. Thus, the management of resources is dynamic, with change resulting from adapting to environmental contingencies and from exploiting opportunities created by those contingencies. Additionally, Table 1 is presented to facilitate identification of and to help distinguish the processes noted in the resource management model.

Environmental Contingencies

Environmental dynamism concerns the amount of uncertainty emanating from the external environment (Baum & Wally, 2003). Uncertainty is created by instability in the environment that produces deficits in the information needed to identify and understand cause-and-effect relationships (Carpenter & Fredrickson, 2001; Keats & Hitt, 1988). An information deficit affects the way firms must manage resources to create value. For example, uncertainty in the industry or in potential competitors' actions affects the type and amount of resources needed in the resource portfolio, the capabilities necessary to outperform rivals, and the leveraging strategies required to gain and maintain a competitive advantage. Dynamism is reflected by the regularity in and amount of change occurring in the environment. Thus, changes in industry structure, the stability of market demand, and the probability of environmental shocks are important elements producing uncertainty in the environment.

Dynamics of industry structure, boundaries, and recipes. Industry structure affects the degree of competitive rivalry and uncertainty. The extent of entry barriers in an industry affects the amount of competition a firm experiences (Porter, 1980, 1985). In turn, the degree of competition and the amount of rivalry it spawns create change that enhances the potential for uncer-

FIGURE 1
A Dynamic Resource Management Model of Value Creation



tainty. However, industry recipes, which are the organizational routines necessary to compete in a particular industry (Spender, 1989), can moderate the extent to which the degree of competition and the amount of rivalry produce uncertainty. Industry recipes provide heuristics or decision rules that guide managerial actions.

But as industry boundaries blur in the competitive landscape, industry recipes become less well-defined. Additionally, industry recipes are not necessarily stable across different institutional and cultural environments (Wan & Hoskisson, 2003), and heightened competition in global markets has placed a premium on innovation in most industries (Bettis & Hitt, 1995; Kim & Mauborgne, 1997). Innovations often make industry recipes less relevant, especially when

they are radical and/or introduced frequently. Additionally, technological changes (environmental shocks) or developments in tangential industries may drastically affect the validity of recipes in mature industries. Technological developments can also make industry boundaries less clear (e.g., telecommunications industry), increasing the difficulty of identifying competitors and determining the value the firm's products create for customers. All of these factors increase environmental uncertainty.

(In)stability of market demand. Market demand can shape an industry's competitive dynamics. While demand is growing, less rivalry among competitors usually exists, because increasing demand affords opportunities for all firms. However, as markets mature and demand

TABLE 1
Resource Management Processes and Distinctions

| Components/ Subprocesses | Description |
|-----------------------------|---|
| Structuring | Refers to the management of the firm's resource portfolio |
| Acquiring | The process of purchasing resources from strategic factor markets |
| Accumulating | The process of developing resources internally |
| Divesting | The process of shedding firm-controlled resources |
| Bundling | Refers to the combining of firm resources to construct or alter capabilities |
| Stabilizing | The process of making minor incremental improvements to existing capabilities |
| Enriching | The process of extending current capabilities; although the degree of enrichment can vary, it extends beyond keeping skills up to date |
| Pioneering | The process of creating new capabilities with which to address the firm's competitive context |
| Leveraging | Refers to the application of a firm's capabilities to create value for customers and wealth for owners |
| Mobilizing | The process of identifying the capabilities needed to support capability configurations necessary to exploit opportunities in the market |
| Coordinating | The process of integrating identified capabilities into effective yet efficient capability configurations |
| Deploying | The process of physically using capability configurations to support a chosen leveraging strategy, which includes the resource advantage strategy, market opportunity strategy, or entrepreneurial strategy |

stabilizes, rivalry often increases. Alternatively, large fluctuations in demand (e.g., owing to changes in the macroeconomic environment) often increase rivalry and produce uncertainty.

Adner (2002) found that market demand affects the introduction of new technologies. For example, demand affects firms' willingness (need) to develop and introduce innovations. When market demand is high or growing, firms are more willing to invest in the development of new technology because they perceive greater opportunities for receiving returns on them. In turn, these innovations affect consumer expectations and thereby affect competitors' behavior as well (Adner, 2002).

Therefore, while reductions or stability in demand often increase competitive rivalry, growing market demand can stimulate innovation, so both increasing and decreasing demand can heighten competition (in different ways) and contribute to increasing environmental uncertainty. To deal with the uncertainty from competitive rivalry or fluctuations in demand, more and diverse resources may be required to develop new capabilities that can be leveraged in response to changes. Environmental shocks can also substantially increase uncertainty.

Probability of environmental shocks. Environmental shocks (e.g., the destabilization of global currencies and rapid privatization of state-owned enterprises) are unexpected events that create discontinuities in an industry (Tushman & Anderson, 1986). Commonly, competitive actions taken by firms outside a focal industry create environmental shocks. For example, a firm external to an industry may introduce a new product that performs the functions of the industry's existing dominant product more efficiently, thus serving as a substitute for it. This action represents a form of Schumpeterian creative destruction (Schumpeter, 1934). When such shocks occur, the relevance of an industry's recipes declines or may even disappear. The introduction of a "disruptive technology" can create this outcome.

The development and introduction of wireless technology into a marketplace (e.g., telecommunications) exemplifies what Christensen (1997) termed a *disruptive technology*. Disruptive technologies create significant uncertainty. For example, the knowledge sets necessary to build products compatible with wireless technology differ significantly from those associated with more conventional wired technology. Thus,

firms must seek new resources to compete in new markets created by the disruptive technology (new industry; Ireland et al., 2003). In this new environment with ambiguous requirements, firms may need to recombine resources to develop new capabilities, and they may need to design and employ different leveraging strategies to exploit their new and current capabilities.

Environmental munificence. Environmental munificence, "the scarcity or abundance of critical resources needed by (one or more) firms operating within an environment" (Castrogiovanni, 1991: 542), is also an important contingency factor in managing resources. For example, dynamic environments with low munificence are substantially different from dynamic environments with high munificence (Rajagopalan, Rasheed, & Datta, 1993), and both have different implications for how resources must be managed to create value. In particular, environments low in munificence heighten the importance of managing resources effectively, because they may not be readily available to the firm when needed. Thus, managerial skills in selecting and/or developing resources become increasingly important to firm success.

In total, because environments vary in their degree of uncertainty and munificence and because these conditions affect the potential value of a firm's resources and capabilities, value creation based on resource management is at least partly contingent on a firm's external environment. Thus, we integrate contingency theory with the RBV and organizational learning theory to explain the resource management processes. We begin the discussion with the structuring component.

Structuring the Resource Portfolio

The resource portfolio is the sum of all firm-controlled resources (i.e., tangible and intangible assets). The resource portfolio establishes the upper bounds of a firm's potential value creation at a point in time (Makadok, 2003).

Structuring the resource portfolio is the process by which firms acquire (Barney, 1986; Denrell, Fang, & Winter, 2003; Makadok, 2001), accumulate (Dierickx & Cool, 1989; Thomke & Kuemmerle, 2002), and divest resources. The subprocesses of structuring (acquiring, accumulating, and divesting) are affected by the environmental context, which, in turn, determines

their contribution to the firm's potential value creation (Miller & Shamsie, 1996). For example, environmental uncertainty strongly influences the efficiency of factor markets (Denrell et al., 2003), the likelihood of radical change in customer demands, and the likelihood of increasingly centralized decision making (Keats & Hitt, 1988). Therefore, managers must adjust the structuring subprocesses according to the degree of environmental uncertainty and munificence; doing so affects the firm's ability to create value through the subsequent bundling and leveraging processes.

Acquiring. Acquiring refers to purchasing resources from strategic factor markets (Barney, 1986). Commodity-like resources (e.g., equipment), intangible resources (e.g., intellectual capital), and complex sets of tangible and intangible resources via mergers and acquisitions (Denrell et al., 2003) are examples of resources available from strategic factor markets. The price paid for the acquired resource(s) greatly affects that resource's contribution to the firm's ability to create value, especially in terms of owners' wealth.

Barney (1986) has suggested that the prospects of acquiring resources to simultaneously contribute to competitive advantage and owner wealth are low, because strategic factor markets are efficient. Thus, the prices paid for resources reflect their expected contribution to a competitive advantage. However, Denrell et al. (2003) have argued that strategic factor markets often have incomplete information on new resources or old resources to be used in new ways (unknown to the market). As such, these markets do not accurately price new resources or resources to be used in unexpected ways. Because of this uncertainty, there may be more opportunities to acquire resources below their true market value than previously thought.

Uncertainty also creates ambiguity regarding the resources needed to develop and maintain a competitive advantage. This ambiguity suggests that firms need a repertoire of resources, especially intangible resources, because they are often the most flexible. Simply put, slack resources are needed to alter current capabilities or to create new ones in response to environmental changes (either opportunities or threats). However, building a repertoire of fully developed and functioning slack resources (e.g., specific knowledge sets, relationships with

other agents, etc.) is likely to be prohibitively costly and risky in highly uncertain environments. Rather than full-scale investment in specific resources, firms may be better served by acquiring resources that "allow preferential access to future opportunities," often referred to as *real options* (Bowman & Hurry, 1993: 762). Real options present the firm with a greater variety of future opportunities to alter existing capabilities or to create new ones while containing the downside risk and costs of doing so to only the loss of the initial investment in the option. Acquiring real options then allows the firm to remain flexible while limiting the cost of that flexibility. Thus, under conditions of uncertainty, acquiring some resources as real options pragmatically increases the firm's range of viable responses to environmental change in the form of opportunities and threats (McGrath & Nerker, 2004).

Real options may be especially important when environmental shocks occur because they can provide the flexibility needed to redirect the firm toward new opportunities. Thus, while real options may be less important in a munificent environment because of resources available, in less munificent environments they are increasingly valuable because they provide the flexibility needed to respond to environmental opportunities and threats. Therefore, we argue that, in addition to the market's inability to accurately price all alternative uses of resources, highly uncertain markets are ones in which a firm acquires resources as real options (emphasizing intangible resources). Resources as options provide the flexibility needed for the firm to respond to expected (high competitive rivalry) and/or substantial (introduction of a new technology) environmental change. Thus, acquiring real options increases the firm's ability to create value under conditions of high environmental uncertainty. These arguments lead to the following proposition.

Proposition 1a: Under conditions of high environmental uncertainty, acquiring resources that allow preferential access to a greater variety of opportunities increases a firm's potential value creation. Resources as real options can be especially valuable in uncertain environments with low munificence.

Accumulating. Accumulating refers to the internal development of resources. Accumulating is necessary because strategic factor markets are unlikely to provide a firm with all its required resources, especially when environmental munificence is low.

Internal development of resources enhances their isolating mechanisms, such as causal ambiguity (Thomke & Kuemmerle, 2002). While isolating mechanisms decrease threats of imitation, thus increasing the maintainability of an advantage based on that resource, greater inimitability may not be the primary goal of accumulating. Under conditions of uncertainty, firms may be less able to respond to unexpected opportunities or significant competitors' actions without appropriate resources. For example, if a firm lacks an adequate number of people with managerial skills, it may be unable to respond to a market opportunity to introduce a new product or service when the demand for it appears. This inability to respond may allow competitors to exploit the opportunity. Building the managerial knowledge and skills of professional employees can create a pool of people who can assume managerial positions when the need arises. Internal development of resources becomes even more critical in less munificent environments, in that resources cannot be easily acquired from external factor markets in these environments. Thus, a firm may create real options by developing its resources internally in anticipation of future needs.

Accumulating often requires learning. For example, to develop a firm's intellectual capital and enhance managerial skills, employees must increase their tacit knowledge. Assigning non-managers and/or relatively inexperienced managers to work on projects along with experienced managers can help these employees develop managerial tacit knowledge. Yet, in some cases, the firm may not possess the needed tacit knowledge. In these instances, the firm might form strategic alliances with companies with the desired knowledge (Lane & Lubatkin, 1998). Strategic alliances can be especially valuable for learning new knowledge in environments of low munificence. Using alliances to develop tacit technical and managerial knowledge is common among firms from emerging markets—markets often characterized by low munificence (Hitt, Dacin, Levitas, Arregle, & Borza, 2000). Alliances used in this fashion can

be viewed as real options (Kogut, 1991). In other words, after alliances are initiated, the partners may invest more in the relationship to accumulate additional resources, such as tacit knowledge. Managers are only likely to make these additional investments when they believe that there is a reasonable probability they will produce desired gains. Accumulating resources via real options, then, is an efficient means to prepare the firm to create new and/or improved resources.

Firms often need new and/or improved resources to respond to changing customer demands, especially when major changes occur in the external environment (e.g., environmental shocks). However, in environments with low munificence, such resources need to be internally developed (accumulated). Firms failing to consistently invest in and create real options are less capable of responding to environmental changes than those making such investments. These arguments lead to the following proposition.

Proposition 1b: Under conditions of high environmental uncertainty, accumulating resources that allow preferential access to a greater variety of opportunities increases a firm's potential value creation. The importance of internal resource development increases in environments with low munificence.

Divesting. Divesting refers to the shedding of firm-controlled resources. Because firms have finite resources, it is imperative that they actively evaluate current resources and divest less-valued resources to generate the slack and flexibility needed to acquire or accumulate resources of higher value (Sirmon & Hitt, 2003; Uhlenbruck, Meyer, & Hitt, 2003). Thus, resources that are not likely to contribute to developing or maintaining a competitive advantage or excess resources that cannot be bundled and leveraged profitably are viable candidates for strategic divestment. Layoffs of human capital, divestitures of noncore businesses, sell-offs of specific assets, spin-offs of businesses, and outsourcing of functions are examples of strategic resource divestitures.

However, research suggests that because of sunk-cost biases or organizational inertia, firms frequently delay divestment of underperforming

assets (Shimizu & Hitt, 2005). Moreover, selecting the appropriate resources to divest is challenging. Firms investing in real options are often unaware of resources' future value (Miller & Arkan, 2004). Sometimes, in the haste to reduce costs in response to changes in competitive or economic conditions, firms often divest valuable resources, thereby harming their ability to build capabilities that can be leveraged successfully. For example, firms commonly lay off significant numbers of employees when the economy enters a recession or competitors capture some of their market share. However, these layoffs can reduce the firm's intellectual capital and harm its ability to take advantage of opportunities when the economy rebounds, or can leave it without the capabilities needed to regain lost market share (Nixon, Hitt, Lee, & Jeong, 2004).

Divesting only contributes to value creation to the extent that it reduces the firm's tangible (e.g., maintenance, investments, etc.) or intangible (e.g., opportunity costs, managerial attention) costs without sacrificing a current competitive advantage or the seeds of future advantages. Effective divesting requires a thorough understanding of a resource's current ability and future potential to contribute to value creation. However, under conditions of uncertainty, the future potential of resources to create value is extremely difficult to evaluate. Therefore, layoffs based on arbitrary metrics, such as seniority, are less likely to increase the firm's potential to create value for customers. In contrast, strategic divesting involves only the human capital deemed unable to contribute to value creation (Cascio, 2002).

When operating in uncertain environments, top-level managers have a tendency to centralize decision making to gain more control (Keats & Hitt, 1988). This centralization creates greater internal information asymmetries. Top-level managers are less likely to have a full understanding about the value of the firm's resources, creating the possibility that they are more likely to divest resources with future (perhaps even current) value-creating potential. These managers are also likely to experience information overload, reducing their ability to make effective decisions about appropriate resource divestments. Thus, environmental uncertainty is likely to reduce the effectiveness of resource divestiture decisions—that is, more errors will be made in divesting resources when firms op-

erate in highly uncertain environments. These errors will be magnified in environments of low munificence because of the difficulty in replacing the resources divested in error. Under conditions of high environmental uncertainty and low munificence, firms should be better able to create value for customers with little or no divestiture of resources. These arguments lead to the following proposition.

Proposition 1c: Under conditions of high environmental uncertainty, divesting resources can harm a firm's value creation potential. Extreme caution should be exercised in divesting resources, especially in uncertain environments with low munificence.

While structuring is important, this process alone is insufficient to create value for customers and owners. Indeed, the resource portfolio provides the basis for developing capabilities. A capability is an ability "to perform a coordinated set of tasks utilizing organizational resources" (Helfat & Peteraf, 2003: 999). Bundling resources into capabilities is a necessary step in appropriating the potential value embedded in the firm's resource portfolio.

Bundling Resources

Bundling is the process by which capabilities are formed. Resources within the firm's resource portfolio are integrated (i.e., bundled) to create capabilities, with each capability being a unique combination of resources allowing the firm to take specific actions (e.g., marketing, R&D, etc.) that are intended to create value for customers. Commonly, customers want value from a firm's good or service in the form of a solution to a problem or satisfaction of a need.

Conceptually, capabilities, or resource bundles, range from small combinations of resources that are designed to perform less complex tasks to the higher-order concept of "patching" or integrating "chunks" of businesses (Brown & Eisenhardt, 1999; Siggelkow, 2002). Different types of bundling processes produce specific capabilities. Thus, different bundling processes are necessary when the firm is attempting to produce incremental change than when the goal is more substantial change in the firm's capabilities (Hamel & Prahalad, 1994). Additionally, the choice of bundling process is in-

fluenced by the uncertainty inherent in the firm's external environment. Higher levels of environmental uncertainty increase the need for creating new capabilities to function in different environmental contexts. Stabilizing, enriching, and pioneering are the three different bundling processes.

Stabilizing. The stabilizing bundling process is similar to the concept of coasting (Siggelkow, 2002). The intent of stabilizing is to make minor incremental improvements in existing capabilities, such as requiring employees to attend a specified number of training hours per year to keep their knowledge and skills up to date. Oftentimes, firms holding a current competitive advantage use stabilizing with the intent to maintain that advantage. Stabilizing can contribute to value creation for firms competing under conditions of low environmental uncertainty and high environmental munificence. However, the enriching bundling process more commonly creates value.

Enriching. The goal of an enriching bundling process is to extend and elaborate a current capability. Although the degree of enrichment can vary, it extends beyond keeping skills up to date. Capabilities can be enriched by learning new skills that extend the repertoire of current skills or by adding a complementary resource from the resource portfolio to the current bundle. An additional resource may have existed in the resource portfolio for some time, or it may have been developed or acquired recently with the purpose of enriching a particular capability. For example, a pharmaceutical firm might use an alliance with or an acquisition of a biotechnology firm to capture knowledge that enhances its R&D capability.

The enriching process that integrates newly acquired resources with an existing capability is similar to grafting (Puranam, Singh, & Zollo, 2003). A pharmaceutical firm that attaches or "grafts" the biotechnology company's product development capability onto its distribution capability, thereby creating a new, higher-order product commercialization capability, exemplifies grafting. Grafting is designed to create synergy among complementary resources so as to enrich capabilities. Greater enrichment is frequently necessary to create new value or to maintain the current value created in highly uncertain environments because of the inability

to easily predict customers' needs or competitors' actions.

Firms may gain competitive advantages by enriching current capabilities to provide greater value than competitors. However, enriched capabilities are more likely to be imitated because they represent capability extensions. Maintaining a competitive advantage for a period of time commonly requires new capabilities. Firms use the pioneering process to create new capabilities.

Pioneering. Ahuja and Lampert (2001) have suggested that instead of building on existing knowledge, a pioneering process is unique and requires exploratory learning (March, 1991). Flowing from this learning, pioneering may involve the integration of completely new resources that were recently acquired from strategic factor markets and added to the firm's resource portfolio. Bundling of this type is usually based on Schumpeterian logic, with the intent of creating a new competitive advantage. Creativity and a broad and deep knowledge base stimulate the creation of new and novel capabilities. These characteristics enhance the likelihood a manager will be able to identify unique, value-enhancing ways of integrating the functionalities of individual capabilities.

It is possible that managers may need to integrate previously unrelated matrices of information, a process Smith and Di Gregorio (2002) refer to as *bisociation*. For example, managers at SmithKline acquired Beckman instruments to obtain access to its capabilities in diagnostic technology. Because of the lack of obvious synergy, analysts criticized the acquisition. However, SmithKline managers intended to combine their drug research capabilities with the diagnostic technological capabilities to create a new capability in biomedical research (Hitt, Harrison, Ireland, & Best, 1998). Thus, while the pioneering bundling process may include the recombination of existing resources, it often involves the integration of new resources with existing ones to create new capabilities. As a result, pioneering bundling may require a heterogeneous team of experienced managers.

The need for new capabilities is more pronounced in uncertain environments, suggesting that in highly uncertain environments, firms must continuously use pioneering bundling processes to gain and certainly to maintain a competitive advantage. Moreover, new capabilities

are needed to exploit opportunities because they are fleeting in dynamic environments. If a firm has to delay exploiting an opportunity once identified until the required capabilities are developed, rivals may exploit it first, or the opportunity may disappear.

Influence of environmental context on bundling processes. The types of bundling processes that can be used to optimize the value created for customers and to develop and maintain competitive advantages are contingent on the degree of environmental uncertainty. Under conditions of high environmental uncertainty, firms must engage in continuous enriching and pioneering bundling processes. Operating under conditions of substantial uncertainty makes it difficult to predict competitors' actions or developments outside the industry that might create technological discontinuities. Furthermore, under these conditions, identifying opportunities is likely to be serendipitous (Denrell et al., 2003). As a result, firms must be prepared to react to influential changes in the environment and to exploit unforeseen opportunities when they occur.

Firms can only do this with enriched and/or new capabilities that provide advantages over rivals' capabilities. Furthermore, in a dynamic and uncertain environment, firms are able to maintain competitive advantages only with capabilities creating more value for customers compared to the value created by competitors' capabilities. Pioneering is required to develop these types of capabilities. Using pioneering to build new capabilities is more difficult, but also more important in environments of lower munificence. Environments of low munificence make it difficult to respond to changes by developing new capabilities, because additional resources may be unavailable or too costly to acquire. Thus, only development of new capabilities before the need for them arises allows firms to respond effectively and in an acceptable time period to environmental changes in low-munificence environments. Higher environmental munificence may make it easier to use these bundling processes but does not reduce their importance. These arguments lead to the following propositions.

Proposition 2a: Under conditions of high environmental uncertainty, the enriching bundling process is re-

quired to build capabilities that create optimum value for customers. The importance of this bundling process is heightened in environments of low munificence.

Proposition 2b: Under conditions of high environmental uncertainty, the pioneering bundling process is required to build capabilities that create new sources of value for customers. The importance of this bundling process is heightened in environments of low munificence.

While a relatively common approach used by firms, a stabilizing bundling process is likely to be effective only in the short term, and only under conditions of low uncertainty, when competitors' actions are predictable and the probability of environmental shocks is low. Stabilizing opens the firm's capabilities to imitation or to the development of even more effective capabilities. Thus, firms using stabilizing under conditions of high environmental uncertainty are likely to lose their competitive advantage, because a rival will develop capabilities that provide more value to customers. In a dynamic environment, stabilizing bundling processes will be ineffective, especially over time. These arguments lead to the following proposition.

Proposition 2c: Under conditions of high environmental uncertainty, the stabilizing bundling process is unlikely to create optimum value for customers.

Leveraging Capabilities

Leveraging involves processes (i.e., mobilizing, coordinating, and deploying) used to apply a firm's capabilities to create value for customers and wealth for its owners. In general, capabilities must be mobilized before they can be coordinated and deployed; thus, mobilizing is the first process firms use to successfully leverage their capabilities. Because of this general relationship, we discuss mobilizing, coordinating, and deploying sequentially. In practice, however, these leveraging processes can follow different paths. For example, while deploying capability configurations, firms might learn how to integrate a capability configuration with

other configurations more effectively. In addition, while coordinating capabilities to form a configuration for deployment, insights could become apparent, allowing firms to more effectively mobilize their capabilities. Thus, the leveraging of capabilities involves actions that can occur sequentially, simultaneously, or at times even in reverse directions through feedback loops.

Effective leveraging is important, in that even when a firm owns or controls resources and has effectively bundled them to develop capabilities with value-creating potential, the firm is unlikely to realize value creation unless it effectively leverages/uses those capabilities in the marketplace (Lichtenstein & Brush, 2001). Miller, Eisenstat, and Foote argue that "the deepest capabilities and most integrated configurations (of capabilities) are of no value unless they extract superior returns. So they have to satisfy the needs of a large enough audience who will pay amply to have that done" (2002: 47). Using creativity and entrepreneurial processes (Barney & Arikan, 2001), as well as learning processes (Dierickx & Cool, 1989; Miller, 2003), a firm decides *where* (i.e., which markets) and *how* to effectively leverage its capabilities to create the greatest amount of value for customers (Brush, Greene, & Hart, 2001). Evidence suggests that the newness (i.e., new products, new markets, etc.) that characterizes entrepreneurial processes is likely to create value for customers (Hamel & Valikangas, 2003; Venkataraman & Sarasvathy, 2001), while learning processes contribute to the firm's ability to match its capabilities to customers' needs and to extend current competitive advantages (Slater & Narver, 1999).

Embedded primarily in the skills and tacit knowledge of a firm's human capital, leveraging processes focus on exploiting market opportunities (Sirmon & Hitt, 2003). In this context, leveraging processes are applied to the firm's idiosyncratic capabilities and their configurations to create value for customers within one or more competitive market arenas (Winter, 2003). Thus, leveraging processes are critical in matching the firm's internal capabilities with conditions in its external environment (Chatzkel, 2002).

Firms choose markets in which their capabilities can be effectively leveraged to create the greatest amount of value for customers (Brush et al., 2001). Building effective, interactive relationships with customers is vital to gaining the

knowledge required to match firms' capabilities with customers' needs, especially latent needs (Slater & Narver, 1999). Kodak, for example, is leveraging long-standing relationships with physicians to replace X-ray machines with digital imaging equipment. Thus, although currently struggling to create wealth for owners, Kodak is attempting to match its digital imaging capabilities with the needs of one of its major customer groups (Symonds, 2003).

Leveraging capabilities across markets. A market is a set of niches and opportunities from which a firm chooses to best leverage its capabilities (Miller et al., 2002). The complexity and heterogeneity of markets create multiple opportunities for firms to leverage their idiosyncratic capabilities and create value for customers (Miller, 2003).

Effective leveraging of the firm's capabilities in one market context often results in organizational learning that fosters their application in other market settings. In general, these additional applications occur by (1) leveraging the same capabilities across different products and industries to serve other customers with similar needs, (2) using the knowledge gained by serving the customer's needs to sell other goods or services to that customer to serve different needs, and (3) learning how to apply the firm's market segment-oriented expertise developed by leveraging its capabilities to meet the expectations of additional customers in that particular market niche (Miller, 2003; Miller et al., 2002). As noted previously, firms use three key processes (mobilizing, coordinating, and deploying) to leverage their capabilities in different market arenas. However, the three processes must work in a complementary manner for capabilities to be leveraged effectively.

Mobilizing. The intent of mobilizing is to identify the capabilities needed and to design the capability configurations necessary to exploit opportunities in the market and gain a competitive advantage (Hamel & Prahalad, 1994). Mobilizing entails the design of the leveraging strategy. When competing in highly uncertain environments, it is more difficult for firms to identify specific capability configurations that will optimize value for customers. The ambiguity between the cause (i.e., capabilities) and effect (i.e., value creation) existing in highly uncertain environments increases the difficulty of identifying the appropriate capability configura-

tions. While specific leveraging strategies are often idiosyncratic to a firm's capabilities and its environmental context, we identify three leveraging strategies that require certain capability configurations. The first is the *resource advantage strategy*.

The intent of the resource advantage strategy is to leverage capability configurations that produce a distinctive competence. A distinctive competence provides value to customers that is superior to the value provided by competitors and, thus, leads to a competitive advantage. Often, firms with known distinctive competencies employ this leveraging strategy. For example, when Philip Morris acquired Miller Brewing Company, it mobilized its capability configurations in marketing and distribution to gain an advantage over most competitors in the beer market. As was the case with Miller Brewing Company, the focus of the resource advantage leveraging strategy is developing a fit between the firm's competencies and the market where it has an advantage over its competitors.

The second leveraging strategy focuses on *exploiting market opportunities*. The *market opportunity strategy* requires careful analysis of the external environment to identify those opportunities for which the firm has capabilities that can be configured to exploit them. Oftentimes, the market opportunities identified will be adjacent to the firm's current markets because of managers' familiarity with these markets. It is more difficult to discover new opportunities in markets distant from the firm's current markets because of knowledge deficits. Still, because they represent new opportunities, some capabilities may need to be enriched and others pioneered in order to create the configurations of capabilities necessary to exploit opportunities. For example, to exploit a new opportunity, the firm may leverage its R&D capability to create an incremental innovation or develop a new service to package with existing products to satisfy growing or evolving customer needs.

The third leveraging strategy involves creating entrepreneurial opportunities. The *entrepreneurial strategy* involves developing capability configurations to produce new goods and/or services that require new markets. Such an opportunity may replace an existing market (e.g., digital technology used in cameras created a number of new markets, such as in retail cameras, security devices, and automotive imaging

equipment). Generally, a configuration of R&D, engineering, and marketing capabilities is needed to design the new product or service that satisfies the customers in a new market.

Through experience, those mobilizing the firm's capabilities learn to develop routines that allow them to effectively and efficiently identify idiosyncratically appropriate capabilities for each leveraging strategy (Glynn, Milliken, & Lant, 1992). Mobilizing capabilities requires continuous adjustments throughout the firm, because to optimize value, the appropriate capabilities must be available to allow a range of actions that create value for different customers in different markets (Hamel & Prahalad, 1994). The development of a dominant logic facilitates the mobilization of capabilities (Bettis & Prahalad, 1995). However, a dominant logic can produce a path-dependent learning process that constrains the design of future leveraging strategies (Lei et al., 1996). Thus, when mobilizing capabilities, firms must be sensitive to path-dependent learning processes that create rigidities in the process.

We conclude that mobilizing capability configurations is a necessary step in creating value for customers. Understanding the markets and customers' needs guides the design of capability configurations to compete effectively and satisfy customers' needs. Yet mobilizing capability configurations is insufficient to create value for customers. The capability configurations must then be implemented in appropriate ways to create value. Doing so requires the capability configurations to be coordinated and deployed.

Proposition 3a: Mobilizing capability configurations is a necessary but insufficient leveraging process alone to create value for customers.

Coordinating. The intent of coordinating is to integrate mobilized capabilities in an effective yet efficient manner so as to create capability configurations. It is the first step in implementing a leveraging strategy. Possessing knowledge about the value of individual capabilities, as well as using effective communication networks to diffuse that knowledge, facilitates efforts to integrate capabilities into comprehensive sets of value-creating organizational skills (Hamel & Prahalad, 1994). While important, possessing useful and accurate knowledge about

the firm's capabilities is an insufficient condition alone for value creation. Proactive coordination involves combinative, experienced-based routines to integrate capabilities in order to implement the leveraging strategy effectively and, thus, to create value for customers (Alvarez & Barney, 2002).

Effective coordination of capabilities results in the sharing of explicit and tacit knowledge to integrate the capabilities into effective configurations. Networks internal to the firm based on internal social capital facilitate the sharing of knowledge (Hitt & Ireland, 2002). In addition, investments in the firm's technology infrastructure (facilitating communication flows) are critical for coordinating capabilities (Hunter, Beaumont, & Matthew, 2002). Managerial relational skills involve using the technology and personal interactions to build internal social capital, thereby increasing the likelihood that capabilities will be coordinated effectively (Sirmon & Hitt, 2003). Relational skills evolve over time and through the development of trust.

Using the examples noted above, coordinating would involve integrating the marketing and distribution capabilities in Philip Morris, or, if an entrepreneurial leveraging strategy were selected, it might require integrating R&D, engineering, and marketing. Creating cross-functional teams and developing routines for rewarding creative ideas and projects that require the joint involvement of the three capabilities could lead to their integration. A goal of coordinating is to integrate capabilities in ways difficult for competitors to observe and duplicate (Chatzkel, 2002). A competitively superior coordination process contributes to a firm's ability to offer unique and innovative value to customers (Kim & Mauborgne, 1997; Yeoh & Roth, 1999). Highly effective coordinating processes facilitate the development of more creative and flexible capability configurations (Sanchez, 1995).

Deploying. The deploying process involves physically using capability configurations to support the chosen leveraging strategy. The ability of the firm's capabilities to create value for customers is *realized* through their successful deployment. Therefore, the deployment process is the second step in implementing the leveraging strategy. The deployment process enhances the maintainability of a competitive advantage only when rivals are unable to acquire the idiosyncratic skills necessary to de-

ploy their capabilities in a way that creates superior value for customers.

The set of explicit and tacit knowledge on which a firm relies to deploy its capabilities is often complex (Johnson, 2002). To reduce complexity, the firm codifies as much knowledge as possible into organizational routines. But because tacit knowledge is critical to successful deployment of integrated capabilities and is highly personal and deeply rooted in an individual's action within a specific context, much of the knowledge associated with deploying capability configurations cannot be codified (Simonin, 1999).

We conclude that coordinating and deploying capability configurations are vital for the implementation of leveraging strategies. Furthermore, managerial tacit knowledge and skills play a critical role in the effectiveness of these leveraging processes. Managers' skills in coordinating and then deploying capability configurations have a major effect on the value created for customers by the leveraging strategy. Managers who are able to build and use relational capital to integrate multiple capabilities into a configuration and to use organizational routines and their tacit knowledge to deploy these configurations to enact the leveraging strategy are most likely to create value for customers.

Proposition 3b: The coordinating and deploying processes are necessary to implement a leveraging strategy, and their effectiveness in the implementation is at least partly dependent on managers' skills in using these processes.

The environment and its attendant degree of uncertainty affect a firm's choices of leveraging strategies and their coordination and deployment. Thus, we next explore the moderating effect of environmental context on the relationship between leveraging strategies and their outcomes.

Environmental context's influence on leveraging processes. The causal ambiguity created by highly uncertain environments increases the difficulty of understanding the cause-effect relationships between using leveraging strategies and creating value (Reed & DeFillippi, 1990). Thus, in the context of leveraging, uncertainty refers to the inability to predict the effects of

different variables on a firm's attempts to effectively mobilize, coordinate, and deploy its capabilities.

When a firm operates in a highly uncertain environment based on unknown or rapidly changing industry recipes, growing or fluctuating market demand, and a high probability of environmental shocks, learning is critical to help the firm understand how to leverage its capabilities to create maximum value for customers. For example, high levels of uncertainty force the firm to leverage its capabilities to achieve a series of temporary and changing competitive advantages (Eisenhardt, 1999). Because of the dynamism, managers need to continuously redesign capabilities and integrate them into new configurations (mobilizing and coordinating) as the firm's competencies rapidly lose their value because of changes in the market and in customer needs. Competitive advantages are rarely sustainable in highly uncertain environments, meaning that a resource advantage leveraging strategy should be largely a short-term strategy. Because of the continuous and sometimes substantial change in a dynamic environment, the firm's competence may not remain distinctive for long, or the advantage may remain but lose its value because competitors develop a new competence that creates superior value for customers. In both cases, the advantage is lost. These arguments lead to the following proposition.

Proposition 3c: Under conditions of high environmental uncertainty, the resource advantage leveraging strategy is likely to create value for customers only in the short term.

In a dynamic environment, the market opportunity leveraging strategy is likely to be more effective than the resource advantage strategy. Exploiting new market opportunities, even those adjacent to a firm's current markets, can produce longer-term advantages. And if the change is continuous but not major and discontinuous, the market opportunity leveraging strategy can contribute to a long-term competitive advantage. That is, it can do so if the firm continues to identify and exploit new adjacent market opportunities. Exploiting new market opportunities often requires rapid deployment of capabilities to beat competitors to the market and maintain their advantage. The regular exploitation of new

market opportunities allows the firm to maintain a competitive advantage, once achieved. The risk with such a strategy comes with a discontinuous change in the market prompted by a competitor's use of an entrepreneurial leveraging strategy that produces discontinuous innovation. In this case, a new market is created that might supplant the existing market.

When an environmental shock occurs, such as the introduction of a discontinuous innovation or a major political catastrophe as in the events of 9/11, the firm likely must respond with an entrepreneurial leveraging strategy to survive. Better yet, the firm may forestall some of the effects of such events by engaging in an entrepreneurial leveraging strategy before the environmental shock. Implementing an entrepreneurial strategy in this type of environment requires that capabilities be mobilized and effectively integrated in capability configurations that allow the firm to exploit the new market. In this way, the firm should be able to positively respond to the environmental shock more rapidly. In fact, the entrepreneurial leveraging strategy might produce a new technology that creates discontinuous change for the firm's competitors. These arguments lead to the following propositions.

Proposition 3d: Under conditions of high environmental uncertainty based on continuous change, a market opportunity leveraging strategy can produce a series of temporary competitive advantages (when implemented effectively), except in the case of extreme environmental uncertainty produced through substantial and discontinuous change.

Proposition 3e: Under conditions of extreme environmental uncertainty caused by substantial and discontinuous change, an entrepreneurial leveraging strategy likely will be required to create value for customers.

A firm's ability to make rapid, high-quality decisions about how to leverage its capabilities strongly influences the amount of value it creates for customers when competing in highly uncertain environments (Baum & Wally, 2003). Rapidly shifting environmental contingencies provide a premium for firms capable of quickly

identifying and understanding the contingencies and then making decisions about how to leverage their capabilities without undue delay. In highly uncertain environments, firms will likely need to employ all three leveraging strategies at appropriate times. The need to use all leveraging strategies highlights the necessity for firms to be able to effectively mobilize, coordinate, and deploy capability configurations necessary for the creation of value for customers and wealth for owners.

DISCUSSION AND IMPLICATIONS

Each component of the resource management process is individually important, but, to optimize value creation, they must be *synchronized*. Thus, while managing each component of the process is important, the integration and balancing of components to ensure harmony in the process is necessary to create value for customers. Therefore, top-level managers should view their firm as a system of resources and capabilities, developing leveraging strategies that match their capabilities to the market and environmental context in order to create value for customers and owners. Likewise, they should be sensitive to the needs and consider feedback at each stage in the resource management process so that appropriate adjustments can be made in any of the resource management components to achieve or maintain synchronization.

Creating synchronization requires top-level managers to be simultaneously involved in all stages of the resource management process while consistently scanning the external environment for salient cues about important change. Simultaneous involvement in the different stages of resource management (i.e., structuring the resource portfolio, bundling the resources to build capabilities, and leveraging configurations of those capabilities to create value for customers and owners) is necessary, because feedback from the market regarding customer needs influences the subprocesses employed in each component. If a firm has not created enough value for customers to gain a competitive advantage, adjustments are necessary. In this case, managers should evaluate customer desires and the capabilities necessary to satisfy them. Managers then need to determine if they can enrich current capabilities to satisfy the customers, or if they need new re-

sources to pioneer new capabilities to do so. If additional resources are needed, they can be developed internally or acquired from external factor markets. The process of feedback and adjustment is continuous such that successful firms are continuously learning and building knowledge.

Likewise, managers should consistently scan and monitor their external environment, focusing especially on potential changes that could affect their firm's ability to create value for customers. A firm will likely need to respond both to competitors and to the level of uncertainty in the environment. When competitors introduce changes in their offerings, which could eliminate the firm's current competitive advantage, swift and significant responses are needed. Significant responses could be initiated in any of the resource management components (e.g., acquiring new resources, pioneering a new capability, or deploying a new entrepreneurial leveraging strategy). Competitor actions contribute to environmental dynamism and, thus, uncertainty. As described herein, firms have to respond to changes in the level of environmental uncertainty (and, in some cases, the environmental munificence) in addition to specific competitor actions. For example, if the level of uncertainty increases, the firm may need to invest in real options in its resource portfolio to maintain the flexibility needed to reconfigure and leverage its capabilities so as to provide superior value to customers.

While creating value for customers in the face of environmental changes, managers must also be concerned with owners' and investors' desires. If a firm is not creating adequate wealth for its owners, its market capitalization will likely diminish because of the lack of demand for the firm's stock. To create value for owners, the firm must provide quality goods to customers to gain a competitive advantage while managing its resources efficiently in order to produce necessary returns for the owners (Powell, 2001).

Each component of the resource management process and its subprocesses must be efficient. For example, capabilities need to be "tightened" to ensure that they are efficient without harming their ability to provide quality products and services to customers. Tightening helps to avoid agency costs by preventing managerial oppor-

portunism in building unnecessary or "bloated" capabilities.

Additionally, Coff (1999) notes that establishing a competitive advantage does not guarantee wealth creation for owners. Stakeholders (factors of production) may appropriate or take substantial amounts of the rents created by the advantage. Thus, managers need to balance the need for efficient investments in resources with the need to maintain the resources necessary to react flexibly to unexpected changes in the dynamic and uncertain external environment.

The model we have presented here has multiple implications for managers. In particular, managers need to be able to acquire, accumulate (develop), and divest (when necessary) resources to have the most effective resource portfolio at any given time (Makadok, 2001). Managers should also have the skills necessary to bundle resources to create effective capabilities. Firms especially need to be able to develop new capabilities, in that discontinuous environmental changes can greatly reduce the value of their current capabilities. Lei et al. (1996) have suggested that firms should employ a process of metalearning to produce these outcomes. Finally, managers should have a repertoire of leveraging skills. Such skills include the ability to design appropriate leveraging strategies (mobilize capabilities), to create effective coordination routines, to manage knowledge development and diffusion, and to be entrepreneurial (identify and exploit opportunities). Managers must also effectively manage the feedback and learning processes necessary to continuously update capabilities and adjust the resource portfolio and/or the leveraging strategies used.

Priem and Butler (2001) have argued that the field does not understand the "black box" involved in using valuable, rare, inimitable, and nonsubstitutable resources to gain and maintain a competitive advantage. We have attempted to "look inside that black box" and explain how these resources can be managed to create superior value for customers that, in turn, helps the firm develop a competitive advantage. Furthermore, our model provides information on how resources must be managed to ensure that the competitive advantage also creates wealth for the firm's owners. The explication of the resource management process represents a clear extension of the RBV of the firm. Additionally, using a contingency theory framework, our re-

source management model integrates effects of the external environment. Integration of external environmental contingencies also extends the RBV, which has been criticized for being insular and overly focused on internal firm attributes. The model integrates a learning theory perspective to develop a dynamic approach to replace the static approaches used in most previous research on the RBV.

The resource management process we have explained here has significant implications for future research. First, the propositions should be examined empirically. Furthermore, we need to understand how to effectively structure the firm's resource portfolio, bundle resources into valuable capabilities, and formulate leveraging strategies that exploit the firm's capabilities to create value for customers. Some research exists on acquiring, developing, and divesting certain types of resources (e.g., human capital). But more research is needed on acquiring and developing other types of resources, as well as on structuring the total resource portfolio. Much more empirical research is needed on bundling and leveraging resources. The theoretical model we have presented provides a base for a new major research stream on the management of resources.

Helfat and Peteraf argue that "it is difficult to fully explain how firms use resources and capabilities to create a competitive advantage" (2003: 997). The resource management process we have presented helps to fill this void. With substantial implications for managers and a base for significant new research on the RBV, this work provides an important value-added contribution to our knowledge of managing resources in dynamic, uncertain environments.

REFERENCES

- Adner, R. 2002. When are technologies disruptive? A demand-based view of the emergence of competition. *Strategic Management Journal*, 23: 667-688.
- Ahuja, G., & Lampert, C. M. 2001. Entrepreneurship in the large corporation: A longitudinal study of how established firms create breakthrough inventions. *Strategic Management Journal*, 22(Special Issue): 521-543.
- Alvarez, S., & Barney, J. B. 2002. Resource-based theory and the entrepreneurial firm. In M. A. Hitt, R. D. Ireland, S. M. Camp, & D. L. Sexton (Eds.), *Strategic entrepreneurship: Creating a new mindset*: 89-105. Oxford: Blackwell.
- Aragón-Correa, J. A., & Sharma, S. 2003. A contingent resource-based view of proactive corporate environmental strategy. *Academy of Management Review*, 28: 71-88.
- Barney, J. B. 1986. Strategic factor markets: Expectations, luck, and business strategy. *Management Science*, 32: 1231-1241.
- Barney, J. B. 1991. Firm resources and sustained competitive advantage. *Journal of Management*, 17: 99-120.
- Barney, J. B., & Arian, A. M. 2001. The resource-based view: Origins and implications. In M. A. Hitt, R. E. Freeman, & J. S. Harrison (Eds.), *Handbook of strategic management*: 124-188. Oxford: Blackwell.
- Baum, J. R., & Wally, S. 2003. Strategic decision speed and firm performance. *Strategic Management Journal*, 24: 1107-1129.
- Bettis, R. A., & Hitt, M. A. 1995. The new competitive landscape. *Strategic Management Journal*, 16(Special Issue): 7-19.
- Bettis, R. A., & Prahalad, C. K. 1995. The dominant logic: Retrospective and extension. *Strategic Management Journal*, 16: 5-14.
- Bowman, E. H., & Hurry, D. 1993. Strategy through the options lens: An integrated view of resource investment and the incremental choice process. *Academy of Management Review*, 18: 760-782.
- Brown, S. L., & Eisenhardt, K. M. 1999. Patching: Restitching business portfolios in dynamic markets. *Harvard Business Review*, 77(3): 72-82.
- Brush, C. G., Greene, P. G., & Hart, M. M. 2001. From initial idea to unique advantage: The entrepreneurial challenge of constructing a resource base. *Academy of Management Executive*, 15(1): 64-78.
- Brush, T. H., & Artz, K. A. 1999. Toward a contingent resource-based theory: The impact of information asymmetry on the value of capabilities in veterinary medicine. *Strategic Management Journal*, 20: 223-250.
- Carpenter, M. A., & Fredrickson, J. W. 2001. Top management teams, global strategic posture and the moderating role of uncertainty. *Academy of Management Journal*, 44: 533-545.
- Cascio, W. F. 2002. *Responsible restructuring: Creative and profitable alternatives to layoffs*. San Francisco: Berrett-Koehler.
- Castanias, R. P., & Helfat, C. E. 2001. The managerial rents model: Theory and empirical results. *Journal of Management*, 27: 661-678.
- Castrogiovanni, G. J. 1991. Environmental munificence: A theoretical assessment. *Academy of Management Review*, 16: 542-565.
- Chatzkel, J. 2002. A conversation with Goran Roos. *Journal of Intellectual Capital*, 3(2): 96-117.
- Christensen, C. M. 1997. *The innovator's dilemma*. Boston: Harvard University Press.
- Coff, R. 1999. When competitive advantage doesn't lead to performance: The resource based view and stakeholder bargaining theory. *Organization Science*, 10: 119-133.
- Conner, K. 1991. A historical comparison of resource-based

- logic and five schools of thought within industrial organization economics: Do we have a new theory of the firm? *Journal of Management*, 17: 121–154.
- Denrell, J., Fang, C., & Winter, S. G. 2003. The economics of strategic opportunity. *Strategic Management Journal*, 24: 977–990.
- Dierickx, I., & Cool, K. 1989. Asset stock accumulation and sustainability of competitive advantage. *Management Science*, 35: 1504–1511.
- Donaldson, L. 2001. *The contingency theory of organizations*. Thousand Oaks, CA: Sage.
- Eisenhardt, K. M. 1999. Strategy as decision making. *Sloan Management Review*, 40(3): 65–72.
- Fiol, C. M., & Lyles, M. A. 1985. Organizational learning. *Academy of Management Review*, 10: 803–813.
- Glynn, M. A., Milliken, F., & Lant, T. 1992. *Learning about organizational learning theory: An umbrella of organizing processes*. Paper presented at the annual meeting of the Academy of Management, Las Vegas.
- Grant, R. M. 1991. The resource-based theory of competitive advantage: Implications for strategy formulation. *California Management Review*, 33(3): 114–135.
- Hamel, G., & Prahalad, C. K. 1994. *Competing for the future*. Boston: Harvard Business School Press.
- Hamel, G., & Valikangas, L. 2003. The quest for resilience. *Harvard Business Review*, 81(9): 52–63.
- Helfat, C. E., & Peteraf, M. A. 2003. The dynamic resource-based view: Capabilities life cycles. *Strategic Management Journal*, 24: 997–1010.
- Hitt, M. A., Dacin, M. T., Levitas, E., Arregle, J., & Borza, A. 2000. Partner selection in emerging and developed market contexts: Resource-based and organizational learning perspectives. *Academy of Management Journal*, 43: 449–467.
- Hitt, M., Harrison, J., Ireland, R. D., & Best, A. 1998. Attributes of successful and unsuccessful acquisitions of U.S. firms. *British Journal of Management*, 9: 91–114.
- Hitt, M. A., & Ireland, R. D. 2002. The essence of strategic leadership: Managing human and social capital. *Journal of Leadership and Organizational Studies*, 9: 3–14.
- Hoopes, D. G., Madsen, T. L., & Walker, G. 2003. Guest editors' introduction to the special issue: Why is there a resource-based view? Toward a theory of competitive heterogeneity. *Strategic Management Journal*, 24(Special Issue): 889–902.
- Hunter, L., Beaumont, P., & Matthew, L. 2002. Knowledge management practice in Scottish law firms. *Human Resource Management Journal*, 23(2): 4–21.
- Ireland, R. D., Hitt, M. A., & Sirmon, D. G. 2003. Strategic entrepreneurship: The construct and its dimensions. *Journal of Management*, 29: 963–989.
- Ireland, R. D., & Webb, J. W. 2006. International entrepreneurship in emerging economies: A resource-based perspective. In A. Cooper, S. A. Alvarez, A. Carrera, L. Mesquita, & R. Vassolo (Eds.), *Entrepreneurship and innovation in emerging economies*: 47–69. Oxford: Blackwell.
- Johnson, W. H. A. 2002. Leveraging intellectual capital through product and process management of human capital. *Journal of Intellectual Capital*, 3: 415–429.
- Kazanjian, R. K., Drazin, R., & Glynn, M. A. 2002. Implementing strategies for corporate entrepreneurship: A knowledge-based perspective. In M. A. Hitt, R. D. Ireland, S. M. Camp, & D. L. Sexton (Eds.), *Strategic entrepreneurship: Creating a new mindset*: 173–199. Oxford: Blackwell.
- Keats, B. W., & Hitt, M. A. 1988. A causal model of linkages among environmental dimensions, macro organizational characteristics, and performance. *Academy of Management Journal*, 31: 570–598.
- Kim, W. C., & Mauborgne, R. 1997. Value innovation: The strategic logic of high growth. *Harvard Business Review*, 75(1): 102–112.
- Kogut, B. 1991. Joint ventures and the option to expand and acquire. *Management Science*, 37: 19–33.
- Lane, P. J., & Lubatkin, M. 1998. Relative absorptive capacity and interorganizational learning. *Strategic Management Journal*, 19: 461–477.
- Lei, D., Hitt, M. A., & Bettis, R. A. 1996. Dynamic core competences through meta-learning and strategic context. *Journal of Management*, 22: 549–569.
- Lichtenstein, B. M. B., & Brush, C. G. 2001. How do "resource bundles" develop and change in new ventures? A dynamic model and longitudinal exploration. *Entrepreneurship Theory and Practice*, 25: 37–58.
- Lippman, S. A., & Rumelt, R. P. 2003. A bargaining perspective on resource advantage. *Strategic Management Journal*, 24: 1069–1086.
- Luo, Y., & Peng, M. W. 1999. Learning to compete in a transition economy: Experience, environment, and performance. *Journal of International Business Studies*, 30: 269–295.
- Makadok, R. 2001. Towards a synthesis of the resource-based and dynamic-capabilities views of rent creation. *Strategic Management Journal*, 22: 387–401.
- Makadok, R. 2003. Doing the right thing and knowing the right thing to do: Why the whole is greater than the sum of the parts. *Strategic Management Journal*, 24: 1043–1056.
- March, J. 1991. Exploration and exploitation in organizational learning. *Organization Science*, 2: 71–87.
- McGrath, R. G., & Nerker, A. 2004. Real options reasoning and a new look at the R&D investment strategies of pharmaceutical firms. *Strategic Management Journal*, 25: 1–21.
- Miller, D. 1996. A preliminary typology of organizational learning: Synthesizing the literature. *Journal of Management*, 22: 485–505.
- Miller, D. 2003. An asymmetry-based view of advantage: Towards an attainable sustainability. *Strategic Management Journal*, 24: 961–976.
- Miller, D., Eisenstat, R., & Foote, N. 2002. Strategy from the inside out: Building capability-creating organizations. *California Management Review*, 44(3): 37–54.
- Miller, D., & Shamsie, J. 1996. The resource-based view of the

- firm in two environments: The Hollywood film studios from 1936 to 1965. *Academy of Management Journal*, 39: 519–543.
- Miller, K. D., & Arikan, A. T. 2004. Technology search investments: Evolutionary, option reasoning, and option pricing approaches. *Strategic Management Journal*, 25: 473–485.
- Morrow, J. L. Jr., Sirmon, D. G., Hitt, M. A., & Holcomb, T. R. In press. Creating value in the face of declining performance: Firm strategies and organization recovery. *Strategic Management Journal*.
- Nixon, R. D., Hitt, M. A., Lee, H., & Jeong, E. 2004. Market reactions to announcements of corporate downsizing. *Strategic Management Journal*, 25: 1121–1129.
- Penrose, E. T. 1959. *The theory of the growth of the firm*. New York: Wiley.
- Peteraf, M. A. 1993. The cornerstones of competitive advantage: A resource-based view. *Strategic Management Journal*, 14: 179–191.
- Porter, M. E. 1980. *Competitive strategy*. New York: Free Press.
- Porter, M. E. 1985. *Competitive advantage*. New York: Free Press.
- Powell, T. C. 2001. Competitive advantage: Logical and philosophical considerations. *Strategic Management Journal*, 22: 875–888.
- Priem, R. L., & Butler, J. E. 2001. Is the resource-based view a useful perspective for strategic management research? *Academy of Management Review*, 26: 22–40.
- Puranam, P., Singh, H., & Zollo, M. 2003. A bird in the hand or two in the bush? Integration trade-offs in technology-grafting acquisitions. *European Management Journal*, 21: 179–184.
- Rajagopalan, N. A., Rasheed, A., & Datta, D. K. 1993. Strategic decision processes: Critical review and future direction. *Journal of Management*, 19: 349–384.
- Reed, R., & DeFillippi, R. S. 1990. Causal ambiguity, barriers to imitation, and sustainable competitive advantage. *Academy of Management Review*, 15: 88–102.
- Ricardo, D. 1817. *Principles of political economy and taxation*. London: Murray.
- Sanchez, R. 1995. Strategic flexibility in product competition. *Strategic Management Journal*, 16(Special Issue): 135–159.
- Schumpeter, J. A. 1934. *The theory of economic development*. Cambridge, MA: Harvard University Press.
- Shimizu, K., & Hitt, M. A. 2005. What constrains or facilitates divestitures of formerly acquired firms? The effects of organizational inertia. *Journal of Management*, 31: 50–72.
- Siggelkow, N. 2002. Evolution toward fit. *Administrative Science Quarterly*, 47: 125–159.
- Simonin, B. L. 1999. Ambiguity and the process of knowledge transfer in strategic alliances. *Strategic Management Journal*, 20: 595–623.
- Sirmon, D. G., & Hitt, M. A. 2003. Managing resources: Linking unique resources, management and wealth creation in family firms. *Entrepreneurship Theory and Practice*, 27: 339–358.
- Slater, S. F., & Narver, J. C. 1999. Market-oriented is more than being customer-led. *Strategic Management Journal*, 20: 1165–1168.
- Smith, K. G., & Di Gregorio, D. 2002. Bisociation, discovery and the role of entrepreneurial action. In M. A. Hitt, R. D. Ireland, S. M. Camp, & D. L. Sexton (Eds.), *Strategic entrepreneurship: Creating a new mindset*: 129–150. Oxford: Blackwell.
- Spender, J.-C. 1989. *Industry recipes: The nature and source of managerial judgment*. Oxford: Blackwell.
- Symonds, W. C. 2003. The Kodak revolt is short-sighted. *Business Week*, November 3: 38.
- Thomke, S., & Kuemmerle, W. 2002. Assets accumulation, interdependence and technological change: Evidence from pharmaceutical drug discovery. *Strategic Management Journal*, 23: 619–635.
- Tushman, M. L., & Anderson, P. 1986. Technological discontinuities and organizational environments. *Administrative Science Quarterly*, 31: 439–465.
- Uhlenbruck, K., Meyer, K. E., & Hitt, M. A. 2003. Organizational transformation in transition economies: Resource-based and organizational learning perspectives. *Journal of Management Studies*, 40: 257–282.
- Venkataraman, S., & Sarasvathy, S. D. 2001. Strategy and entrepreneurship. In M. A. Hitt, R. E. Freeman, & J. S. Harrison (Eds.), *Handbook of strategic management*: 650–668. Oxford: Blackwell.
- Wan, W. P., & Hoskisson, R. E. 2003. Home country environments, corporate diversification strategies, and firm performance. *Academy of Management Journal*, 46: 27–45.
- Winter, S. G. 2003. Understanding dynamic capabilities. *Strategic Management Journal*, 24: 991–995.
- Yeoh, P. L., & Roth, K. 1999. An empirical analysis of sustained advantage in the U.S. pharmaceutical industry: Impact of firm resources and capabilities. *Strategic Management Journal*, 20: 637–653.
- Zahra, S. A., & George, G. 2002. Absorptive capacity: A review, conceptualization, and extension. *Academy of Management Review*, 27: 185–203.
- Zott, C. 2003. Dynamic capabilities and the emergence of intraindustry differential firm performance: Insights from a simulation study. *Strategic Management Journal*, 24: 97–125.

David G. Sirmon (dsirmon@mays.tamu.edu) is an assistant professor of management at Texas A&M University. He received his Ph.D. from Arizona State University and has served on the faculty at Clemson University. Resource management, family business, and strategic entrepreneurship are current research interests.

Michael A. Hitt (mhitt@cgsb.tamu.edu) is a distinguished professor of management and holds the Joe B. Foster Chair in Business Leadership and the Dorothy Conn Chair in New Ventures at Texas A&M University. He received his Ph.D. from the University of Colorado. His research interests include managing resources in organizations, international strategy, corporate governance, and strategic entrepreneurship.

R. Duane Ireland (direland@mays.tamu.edu) holds the Foreman R. and Ruby S. Bennett Chair in Business at Texas A&M University. He is a fellow of the Academy of Management. Strategic alliances, managing organizational resources, and strategic entrepreneurship are current research interests.

Copyright of *Academy of Management Review* is the property of *Academy of Management* and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.