ORIGINAL EMPIRICAL RESEARCH

Market-based capabilities and financial performance of firms: insights into marketing's contribution to firm value

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Abstract While there is recognition that market-based capabilities contribute to a firm's financial performance, the exposition is largely conceptual (Srivastava et al. Journal of Marketing 62:2–18, 1998; Journal of Marketing 63:168–179, 1999). Using a resource based view of the firm, the present study proposes that (1) market-based assets and capabilities of a firm impacts (2) performance in three market-facing business processes (new product development, supply-chain and customer management), which in turn, influence (3) the firm's financial performance. It develops related hypotheses and tests the framework empirically. The study also examines for the first time the interrelationship among the three business processes and their impact on the market value of firms. Further, the study examines the moderating influence of two organizational variables—size and age of the firm. Overall, the major contribution of the study is that it offers a process linkage between capabilities, process performance and financial performance. The results of this research will provide strategic insights to managers on optimal customer management, product development and supply chain strategies.

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Introduction

The last few decades have seen a dramatic economic shift from manufacturing to information- and knowledge-driven services. This shift has been accompanied by a corresponding increase in the contribution of intangible assets (i.e., *market-based assets* such as brands, customers, and channels, and *capabilities* such as marketing expertise and process knowledge) toward the total market capitalization of firms. In other words, the source of competitive advantage (and hence the ability to drive future cash flows and market capitalization) has shifted from manufacturing assets, among other assets, to market-based assets and capabilities.

Appropriately, marketing researchers in recent years have begun giving attention to the creation and management of market-based capabilities (MBCs from hereon) that contribute to the value of a firm (Fornell et al. 2006; Gupta et al. 2004; Joshi and Hanssens 2004). While Fornell et al. and Gupta et al. suggest that value is created because of capabilities tied to customer management, Joshi and Hanssens (2004) indicate that value is created through superior new product processes.

While these efforts have slowly helped build a body of knowledge in this area, an important gap in the literature at this time is the absence of a comprehensive evaluation of MBCs and the pathways by which they add value to the firm (Varadarajan and Jayachandran 1999). Srivastava et al. (1999) provide an exhaustive, yet untested, conceptual framework based on the resource-based view of the firm that links MBCs with firm performance using the mediating

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concept of process performance. This framework has not been empirically validated to date. One objective of the present study is to provide an empirical evaluation of Srivastava et al.'s framework.

Specifically, the present study focuses on two important issues that define the capabilities—firm value relationship. The first issue relates to developing a better understanding of how MBCs impact the market performance and value of a firm. According to Srivastava et al. (1999) and Zahay and Handfield (2004), MBCs create value for the firm within three important categories of organizational processes—namely, the new product development (NPD) process, the customer management (CM) process and the supply chain management (SCM) process. For example, more value is created in the NPD process of a firm for firms that have greater spanning ability (i.e., integrating outside information with inside structures; Day 1994); and more value is created in the CM process of firms that have the ability to identify high-value customers and nurture a long-term relationship with them. Such value creation abilities contribute to superior process performance that in turn leads to superior corporate performance.

A second issue addressed in the study relates to the nature of interdependence among these three processes, extending the work by Srivastava et al. (1999). Since no study known to the authors has examined all three processes concurrently, not only do we not know the true financial impact of each process controlling for the other two processes, we also do not know how the three processes work in combination to affect the market value of a firm. Srivastava et al. (1999) have argued that the three processes are likely to have a synergistic impact on firm performance. The study evaluates if this can be illustrated empirically. Additionally, the study examines another form of interdependence—it tests if capabilities that drive any of the three processes also have an impact on performance of the other two processes.

The relevance of the study derives from three factors: (a) not too many studies have recognized that marketing's role needs to be evaluated in terms of how it contributes to better execution of overall organizational processes; (b) there is a need to understand better how marketing capabilities influence processes such as NPD and SCM that have been traditionally considered as being beyond the responsibility of the marketing function; and (c) there is a need to simultaneously link all three organizational processes to overall financial performance and value of firms (Moorman and Rust 1999).

The rest of this paper is organized into four additional sections. The "Theoretical framework and analysis" provides an overview of the resource-based view of the firm and presents the hypotheses. The "Research methods" outlines the research methodology. The "Results" presents empirical results based on a survey of senior marketing managers from a sample of firms. The "Discussion" discusses the implications of these preliminary findings for academic research and managerial practice.

Theoretical framework and hypotheses

In recent years, market competition has not only increased in intensity, its nature has changed in fundamental ways. The source of competitive advantage has shifted from physical, tangible assets to intellectual and knowledge-based resources or capabilities (Prahalad and Hamel 1990). A capability can be viewed as 'a competence that is truly distinctive' (Learned et al. 1969). Taking a similar view, Day (1994) suggested that capabilities are complex bundles of skills and accumulated knowledge, exercised through organizational processes that create positional or competitive advantages for the firm which are not easily imitable by competitors. The challenge facing a firm aiming to generate superior financial performance and market value is therefore to identify, ex ante, a set of intangible MBCs as grounds for establishing sustainable market performance.

Identifying relevant MBCs and examining their effects

The present study performs this identification within the overall processes engaged in by a business. Business processes are actions or work practices that firms engage in to accomplish defined business purposes or objectives (Srivastava et al. 1999). Srivastava et al. (1999) have identified three core processes as being crucial to the creation of customer value.[1] These include:

1. a NPD process that aims to create solutions that customers need and want,
2. a SCM process that manages acquisition of physical and informational inputs and converts them into customer solutions in an efficient and effective manner, and
3. a CM process that manages identification of customers, creation of customer knowledge, shaping of customer perceptions of the organization's products and image, building customer relationships through rich and satisfactory experiences, and maximizing customer responses for optimal revenue and profit growth.

NPD process A good NPD process should yield products that (a) are unique and differentiated, (b) enjoy market success, and (c) are developed in a time-efficient manner (Baker and Sinkula 1999, 2005). Obviously, NPD process

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[1] We believe that marketing is likely to influence all three cross-functional business processes (NPD, SCM and CM) within the organization by the impact it has on MBCs. This approach is different from other work that relates the function directly to firm performance.

performance will likely be influenced somewhat by the amount of resources allocated by a firm to its R&D activities. The present study's focus, however, is not on quantity but the quality of a firm's NPD effort. A review of past studies suggests the importance of two important factors that define the quality of a firm's effort—namely, customer-driven development (CDD) and cross-functional integration (CFI) (Baker and Sinkula 1999, 2005; Souder et al. 1997; Cooper and Kleinschmidt 1993, 1995; Atuahena-Gima 1995). CDD refers to the degree to which customers are involved with and drive the product development process, while CFI captures the degree to which the development process is integrated across functional units within the firm and external partners outside the firm. To develop unique and successful products, firms need better insights into the needs of their customers, together with better capabilities for acting on those insights (Souder et al. 1997). With both domestic and foreign competition increasing in intensity, the only way to succeed is to become customer-driven (Baker and Sinkula 2005). However, being customer-driven may be toothless unless top management sets up a cross-functional process in which different functional areas cooperate in converting customer insights into successful products (Leenders and Wierenga 2002). Doing so, according to Song and Parry (1997) enhances time efficiency in product development.

Companies today do not restrict customer interaction only to evaluation of needs and gathering of new product ideas; in fact, they involve customers closely in the actual design of the product itself. Typically, the manufacturer develops a prototype based on information from customers that may be incomplete and only partially correct. The product prototype is then tested on the customer and feedback information is received. Product improvements are carried out using this feedback. This cycle repeats itself until a satisfactory solution is reached. The impact of this cycle, we believe, may be felt as much on cycle time as on the ability of the firm to develop successful products. Gupta and Wilemon (1990) suggested that early market testing—testing the product concept early and testing it on an "as-you-go" basis with active customer involvement is an important way to reduce cycle time. Further, given that customer voice is heard during the stage of translation of product benefits into actual products, companies can be more careful in designing into the product features that customers believe impart the product with distinctiveness.

The other quality dimension is cross-functional integration. Song and Parry (1992) note that CFI contributes to (a) better quality of information transfer among functional units, and (b) better implementation of new product development activities such as product design and product launch. On the information aspect, integration enhances "information flows from marketing to manufacturing (sales forecasts), market-

ing to engineering (product modifications), and engineering to marketing (product support services)" (Song and Parry 1997; p. 67). Additionally, high levels of CFI increase the likelihood that unsuccessful new products will be withdrawn from the market earlier rather than later, thereby decreasing the financial losses associated with the project.

We can expect companies that do a better job of CDD and CFI in comparison to other firms in the same competitive space to enjoy extra-normal NPD returns. By bringing products to market faster and making products that are differentiated, they can ensure market success.

H1 The greater a firm's capability in involving customers during product development, the higher the firm's NPD performance.

H2 The greater a firm's capability in integrating NPD activities across functional units (internal and external), the higher the firm's NPD performance.

CM process In recent years, a variety of market forces—commoditization of brands, more intense competition, development of new marketing channels such as the Internet and ever-rising customer expectations—have put pressure on companies to come up with better ways of creating value for customers. CM is a management approach that uses deep customer insights and analysis, drawn from *individual customer interactions*, to identify and understand value generators and fulfill customer needs as completely as possible (Sheth and Parvatiyar 1995). Based on past research, we propose that a high quality CM solution depends on organizational ability to (a) select high-value customers (Zhou et al. 2005), (b) capture and use knowledge about such customers to develop customized offerings and personalized communication (Day 1994, 1999), and (c) nurture them by maximizing the value of their relationship with the organization (Mathias and Capon 2003).[2,3]

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[2] Our study is somewhat different from other CM studies that have focused primarily on organizational determinants of CM performance. Some of the organizational factors identified in other studies include culture, cross-functional integration, management commitment, user participation, and training. We believe that these organizational determinants will eventually impact CM performance by their effect on organizational ability to execute customer-related activities like the ones used in our study. For example, management commitment could result in (a) greater CM investments, (b) greater authority for CM implementers, and (c) greater coordination across business functions. These however will impact organizational ability to respond effectively to customer needs and treatment of customers as internal assets rather than as external entities (which are the determinants used in our study).

[3] Active consideration was given for using the marketing orientation concept (Kohli and Jaworski 1990) to explain differences in CM performance. However, because the CM literature prescribes a much broader set of determinants, the same was used in developing the study hypotheses.

Companies differ on their CM performance because they vary in the degree to which they invest in building these capabilities.

The starting point for a CM process is identifying strategically significant customers for the firm. CM is based on the concept that not all customers are equally important to a firm. In fact, customers differ in their value to a firm and *focusing on* "high-value" *customers* (HVCs) will lead to retention of the right customers. High value customers are those that bring in higher revenue and profitability to the firm or stability in the revenue and profitability streams of the firm (Collings and Baxter 2005). To identify HVCs, organizations need skills relating to development of customer data bases and warehouses and use of data analytics. Organizations that have this capability will be in a better position to satisfy the needs of HVCs in a personalized manner and maximize the chances of retaining them.

Upon identification of HVCs, the next step is to be responsive to meeting their goals. Responsiveness is defined in this study as the degree to which organizations meet customer needs and goals (Kohli and Jaworski 1990). More effective response leads to higher value creation for customers (Day 1994). Previous research has determined that effective responses are likely to influence both customer satisfaction and retention.

However, what should companies do if competitors narrow their differences on the responsiveness dimension? Relating to this, a new view gaining ground among both academics and practitioners is that organizations have to manage customer relationships as assets (Gupta et al. 2004). The notion that a firm's relationship with a customer can be viewed as an asset is grounded in both the resource-based view of the firm (Barney 1991) and the relationship-marketing paradigm (Hunt and Morgan 1995). Peppers and Rogers (2004) note that when companies assess their performance, while they consider total income, they fail to consider changes in value of their customer base. In other words, there is a lack of connection between future income and the treatment of the customer population that will deliver it. They strongly recommend that managers should be held accountable for preserving and increasing the value of their customer assets. However, the budgetary controls used in organizations and the demands of Wall Street direct the focus of managers on short-term revenues and today's share of the customer wallet (Woolridge and Snow 1990). Mathias and Capon (2003) are of the view that this short-term strategy is more likely to lead to declining margins and commoditization. On the other hand, companies can facilitate growth of relationship capital if they are willing and able to make investments in nurturing customers and participating in their growth. Because customer nurturing takes time to develop, the potential exists for this ability to be relatively rare and difficult for rivals to replicate (Francis 2000).

H3 The greater a firm's capability in focusing on high-value customers, the better its CM performance.

H4 The greater a firm's capability in responding to customer goals, the better its CM performance.

H5 The greater a firm's capability in building customer relationship assets, the better its CM performance.

SCM process Over the last several years, two important and related trends have impacted the management of supply chains. The first is the use of the supply chain as a competitive weapon. Organizations today are building what are called as "value-chain constellations" (Poirier and Reiter 1996). These are organized networks of businesses that work together by sharing resources and rewards in the pursuit of targeted markets and consumers. To maximize value creation (for customers), it is necessary for the major partner in the network or constellation to take on a *leadership role* and coordinate efforts with other partners within the network. Organizations, however, differ in their *ability to lead the supply chain*.

A second related trend is the use of information technology tools for transmission and processing of information necessary for synchronous decision making (Sanders and Premus 2005). Through use of technology, companies can develop solid insights into the operations of their suppliers and can anticipate and react to supply problems before they have an impact on performance. This is based on *information sharing*—one of the most important factors for better SCM performance (Bowersox et al. 2000). Schalet (2001) identified two types of information that can be shared among supply chain members: demand and decisions. Transparency of demand information would ensure that suppliers are making available the right supplies (i.e., for those products in demand) at the right time. Transparency of decision information would ensure that the suppliers are in the know and can adjust their policies accordingly. For example, supplier firms involved in the design process have a better knowledge of the material and design requirements of the new product. Overall, information transparency enables a firm to reduce supply chain costs and create a competitive advantage due to stronger vendor relationships. Thus:

H6 The greater a firm's capability in "information sharing" with supply chain partners, the better the SCM performance.

H7 The greater a firm's capability in leading a supply chain network, the better the SCM performance.

The asset assortments that are posited (in the above discussion) to influence performance of each of the three

processes—NPD, CM, and SCM—are represented in Fig. 1.

Inter-relationship among business processes and impact on financial performance

While H_1 through H_7 evaluated the drivers of each business process, the three processes are likely to be inter-related. The inter-relationship is studied at three levels: (1) the impact of each business process on firm performance, controlling for the impact of the other two processes; (2) the joint impact of the three processes on firm performance based on arguments posed by Srivastava et al. (1999); and (3) the cross-impact of the drivers of one process on the performance of other processes.

Impact of each business process Ultimately, the competitive advantage arising from effective use of resources in each of the three business processes must be reflected in superior financial performance and firm value. In the case of SCM, effective SCM processes are based primarily on scale economies and thus can contribute to lower costs in such areas as inventory management, warehousing, and transportation; they also can enhance revenues through programs that assure higher product availability (Thomas 1999). Improvements in a company's supply chain network can translate into both decreased cost and increased sales and thus to higher corporate profitability.

Similarly, effective CM processes imply that firms are doing a better job than competition in targeting high value customers, responding effectively to their needs, and creating value for them. These should have positive effects on increasing the scope of relationships with customers. Scope is captured by customer satisfaction, retention and cross-selling, which lead to both higher revenues and lower costs (Reinartz et al. 2004; Ryals 2005). In a CM study in the communication industry, Accenture found that as much as 50% of the difference in return on sales between average- and high-performing companies could be explained by CM performance (Business Wire, September 27, 1999).
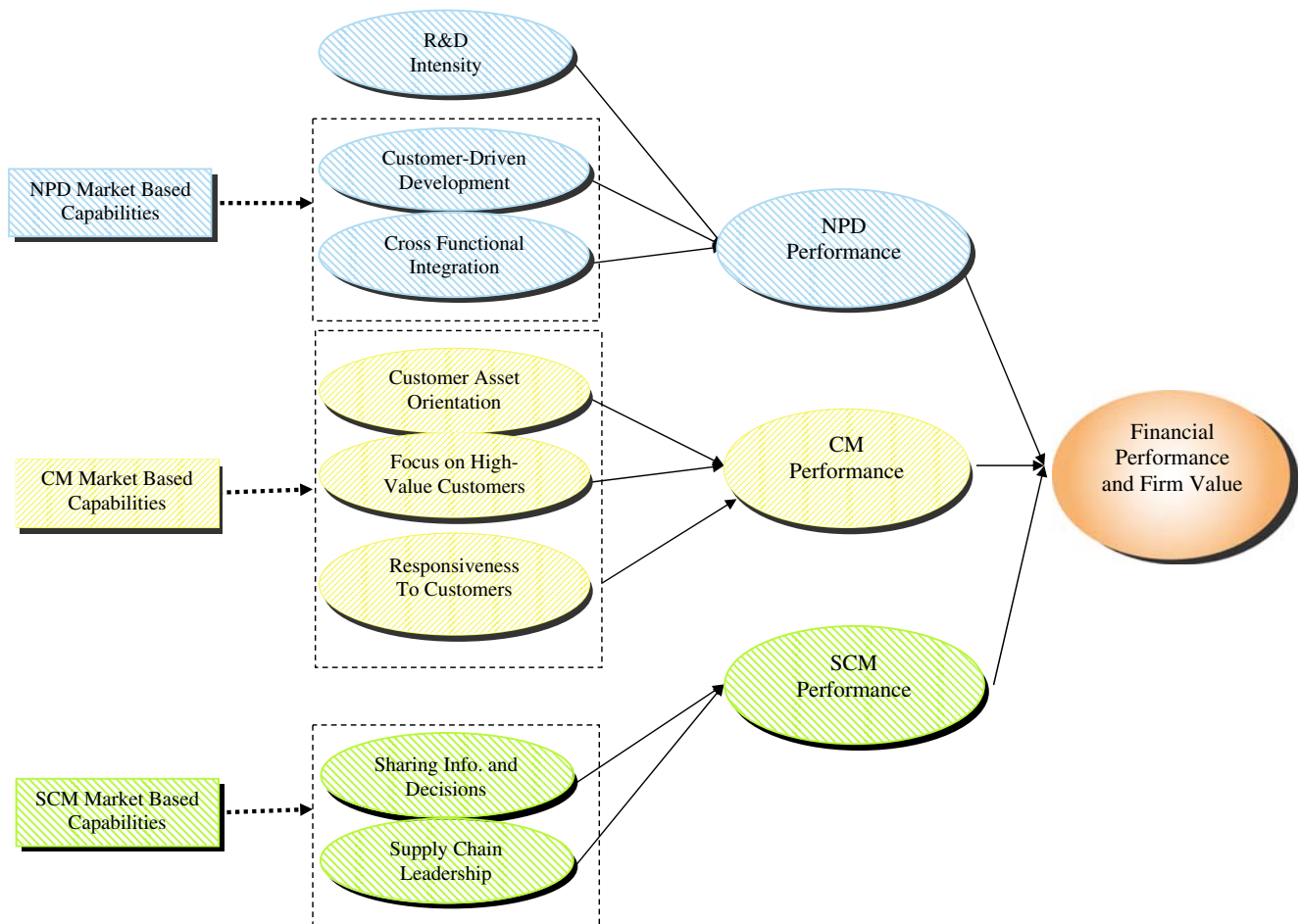
Figure 1 Competitive advantage in capabilities and business performance hypothesized model: capabilities, process performance and financial performance.

Finally, NPD performance should also impact financial performance positively. The NPD process allows organizations to deliver a stream of new products to the marketplace with meaningful benefits that consumers are willing to pay for (Gatignon and Xuereb 1997). Additionally, it facilitates bringing the new products to the market at a faster pace (Wind and Mahajan 1997). The effect of these would be to increase share of the market and growth in revenues to the firm. Through these benefits, the organization can increase financial performance.

H8   Controlling for the effects of the remaining two processes:

1. The greater the NPD performance, the better the financial performance.
2. The greater the CM performance, the better the financial performance.
3. The greater the SCM performance, the better the financial performance.

Joint impact of business processes on financial performance Srivastava et al. (1999) suggest that exploiting the interdependencies among the three core processes may likely yield superior performance for firms than simply maximizing the outcome of any one process. For example, a natural outcome of developing more innovative products and a more efficient supply chain is that customers get better products when and where they want them. The value from this synergy can be further maximized if customer offerings are based at the individual level. O'Reilly and Tushman (2004) observe that ambidextrous organizations are successful at both exploiting the present (CM and SCM) and exploring the future (NPD). However they also note that few companies have the capability to integrate all three processes well. It is not surprising then that integration of these processes provides competitive advantages that are harder for competitors to overcome (e.g., Nike's integration of innovation and branding; Dell's demand-chain management where supply-chain efficiencies are driven by customer information). On the other hand, it is possible that the three processes may be focused on different goals—such as NPD on bringing products to market faster and CM on offering quality products to customers. They may also differ on implementation requirements; for example, the NPD strategy may *not* go hand-in-hand with a supply chain strategy as they require different structures and processes for implementation success (Miles and Snow 1978). Although the last two points argues against synergy effects, we offer the following hypothesis based on Srivastava et al.'s view.

H9   The three business processes—NPD, SCM, and CM—are likely to have a synergistic positive impact on firm performance.

Firm size as a moderator This hypothesis may, however, not be applicable under all conditions or for all types of firms. One variable that has been clearly identified in the previous literature as an impediment for synergy effects is the size of the firm. Hagel and Singer (1999) note that size of the firm may contribute to conflict among the three processes. Smaller firms have the natural disadvantage of scale and scope inefficiencies. They are not large in size and thus do not enjoy economies of scale in their operations. They also may not have a large portfolio of product offerings to facilitate scope benefits (such as development of multiple relationships with customers). On the plus side, they may be better suited than larger bureaucracies for nurturing the creativity and speed required for product innovation. On the other hand, larger firms enjoy scale and scope advantages; however, they are prone to inertia and may not have the flexibility to make rapid adjustments to changing circumstances (D 'Amboise and Muldowney 1988). A higher level of inertia implies that (a) organizations may become locked-in to strategies, structures, and routines adopted during the earlier years, and (b) these may become irrelevant in a changing marketplace. Smaller firms, on the other hand, may be organized to facilitate rapid and effective communication throughout the organization, especially across different functional areas. Thus, while speed and adaptability favor smaller firms, larger firms are likely to enjoy scale and scope benefits.

The question then is which type of firm can manage these conflicts better in the process of bringing synergies into play. While scale and scope are beyond the reach of smaller firms, speed and adaptation may be feasible for larger firms. Larger organizations usually have more control over their environment, stronger marketing skills, more bargaining power with suppliers and distributors, more product development and customer management experience and more resources to develop technological capabilities (Gopalakrishnan and Bierly 2006). These advantages are likely to contribute to speed to market although speed of development may be an issue. The overall expectation is that larger firms are likely to take advantage of process synergies better than smaller firms and thereby pave the way for superior financial performance for the firm. Thus:

H9a   The synergy between the three processes—NPD, CM, and SCM, is likely to have a higher, positive impact on firm performance for larger firms compared to smaller firms.

Age of firm as moderator Another firm-level factor that may constrain the potential synergies among the three processes is the age of the firm. Younger firms suffer from the *liability of newness* (Stinchcombe 1964; Thornhill and Amit 2003). Younger organizations typically have less

knowledge about markets and customers; they may engage in inefficient practices until they learn; they may need time to forge relationships with external partners, including customers and channel members; and they may also not know about what they can do or should do (Lippman and Rumelt 1982). Further, they may not be sufficiently endowed with resources to execute their strategy (Venkatraman et al. 1990). The net impact is that process synergy is a goal that is difficult and costly to achieve for such firms. The problems of older organizations are somewhat different as they focus more on "strategic transformation." With passage of time, managers gain greater depth and breadth of knowledge about customers, suppliers, and competitors. Consequently, they do not face knowledge deficiencies that younger firms do and will be less prone to the liabilities of newness. Older firms, in fact, will have a significant edge on industry-specific knowledge and have a better "understanding of the key success factors in an industry, specialized knowledge of the product or technologies, or accumulated goodwill with customers and/or suppliers" (Cooper et al. 1994; pp. 374–375). Overall, they are more experienced and have had time to go through the process of learning. According to Agarwal and Gort (2002), learning relating to cost reductions, product improvements and new market techniques improve with age of the firm. Additionally, the firm accumulates knowledge about itself with time. Not only are firms able to learn about the quality of their endowments, they also are able to transfer knowledge across product and industry boundaries as they age. Their main issue is to ensure that the resources and capabilities they have developed do not lose relevance in a changing competitive environment.

The expectation is that older firms, because of their knowledge advantage, may be able to fire on all cylinders; in a process context, the implication is that all business processes work together and support each other. For instance, to counteract competitive actions and keep customers loyal to the firm, older firms may have developed excellent CM processes. They may then use better customer insights to boost NPD outcomes and to increase efficiency of SCM processes. In the case of younger firms, achieving a similar level of synergy is likely to come at a price. Overall, we can stipulate that synergy effects among the three processes may become more of a reality for older firms as compared to younger firms.

H9b   The synergy between the three processes—NPD, CM, and SCM, is likely to have a stronger impact on firm performance for older firms as compared to younger firms.

Cross-impact of drivers Given the need for integrated operations in any firm, it is likely for elements of one

business process to influence the performance of other processes. For example, responsiveness to customer needs may translate into better NPD performance; or, leadership in the supply chain may enable firms to combine network resources to not only create higher customer value (and thus influence CM performance), but also to bring about the synergies of the network to improve the NPD performance of the firm. Since there are a large number of such relationships that are feasible given our model, no attempt is made to provide specific hypothesis; instead the analytical method used for testing the model will be utilized to identify such cross-relationships after accounting for the drivers identified for each type of process.

Research methods

Sample and procedure

A sampling frame of firms was developed for four big cities in the mid-western and southern parts of the country. Fifty firms were selected from each city using a convenience sampling procedure. Of the 200 firms selected, 84 were public and 116 were private companies and sole-proprietorships. The key informant was defined as a top manager from the marketing function—VP, Director, or Manager. If the firm did not have a separate marketing department, the person in charge of marketing was identified as the key informant. A search process was initiated to find a contact person in each firm. This contact person was given a detailed explanation of the survey questions in a face-to-face meeting. In cases ($n=25$) where the contact person and the key informant were the same, that person was asked to complete the survey and mail it back in a self-addressed stamped envelope. Wherever the contact person and the informant were not one and the same ($n=63$), the former took responsibility for conducting a personal interview on behalf of the researchers with the latter. Given the strategic focus of the study and the need to contact top managers, it was recognized that mail surveys will get a low response rate; telephone surveys would be impossible; and personal interviews was a must.

Using the above process, a total of 190 contacts were made. Of these, complete survey responses were obtained from 88 firms, yielding a response rate of 46%. Non-response bias was tested by comparing the responding firms against a sample of non-responding firms on sales, net income, market value, and ROA (for the time period covered by the study). This evaluation was feasible only for publicly-listed firms in the sampling frame. The p-value for the four comparisons was 0.45, 0.49, 0.24, and 0.75, respectively, indicating the lack of difference between responding and non-responding firms.

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The sample profile of responding firms is reported in Table 1. Respondents are primarily in B to B firms (56.8%) that have a separate marketing department (92%). These firms are large in size with 65.5% employing more than 1,000 employees and have been around for more than 15 years (71.6%). Of the respondents, 59% are involved in the CM process, 59% in the NPD process, while 36% are involved with the SCM process. The profile variables of size, type of firm—B to B or B to C and presence of a separate marketing department are used as control variables in the analytical models used to test the proposed hypotheses.

Measurement

Table 2 includes a complete description of the measures used in the study. Similar to the procedure used by Moorman and Rust (1999), if the organization had only one strategic business unit (SBU), respondents were asked to focus on the overall firm when providing responses.

Measurement of Capability Capability is defined as a resource that is unique to a firm that can provide it with

Table 1 Sample description

	Number	Percent
Type of firm		
Type		
Retail	5	5.7
Consumer services	9	10.2
B-to-B	50	56.8
Consumer	14	15.9
Others	10	11.4
Size		
Size range		
<50	5	5.7
50–250	13	14.9
251–500	6	6.9
501–1000	6	6.9
>1000	57	65.5
Length of existence		
Length range		
<1 year	1	1.1
1–5	9	10.2
6–15	15	17.0
>15	63	71.6
Marketing structure		
Structure		
No marketing department	7	8.0
One overall marketing department	36	41.4
One marketing department for each SBU	44	50.6
Process involvement		
Process responsibility		
CM	52	59
SCM	32	36
NPD	52	59

comparative advantage (Day 1994). Accordingly, the present study views capability in terms of two components—a firm's perceived competency on a resource and the degree to which the resource is unique to the firm when compared to its closest competitors. The first component is measured using a multi-item scale for each resource, while the second component is measured with multi-item scales wherever feasible (some were measured using a single-item scale). The score for a firm on a capability will be a multiplicative term of the two components. The details of measurement are provided in Table 2.

For example, in the case of customer driven product development, a firm's competency is measured using a five-item scale. The five items capture whether the firm "co-designs products with customers," "relies on customers to define and clarify needs," "has users try out whatever we have developed to that point," "uses customers to try out product prototypes," and "reviews customer reactions to product designs as and when they are developed." After ensuring that the scale is consistent (Cronbach alpha=0.82), a summated scale is developed to reflect the level of CDD achieved by the firm. The summated scale is an average of the item scores comprising a scale. The uniqueness of this competency is captured with a global item: "to what extent do you believe this competency (i.e., designing products that are customer-driven) is unique to your firm/division when compared to your relevant competitors?" A capability score for CDD is computed next by multiplying the summated score with the uniqueness score. Where uniqueness is captured with a multi-item scale, the Cronbach alpha value for the same is reported in Table 2.

The competency information for the remaining capabilities used in the study is discussed below. The corresponding uniqueness items for each competency are reported in Table 2 and a separate discussion of the same is not provided. The Cronbach alpha value for uniqueness scales with multiple items range from 0.626 to 0.748 (see Table 2).

NPD capabilities NPD performance is hypothesized to be a function of two resources—CDD and CFI.[4] CDD is based

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[4] R&D Intensity is used as a covariate in the NPD process part of the model. It is typically defined as the proportion of annual sales that is spent on research and development. As pointed out by a reviewer, this measure is useful within an industry, but can be misleading in cross-sectional comparisons (an R&D/sales ratio may be low within a particular industry but look high compared to firms from other industries). A new R&D intensity index was therefore created by computing a multiplicative term that is based on (a) a firm's R&D score indexed by the average R&D score in its SIC group, and (b) a firm's R&D score indexed by the overall mean for the entire sample of firms. The first component captures whether a firm's R&D score is smaller or bigger than the average in its industry; and the second component captures where a firm is across the entire sample of firms.

Table 2 Measurement of market-based capabilities

Capability	Competency related to capability[a]	Uniqueness of competency[b]
Customer-driven development	1. We typically co-design our products with our customers. 2. We typically rely on the user to help us define and clarify the user's needs in developing our new products. 3. During the development of our products, we often have the users try out whatever we have developed up to that point. 4. We typically try to put working prototypes in the user's hands as early as possible in our development efforts. 5. We evaluate customer reactions to early product designs.	1. Designing/developing products that are customer-driven
Cross functional intergration	1. We use cross-functional teams (e.g., involving R&D, manufacturing, sales, and marketing) in designing new products. 2. We use trans-organizational teams (e.g., involving suppliers and complementors) while designing new products.	1. Closeness of relationship with suppliers 2. Loyalty of distribution network (Cronbach alpha=0.652)
Focus on high value customers	1. We continuously refine our customer base by eliminating low-value customers. 2. We make a conscious attempt to minimize catering to price-sensitive customers. 3. We focus our sales resources on high-value customers. 4. Our products are positioned at the high-end of the price-quality continuum. 5. We like to personalize services to our major customers.	1. Increasing the number of high value customers
Customer responsiveness	1. We try to help customers achieve their goals. 2. We educate the customer on the kind of product (even if it is not ours) that would best suit their needs. 3. We do not mind disagreeing with a customer in order to help him make a better business decision.	1. Capacity to respond to customer needs effectively 2. Customer education (Cronbach alpha=0.748)
Customer asset orientation	1. Our firm recognizes customers as assets. 2. Our firm is willing to spend dollars to nurture our customers. 3. We have designed systems to better understand and serve our customers. 4. We look upon CRM as the most important business process for driving financial performance.	1. Customer support 2. Focus on customer retention 3. Customer education (Cronbach alpha=0.626)
Information sharing	1. Our component suppliers often place some of their personnel on our product development teams. 2. We share demand knowledge with key component suppliers.	1. Relationship with suppliers 2. Supplier outsourcing arrangements (Cronbach alpha=0.699)
Supply chain leadership	1. We play a lead role in integrating products and services across vendors in developing customer solutions. 2. We actively leverage our "customer ownership" in negotiating with other members (suppliers, distributors, and complementors) of the value chain. 3. We are considered a partner-of-choice by our strategic partners. 4. We actively manage strategic alliances to enhance the value of our products and services to our customers.	1. Relationship with suppliers 2. Relationship management system for suppliers (Cronbach alpha=0.740)

[a] Unless mentioned otherwise, the items in this column are rated on a five-point strongly disagree-strongly agree scale.

[b] The items in this column are rated using the following stem: To what extent do you believe each competency or skill is unique to your firm/business unit when compared to your most relevant competitors? A four-point scale is used where 1=not all unique, 2=somewhat unique, 3=fairly unique, and 4=very unique.

on a scale proposed by Souder et al. (1998). Its details were presented above. CFI is captured by the degree to which a firm uses cross-functional teams internally and trans-organizational teams externally in the design and development of new products. A two-item scale proposed by Harmsen et al. (2000) was used (alpha=0.77).

CM capabilities The study includes three CM capabilities—focus on high-value customers, responsiveness to customer goals and needs, and nurturing customers as assets of the firm. Since no previous study has empirically examined the impact of a firm's ability to identify and service high value customers, a new scale is developed for this study. Five

items were developed that measure whether the firm makes a conscious attempt to serve high-value customers (HVCs) and avoids serving low-value customers. The five-item scale has an acceptable Cronbach alpha of 0.72. Customer responsiveness refers to the firm's willingness to help the customer meet his goals and needs. Three items proposed by Harmsen et al. (2000) were used to measure this construct (Cronbach alpha=0.67). Customer asset orientation refers to whether a firm views its customers as assets and is willing to invest in their future. A five-item scale developed for this concept has high internal consistency (alpha=0.81).

SCM capabilities The key capabilities driving SCM performance are information sharing among supply chain members and leadership of the supply chain network. A three-item scale was developed to measure information sharing, of which one item was dropped due to low correlation with the remaining two items. The two items remaining show a high consistency (alpha=0.82). Leadership is defined in terms of how a firm leverages supply chain relationships to create value for customers. A good supply chain leader uses their "ownership" of customers for negotiating with other members of the value chain. This concept was measured using four items (alpha=0.83).

Business process performance Since objective data is typically not available for organizational performance at the process level, the subjective evaluations of respondents are utilized instead in the current study. The specific items used are listed in the Appendix. NPD performance is expressed along three dimensions[5]—development of products that are unique and differentiated from those of competitors (NPD-DP), market performance of products developed (NPD-MP), and time efficiency as captured by the cycle time of product development (NPD-TE). A factor analysis of the items comprising the three dimensions suggested that two of the three—NPD-MP and NPD-TE—were highly correlated. These two were therefore combined into a single dimension and named NPD effectiveness (NPD-EFF). The Cronbach alpha value for this five-item scale is 0.808. The NPD-DP dimension is measured with the help of a three-item scale drawn from measures recommended by Storey and Easingwood (1998) and Sengupta (1998). This scale has good internal consistency

property (alpha=0.75; see Table 2). CM focuses on increasing the scope of relationships with customers. This can be done through increased satisfaction and cross-selling of products to existing customers. Five items are used that capture the scope of relationships, namely, (1) customer satisfaction, (2) customer retention, (3) ability to charge price-premium for products, (4) number of customer relationships, and (5) reputation or image (alpha=0.82). Finally, the SCM process attempts to increase the efficiency of operations so that cost can be minimized. Efficiency can be thought of both in terms of supplier as well as customer demand. Three items are used that capture efficiency, namely, (1) inventory cost, (2) implementing JIT processes and (3) smoothing demand volatility. The Cronbach alpha value for this scale is 0.78.

Financial performance The study adapted a measure used by Moorman and Rust (1999) for measuring subjective financial performance. The measure has the following components: (1) return on assets, (2) net profits, (3) sales and (4) market share. Together, the items show good reliability (alpha=0.91).

Control variables Firm size (expressed in terms of number of employees), type of business (business to business or business to consumer), presence of a separate marketing department, and process affiliation of the respondent (i.e., whether the respondent is associated with NPD, CM, or SCM process) were used as control variables in every model tested.

Measurement validity

Discriminant validity On confirming the internal consistency of each scale, the next step was to explore the discriminant validity of the 12 study measures using confirmatory factor analysis (CFA). In the case of the seven MBCs, the correlation/covariance matrix used as input in the CFA model was based on the multiplicative scores. A fully disaggregated measurement model with all observed indicators was estimated to ensure that the measures corresponded only to their hypothesized constructs and evidenced acceptable reliability as well as convergent and discriminant validity. The fit statistics are as follows: chi-square=328.6 (df=221), chi square/df ratio <2.0; RMSE=0.058; NNFI=0.91, CFI=0.94, and IFI= 0.95. These statistics suggest that there is evidence of discriminant validity among the measures that are used to capture the entire set of concepts used in the model. Further, each item has a significant and dominant loading on its hypothesized factor (>.30, p<.05) and the spread between the dominant and cross-loading is large and

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[5] These items/dimensions are similar to the measures used by Baker and Sinkula (2005) for capturing new product success of a firm. Baker and Sinkula (2005) include new product rate (number of new products in the present study), new product success rate (products that are market winners in the present study), degree of product differentiation (NPD-DP), competitors' ability to copy new products (NPD-DP) and new product cycle time (NPD-TE).

reasonable (e.g., >.30). Both these conditions are satisfied for all items but one. Overall, each item has a dominant loading on its hypothesized factor and cross loadings are significantly smaller in magnitude.

Common method variance A critical issue in survey research is 'common method variance' as there is considerable evidence that it can have a substantial effect on observed relationships between measures of different constructs. Of the several approaches recommended by Podasakoff et al. (2003) to handle this issue, the "general factor covariate" approach was used in this study. The general factor was used as one of the covariates in each model tested.

Method of analysis Multiple regression analysis, using the hierarchical method of entry, was performed to test the hypotheses. The hierarchical method evaluates the mediation role of the three process performance (NPD, CM, and SCM) concepts. Regression was chosen rather than a structural equations approach because of sample size limitations. A variant of structural equations, namely path analysis, was used for the limited purpose of identifying cross-process relationships beyond those posited by the model (using modification indices data). The modification index can be used to re-specify the hypothesized model. The modification index of a fixed parameter gives the approximate decrease in chi-square if the fixed parameter is freed. Regression analysis was also used for capturing the interdependencies among the three processes (NPD, CM, and SCM) within organizations. Five two-way interaction terms (two dimensions of NPD * CM, two dimensions of NPD * SCM, and CM * SCM) and two three-way interaction terms (two dimensions of NPD * CM * SCM) for the process performance variables are computed based on the residual method to make them orthogonal to the main

effect terms and thereby eliminate any multi-collinearity among them. Further, the moderator hypotheses are tested by creating sub-groups of respondents based on approximately equal sizes in each group and estimating the model with financial performance as the dependent variable within each sub-group. Tables 3, 4, reports correlations among the study variables and their descriptive statistics. Table 5 reports the results of model estimation.

Results

Cross-process drivers

Given the preponderance of opinion that the three business processes are likely to be inter-related, the nature of the interrelationship was identified with the help of a path analysis procedure using LISREL. The fit statistics for the predicted model indicated the following: chi-square with 262 $df=424.4$ ($p=.00$); CFI=0.91; normed fit index (NFI)= 0.88. The modification index value provided by a LISREL algorithm was utilized to add one cross-process path to the proposed model: CA in customer asset orientation → SCM performance. The relationship signaled by this path makes intuitive sense. When customers are considered as assets, firms have more information on them which can contribute to greater demand certainty and better SCM performance. After adding the new path, the fit statistics improved as follows: chi-square with 261 $df=409.1$ ($p=.000$); CFI= 0.92; and NFI=0.90.

Mediation analysis

To test for the explanatory power of the four process performance variables—NPD (DP, EFF), PCM, PSCM—a

Table 3 Descriptive statistics and correlations

Variable	Description	Mean	Standard deviation	Range
PFIN	Financial performance	3.31	1.01	1–7
DP	Differentiated products	2.94	0.93	1–5
EFF	NPD effectiveness	3.23	0.94	1–7
PCM	CM performance	4.41	1.17	1–7
PSCM	Supply chain performance	3.86	1.20	1–7
CDD	Customer-driven development	3.39	0.86	1–5
CFI	Cross functional integration	3.20	1.12	1–5
HVC	Focus on high value customers	3.35	0.69	1–5
CRES	Customer responsiveness	3.39	0.86	1–5
CN	Customer asset orientation	3.32	0.86	1–5
IT	Information transparency	2.87	1.04	1–5
SCL	Supply chain leadership	3.45	0.81	1–5

Interaction terms (not reported above) have a mean of 0 and a variance of 1

Table 4 Correlations among study constructs

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	PFIN	.91																		
2	DP	−.09	.75																	
3	EFF	.36	.19	.81																
4	PCM	.62	.12	.46	.82															
5	PSCM	.59	−.10	.33	.64	.78														
6	CDD	.16	.15	.29	.28	.30	.82													
7	CFI	.26	.23	.41	.31	.38	.55	.77												
8	HVC	.28	.20	.33	.53	.35	.23	.20	.72											
9	CRES	.39	.14	.28	.51	.48	.33	.36	.22	.67										
10	CN	.35	.03	.25	.53	.60	.20	.43	.38	.45	.81									
11	IT	.03	−.07	.16	.17	.27	.07	.32	.02	.10	.02	.82								
12	SCL	.33	.09	.41	.56	.53	.21	.42	.36	.40	.32	.51	.83							
13	DPSCM	.10	.06	.05	.17	.00	−.27	−.06	.00	.16	−.11	.15	.14	NA						
14	DPCM	.44	−.19	.18	.25	.16	−.05	.06	−.05	.11	−.01	.07	.17	.10	NA					
15	EFFSCM	−.06	−.21	.00	.12	.00	−.03	−.02	−.04	.15	.02	−.06	.06	.04	−.15	NA				
16	EFFCM	.01	−.20	.00	.00	.15	.15	.13	.00	.11	−.03	.00	.09	−.08	−.02	.59	NA			
17	CMSCM	.11	−.03	.19	.00	.00	−.04	.13	−.04	.08	.08	.08	.10	.14	.01	.45	.30	NA		
18	DPSCMCM	−.04	.09	.00	.00	.00	−.09	−.05	−.06	−.01	.10	.08	.15	.00	.00	.00	.00	NA		
19	EFFSCMCM	.07	.02	.00	.00	.00	.01	−.02	.15	−.02	.23	.07	−.02	.00	.00	.00	.00	.00	.13	NA

Reliability values are reported along the diagonal

NA not applicable, *DPSCM*=DP*PSCM, *DPCM*=DP*PCM, *EFFSCM*=EFF*PSCM, *EFFCM*=EFF*PCM, *CMSCM*=PCM*PSCM, *DPSCMCM*= DP*PSCM*PCM, *EFFSCMCM*=EFF*PSCM*PCM

hierarchical regression approach suggested by Baron and Kenny (1986) was used. Initially, the influence of the seven drivers of process performance was evaluated using a step-down *F*-test. This involved including the MBC drivers (seven), the process performance variables (four) and two of the 14 uniqueness/competency variables that showed a significant relationship with financial performance in a model explaining subjective financial performance (R^2=.460), and then selectively excluding either the drivers or the process performance variables. The exclusion of the drivers did not significantly change the explanatory power of the regression model (R^2=.460; change in R^2=.037; change in mean-squares=.400, F=0.692, p=.679). On the other hand, the exclusion of the four process performance concepts significantly decreased model fit (R^2=.224; change in R^2=0.236, change in mean squares=4.494, F=7.765, p=.000). Further, the model R^2 for the equations explaining process performance as a function of the drivers were all significant (R^2 (NPD-DP)=.25; R^2 (NPD-EFF)=.35; R^2 (CM)=.51; R^2 (SCM)=.38). These results show that NPD performance, CM performance, and SCM performance mediate the influence of firm capabilities on firm financial performance.

Test of hypotheses

The standardized parameter estimates corresponding to the regression model are reported in Table 5. Overall, it appears that the models provide a reasonable assessment of the MBCs that drive performance of business processes. The

range of variance (adjusted R^2) explained is between 21% and 54% for the four major performance variables.

Because each of the models included multiplicative or interaction terms, the traditional Baron and Kenny (1986) approach to testing moderating effects was carried out. A conservative approach was used as the interaction terms were computed after taking out the main effect terms using a residual method. The improvement in R^2 arising from inclusion of interaction terms was .044 for product differentiation, .008 for NPD effectiveness, .167 for customer management performance, .302 for supply chain management performance, and .146 for financial performance. Except for the second model, the rest were statistically significant at the p<.05 level, illustrating the relevance of the interaction terms.

Development of differentiated products There was strong support for one of the two hypothesized predictors, namely capability in CDD (b=0.22, p=.044). Additionally, uniqueness in CDD was another significant predictor (b=0.62; p=.000).

NPD effectiveness On the other hand, except for competency in CFI (b=0.29, p=.044), neither uniqueness nor capability in CFI exhibited a positive association with the second NPD metric—that is, effectiveness. Thus, there is partial support for H$_1$ and no support for H$_2$.

CM performance H$_3$ to H$_5$ investigate the determinants of CM process performance. Results show support for one of

Table 5 Effects of market-based capabilities on financial performance of firms

		Beta coefficient[a]	T-value	R^2 (Adj. R^2)
Process performance models				
Dependent variable: NPD performance-differentiated products (DP)				**.36 (.21)**
	R&D Intensity (RD) → DP	.13	1.23	
H1	Customer driven development (CDD) → DP			
	Competency	.12	.89	
	Uniqueness	**.62**	**3.68**	
	Competency * uniqueness	**.22**	**2.06**	
H2	Cross-functional integration (CFI) → DP			
	Competency	.10	.74	
	Uniqueness	−.25	−1.49	
	Competency * uniqueness	−.11	−.93	
	Common factor variable	−.02	−.19	
Dependent variable: NPD performance-effectiveness (EFF)				**.34 (.19)**
	R&D Intensity (RD) → EFF	.09	.84	
H1	Customer Driven Development (CDD) → EFF			
	Competency	.04	.28	
	Uniqueness	.13	.76	
	Competency * uniqueness	.05	.46	
H2	Cross-functional integration (CFI) → EFF			
	Competency	**.29**	**2.05**	
	Uniqueness	.21	1.26	
	Competency * uniqueness	.08	.69	
	Common factor variable	.10	0.85	
Dependent variable: CM performance (PCM)				**.63 (.54)**
H3	Focus on high value customers (HVC) → PCM			
	Competency	.05	.64	
	Uniqueness	**−.34**	**−3.31**	
	Competency * uniqueness	**.49**	**5.17**	
H4	Customer responsiveness (CRES) → PCM			
	Competency	**.27**	**2.62**	
	Uniqueness	−.03	−.35	
	Competency * uniqueness	−.15	−1.63	
H5	Customer asset orientation (CN) → PCM			
	Competency	**.25**	**2.46**	
	Uniqueness	**.20**	**2.29**	
	Competency * uniqueness	.13	1.46	
	Common factor variable	*.14*	*1.67*	
	Respondent-SCM function	**.23**	**2.74**	
Dependent variable: SCM performance (PSCM)				**.48 (.36)**
H6	Information sharing (IT) → PSCM			
	Competency	**.57**	**2.32**	
	Uniqueness	.15	.91	
	Competency * uniqueness	.07	.64	
H7	Supply chain leadership (SCL) → PSCM			
	Competency	.04	.37	
	Uniqueness	−.02	−.16	
	Competency * uniqueness	**.68**	**3.75**	
Firm performance: subjective indicator				
Dependent variable: subjective financial performance (FP)				**.72 (.64)**
H8a	Differentiated products (DP) → FP	.01	.09	
H8a	NPD effectiveness (EFF) → FP	.06	.74	
H8b	CM performance (PCM) → FP	**.27**	**2.46**	
H8c	SCM performance (PSCM) → FP	**.45**	**4.65**	
H9	DP * PCM → FP	**.38**	**5.02**	
H9	DP * PSCM → FP	.03	.36	
H9	EFF * PCM → FP	−.04	−.43	

Table 5 (continued)

		Beta coefficient[a]	T-value	R^2 (Adj. R^2)
H9	EFF * PSCM → FP	−.05	−.45	
H9	PCM * PSCM → FP	.12	1.33	
H9	DP * PSCM * PCM → FP	.02	.22	
H9	EFF * PSCM * PCM → FP	.09	1.33	
	Common factor variable	**−.25**	**−3.34**	
	Respondent – B to C firm	**.32**	**2.47**	
Firm performance: objective indicators				
Dependent variable: growth in sales (GS)				**.17 (.08)**
H9	Differentiated products (DP) → GS	−.05	−.30	
H9	NPD effectiveness (EFF) → GS	.09	.48	
H9	CM performance (PCM) → GS	**.31**	**1.98**	
H9	SCM performance (PSCM) → GS	.20	1.28	
Dependent variable: growth in profitability (GP)				**.33 (.24)**
H9	Differentiated products (DP) → GP	−.23	−1.57	
H9	NPD effectiveness (EFF) → GP	−.22	−1.30	
H9	CM performance (PCM) → GP	−.14	−.86	
H9	SCM performance (PSCM) → GP	.15	1.03	
	Size of firm	**−.31**	**−2.06**	
Dependent variable: price-to-book ratio (PB)				**.38 (.24)**
H9	Growth in sales (GS) → PB	**.37**	**2.35**	
H9	Growth in profitability (GP) → PB	−.06	−.34	
	SCM performance	**.41**	**2.57**	
Dependent variable: growth in market value (MCAP)				**.20 (.03)**
H9	Growth in sales (GS) → MCAP	**.39**	**2.21**	
H9	Growth in profitability (GP) → MCAP	−.09	−.47	

In all of the above models involving subjective indicators as the dependent variable, the following control variables were included as covariates: size of firm, presence of separate marketing department, Type of industry (B to B or B to C), respondent association to process type (NPD, CM, or SCM). Also included was the common factor variable to account for common method bias. Only the significant covariates are however reported in this table. Non-significant covariate information has been left out to avoid the clutter and enhance interpretation.

[a] Coefficients in *bold* are significant at $p<.05$ and coefficients in *bold and italics* are significant at $p<.10$.

the three hypotheses (H₃), namely capability associated with focus on high value customers ($b=0.49$; $p=.000$). In the case of customer responsiveness, while competency has a positive association, uniqueness shows no association. Finally, both competency and uniqueness in customer asset orientation support positive CM performance.

SCM performance H₆ and H₇ hypothesized that sharing demand information and supply chain leadership respectively would contribute to better SCM performance. The results show that while competency in sharing information with suppliers contributes to SCM performance, capability associated with supply chain leadership provides higher SCM performance ($b=.68$, $p=0.000$). Thus H₇ is supported while H₆ is not.

Financial performance Finally, of the three business processes, both CM and SCM have a positive, significant association with the financial performance of firms. The beta coefficient for CM process is 0.27 ($p=.017$) and SCM process is 0.45 ($p=.000$). The two way interaction term PCM*PNPD (differentiated products) is also positive and

significant ($b=0.38$; $p=0.000$). These results support H₈b and H₈c and partially support H₉. Results using objective financial information for a subset of firms are reported in the end note.[6]

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[6] Additionally, objective financial performance metrics—profitability (EBIT), sales, and market value—were collected from Compustat tapes for the time period 1997–2004. The data collection year (2001) was used as a separation point and average performance was computed for the four years before 2001 (1997–2000) and three years after 2001 (2002–2004). These average numbers were used to compute a growth index for each objective indicator. Additionally, the price to book ratio was computed for each firm for the time period 2002 to 2004. We were however limited in gathering objective data for all firms in the sample as many were privately-held. Objective data was collected only for 51 of the 88 firms in the sample. The model captured the direct and indirect effect of process performance variables on firm performance. The indirect effect is based on the notion that the impact of business processes will be felt first on revenue and profit growth of the firm; these, in turn, will likely enable investors providing a higher price multiple for such firms. Results showed that CM performance influenced both price-to-book ratio and growth in market value indirectly through its positive impact on sales growth. SCM performance influenced price-to-book ratio directly in a positive manner. NPD performance had no impact on any of the objective performance indicators. Overall, these results are quite consistent with the findings for subjective financial performance.

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To assess stability of the model results, the financial performance model was estimated in two groups of firms—industrial and consumer product companies. The results were quite consistent across the two groups. Both CM performance and the CM performance * NPD (DP) terms were positively associated with financial performance for both groups of firms. Supply chain performance showed a positive correlation in the case of consumer product group, while remaining non-significant for the industrial products group. Overall, it can be concluded that the model is valid at least for broad industry groups. The stability of estimates will need to be tested among more finely defined industry groups in future research.

Moderator hypotheses Firm size and age were proposed as moderator variables. For both small and large firms, three predictors were significant—namely, CM performance, SCM performance, and the interaction term between NPD performance (differentiated products) and CM performance (see Table 6). In addition, the interaction between CM performance and SCM performance was marginally significant and positive for smaller firms. The three-way interaction term signaling presence of synergy among all three processes was non-significant.

The use of age of the firm as a moderator variable yielded more complex results. Older firms (>10 years) showed results that were similar to those of larger firms. In the case of firms that were younger, CM performance

had the strongest impact on financial performance. Additionally, the following (non) synergies were observed:

– NPD performance (differentiation ability)*CM performance: positive
– CM performance * SCM performance: negative
– NPD performance (effectiveness)* CM performance* SCM performance: negative

These results suggest that synergies among the processes have differential impact on the financial performance of younger firms.

Discussion

The primary objective of the present study was to gain a better understanding of MBCs and their influence on value-adding processes such as NPD, CM, and SCM and consequently the financial value of a firm. Before discussing the study's contributions in greater detail, we would like to acknowledge the limitations of the study.

First, since the study uses survey design, the data is cross-sectional in nature and we advise caution in drawing cause–effect inferences. The results, therefore, might not be interpreted as proof of causal relationships, but rather as lending support for a prior causal scheme. Second, the study is based on a small sample of 88 firms. However, any

Table 6 Moderator results

Dependent variable: firm financial performance				
Predictor variable	Size of firm		Age of firm	
	Small beta (p)	Large beta (p)	Younger beta (p)	Older beta (p)
NPD performance				
Differentiated products	−.008 (.953)	.075 (.607)	−.111 (.535)	.042 (.675)
NPD effectiveness	.143 (.328)	−.045 (.833)	−.138 (.368)	.108 (.328)
CM Performance	**.301** (.032)[a]	**.611** (.001)	**.675** (.002)	**.453** (.000)
SCM Performance	**.239** (.052)	**.328** (.023)	.116 (.359)	**.271** (.014)
DP*PSCM	.020 (.850)	−.040 (.775)	.039 (.688)	.072 (.478)
EFF*PSCM	.058 (.792)	−.178 (.463)	−.277 (.235)	−.038 (.774)
DP*PCM	**.461** (.001)	**.385** (.015)	**.446** (.009)	**.453** (.000)
EFF*PCM	−.279 (.175)	−.010 (.954)	.261 (.235)	−.014 (.914)
PCM*PSCM	***.258*** (*.094*)	.194 (.231)	**−.385** (.050)	.150 (.195)
DP*PCM*PSCM	−.132 (.223)	.021 (.880)	−.082 (.593)	−.004 (.966)
EFF*PCM*PSCM	.069 (.642)	.024 (.921)	**−.489** (.009)	.131 (.252)
R^2	**0.665**	**0.621**	**0.837**	**.551**
Adj. R^2	**0.550**	**0.461**	**0.767**	**.450**

To facilitate interpretation, although control variables (B to B, B to C, presence of marketing department, the functional area of respondent and the marker variable) were used in the above moderator regression models, their coefficients are not reported in the above table. Most of the control variables were non-significant.

[2] Coefficients in bold are significant at $p < .05$ and coefficients in bold and italics are significant at $p < .10$

significant effects found in such a small sample will only become more apparent in larger samples. Third, the study could not provide an exhaustive account of all MBCs that affect business process performance. Future studies could extend our study by including additional capabilities in the conceptual model. Fourth, the study could not test the validity of the results across different industry groups because of sample size limitations. Future studies need to examine the generalizability of the results in different vertical industries such as industrial products, electronics, trade, pharmaceuticals, and so on. Fifth, the study could not provide a comprehensive evaluation of NPD performance because of measurement issues. Future studies could utilize proximal measures of NPD performance to provide a definitive evaluation of the relevance of NPD capabilities. Despite these limitations, our results offer useful insights into the relevance of MBCs for business process performance. We discuss key findings of the study and draw managerial implications from them in the next section.

MBCs and business process performance

The results suggest that the set of MBCs considered in the study have a significant influence on the three business processes, NPD, CM and SCM. Among the three, the R-Square for the respective models indicated that there was stronger identification of MBCs for CM processes and much less so for the SCM and NPD processes.

NPD performance Businesses that have built the capability to understand the voice of customers and engage them during the development process show better results with respect to development of unique and distinctive products. Competence in CDD alone is insufficient; to enjoy greater NPD differentiation, firms also need to be unique when compared to competitors in understanding customer voice. In other words, if a firm is equivalent on CDD with other firms, higher success on NPD performance may not result to that firm. This result is a strong endorsement for superior customer orientation as a tool for developing distinctiveness in the innovation processes used by the firm. Capability relating to integration of product development activities across functional units and external partners does not appear to be important for developing differentiated products. On the other hand, bringing about effectiveness in developing products faster and developing products that are winners appear to be more sensitive to competence in cross-functional integration. Results show that competence in CFI is sufficient for higher NPD performance; whether the firm has a distinctive advantage on this competence does not seem to matter. Overall, there is intuitive appeal to the idea that using the knowledge and expertise of suppliers to complement internal knowledge can systematically

reduce cycle time. Interestingly, faster and different are two metrics that innovation teams are focused upon and the present study offers results which suggest that the drivers of the two metrics may be different.

CM performance With respect to CM performance, the study findings are thought provoking. CM performance is based on loyalty and satisfaction metrics. Results show that these are influenced critically by a firm's capabilities in targeting high value customers. This result is consistent with the prescription of most CM pundits that companies need to achieve focus in selecting customers and serve high-value customers rather than all customers. It appears that skills with respect to targeting high value customers represent conditions for staying ahead in the game and enabling the firm to derive CM advantages. However, this result may not be socially acceptable—if firms avoid the weaker customers for the sake of increasing profitability, they may be viewed as lacking a social conscience. In the case of customer responsiveness, while competency has a positive impact, uniqueness mitigates that impact. This result is surprising as it implies that showing responsiveness may actually be raising customers' expectations to a degree where loyalty and satisfaction decreases rather than increases. Finally, customer nurturing has positive outcomes—both competence and uniqueness are positively associated with CM performance. The overall prescription is clear—firms need to target high value customers, be responsive while managing their expectations, and nurture them as assets of the firm.

SCM performance Finally, SCM performance is affected by capabilities in supply chain leadership and competence in information sharing. We had expected both determinants to reduce demand certainty and increase supply chain efficiency. Together, the objective was to keep supply and demand in sync, increase supply chain efficiencies and pass on the lower costs to customers. We also found that information sharing provided firms with the ability to lead supply chain networks (thus having an indirect impact on a firm's supply chain performance). Transparency coming through sharing of information has been identified as an important coordination mechanism affecting the inventory and production levels of all parties in the supply chain (Lee et al. 1997).

Impact of business process performance on financial performance of firm

Of the three business processes, with one exception, results provide consistent support for the importance of the CM process. It was a significant predictor in the model

explaining a firm's financial performance. It also exhibited positive synergy with (one dimension of) NPD performance in its impact on a firm's financial performance in the overall sample as well as in all the four sub-samples that were examined. Even in the model that was based on objective performance indicators, it had a positive, indirect influence on both price-to-book ratio and growth in market value of firms (see Table 5 and end notes for more details). CM performance had a positive impact on growth in sales, which, in turn, influenced growth in both of these value indicators. Thus the biggest managerial contribution of the study is the illustration that CM processes can yield positive economic returns to businesses that adopt them. Not only has this issue been at the center of managerial debate for the last few years, but also most practitioner observations have generally been negative with regards CM payoff.

Results pertaining to SCM performance were mixed. SCM processes show a positive direct impact on financial performance of firms. However, for younger firms, SCM performance exhibits negative synergy with CM and NPD performance. The implication is that younger firms, because of the liability of newness, have difficulty achieving consistently positive results across processes. In other words, younger firms face difficulties in simultaneously maximizing the objectives of each of the three business processes. Overall, it does appear that enhancing SCM performance will be positive for firms.

Finally, the results for NPD performance were mixed. One of the NPD performance indicators—developing differentiated products—had a positive synergistic impact on firm financial performance when combined with CM performance. This synergy was observed not only for the entire sample, but also for each of the four groups reported in Table 6. The message is clear: when customers are offered differentiated products and services and when they show satisfaction and loyalty to firms based on how firms involve them in understanding and responding to their needs, the net impact is a higher level of financial performance by the firm. An alternative argument is that CM processes provide the opportunity to firms to improve scope of relationship with customers and the NPD processes provide the tools for establishing those relationships.

However, some differences were observed for firms that differed on age. Older firms were able to manage the synergies among the three processes better than younger firms; the latter showed conflicting effects for SCM and CM performance when crossed with one indicator of NPD performance (effectiveness). Maximization of PNPD indicates faster market introductions. Faster product introductions (facilitated in companies that have strong CM processes) are likely to be more risky (as there is less time to reach equilibrium levels) and thus result in greater demand volatility and the need to hold higher levels of inventory to reduce that uncertainty. But doing this will weaken the impact of PSCM on financial performance of the firm. The latter result suggests that economies of scale and speed of development may not go together for younger firms—nimbler firms may not have the scale, and firms with scale may not be quick.

Overall, when all processes are examined simultaneously, the clear winner is the CM process. This result augurs well for the marketing function within organizations, as it has the most interaction with customers and is most concerned with maximizing satisfaction and retention of existing customers. Additionally, the results seem to indicate that synergies may have a positive impact between pairs of processes, but not across all three processes. Thus, Srivastava et al.'s (1999) synergy hypothesis receives only partial support in this study.

Moderator results

Firm size and age were used as moderator variables for the overall model tested in the study. Results indicate that smaller firms benefit from synergy much more than larger firms. Higher performance in both CM and SCM processes yields better financial performance for such firms. Similarly, higher performance in both CM and NPD-DP processes yields better financial performance. On the other hand, only the latter effect is found in larger firms. The three-way interaction effects were non-significant for both types of firms, suggesting that maximizing performance in all three processes simultaneously may not yield positive benefits to firms. In other words, it may not be possible for firms to bring about positive synergies across all three processes. Additionally, it was found that the scale of influence of CM and SCM performance is larger for bigger firms as compared to the smaller firms. The message is that larger firms get more bang for their buck when their CM processes work well than is the case with smaller firms.

When using age as the moderator variable, it was observed that older firms had positive synergy between SCM and NPD processes. The younger firms, however, showed mixed results and signaled that they may be unable to integrate all three processes to work together in a synergistic manner. The knowledge gap logic given in the hypothesis section may explain why younger firms are unable to enjoy the benefits of synergy.

Implications for theory and practice

The study not only underscored the importance of business processes for firm performance, it also laid out a framework of capabilities that drive process performance. From a generalizability perspective, more studies using different contexts and larger samples are needed to throw light on the

framework tested in the present study. Additionally, future studies could identify other firm characteristics, environment characteristics, or process characteristics that make the model relationships more salient under certain conditions. Moreover, future studies could use more secondary data to evaluate the impact of the three business processes on firm performance. Finally, one of the under-explored areas is the cross-relationships among the three processes. Future studies could more thoroughly examine the cross-impact of process drivers on the performance of other processes.

From a managerial perspective, several key implications can be drawn from the study's results. First, marketing managers have to shift from an "expense and revenue" focus to an "investment and assets" focus. This shift will have positive impact on both the strategic role of marketing and the function's ability to address top management concerns. Second, there is a clear message that the processes are intertwined and affect each other. Third, CM appears overall to be more important than the other two processes in driving firm value. This finding provides a solid platform from which marketing's value to the organization can be measured and leveraged. Finally, while making resource allocation decisions, managers need to recognize conditions under which those allocations will bring about higher outcomes.

Conclusion

The purpose of this study was to develop and test a conceptual framework that broadens our understanding of the role of MBCs in driving performance and creating shareholder value. While Srivastava and his colleagues (1998, 1999) have exhorted marketing to bring in relevant inputs into business processes, no previous study has (a) provided clarity with respect to what these inputs should be, or (b) how important they are likely to be in impacting process performance and firm value. The present study addresses these gaps and examines their implications for the marketing function. More detailed studies incorporating other process drivers and evaluating the interactions among the processes themselves would be natural extensions to the work reported in the present study.

Appendix: measures

This section includes measures for constructs not included in Table 2. A five-point strongly disagree–strongly agree scale is used for the first two scales below.

New product development performance-differentiated products (NPD-DP)

- Our products are difficult for competition to copy.
- Our product designs are unique.
- Our products do not have a significant advantage over those of competitors. [R]

New product development performance-time efficiency (NPD-TE)

- In general, we have difficulty adhering to time deadlines in our new product projects. [R]
- We get our products to market on or ahead of schedule.
- We perform better than our objectives on speed of new product development.

The following stem is used for the next four measures. (1=worse, 4=on par, and 7=better)

Relative to your firm's (division's) stated objectives, how is your firm (division) performing on:

New product development performance-outcomes (NPD-OS)

- Number of new products developed
- Number of new products that are "big" winners

Customer management performance (PCM)—adapted from Moorman and Rust (1999)

- Customer satisfaction
- Customer retention
- Ability to charge price premium for products/services
- Increasing number of relationships with customers through cross-selling
- Image/reputation

Supply chain management performance (PSCM)—new scale

- Inventory cost
- Implementing JIT processes
- Smoothing demand volatility

Financial performance—adapted from Moorman and Rust (1999)

- Sales
- Profitability
- Market share
- Net operating margins
- Return on assets

R&D intensity (adjusted to industry norms)

What is your annual R&D expenditures as a percentage of sales?

   (<1%, 1–3%, 4–6%, 7–9%, 10–12%, 13–15%, >15%)

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