J PROD INNOV MANAG 2012;29(5):861–877

DOI: 10.1111/j.1540-5885.2012.00939.x

# In Search of Innovation and Customer-related Performance Superiority: The Role of Market Orientation, Marketing Capability, and Innovation Capability Interactions

Liem Viet Ngo and Aron O'Cass

*Understanding the mechanisms through which firms realize the value of their market-based knowledge resources such as market orientation is a central interest of innovation scholars and practitioners. The current study contends that realizing the performance impact of market orientation depends on know-how deployment processes and their complementarities in functional areas such as marketing and innovation that co-align with market orientation. More specifically, this study addresses two research questions: (1) to what extent can market orientation be transformed into customer- and innovation-related performance outcomes via marketing and innovation capabilities; and (2) does the complementarity between marketing capability and innovation capability enhance customer- and innovation-related performance outcomes? Drawing upon the resource-based view and capability theory of the firm, a model is developed that integrates market orientation, marketing capability, innovation capability, and customer- and innovation-related performance. The validity of the model is tested based on a sample of 163 manufacturing and services firms. In answer to the first research question, the findings show that market orientation significantly contributes to customer- and innovation-related performance outcomes via marketing and innovation capabilities. This finding is important in that market-based knowledge resources should be configured with the deployment of marketing and innovation capabilities to ensure better performance. In answer to the second research question, the findings indicate that market orientation works through the complementarity between marketing and innovation capabilities to influence customer-related performance but not innovation-related performance. Managers are advised to have a balanced approach to managing the deployment of capabilities. If they seek to achieve superiority in customer-related performance, marketing capability, innovation capability, and their complementarity are essential for attracting, satisfying, building relationships with, and retaining customers. On the other hand, this complementarity would be considerably less important if firms placed greater emphasis on achieving superiority in innovation-related performance. In contrast to many existing studies, this study is the first to model the roles of both innovation capability and marketing capability in mediating the relationship between market orientation and specific performance outcomes (i.e., innovation- and customer-related outcomes).*

## Introduction

While the resource-based view (RBV) of the firm has provided substantial advances in the understanding of performance differentials through firm resources, the focus has recently shifted from the resources to the outcomes of the resource deployment process (e.g., Vorhies, Morgan, and Autry, 2009). This work has seen the development of a growing literature built around the concept now commonly referred to as firm capabilities (e.g., Slater, Olson, and Hult, 2006) and how these capabilities complementary with firm resources contribute to firm performance (e.g., Morgan, Vorhies, and Mason, 2009). However, while there have been major advances in this area, little is yet known about why and how some firms are better than others at utilizing their capabilities in competitive markets to achieve superior performance (Song, Droge, Hanvanich, and Calantone, 2005).

Researchers focusing on firm capabilities have recognized that "a firm's ability to deploy resources through organizational capabilities may be more important than absolute resource levels in driving performance" (Vorhies et al., 2009, p. 1310). This growing body of research has enhanced the understanding of how some firms overcome resource deficiencies by deploying their available resources through high-level capabilities such that they

Address correspondence to: Liem Viet Ngo, The University of New South Wales, Australian School of Business, UNSW Kensington Campus, Sydney, NSW 2052, Australia. E-mail: liem.ngo@unsw.edu.au. Tel: +61 (2) 9385 3605. Fax: +61 (2) 9663 1985.

outperform firms with similar resources (DeSarbo, Di Benedetto, and Song, 2007; Krasnikov and Jayachandran, 2008; Morgan et al., 2009). The focus on resource–capability interactions also fits with the contentions raised by Gebhardt, Carpenter, and Sherry (2006) that the lack of research on internal processes seriously limits the understanding of performance differentials. The importance of capabilities can be seen in the arguments of Ketchen, Hult, and Slater (2007) and others who contend that resources have only potential value, and that the actions (i.e., capabilities) developed and utilized by firms are what capitalize on the resources and result in superior firm performance. The RBV has not yet fully explored which actions are critical and how such actions matter in realizing the value of available resources.

While some researchers argue that developing firm capabilities is a means to implementing firm strategies (Slater et al., 2006), little attention has been devoted to exploring capabilities, particularly innovation and marketing capabilities, as mechanisms through which firms realize their market orientation (MO). Despite the theoretical and practical importance of this issue, an examination of the RBV and capability theory reveals that not a single empirical study has assessed whether innovation capability (IC) and marketing capability (MC) aid in implementing a firm's MO or how these firm capabilities connect MO and performance.

While discussed in various contexts in the literature focusing on resources and capabilities, the interaction of firm capabilities couched within the complementarity perspective has not been empirically examined extensively (Moorman and Slotegraaf, 1999; Newbert, 2007; Song et al., 2005). In an extensive analysis of the relevant literature, Newbert (2007) also highlights deficiencies related to both theoretical and empirical research dealing with interactions among firm capabilities. While capability–capability interactions appear to be factors in firms' achieving superior performance, they have only been investigated in a limited number of studies (e.g., Menguc and Auh, 2006; Moorman and Slotegraaf, 1999; Morgan et al., 2009; Song et al., 2005), despite being a potential source of positional advantage. In particular, no article within Newbert's (2007) list of empirical RBV research investigates any form of innovation and marketing capabilities as a vehicle for realizing a firm's MO, nor do any focus on the interaction between innovation and marketing capabilities. This finding is particularly anomalous, given that strategic management research has historically recognized the important role that innovation and marketing play in determining firm performance (Hult, Ketchen, and Slater, 2005; Moorman and Rust, 1999; Song et al., 2005; Vorhies et al., 2009).

The opportunity to advance the understanding of firm capabilities and performance by addressing, at least partially, some of the above research gaps provides the foundation for this paper. This paper makes two distinct contributions to the strategic management and marketing literature. First, the paper shows how the contribution of MO as "know-what" resources to firm performance can be realized through the mediational roles of innovation and marketing capabilities. Importantly, this paper focuses on customer-related performance (CRP) and innovation-related performance (IRP) as disaggregated dependent indicators of marketplace performance outcomes (see Amit and Schoemaker, 1993; Collis and Montgomery, 1995; Peteraf and Bergen, 2003; Ray, Barney, and Muhanna, 2004). Second, the paper shows that improving the complementarity between IC and MC is a useful approach to preventing imitation of firm capabilities and to enhancing marketplace performance outcomes.

Drawing on RBV-capability theory, the paper develops and empirically tests a theoretical model that integrates MO, MC, IC, and CRP and IRP using a sample of 163 manufacturing and services firms. The paper proceeds as follows: first, the paper explains the theoretical underpinnings of our theoretical model and develops specific hypotheses. The paper then discusses the research method and data collection procedures developed to test the hypotheses and to validate the model. Next, the results are presented. The final section discusses the findings, contributions, and implications of the study,

**BIOGRAPHICAL SKETCHES**

Dr. Liem Viet Ngo is a Senior Lecturer in Marketing at Australian School of Business, the University of New South Wales. His research interests include competitive strategies, business orientations, resources and capabilities, value creation, value appropriation, and brand management. He has published in *Journal of Business Research*, *British Journal of Management*, *European Journal of Marketing*, and *Industrial Marketing Management*.

Dr. Aron O'Cass is Professor of Marketing at the School of Management, The University of Tasmania. He holds a bachelor of commerce, majoring in marketing, a master of business, majoring in marketing, and a Ph.D. in consumer behavior. Professor O'Cass has published over 150 research papers on issues related to brand perceptions, consumer behavior, political marketing, voter behavior, export marketing, fashion, organizational learning, innovation, sustainable competitive advantage, and numerous other issues. His publications appear in journals such as *Journal of Business Research*, *British Journal of Management*, *European Journal of Marketing*, *Industrial Marketing Management*, *Journal of Economic Psychology*, *Journal of Product and Brand Management*, *Journal of Vacation Marketing*, *Journal of Advertising*, *Journal of Consumer Behaviour*, among others.

and outlines future research on MO, firm capabilities, and specific aspects of firm performance. The paper finishes with general conclusions drawn from the study.

## Theoretical Framework and Hypotheses

The RBV has been widely viewed as a prominent frame of reference for explaining performance differentials between firms (Barney, 1991). Specifically, the RBV's underlying logic is that the heterogeneity of resources across firms is a fundamental reason for the differences in advantages that firms gain in their marketplace (Barney, 1991). Importantly, the notion of the marketplace has received limited attention in RBV. For example, Amit and Schoemaker (1993) suggest that resources are valuable in the context of a specific market. Collis and Montgomery (1995) further explain that "a valuable resource must contribute to the production of something customers want" (p. 120). This theoretical contention has been adopted more recently by Peteraf and Bergen (2003) in linking the value of a resource and its application in product markets to the satisfaction of customer needs. This paper further extends this theoretical contention by arguing that performance outcomes should pertain to specific markets and specific types of performance that are set within a marketplace (see also Ray et al., 2004) at a disaggregated level.

Despite the strong appeal of focusing on resources and performance differentials, the evolving debate has centered on explaining how resources are deployed to achieve superior firm performance. For example, Mahoney and Pandian (1992) argue that a firm may outperform competitors not because it has better resources but because it has distinctive capabilities that allow it to make better use of its resources. More recently, Priem and Butler (2001) have raised the contention that resources are static, and the processes through which particular resources contribute to firm performance remain largely a black box. In a similar vein, Ketchen et al. (2007) contend that the potential value of resources is realized by way of resource deployment competencies, which are how firms capitalize on resources to effect superior performance. These contentions outlining limitations within the RBV's logic are in line with and are fundamentally reflected in the evolving area of capabilities theory (Eisenhardt and Martin, 2000; Newbert, 2007).

Capability theorists seek to explain how combinations of resources and capabilities can be developed and deployed in response to dynamic business environments (Teece, Pisano, and Shuen, 1997). Capabilities are deemed "know-how" deployment activities, which can be viewed in terms of different functional areas, including marketing and innovation (Eisenhardt and Martin, 2000; Krasnikov and Jayachandran, 2008; Morgan et al., 2009). Drawing on RBV and capability theory, the argument is raised that superior performance in the marketplace may be achieved through the integration of resources and capabilities associated with specific functional areas within firms (e.g., innovation and marketing) that provide greater complementarity. The achievement of complementarity should lead to differential performance outcomes, particularly IRP and CRP outcomes. Building on this theoretical backdrop, a theoretical model with testable hypotheses is developed as shown in Figure 1.

Specifically, this paper adopts the position that firm capabilities (such as innovation and marketing) may not contribute to firm performance in isolation. The contention is raised here that the performance impact of capabilities rests on their complementarity. With few exceptions, the relevant literature (especially the marketing literature) has largely focused on narrow conceptions of capabilities and examined them in isolation (see, e.g., Moorman and Slotegraaf, 1999; Song et al., 2005), focusing on either MC or technology capability. However, the significant benefits and potential synergy that marketing capabilities have with other capabilities could enable firms to outperform competitors.

Extending previous work by Griffin and Hauser (1996), Moorman and Rust (1999), and Song et al. (2005), the argument is developed that the presence of both IC and MC is essential for firms to realize the potential of MO and to achieve superior IRP and CRP outcomes. MO as the market-sensing resource provides a knowledge structure that permits recognition of market dynamism and provides a knowledge base for developing the required processes and for developing and deploying a firm's capabilities to serve its markets. As such, a more market-oriented firm is one that is able to identify and deploy distinctive resource–capability combinations more efficiently and effectively than others (Menguc and Auh, 2006; Morgan et al., 2009; Zhou, Li, Zhou, and Su, 2008; Zhou, Yim, and Tse, 2005). Firms with a strong MO encourage the acquisition of capabilities that facilitate linkages between what is to be delivered to customers in marketplace offerings and what customers expect from these offerings. In this context, managerial decisions and actions are oriented toward developing a set of specific capabilities because of the overarching MO that unifies and guides activities such as marketing and innovation. The firm capabilities that emerge from a strong MO are skills and activities that become more refined and valuable through continual investment over time (see also

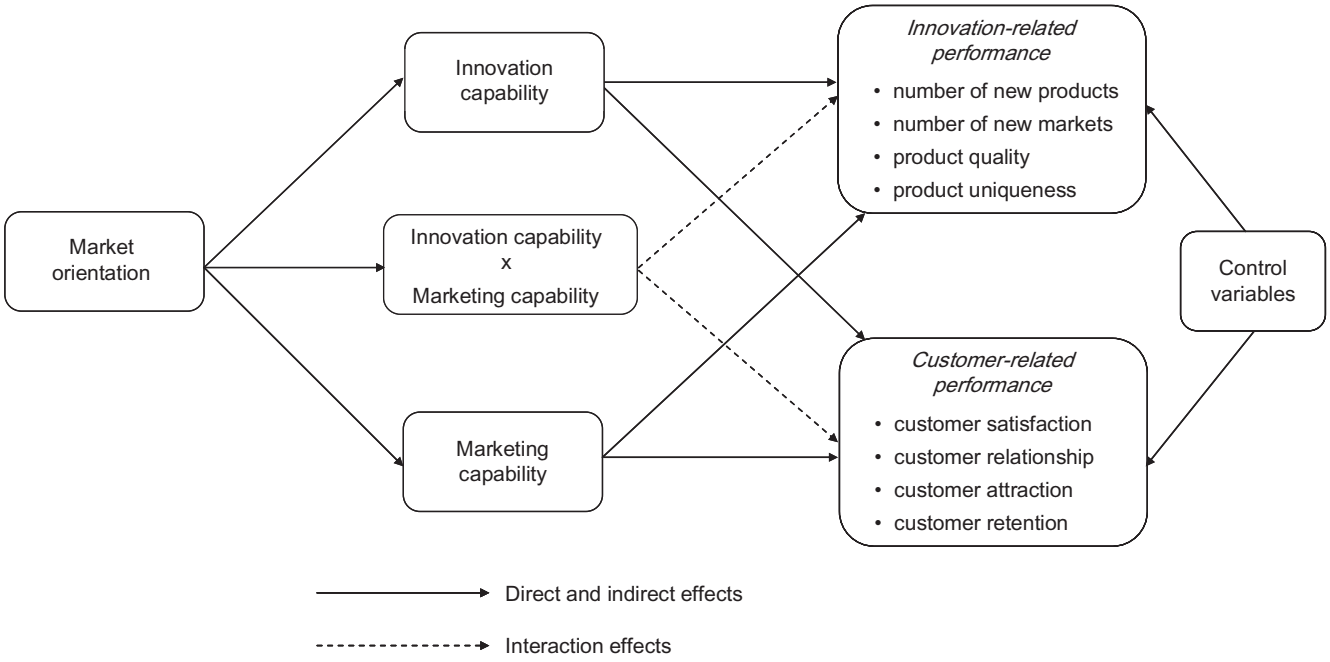


**Figure 1. Theoretical Framework and Hypotheses**

Prahalad and Hamel, 1990). The argument is raised that the dominant firm capabilities required to implement an MO be carefully built and accumulated gradually, and, while the focus here is extensively on marketing and innovation, one should not dismiss the possibility that other capabilities are relevant.

Among diverse theoretical perspectives on MO, the market intelligence perspective has received substantial attention (Hult et al., 2005; Morgan et al., 2009). Based on this perspective, MO is defined as the organization-wide generation, dissemination, and response to market intelligence pertaining to customer needs, competitor strategic moves, and supplier requirements (Kohli and Jaworski, 1990). Drawing on the RBV, one of the fundamental propositions of marketing theory is that, while possessing a superior MO is imperative, it is not sufficient for attaining superior firm performance (Hult et al., 2005). Customers do not purchase a firm's goods and services simply because the firm possesses a superior MO, rather, they are attracted by and stay with firms that are able to act on knowledge about customer needs to serve them better (Hult et al., 2005). As such, the unique contribution of MO as a rare, valuable, and inimitable knowledge resource can be diminished in the absence of certain capabilities (Menguc and Auh, 2006; Morgan et al., 2009). In this context, the general findings are consistent with the literature indicating that MO is a valuable, nonsubstitutable, and inimitable resource (Hunt and Morgan, 1995; Menguc and Auh, 2006).

Because a market-oriented firm places emphasis on understanding both the expressed and the unexpressed needs of its customers (Jaworski and Kohli, 1993; Slater and Narver, 1999), it should possess capabilities to fulfill customers' expressed needs and to discover new solutions to unexpressed (i.e., latent) needs. Although MO has shown to relate to innovation (e.g., Han, Kim, and Srivastava, 1998), the literature concerning the relationship between MO and innovation is inconclusive (Siguaw, Simpson, and Enz, 2006). Of importance to our theoretical contentions are the works by Hurley and Hult (1998) and Han et al. (1998) modeling MO as an antecedent of an innovative culture. Our study concurs with these researchers and proposes that innovation-capable firms driven by a stronger MO place greater emphasis on developing and implementing market-sensing and marketing competencies to enhance their innovation.

In the context of our model as shown in Figure 1, the focus here is on the interaction between marketing and innovation capabilities. In particular, the argument is raised that MO is set within a socially complex, firm-level system of routines and learning, which in turn has the potential to create greater causal ambiguity. Therefore, MO will have more value and exhibit greater rarity and inimitability when complemented by specific capabilities than when adopted in isolation (Amit and Schoemaker, 1993; Teece et al., 1997). A closer look at the existing literature suggests that marketing and innovation capabilities may help unlock the performance impact of MO

because of their ability to transform knowledge of the market into knowledge of what to do (i.e., which capabilities to deploy).

An increasing number of scholars define capabilities as bundles of interrelated yet distinct routines and processes (e.g., Amit and Schoemaker, 1993; Prahalad and Hamel, 1990). Capabilities are more firm-specific and less transferable than resources, and thus have greater capacity to lead to superior performance. For instance, a firm may have customer databases, designers, engineers, and financial and physical resources to carry out new product development projects. However, to build superior IC, effective routines need to be developed to facilitate the information and knowledge exchange among individual sources of knowledge (Kusunoki, Nonaka, and Nagata, 1998). A capability is the interrelated routines and behaviors utilized in performing specific functional tasks. Specifically, capabilities do not reside in individual routines but rather emerge from integration of multiple interrelated routines and processes, and are therefore built through managerial choices in identifying, developing, and integrating the routines and processes. Conceptualizing capabilities in this way has important implications for their inimitability and value to firms. As the competitive intensity in a market increases and product life cycles shrink, the ability to innovate in market offerings becomes increasingly important. Therefore, the capabilities required for innovation in and marketing of products and services provide significant competitive weapons for firms.

Capabilities related to market resource deployment are usually associated with the marketing function (e.g., Danneels, 2007). Previous studies have identified two interrelated MC areas. The first concerns individual marketing mix processes such as product development and management, pricing, selling, marketing communications, and channel management (e.g., Vorhies and Morgan, 2005). The second area concerns the processes of marketing strategy development and execution (e.g., Morgan, Zou, Vorhies, and Katsikeas, 2003). The focus here is on the marketing mix capability, and thus define MC as a firm's interrelated organizational routines for performing marketing activities such as product, pricing, channel management, marketing communications, marketing planning, and marketing implementation (Morgan et al., 2009; Song et al., 2005). Firms possessing a strong MO are more likely to develop higher order MC to achieve customer-related advantage with respect to customer attraction, customer satisfaction, customer relationship building, and customer retention. Therefore, it is hypothesized that:

*H1: MC mediates the relationship between MO and (a) IRP, and (b) CRP.*

IC represents a firm's ability to develop new solutions to satisfy customers' current and future needs (Adler and Shenhar, 1990). Hurley and Hult (1998) point out that the capacity to innovate contributes to a firm's competitiveness and spans such areas as product and service development, production process, management, market, and marketing (Han et al., 1998; Hurley and Hult, 1998; Weerawardena and O'Cass, 2004). As such, IC is defined as a firm's interrelated organizational routines for performing innovation activities related to products and services, production process, management, market, and marketing.

Being oriented toward markets provides a source of ideas for change and improvement (Hurley and Hult, 1998). These market-oriented activities, when accompanied by the appropriate capabilities, may result in advantages in product and process innovations (Slater and Narver, 1995). A number of studies note that MO plays a role in firms' development of IC (Atuahene-Gima and Ko, 2001; Hurley and Hult, 1998; Slater and Narver, 1995). This work and that of Han et al. (1998) provide the impetus for treating innovation as a mediator between MO and specific firm-performance outcomes. As such, firms possessing a strong MO are more likely to develop IC to achieve IRP outcomes with respect to new products and market developments, product quality, and product design (Atuahene-Gima, 1996), and consequently serve customers better. Therefore, it is hypothesized that:

*H2: IC mediates the relationship between MO and (a) IRP, and (b) CRP.*

To improve marketplace performance, a firm needs to be a moving target in the eyes of its competitors through sustained investment in the sources of advantage (Bharadwaj, Varadarajan, and Fahy, 1993). Day (1994) indicates the particular necessity for functionally coordinated integration directed at improving marketplace performance. The essence of the integration of idiosyncratic capabilities is that it reconfigures capabilities, reduces resource deficiencies, and generates new applications from those resources (Song et al., 2005; Teece et al., 1997). Complementary capability combinations (e.g., resources–capabilities and capabilities–capabilities) have recently attracted attention as an important emerging research issue in marketing. For instance, Menguc and Auh (2006) find that the combination of MO and innovativeness strengthens firm performance. In a similar vein, Morgan et al. (2009) report that MO and marketing capabilities are complementary in contributing to

superior firm performance. Interestingly, Song et al. (2005) find that integrating marketing capabilities and technological capabilities leads to better performance because these capabilities are complementary with each other.

Moorman and Slotegraaf (1999) observe that research into innovation has largely ignored the interaction dynamics of functional capabilities such as marketing and innovation. IC is a critical complement to MC because an organization that pursues specific market opportunities but is not innovative is unlikely to sustain long-term performance (Atuahene-Gima, 1996). However, innovation alone does not provide an assurance of long-term success; rather, a firm must have the ability to market its offering effectively. Tushman (1997) emphasizes this point by arguing that innovations by themselves are not necessarily the key to long-term business success. In effect, a firm can leverage its innovation capabilities to enter new markets, serve markets better, or provide greater value than rivals only if it possesses market-related capabilities (Garud and Nayyar, 1994; Hult and Ketchen, 2001). Song et al. (2005) also raise the notion of capability complementarity, arguing that better results are achieved through capabilities that combine effectively to enhance performance.

In this context, innovation and marketing are seen as complementary in that they synergistically improve marketplace performance. The success of Apple with its iPod and iPhone is a typical example of how innovation helps create customers and marketing helps retain customers. Apple did not invent the portable digital music player. However, innovators such as Creative Labs may nevertheless be disadvantaged in this market by a lack of complementary capabilities—in this case, specialized marketing. It is contended here that MC and IC have greater synergy when combined to achieve common outcomes, and that their integration results in better IRP and CRP. Therefore, it is hypothesized that:

*H3: MC and IC interact to positively affect (a) IRP, and (b) CRP.*

It is also argued that the interplay (i.e., complementarity) between innovation and marketing capabilities matters in the link between MO and firm performance. Our theoretical contention is that capability–capability integration acts as the mediator in the MO–performance link because the complementarity of marketing and innovation is imperative for achieving superior marketplace performance. Specifically, market knowledge generation as an outside-in process promotes the collective efforts of various departments, including marketing and research and development, in response to market-based know-what knowledge generated in the marketplace (Zhou et al., 2008). It is therefore of paramount importance that firms understand how market knowledge is transformed into innovation- and customer-related outcomes through the integration of innovation and marketing. Therefore, it is hypothesized that:

*H4: The interaction between IC and MC mediates the relationship between MO behavior and firms' (a) IRP and (b) CRP.*

## Research Method

### *Sampling and Data Collection*

This study used survey data to test the hypotheses. A sample of 1000 firms was randomly obtained from a commercial listing of manufacturing and services firms. An online self-administered questionnaire was used as the primary means for data collection.[1] The focus of the study was on manufacturing and services firms operating in 20 different two-digit Standard Industrial Classification code industries (20, 30, and 40) not only to maintain relevance across industries but also to be broad enough for the results to be generalizable. A commercial mailing list of 1000 senior managers in single-business firms with more than 20 employees operating in these industries (Hult et al., 2005) was purchased. In collecting the data, the study followed Huber and Power's (1985) guidelines for obtaining high-quality data from key informants. A key informant design is common in studies of marketing organization (e.g., Moorman and Rust, 1999; Olson, Slater, and Hult, 2005) and of market-oriented behavior (e.g., Gatignon and Xuereb, 1997).

This sampling frame enabled the collection of information about different variables from respondents who work in relevant positions (i.e., the most knowledgeable informants) and thereby reduce systematic measurement error. For example, information on key variables from the manager most closely associated with marketing activities in each organization was obtained. Senior marketing executives (single informant) served as the respondents because they are the most knowledgeable informants about MO, marketing organization structure, strategic marketing behavior, and marketplace performance metrics (Olson et al., 2005; Zhou et al., 2008).

[1] The prescreening of the respondents ensured that surveys were sent to the most senior manager responsible for marketing (and who had knowledge of the firm's innovation activities and firm performance) at each firm and that the respondents were confident that they could accurately respond to the survey questions.

All respondents who reported their positions indicated that they held senior marketing positions within their respective firms. Although nonresponse bias is always a concern in survey research, the response rate is within the accepted range of typical response rates for this type of study (e.g., Gatignon and Xuereb, 1997). Furthermore, Armstrong and Overton (1977) find that late respondents more closely resemble nonrespondents than do early responders. Significant differences between late responders and early responders indicate the presence of nonresponse bias. No significant differences were found between those firms who responded early and those who responded late with respect to key measures (Olson et al., 2005).

In total, 163 useable surveys were received, producing a response rate of 16.3%. The sample consisted of 45% of firms operating within the services sector and 55% in the manufacturing sector. With respect to firm size, the sample contained 42% medium-sized firms (the number of full-time employees >20 and <200) and 48% large-sized firms (the number of employees >200).

### *Measurement of Key Model Constructs*

MO was measured using nine items adapted from Jaworski and Kohli (1993) and Matsuno and Mentzer (2000). The respondents indicated the extent to which they agreed or disagreed with nine statements about being market oriented, with one indicating "*strongly disagree*" and seven indicating "*strongly agree*." IC was measured using five items developed from the work of Aragón-Correa, García-Morales, and Cordón-Pozo (2009), Chiesa, Coughlan, and Voss (1996), and Weerawardena and O'Cass (2004) using 7-point scales with "*much worse than competitors*" and "*much better than competitors*" anchors. MC was measured using six items adapted from Atuahene-Gima (1993) and Vorhies and Morgan (2005) using 7-point scales with anchors of "*much worse than competitors*" and "*much better than competitors*."

IRP was measured using four items adapted from Cooper and Kleinschmidt (2000), Gatignon and Xuereb (1997), and Ramaswami, Srivastava, and Bhagarva (2009). The respondents rated their firms' IRP in the areas of new product development, access to new markets, product quality, and product uniqueness relative to their major competitors. The measurement of CRP outcomes was undertaken using managers' perceptions. Because managers are increasingly turning their attention to linking their actions to the realization of CRP indicators such as customer satisfaction and customer loyalty (Jayachandran, Sharma, Kaufman, and Raman, 2005; Ramaswami et al., 2009), the measurement of customer-related issues as perceived by managers has been adopted extensively in the literature (see Ramani and Kumar, 2008). Therefore, CRP was measured using four items adapted from Jayachandran et al. (2005), Ramani and Kumar (2008), and Ramaswami et al. (2009). The respondents rated their firms' CRP in the areas of customer satisfaction, customer relationships building, customer attraction, and customer retention relative to their major competitors. Seven-point scales were used with "*very low*" and "*very high*" anchors for both IRP and CRP.

### *Measure Development and Validity*

To establish measure precision and representativeness, six senior academic experts in the area of marketing strategy were provided with the conceptual definitions of the constructs, the corresponding items, and a set of instructions for judging (cf. DeSarbo, Jedidi, and Sinha, 2001). The expert judges rated each item as "*not representative*," "*somewhat representative*," or "*very representative*" in relation to the construct definition. After receiving the judges' feedback, decisions about which items to delete or retain were based on a three-stage procedure that is a synthesis of the sum score and the complete approaches. This procedure resulted in the inclusion of 28 items.

A pretest of the draft survey with five senior executives (cf. DeSarbo et al., 2001; Menguc and Auh, 2006), who were asked to complete the draft questionnaire and discuss the items of the questionnaire for comprehension, logic, and relevance, was undertaken. Specifically, they were asked whether they could think of more than one way to interpret what each item was asking and to report these interpretations. They were also asked to explain why they responded the way they did for each item. Having completed the in-depth interviews with executives, 28 items were retained in the final survey, plus the firm and manager demographic measures.

Table 1 reports the measures and results of the reliability analyses. All the indicators in the outer-measurement models had acceptable bootstrap critical ratios (>1.96) with loadings (.53–.90) greater than the recommended .5 (Hulland, 1999), thus demonstrating adequate individual item reliabilities. Average variance extracted (AVE) values for all constructs were uniformly acceptable, ranging from .53 to .77. CRP demonstrates a marginal but acceptable AVE value of .46, which is consistent with similar benchmarks reported in the marketing literature (e.g., Green, Barclay, and Ryans, 1995).

## Table 1. Measurement Model Results

| Constructs and Manifest Variables | Loading | *T*-Value |
|---|---|---|
| Market orientation (MO) *AVE = .55 Composite Reliability = .92* (adapted from Jaworski and Kohli, 1993; Matsuno and Mentzer, 2000; *7-point scale 1 = "strongly disagree" and 7 = "strongly agree"*) | | |
| *Please indicate the extent to which you agree or disagree with each of the following statements.* | | |
| *Intelligence generation* (IG) *AVE = .68 Composite Reliability = .87* | | |
| 1. We generate information about our customers (e.g., feedback on delivered products and/or services, needs, product/service preferences). (MO1) | .80 | 18.97 |
| 2. We generate information about our competitors (e.g., competitive products and/or services, pricing, promotion campaigns, strategic moves). (MO2) | .84 | 28.30 |
| 3. We generate information about our suppliers (e.g., manufacturing process, industry practices, clientele). (MO3) | .84 | 35.32 |
| *Intelligence dissemination* (ID) *AVE = .77 Composite Reliability = .91* | | |
| 4. We disseminate information about customers (e.g., feedback on delivered products and/or services, needs, product/service preferences) throughout the business using a range of communication tools (e.g., circulated documents, cross-functional meetings). (MO4) | .86 | 33.92 |
| 5. We disseminate information about competitors (e.g., competitive products and/or services, pricing, promotion campaigns, and strategic moves) throughout the business using a range of communication tools (e.g., circulated documents, cross-functional meetings). (MO5) | .90 | 51.62 |
| 6. We disseminate information about suppliers (e.g., manufacturing process, industry practices, and clientele) throughout the business using a range of communication tools (e.g., circulated documents, cross-functional meetings). (MO6) | .88 | 41.27 |
| *Responsiveness* (RESP) *AVE = .70 Composite Reliability = .88* | | |
| 7. We respond to information about customers that we have generated and disseminated. (MO7) | .82 | 18.92 |
| 8. We respond to information about competitors that we have generated and disseminated. (MO8) | .87 | 29.34 |
| 9. We respond to information about suppliers that we have generated and disseminated. (MO9) | .81 | 25.25 |
| Innovation capability (IC) *AVE = .59 Composite Reliability = .88* (adapted from Aragón-Correa et al., 2009; Chiesa et al., 1996; Weerawardena and O'Cass, 2004; *7-point scale 1 = "much worse than competitors" and 7 = "much better than competitors")* | | |
| *Please rate your business unit, relative to your major competitors in terms of its innovation capabilities over the past year in the following areas* | | |
| 1. Products and service innovations (IC1) | .76 | 18.92 |
| 2. Production process innovations (IC2) | .59 | 8.60 |
| 3. Managerial innovations (IC3) | .79 | 21.19 |
| 4. Market innovations (IC4) | .88 | 47.82 |
| 5. Marketing innovation (IC5) | .79 | 25.44 |
| Marketing capability (MC) *AVE = .53 Composite Reliability = .87* (adapted from Atuahene-Gima, 1993; Vorhies and Morgan, 2005; *7-point scale 1 = "much worse than competitors" and 7 = "much better than competitors")* | | |
| *Please rate your business unit, relative to your major competitors in terms of its marketing capabilities over the past year in the following areas* | | |
| 1. Incorporating customer needs into marketing of products and services (MC1) | .68 | 13.18 |
| 2. Developing pricing programs (MC2) | .67 | 9.54 |
| 3. Developing distribution systems (MC3) | .63 | 8.83 |
| 4. Developing marketing communication programs (MC4) | .68 | 10.71 |
| 5. Marketing planning skills (MC5) | .83 | 26.49 |
| 6. Implementing marketing activities (MC6) | .83 | 21.38 |
| Innovation-related performance (IRP) *AVE = .59 Composite Reliability = .85* (adapted from Ramaswami et al., 2009; Gatignon and Xuereb, 1997; Cooper and Kleinschmidt, 2000; 7-point scale *1 = "very low" and 7 = "very high"*) | | |
| *Please rate your business unit, relative to your competitors in terms of its performance over the past year in the following areas* | | |
| 1. Number of new products and services developed (IRP1) | .70 | 12.89 |
| 2. Entering new markets (IRP2) | .78 | 25.08 |
| 3. Product and service quality (IRP3) | .71 | 14.64 |
| 4. Product and service uniqueness (IRP4) | .86 | 39.59 |
| Customer-related performance (CRP) *AVE = .46 Composite Reliability = .77* (adapted from Jayachandran et al., 2005; Ramaswami et al., 2009; Ramani and Kumar 2008; 7-point scale *1 = "very low" and 7 = "very high"*) | | |
| *Please rate your business unit, relative to your competitors in terms of its performance over the past year in the following areas* | | |
| 1. Satisfying customers (CRP1) | .76 | 16.75 |
| 2. Building customer relationships (CRP2) | .53 | 4.53 |
| 3. Attracting customers (CRP3) | .65 | 8.68 |
| 4. Retaining customers (CRP4) | .73 | 10.16 |

AVE, Average variance extracted.

**Table 2. Construct-level Measurement Statistics and Correlation Matrix**

| Constructs | Internal Consistency | MO | IC | MC | IRP | CRP |
|---|---|---|---|---|---|---|
| Market orientation (MO) | .92 | **.74** | | | | |
| Innovation capability (IC) | .88 | .48 | **.77** | | | |
| Marketing capability (MC) | .87 | .55 | .59 | **.73** | | |
| Innovation-related performance (IRP) | .85 | .51 | .67 | .55 | **.77** | |
| Customer-related performance (CRP) | .77 | .44 | .56 | .49 | .64 | **.68** |

*Note*: Diagonal entries (shown in bold) show the square roots of average variance extracted, others represent correlation coefficients.

*Convergent validity.* The examination of convergent validity was undertaken using the internal consistency measure (composite reliability) developed by Fornell and Larcker (1981), which is considered a better choice than coefficient alpha (Shook, Ketchen, Hult, and Kacmar, 2004). Table 2 reports the internal consistency values for all constructs in the second column. These values (ranging from .77 to .92) were above the threshold of .70 (cf. Nunnally, 1978).

*Discriminant validity.* The assessment of the discriminant validity of the four constructs was undertaken in two ways. First, Fornell and Larcker (1981) suggest the use of AVE, which indicates that discriminant validity is evident if the square root of the AVE is greater than all corresponding correlations. As shown in Table 2, the square roots of the AVE values are consistently greater than the off-diagonal correlations. Second, O'Cass and Ngo (2007) suggest that satisfactory discriminant validity among constructs is obtained when the correlation between two composite constructs (the off-diagonal entries) are not higher than their respective reliability estimates. Table 2 demonstrates that no individual correlations (.23–.67) were higher than their respective reliabilities (.77–.92), thus indicating satisfactory discriminant validity of all constructs.

*Common-method variance.* Because data were collected using a single-source method (self-report scales), common-method variance had the potential to introduce spurious relationships among the variables. To assess and mitigate the threat of common-method bias, two tests were conducted following the recommendations of Lindell and Whitney (2001) and Podsakoff, MacKenzie, Podsakoff, and Lee (2003). First, a Harmon's single-factor test was conducted, which reveals that no single factor accounted for the majority of the variance (the first factor accounted for 34.7% of the 69.1% explained variance). Second, the marker-variable technique (Lindell and Whitney, 2001; Malhotra, Kim, and Patil, 2006) was undertaken in which market type (export versus domestic) was selected as a marker variable to control for common-method variance ($r_M = .06$, $p = .49$). The mean change in correlations of the five key constructs ($r_U$–$r_A$) when partialling out the effect of $r_M$ was .03, providing no evidence of common-method bias.

The variance inflation factors ranged from 1.49 and 1.71, which is less than the benchmark of 6 (Hair, Anderson, Tatham, and Black, 1998) and suggests that multicollinearity among variables is not a concern. Industry type and firm size as controls for industry and firm heterogeneity were also included. Firms were coded as either manufacturing or service firms (dummy). Firm size was the logarithm of the total number of full-time employees.

*Method of analysis.* Partial least squares (PLS; PLS-GRAPH v.3.00) was used to estimate the structural model. PLS considers all path coefficients simultaneously, thus allowing analysis of direct and indirect relationships (White, Varadarajan, and Dacin, 2003). As a structural equation modeling technique, PLS uses a principal component-based estimation approach (Chin, 1998) to test hypotheses. PLS was chosen for several reasons. First, this study was primarily intended for causal-predictive analysis, a condition for PLS as suggested by Chin and Newsted (1999) and Joreskog and Wold (1982). Second, PLS requires fewer statistical specifications and constraints on the data than the covariance-based strategy of LISREL (e.g., assumptions of normality). PLS has also been used extensively in analyzing interaction effects (see Chin, Marcolin, and Newsted, 2003; Eggert, Ulaga, and Schultz, 2006; Sarkar, Echambadi, and Harrison, 2001) and mediational analysis. PLS has also shown to accommodate similar sample sizes to that obtained in this study (cf. Cassel, Hackl, and Westlund, 2000; Slotegraaf and Dickson, 2004).

For hypothesis testing, bootstrapping procedure was followed as outlined by Brown and Chin (2004) and Chin (1998). Path coefficients were reestimated with each

random sample, and mean parameter estimates and standard errors were computed across the total number of samples. Following Chin (1998) and others, 500 resamples were undertaken.

## Results

Following the procedures suggested by Baron and Kenny (1986),[2] eight models in total for testing the hypotheses were estimated. To test H1a, which predicts that MC mediates the effect of MO on IRP, model 1 and model 2 were developed. As shown in Table 3, MO positively influences IRP (model 1, β = .53 *t*-value = 9.76) and MC (model 2, β = .55 *t*-value = 9.00), which also positively influences IRP (model 2, β = .37 *t*-value = 4.92). Comparing models 1 and 2, it was found that the positive effect of MO on IRP in model 1 becomes weaker in model 2 (β = .53 versus β = .32). Thus, MC partially mediates the relationship between MO and IRP, supporting H1a.

To test H1b, which predicts that MC mediates the effect of MO on CRP, model 3 and model 4 were developed. As shown in Table 3, MO positively influences CRP (model 3, β = .49 *t*-value = 9.08) and MC (model 4, β = .55 *t*-value = 9.68), which also positively influences CRP (model 4, β = .33 *t*-value = 3.93). Comparing model 3 and model 4, it was found that the positive effect of MO on CRP in model 3 becomes weaker in model 4 (β = .49 versus β = .30). Thus, MC partially mediates the relationship between MO and CRP, supporting H1b.

To test H2a, which predicts that IC mediates the effect of MO on IRP, model 5 was developed and compared with model 1. As shown in Table 3, MO positively influences IRP (model 1, β = .53 *t*-value = 9.76) and IC (model 5, β = .48 *t*-value = 7.74), which also positively influences IRP (model 5, β = .55 *t*-value = 9.81). Comparing models 1 and 5, it was found that the positive effect of MO on IRP in model 1 becomes weaker in model 5 (β = .53 versus β = .25). Thus, IC partially mediates the relationship between MO and IRP, supporting H2a.

To test H2b, which predicts that IC mediates the effect of MO on CRP, model 6 was developed and compared with model 3. As shown in Table 3, MO positively influences CRP (model 3, β = .49 *t*-value = 9.08) and IC

[2] To establish mediation, four conditions must hold: (1) the independent variable must affect the dependent variable; (2) the independent variable must affect the mediators; (3) the mediators must affect the dependent variable; and (4) when mediators enter the model, the contribution of a previously significant independent variable must drop substantially for partial mediation and become insignificant for full mediation.

**Table 3. H1, H2, and H4: Structural Equation Parameter Estimates (*t*-value)**

| Independent Variables | Endogenous Variables | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H1a | | | H1b | | | H2a | | H2b | | H4a | | | H4b | | | | |
| | Model 1 | Model 2 | | Model 3 | Model 4 | | Model 5 | | Model 6 | | Model 7 | | | Model 8 | | | | |
| | IRP | MC | IRP | CRP | MC | CRP | IC | IRP | IC | CRP | MC × IC | IRP | | MC × IC | CRP | | | |
| MO | .53** (9.76) | .55** (9.00) | .32** (3.74) | .49** (9.08) | .55** (9.68) | .30** (3.57) | .48** (7.74) | .25** (3.92) | .48** (8.07) | .26** (3.52) | .57** (10.31) | .19* (2.55) | | .57** (10.31) | .20** (2.64) | | | |
| MC | – | – | .37** (4.92) | – | – | .33** (3.93) | – | – | – | – | – | – | | – | – | | | |
| IC | – | – | – | – | – | – | – | .55** (9.81) | – | .42** (6.01) | – | – | | – | – | | | |
| MC × IC | – | – | – | – | – | – | – | – | – | – | – | .56** (8.18) | | – | .46** (6.41) | | | |
| Controls | | | | | | | | | | | | | | | | | | |
| Firm size (log) | .12 (1.79) | – | .08 (1.44) | –.17* (2.36) | – | –.12 (1.85) | – | .05 (.92) | – | –.11 (1.85) | – | .06 (1.12) | | – | –.12* (1.99) | | | |
| Industry type (1 = manufacturing) | .00 (.03) | – | .03 (.45) | –.20** (2.96) | – | –.17** (2.71) | – | .05 (.89) | – | .15* (2.48) | – | .06 (.93) | | – | –.15* (2.52) | | | |
| *R*-square | .28 | .30 | .37 | .27 | .30 | .34 | .23 | .50 | .23 | .39 | .33 | .48 | | .33 | .39 | | | |
| Sobel *t*-Test | Test of Increases in $R^2$ ($\Delta R^2$) of Innovation-related and Customer-related Performance | | | | | | | | | | | | | | | | | |
| ■ H1a: $SE_{indirect\ effect}$ = .047; *z*-score = 4.31, $p < .01$ | | | | | | | | | | | ■ $\Delta R^2_{model\ 1\text{–}2, 1, 158}$ = .09* ($F_{model\ 1\text{–}2, 1, 158}$ = 22.57 > $F_{critical}$ = 3.84) | | | | | | | | |
| ■ H1b: $SE_{indirect\ effect}$ = .049; *z*-score = 3.67, $p < .01$ | | | | | | | | | | | ■ $\Delta R^2_{model\ 3\text{–}4, 1, 158}$ = .07* ($F_{model\ 3\text{–}4, 1, 158}$ = 16.76 > $F_{critical}$ = 3.84) | | | | | | | | |
| ■ H2a: $SE_{indirect\ effect}$ = .044; *z*-score = 6.05, $p < .01$ | | | | | | | | | | | ■ $\Delta R^2_{model\ 1\text{–}5, 1, 158}$ = .22* ($F_{model\ 1\text{–}5, 1, 158}$ = 69.52 > $F_{critical}$ = 3.84) | | | | | | | | |
| ■ H2b: $SE_{indirect\ effect}$ = .042; *z*-score = 4.81, $p < .01$ | | | | | | | | | | | ■ $\Delta R^2_{model3\text{–}6, 1, 158}$ = .12* ($F_{model\ 3\text{–}6, 1, 158}$ = 31.08 > $F_{critical}$ = 3.84) | | | | | | | | |
| ■ H4a: $SE_{indirect\ effect}$ = .050; *z*-score = 6.37, $p < .01$ | | | | | | | | | | | ■ $\Delta R^2_{model\ 1\text{–}7, 1, 158}$ = .20* ($F_{model\ 1\text{–}7, 1, 158}$ = 60.77 > $F_{critical}$ = 3.84) | | | | | | | | |
| ■ H4b: $SE_{indirect\ effect}$ = .048; *z*-score = 5.41, $p < .01$ | | | | | | | | | | | ■ $\Delta R^2_{model3\text{–}8, 1, 158}$ = .12* ($F_{model\ 3\text{–}8, 1, 158}$ = 31.08 > $F_{critical}$ = 3.84) | | | | | | | | |

*Notes*: MO, market orientation; MC, marketing capability; IC, innovation capability; IRP, innovation-related performance; CRP, customer-related performance; SE, standard error; ** $p < .01$, * $p < .05$.

**Table 4. H3: Structural Equation Parameter Estimates (*t*-Value)**

| | Endogenous Variables | | | |
|---|---|---|---|---|
| | H3a | | H3b | |
| | Model 9 | Model 10 | Model 11 | Model 12 |
| Independent variables | IRP | IRP | CRP | CRP |
| MC | .25** (3.83) | .27** (3.95) | .28** (3.24) | .33** (4.09) |
| IC | .53** (8.49) | .53** (7.99) | .38** (4.40) | .37** (4.27) |
| MC × IC | – | .06 (1.29) | | .17* (2.17) |
| Controls | | | | |
| Firm size (log) | .01 (.20) | .02 (.28) | .06 (1.97) | .07 (1.21) |
| Industry type (1 = manufacturing) | .08 (1.60) | .09 (1.65) | –.11 (1.91) | –.10 (1.65) |
| *R*-square | .50 | .51 | .38 | .41 |
| Test of increases in $R^2$ ($\Delta R^2$) of innovation-related and customer-related performance | | | | |
| ■ $\Delta R^2_{\text{Model 9–10}} = .01$ ($F_{\text{model 9–10, 1, 158}} = 3.22 < F_{\text{critical}} = 3.84$) | | | | |
| ■ $\Delta R^2_{\text{Model 11–12}} = .03$* ($F_{\text{model 11–12, 1, 158}} = 8.03 > F_{\text{critical}} = 3.84$) | | | | |

*Notes*: MC, marketing capability; IC, innovation capability; IRP, innovation-related performance; CRP, customer-related performance; ** $p < .01$; * $p < .05$.

(model 6, β = .48 *t*-value = 8.07), which also positively influences CRP (model 6, β = .42 *t*-value = 6.01). Comparing models 3 and 6, it was found that the positive effect of MO on CRP in model 3 becomes weaker in model 6 (β = .49 versus β = .26). Thus, IC partially mediates the relationship between MO and CRP, supporting H2b.

To test H4a and H4b predicting that the interaction between IC and MC (IC–MC interaction[3]) mediates the effect of MO on IRP and CRP, respectively, model 7 was developed and compared with model 1. Model 8 was developed and compared with model 3. As shown in Table 3, MO positively influences IRP (model 1, β = .53 *t*-value = 9.76) and IC–MC interaction (model 7, β = .57 *t*-value = 10.31), which also positively influences IRP (model 7, β = .56 *t*-value = 8.18). Comparing models 1 and 7, it was found that the positive effect of MO on IRP in model 1 becomes weaker in model 7 (β = .53 versus β = .19). Thus, IC–MC interaction partially mediates the relationship between MO and IRP, supporting H4a.

As shown in Table 3, MO positively influences CRP (model 3, β = .49 *t*-value = 9.08) and IC–MC interaction (model 8, β = .57 *t*-value = 10.31), which positively influences CRP (model 8, β = .46 *t*-value = 6.41). Comparing models 3 and 8, it was found that the positive effect of MO on CRP in model 3 becomes weaker in model 8 (β = .49 versus β = .20). Thus, IC–MC interaction partially mediates the relationship between MO and CRP, supporting H4b. Sobel's (1982, 1988) test[4] was also conducted to determine whether the mediating variables carried the effect of the independent variable onto the endogenous variables. Significant *t*-values indicate that MC, IC, and their interaction are important mediators of the linkages between MO and IRP and CRP.

Finally, the contributions of MC, IC, and their interaction to the explanatory power of models 2, 4–8 were examined. Specifically, the increases in $R^2$ ($\Delta R^2$) of IRP and CRP when MC, IC, and their interaction were included in models 2 and 4, models 5 and 6, and models 7 and 8, respectively, were examined. As shown in Table 3, $\Delta R^2_{\text{models 1–2}}$, $\Delta R^2_{\text{models 3–4}}$, $\Delta R^2_{\text{models 1–5}}$, $\Delta R^2_{\text{models 3–6}}$, $\Delta R^2_{\text{models 1–7}}$, and $\Delta R^2_{\text{models 3–8}}$ attributable to the mediating effect are statistically significant at <.05.

H3 predicts that IC and MC interact to influence (1) IRP and (2) CRP. This hypothesis was tested using the procedure suggested by Chin et al. (2003) and adopted by Eggert et al. (2006) and Sarkar et al. (2001). First, the main effects were examined by estimating models 9 and 11. Second, the interaction variable was included in addition to main effects and estimated models 10 and 12. The results in Table 4 show that the interaction term does not significantly influence IRP (β = .06 *t*-value = 1.29; not significant), indicating that H3a is not supported but does significantly influence CRP (β = .17; *t*-value = 2.17; significant at $p < .05$), thus supporting H3b. It was found that the $\Delta R^2_{\text{models 11–12}}$ attributable to the interaction effect is statistically significant at $p < .05$.

[3] Prior to the creation of the interaction term, we mean-centered variables to reduce the risk of multicollinearity, making for a better interpretation (Aiken and West, 1991; Brown and Chin, 2004).

[4] Sobel (1982, 1988) provided an approximate significance test for the indirect effect that includes three variables ($X_1 \rightarrow X_2 \rightarrow X_3$) as follows: a and b are the path coefficients for the direct effects of $X_1 \rightarrow X_2$ and $X_2 \rightarrow X_3$, respectively. $SE_a$ and $SE_b$ are denoted as the standard errors. The standard error of the indirect effect (the product ab) is $SE_{ab} = \text{SQRT}[(b^2SE_a^2 + a^2SE_b^2 + SE_a^2{*}SE_b^2)]$.

Given the unsupported relationship between the IC–MC interaction and the IRP, the assessment of the significant difference in magnitude of the individual relationships between IC and IRP and MC and IRP was undertaken. In particular, a Hotelling–Williams test as recommended by Steiger (1980) was computed. The results of the test indicate that the difference between IC–IRP and MC–IRP was significant ($t = 2.25$). Thus, while the effect of IC–MC interaction on IRP was not significant, there is a difference in the magnitude of the individual relationships, with the IC–IRP relationship being significantly stronger than the MC–IRP relationship. Further, the procedure suggested by Tenenhaus, Vinzi, Chaltelin, and Lauro (2005) was followed to assess the fit of both outer-measurement and inner-structural models to the data simultaneously[5] and used a blindfolding procedure to establish the predictive validity of our model.[6]

## Discussion and Implications

The key objective of this study was to examine how MO contributes to the achievement of superior CRP and IRP with respect to innovation and marketing as the two key functions. Specifically, this paper provides empirical evidence that MO facilitates a firm's IC and MC, which in turn positively influence its IRP and CRP and thus indicate a mediational role of the MO–capability–performance linkages, through which a firm's capabilities mediate the relative impact of MO on CRP and IRP. In addition, the findings of this study reveal a significant interaction effect of IC and MC on CRP, but not on IRP.

Given the findings, this study offers two key contributions. First, although possession of a strong MO may result in superior firm performance (Jaworski and Kohli, 1993; Menguc and Auh, 2006), there is limited understanding of the "action" components that facilitate implementation of MO. Drawing on the RBV, Ketchen et al. (2007) characterize MO as an important resource that only has potential to impact performance. They specifically indicate that realizing this performance contribution of MO depends on action components that co-align with MO. The findings of this study support this view and show that MO, when treated as a know-what knowledge resource, is co-aligned with IC and MC as the know-how deployment processes. This facilitates the creation of superior IRP (new products, new markets, product quality, and product uniqueness) and CRP (attraction, satisfaction, relationships, and retention). This study also addresses recent work by Morgan et al. (2009), who call for further research on other kinds of resources and capabilities that are co-aligned with MO.

Second, this study supports recent extensions of capability-based theory by providing evidence that IC and MC are complementary in enhancing CRP. As such, this study extends recent studies on resource–capability combinations (e.g., Menguc and Auh, 2006; Morgan et al., 2009; Song et al., 2005). The findings also reaffirm the conventional wisdom of Drucker (1954) that innovation and marketing are two key functions that enable firms to create and serve customers. Interestingly, no evidence was found to support the proposition that the complementarity between IC and MC mediates the impact of MO on IRP. However, this study found that the complementarity between IC and MC mediates the relationship between MO and CRP. This finding is thought provoking and somewhat puzzling. On further examination of the literature, no empirical research in this domain has examined the complementarity between capabilities as mediators. However, upon closer examination of the findings and based on careful consideration, this study suggests that MO works through the interaction term (IC–MC) to influence CRP but not IRP. In particular, a firm requires complementarity of MC and IC to realize the value of the know-what knowledge resources that MO can provide in terms of attracting, satisfying, building relationships with, and retaining customers. However, this may not necessarily be the case if a firm is able to develop additional new products and services to enter new markets and to provide products and services with greater quality and uniqueness. Importantly, the findings of this study indicate that the interplay between IC and MC is unnecessary because IC is much stronger than MC in achieving superiority in IRP outcomes.

[5] Compared with covariance-based structural equation modeling (SEM) techniques (e.g., LISREL), PLS does not optimize any global scalar function, leading to a lack of an index for global validation of the model as in LISREL (e.g., $\chi^2$-based indices). The goodness-of-fit index (GoF) represents an operational solution to this problem and acts as a global fit index for validating a PLS path model (Tenenhaus et al., 2005). The GoF is a compromise between communality and redundancy in which the communality index measures the quality of the measurement model for each construct, and the redundancy index measures the quality of the structural model for each endogenous construct taking into account the measurement model (Tenenhaus et al., 2005). The GoF is computed by taking the square root of the product of the average communality of all constructs and the average $R^2$ value of the endogenous constructs as: $GoF = \sqrt{\overline{communality} \times \overline{R^2}}$ . The computed GoF for the noninteraction model (model 7) and interaction model (model 8) were .44 and .48, respectively, indicating good fit of the models to the data (see Schepers, Martin, and de Ruyter, 2005).

[6] We examined $Q^2$ predictive relevance (i.e., predictive sample reuse technique) as developed by Stone (1974). $Q^2$ represents a statistic of how well the observed values are reconstructed in the model (and the model parameters). $Q^2 > 0$ indicates the model has predictive relevance. Using this procedure and with omissions distances between 5 and 15, the $Q^2$ values for the noninteraction model (model 7) and the interaction model (model 8) were .28 and .26, indicating satisfactory predictive relevance of the models.

This study provides several managerial implications. First, the findings not only underscore the individual contributions of marketing and innovation capabilities but also lend significant support for the performance impact of the complementarity (i.e., beneficial synergy) between the two important capabilities. Managers are advised to seek a balanced approach to managing the deployment of capabilities to achieve optimal results in CRP and IRP. The independent potential of the two capabilities (marketing and innovation) are becoming evident to managers and scholars alike. However, balanced deployment of innovation and marketing capabilities does not appear to be prevalent. The findings of this study reinforce the necessity for a balance between innovation and marketing in reaping specific performance outcomes. The complementarity between the two compared with the independent effects of each is a key issue and one that begs further attention. Therefore, firms might consider specific performance objectives and their achievement by considering both innovation and marketing synergy.

Furthermore, while the precept that MO facilitates the enhancement of firm performance has gained widespread support, little if any research has adopted the approach pursued here. The manner in which firms go about implementing this process (MO actions) remains somewhat unclear; however, this study does further the growing work of disentangling MO constructs and of establishing MO's rightful place in performance-based research. The findings of this study go some way in supporting the view that innovation and marketing facilitate the conversion of MO behaviors into superior CRP and IRP, which should be given priority in managerial practices. Managers are advised that market-based knowledge (know-what knowledge) should be configured with the deployment of marketing and innovation capabilities and performance objectives in mind. If firms seek to achieve superiority in CRP, they need to deploy marketing capabilities and innovation capabilities, and to give increased consideration to their complementarity to transform market-knowledge resources into CRP. Marketing and innovation capabilities and their interplay are essential for attracting, satisfying, building relationships with, and retaining customers. On the other hand, if firms emphasize achieving superiority in IRP, the complementarity between marketing and innovation is not necessarily important. Instead, the deployment of innovation capabilities is the most important mechanism for transforming market-based knowledge into IRP. For managers seeking to achieve superior CRP, this finding suggests that priority be given not only to IC and MC but also to their complementarity. However, if managers seek superior IRP, they need to give greater attention to IC, which should be supported by MC, although their complementarity is not critical.

Furthermore, MO behaviors (activities and actions) should be designed with innovation and marketing capabilities and performance objectives in mind. Being market oriented alone is insufficient (perhaps increasingly so) for obtaining marketplace advantages. A point also emphasized by Han et al. (1998) in the context of MO is that managers and scholars need to consider the role of MO in contributing to key firm capabilities and specific marketplace performance outcomes. To this end, this study shows that the logic of the RBV when focusing on capabilities is that the heterogeneity of capabilities across firms is a fundamental aspect of the differences in advantages that firms gain in their specific marketplaces. This is consistent with Amit and Schoemaker (1993), Collis and Montgomery (1995), and Peteraf and Bergen (2003), who suggest that resources are valuable in the context of a specific market. This study extends this argument by arguing that specific types of performance (e.g., CRP and IRP) are set within a marketplace at a disaggregated level (see also Ray et al., 2004), together with the parameters of MO and marketing and innovation capabilities.

The RBV claims that complementary resources provide synergistic performance impacts, but this is rarely empirically tested. Importantly, this same claim in relation to complementary capabilities has also received little empirical attention. Thus, this study modeled the interaction effects on performance in addition to the main effects of functional capabilities and MO behaviors. Clearly, capability combinations do not always lead to synergistic performance impacts in all performance domains (e.g., innovation and customers). As such, managers should avoid overinvesting in market-performance contexts where certain capabilities cannot be leveraged through specific resource configurations. In terms of resource-based theory, synergistic rents in a generic sense cannot always be obtained across all domains, but they must be market-performance context specific.

## Limitations and Directions for Future Research

The findings of this study need to be interpreted in light of several limitations. First, based on the cross-sectional data used in this study, inferences about causality should be drawn with caution. Future research using longitudinal data may help in evaluating the prescribed order of investment in developing of the relationships among MO, IC, MC, and IRP and CRP. Second, this study regarded

the behavioral aspect of MO. Future research could adopt both cultural and behavioral approaches to MO (see Zhou et al., 2008) to fully discover the nature of MO and its potential performance advantage.

Third, drawing on RBV and capability theory, this study has placed the emphasis on MO, IC, MC, and their combination. Future research might take into account other potential action components such as innovativeness (Hurley and Hult, 1998), organizational learning (Slater and Narver, 1995), and their combination. Fourth, because this study does not take into account the potential impact of contextual conditions (e.g., technological turbulence and marketplace turbulence), the co-alignment and combinations of MO, IC, and MC might produce different performance results. This might explain the lack of evidence supporting the expected synergistic impact of capability combination on IRP. This suggests that environmental influences ought to be included in future research as control variables.

Fifth, although the approaches to measuring firm capabilities and firm performance in this study are in line with the existing literature (Morgan et al., 2009; Vorhies and Morgan, 2005; Zhou and Wu, 2010), these objective approaches are limited, especially in cases where the survey questions did not ask about capabilities at a particular point in time earlier (e.g., one year earlier) than the time at which performance was measured. Future research should collect longitudinal data at point A on innovation and marketing capabilities, and at a later point B on firm performance. In addition, both subjective and objective data on performance should also be collected (see Zhou and Wu, 2010).

Finally, the empirical findings of this study are limited to the perceptions of managers alone in measuring CRP. Possible biases may occur because some CRP indicators (e.g., customer satisfaction) are subjectively perceived by customers. Further research might attempt to measure these performance indicators in terms of both firm and customer perceptions.

## Conclusion

This present study sought to build on the RBV of the firm and capability theory. In particular, the theoretical contention was that MC and IC are the two (of several) important capabilities that collectively enable firms that can deploy them using specific resources to gain IRP and CRP outcomes. Building on the results of past research, this study also examined the role of MO as an important driver of the development and deployment of innovation and marketing capabilities. The relationships between these focal constructs were theorized to lead to superiority in both CRP and IRP.

This present study raised the contention that IC, MC, and MO do not constitute significantly unique advantages in isolation. Rather, they collectively contribute to the creation of a significant positional advantage (cf. Day, 1994) through their interaction. These characteristics are individually necessary but not sufficient for creating superiority in marketplace performance (cf. Day and Wensley, 1988). The findings of this study also support the view of Hult and Ketchen (2001) on the importance of incorporating MO with action components in explaining performance differentials between firms. MO as the market-sensing resource permits recognition of market dynamism and provides a knowledge base for developing firm capabilities that facilitate market linking and guide action such as marketing and innovation. As such, the findings of this study confirm the view that MO acts as a key market-based know-what knowledge resource, and that firms' marketing and innovation capabilities act as key market-related deployment mechanisms and provide the basis for superior performance.

In this study, attention was given to the value of the marketing function and MO. Likewise, the arguments found in the literature suggest that the marketing function can provide important tools for conceptualizing the marketing capabilities of firms and should coexist with MO. In line with Moorman and Rust (1999), this study shows that the effectiveness of MO depends on the presence of specific capabilities, including those residing within the marketing function. A central tenet of our conceptualization is that the marketing function's capabilities facilitate both the market-linking requirements of firms and the integration of MO and other capabilities such as innovation.

Overall, the purpose of this study was to enhance the understanding of the competitive value of MO by drawing on the RBV of the firm and capability theory (e.g., Eisenhardt and Martin, 2000). In contrast to much of the research that has been done in this area, this study addressed the competitive value of MO through firm-specific functional capabilities. For example, in their original study of resource-advantage theory, Hunt and Morgan (1995) described MO as a valuable, rare, socially complex, and causally ambiguous resource available to firms. Both Day (1994) and Hunt and Morgan (1995) implied that not all firms are able to achieve superiority in marketplace performance outcomes by implementing MO. Consequently, this study posited that MO would produce greater improvement in firm performance when combined with other internal complementary capabilities

to create new dynamic capabilities that contribute to superior firm performance (customer and innovation outcomes).

This study attempted to explain how firms could generate greater firm performance from implementation of MO by viewing the implementation of this resource as a step toward generating a dynamic capability. The shortcomings of MO as a stand-alone resource for generating superior firm performance reinforce the need to theorize MO as a precursor to dynamic capabilities that are complementary. Overall, the findings of this study speak to the issue of how resource–resource or resource–capability combinations can create performance heterogeneity and ultimately deliver superior performance. The idea of resource combination (and recombination) is central to the literature on capabilities and an important path for marketing to pursue.

## References


Adler, P. S., and A. J. Shenhar. 1990. Adapting your technological base: The organizational challenge. *Sloan Management Review* 32 (1): 25–37.

Aiken, L. S., and S. G. West. 1991. *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.

Amit, R., and P. J. H. Schoemaker. 1993. Strategic assets and organizational rent. *Strategic Management Journal* 14 (1): 33–46.

Aragón-Correa, A. J., V. J. García-Morales, and E. Cordón-Pozo. 2007. Leadership and organizational learning's role on innovation and performance: Lessons from Spain. *Industrial Marketing Management* 36 (3): 349–59.

Armstrong, S. J., and T. S. Overton. 1977. Estimating nonresponse bias in mail surveys. *Journal of Marketing Research* 14 (3): 396–402.

Atuahene-Gima, K. 1993. Determinants of inward technology licensing intentions: An empirical analysis of Australian engineering firms. *Journal of Product Innovation Management* 10 (3): 230–40.

Atuahene-Gima, K. 1996. Market orientation and innovation. *Journal of Business Research* 35 (2): 93–103.

Atuahene-Gima, K., and A. Ko. 2001. Empirical investigation of the effect of market orientation and entrepreneurship orientation alignment on product innovation. *Organization Science* 12 (1): 54–74.

Barney, J. B. 1991. Firm resources and sustained competitive advantage. *Journal of Management* 17 (1): 99–120.

Baron, R. M., and D. A. Kenny. 1986. The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology* 51 (6): 1173–82.

Bharadwaj, S. G., R. P. Varadarajan, and J. Fahy. 1993. Sustainable competitive advantage in service industries: A conceptual model and research propositions. *Journal of Marketing* 57 (4): 83–99.

Brown, S. P., and W. W. Chin. 2004. Satisfying and retaining customers through independent service representatives. *Decision Sciences* 35 (3): 527–50.

Cassel, C. M., P. Hackl, and A. H. Westlund. 2000. On measurement on intangible assets: A study of robustness of partial least squares. *Total Quality Management* 11 (7): 897–907.

Chiesa, V., P. Coughlan, and C. A. Voss. 1996. Development of a technical innovation audit. *Journal of Product Innovation Management* 13 (2): 105–36.

Chin, W. W. 1998. Commentary: Issues and opinion on structural equation modeling. *MIS Quarterly* 22 (1): vii–xvi.

Chin, W. W., B. L. Marcolin, and P. R. Newsted. 2003. A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and electronic mail emotion/adoption study. *Information Systems Research* 14 (2): 189–217.

Chin, W. W., and P. R. Newsted. 1999. Structural equation modeling analysis with small samples using partial least squares. In *Statistical strategies for small sample research*, ed. R. H. Hoyle, 307–41. Thousand Oaks, CA: Sage.

Collis, D. J., and C. A. Montgomery. 1995. Competing on resources: Strategy in the 1990s. *Harvard Business Review* 73 (4): 118–28.

Cooper, R. G., and E. J. Kleinschmidt. 2000. New product performance: What distinguishes the star products. *Australian Journal of Management* 25 (1): 17–46.

Danneels, E. 2007. The process of technological competence leveraging. *Strategic Management Journal* 28 (5): 511–33.

Day, G. S. 1994. The capabilities of market-driven organizations. *Journal of Marketing* 58 (4): 37–52.

Day, G. S., and R. Wensley. 1988. Assessing advantage: A framework for diagnosing competitive superiority. *Journal of Marketing* 52 (2): 1–20.

DeSarbo, W. S., C. Anthony Di Benedetto, and M. Song. 2007. A heterogeneous resource based view approach for exploring relationships between firm performance and capabilities. *Journal of Modelling in Management* 2 (2): 103–30.

DeSarbo, W. S., K. Jedidi, and I. Sinha. 2001. Customer value analysis in a heterogeneous market. *Strategic Management Journal* 22 (9): 845–57.

Drucker, P. F. 1954. *The practice of management*. New York: Harper Press.

Eggert, A., W. Ulaga, and F. Schultz. 2006. Value creation in the relationship life cycle: A quasi-longitudinal analysis. *Industrial Marketing Management* 35 (1): 20–27.

Eisenhardt, K. M., and J. A. Martin. 2000. Dynamic capabilities: What are they? *Strategic Management Journal* 21 (10/11): 1105–21.

Fornell, C., and D. F. Larcker. 1981. Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research* 18 (1): 39–50.

Garud, R., and P. R. Nayyar. 1994. Transformative capacity: Continual structuring by intertemporal technology transfer. *Strategic Management Journal* 15 (5): 365–85.

Gatignon, H., and J.-M. Xuereb. 1997. Strategic orientation of the firm and new product performance. *Journal of Marketing Research* 34 (February): 77–90.

Gebhardt, G. F., G. S. Carpenter, and J. F. Sherry. 2006. Creating a market orientation: A longitudinal, multifirm, grounded analysis of cultural transformation. *Journal of Marketing* 70 (October): 37–55.

Green, D. H., D. W. Barclay, and A. B. Ryans. 1995. Entry strategy and long-term performance: Conceptualization and empirical examination. *Journal of Marketing* 59 (4): 1–16.

Griffin, A., and J. R. Hauser. 1996. Integrating R&D and marketing: A review and analysis of the literature. *Journal of Product Innovation Management* 13 (3): 191–215.

Hair, J. F., Jr., R. E. Anderson, R. L. Tatham, and W. C. Black. 1998. *Multivariate data analysis*. Upper Saddle River, NJ: Prentice Hall.

Han, J. K., N. Kim, and R. K. Srivastava. 1998. Market orientation and organizational performance: Is innovation a missing link? *Journal of Marketing* 62 (4): 30–45.

Huber, G. P., and D. J. Power. 1985. Retrospective reports of strategic-level managers: Guidelines for increasing their accuracy. *Strategic Management Journal* 6 (2): 171–80.

Hulland, J. 1999. Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal* 20 (2): 195–204.

Hult, G. T. M., and D. J. Ketchen Jr. 2001. Does market orientation matter?: A test of the relationship between positional advantage and performance. *Strategic Management Journal* 22 (9): 899–906.

Hult, G. T. M., D. J. Ketchen Jr., and S. F. Slater. 2005. Market orientation and performance: An integration of disparate approaches. *Strategic Management Journal* 26 (12): 1173–81.

Hunt, S. D., and R. M. Morgan. 1995. The comparative advantage theory of competition. *Journal of Marketing* 59 (2): 1–15.

Hurley, R. F., and G. T. M. Hult. 1998. Innovation, market orientation, and organizational learning: An integration and empirical examination. *Journal of Marketing* 62 (3): 42–54.

Jaworski, B. J., and A. K. Kohli. 1993. Market orientation: Antecedents and consequences. *Journal of Marketing* 57 (3): 53–70.

Jayachandran, S., S. Sharma, P. Kaufman, and P. Raman. 2005. The role of relational information processes and technology use in customer relationship management. *Journal of Marketing* 69 (4): 177–92.

Joreskog, K. G., and H. Wold. 1982. *Systems under indirect observation: Causality, structure, prediction*. Amsterdam: North Holland.

Ketchen, D. J., Jr., G. T. M. Hult, and S. F. Slater. 2007. Toward greater understanding of market orientation and the resource-based view. *Strategic Management Journal* 28 (9): 961–64.

Kohli, A. K., and B. J. Jaworski. 1990. Market orientation: The construct, research propositions, and managerial implications. *Journal of Marketing* 54 (April): 1–18.

Krasnikov, A., and S. Jayachandran. 2008. The relative impact of marketing, research and development, and operations capabilities on firm performance. *Journal of Marketing* 72 (4): 1–11.

Kusunoki, K., I. Nonaka, and A. Nagata. 1998. Organizational capabilities in product development of Japanese firms: A conceptual framework and empirical findings. *Organization Science* 9 (6): 699–718.

Lindell, M. K., and D. J. Whitney. 2001. Accounting for common method variance in cross-sectional research designs. *Journal of Applied Psychology* 86 (1): 114–21.

Mahoney, J. T., and R. J. Pandian. 1992. The resource-based view within the conversation of strategic management. *Strategic Management Journal* 13 (5): 363–80.

Malhotra, N. K., S. S. Kim, and A. Patil. 2006. Common method variance in IS research: A comparison of alternative approaches and a reanalysis of past research. *Management Science* 52 (12): 1865–83.

Matsuno, K., and J. T. Mentzer. 2000. The effects of strategy type on the market orientation–performance relationship. *Journal of Marketing* 64 (4): 1–16.

Menguc, B., and S. Auh. 2006. Creating a firm-level dynamic capability through capitalizing on market orientation and innovativeness. *Journal of the Academy of Marketing Science* 34 (1): 63–73.

Moorman, C., and R. T. Rust. 1999. The role of marketing. *Journal of Marketing* 63: 180–97.

Moorman, C., and R. J. Slotegraaf. 1999. The contingency value of complementary capabilities in product development. *Journal of Marketing Research* 36 (2): 239–57.

Morgan, N. A., D. W. Vorhies, and C. H. Mason. 2009. Market orientation, marketing capability, and firm performance. *Strategic Management Journal* 30 (8): 909–20.

Morgan, N. A., S. Zou, D. W. Vorhies, and C. S. Katsikeas. 2003. Experiential and informational knowledge, architectural marketing capabilities, and the adaptive performance of export ventures. *Decision Sciences* 34 (2): 287–321.

Newbert, S. L. 2007. Empirical research on the resource-based view of the firm: An assessment and suggestions for future research. *Strategic Management Journal* 28 (2): 121–46.

Nunnally, J. C. 1978. *Psychometric theory*. New York: McGraw-Hill.

O'Cass, A., and L. V. Ngo. 2007. Market orientation versus innovation culture: Two routes to superior brand performance. *European Journal of Marketing* 41 (7/8): 868–87.

Olson, E. M., S. F. Slater, and G. T. M. Hult. 2005. The performance implications of fit among business strategy, marketing organization structure, and strategic behavior. *Journal of Marketing* 69 (3): 49–65.

Peteraf, M. A., and M. E. Bergen. 2003. Scanning dynamic competitive landscapes: A market-based and resource-based framework. *Strategic Management Journal* 24 (10): 1027–41.

Podsakoff, P. M., S. B. MacKenzie, N. P. Podsakoff, and J. Y. Lee. 2003. The mismeasure of management and its implications for leadership research. *Leadership Quarterly* 14 (6): 615–56.

Prahalad, C. K., and G. Hamel. 1990. The core competence of the corporation. *Harvard Business Review* 68 (3): 79–91.

Priem, R. L., and J. E. Butler. 2001. Is the resource-based "view" a useful perspective for strategic management research? *Academy of Management Review* 26 (1): 22–40.

Ramani, G., and V. Kumar. 2008. Interaction orientation and firm performance. *Journal of Marketing* 72 (1): 27–45.

Ramaswami, S. N., R. K. Srivastava, and M. Bhagarva. 2009. Market-based capabilities and financial performance of firms: Insights into marketing's contribution to firm value. *Journal of the Academy of Marketing Science* 37 (2): 97–116.

Ray, G., J. B. Barney, and W. A. Muhanna. 2004. Capabilities, business processes, and competitive advantage: Choosing the dependent variable in empirical tests of the resource-based view. *Strategic Management Journal* 25 (1): 23–37.

Sarkar, M. B., R. Echambadi, and J. S. Harrison. 2001. Alliance entrepreneurship and firm market performance. *Strategic Management Journal* 22 (6/7): 701–11.

Schepers, J., W. Martin, and K. de Ruyter. 2005. Leadership styles in technology acceptance: Do followers practice what leaders preach? *Managing Service Quality* 15 (6): 496–508.

Shook, C. L., D. J. Ketchen Jr., G. T. M. Hult, and M. K. Kacmar. 2004. An assessment of the use of structural equation modeling in strategic management research. *Strategic Management Journal* 25 (4): 397–404.

Siguaw, J. A., P. M. Simpson, and C. A. Enz. 2006. Conceptualizing innovation orientation: A framework for study and integration of innovation research. *Journal of Product Innovation Management* 23 (6): 556–74.

Slater, S. F., and J. C. Narver. 1995. Customer-led and market-oriented: Let's not confuse the two. *Strategic Management Journal* 19 (10): 1001–6.

Slater, S. F., and J. C. Narver. 1999. Market-oriented is more than being customer-led. *Strategic Management Journal* 20 (12): 1165–68.

Slater, S. F., E. M. Olson, and G. T. M. Hult. 2006. The moderating influence of strategic orientation on the strategy formation capability-performance relationship. *Strategic Management Journal* 27 (12): 1221–31.

Slotegraaf, R. J., and P. R. Dickson. 2004. The paradox of a marketing planning capability. *Journal of the Academy of Marketing Science* 32 (4): 371–85.

Sobel, M. E. 1982. Asymptotic confidence intervals for indirect effects in structural equation models. In *Sociological methodology*, ed. S. Leinhardt, 290–312. Washington, DC: American Sociological Association.

Sobel, M. E. 1988. Direct and indirect effect in linear structural equation models. In *Common problems/proper solutions: Avoiding error in quantitative research*, ed. J. S. Long, 46–64. Beverly Hills, CA: Sage.

Song, M., C. Droge, S. Hanvanich, and R. Calantone. 2005. Marketing and technology resource complementarity: An analysis of their interaction effect in two environmental contexts. *Strategic Management Journal* 26 (3): 259–76.

Steiger, J. 1980. Tests for comparing elements of a correlation matrix. *Psychological Bulletin* 87 (2): 245–51.

Stone, M. 1974. Cross-validatory choice and assessment of statistical predictions. *Journal of the Royal Statistical Society* 36 (2): 111–33.

Teece, D. J., G. Pisano, and A. Shuen. 1997. Dynamic capabilities and strategic management. *Strategic Management Journal* 18 (7): 509–33.

Tenenhaus, M., V. E. Vinzi, Y.-M. Chaltelin, and C. Lauro. 2005. PLS path modeling. *Computational Statistics & Data Analysis* 48 (1): 159–205.

Tushman, M. L. 1997. Winning through innovation. *Strategy and Leadership* 25 (4): 14–19.

Vorhies, D. W., and N. A. Morgan. 2005. Benchmarking marketing capabilities for sustainable competitive advantage. *Journal of Marketing* 69 (1): 80–94.

Vorhies, D. W., R. E. Morgan, and C. W. Autry. 2009. Product-market strategy and the marketing capabilities of the firm: Impact on market effectiveness and cash flow performance. *Strategic Management Journal* 30 (12): 1310–34.

Weerawardena, J., and A. O'Cass. 2004. Exploring the characteristics of the market-driven firms and antecedents to sustained competitive advantage. *Industrial Marketing Management* 33 (5): 419–28.

White, C. J., P. R. Varadarajan, and P. A. Dacin. 2003. Market situation interpretation and response: The role of cognitive style, organizational culture, and information use. *Journal of Marketing* 67 (3): 63–79.

Zhou, K. Z., J. J. Li, N. Zhou, and C. Su. 2008. Market orientation, job satisfaction, product quality, and firm performance: Evidence from China. *Strategic Management Journal* 29 (9): 985–1000.

Zhou, K. Z., and F. Wu. 2010. Technological capability, strategic flexibility, and product innovation. *Strategic Management Journal* 31 (5): 547–61.

Zhou, K. Z., C. K. Yim, and D. K. Tse. 2005. The effects of strategic orientations on technology- and market-based breakthrough innovations. *Journal of Marketing* 69 (2): 42–60.