An integrated marketing capability benchmarking approach to dealer performance through parametric and nonparametric analyses

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A B S T R A C T

The role of marketing capabilities as a source of sustainable competitive advantage has been discussed previously in the marketing strategy field. Benchmarking, a well-known learning mechanism, is suggested as a tool to identify and improve the marketing capabilities of a firm. Despite its popularity as a theoretical concept, there is not much empirical evidence to support the view of benchmarking marketing capabilities as a route to guide managers’ efforts in this direction. This paper contributes to the three perspectives in the literature that support the view that benchmarking marketing capabilities can offer a basis for sustainable competitive advantage of the firm through both a conceptual and integrated benchmarking model. They are empirically analyzed using stochastic frontier and data envelopment analysis methods based on four-year data set of forty-five dealers of a leading business-to-business supplier. The results indicate the importance of competent salespeople and building a long-term relationship in enhancing dealer performance. In addition, they reinforce a recipe of how marketing capabilities can be benchmarked to achieve sustainable competitive advantage. Discussions and implications for managers are also presented.

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1. Introduction

The role of marketing capabilities as a source of sustainable competitive advantage has been discussed previously in the marketing strategy field. Recently, benchmarking, a famous management tool for organizational learning, has been suggested as a method to improve the marketing capabilities of a firm (e.g., Andersen, 1999; Vorhies & Morgan, 2003). Benchmarking is the process of identifying the highest standards of excellence for products, services or processes, and hence making the improvements necessary to reach those standards, which are commonly called “best practices” (Biehl, Cook, & Johnston, 2006; Bhutta & Huq, 1999). It offers the opportunity to recognize good performance and expose poor performance for remedial action.

In both academia and the business world, benchmarking has been discussed and analyzed in terms of the processes of marketing implementation, i.e. the ways in which a company converts its marketing inputs of cash, information, expertise, time, and strategy into marketing outputs of new products, communications, customer expectations, sales, and margins. Benchmarking of marketing productivity, processes, and capabilities utilize diverse methods. Some methods rely on an expert assessor external to the company for scoring marketing capabilities as input to regression analyses (Woodburn, 1999). Other types of methods rely on financial data and operating statistics to estimate efficiency frontiers through data envelopment analysis (Donthu, Hershberger, & Osmonbekov, 2005), and stochastic frontier analysis (Dutta, Narasimhan, & Rajiv, 2005). Despite its popularity as a theoretical and empirical concept, there is not much evidence to support the view of benchmarking marketing capabilities as a way to sustainable competitive advantage or to guide managers’ benchmarking efforts (Vorhies & Morgan, 2005).

We build our study on three theoretical perspectives of benchmarking marketing capabilities mentioned in the literature. These are resource-based view of the firm, market orientation, and organizational learning. Our aim is to demonstrate the relevance of these theoretical perspectives of benchmarking in a business-to-business (B2B) context; specifically in a dealership network for this study. Characteristics of business markets include, among others, a small number of customers, long-term business relationships, and a high degree of interaction between members of the supplier and the customer company (Homburg & Fürst, 2005). There are several reasons to choose a B2B context for this study. Companies doing business in a B2B environment have a narrower range of marketing measures available to them, and generally focus on expenses, which rarely contribute to performance improvement (White & Dieckman, 2005). However, a supplier’s deployment of marketing and sales channels can significantly improve its strategy and can even lead to a structural transformation in channels (Wilson & Daniel, 2007). In this...
transformation, dealers play a critical role for complex product sales by creating customer knowledge of the products; working with the customer to discover the best solution and providing after-sales support (Sharma & LaPlaca, 2005). So, measuring outcomes from marketing activities in a dealer distribution channel is becoming increasingly important in a competitive environment and benchmarking offers the opportunity to recognize good performance and expose poor performance for remedial action.

Based on the three theoretical perspectives and the B2B context indicated above, this study will be conducted in two parts. In the first part, we introduce our conceptual model adopted from Dutta, Narasimhan, and Rajiv (1999), which offers a resource-based perspective on a firm’s marketing capabilities and the impact of these capabilities on financial performance. In the second part, we have an integrated benchmarking model adopted from Ross and Droge (2002), in which nonparametric approaches are incorporated into the model to benchmark the temporal performance of dealers. According to Vorhies and Morgan (2005), there are two benchmarking alternatives; functional and integrative benchmarking. In functional benchmarking, individual capabilities are assessed separately whereas in integrative benchmarking a set of related capabilities is assessed collectively (Fawcett & Cooper, 2001). In this study, we implement integrated benchmarking, in which the existence of interdependencies between individual capabilities can be a source of competitive advantage (e.g., Teece, Pisano, & Shuen, 1997). Our data set has a panel setting, which includes four-year time period data of forty-five dealers of a leading B2B supplier, and we employ stochastic frontier estimation and recent extensions of data envelopment analysis to analyze the functional forms.

We explore three research questions in this paper. First, we examine how efficiently the dealers utilize marketing capabilities to transform marketing resources to superior financial performance. Second, we explore whether there exists any efficiency trends in the observed ranking order of dealer performance over time. Third, we look at whether there has been a shift in the efficiency frontier of dealers across time, specifically we analyze whether each dealer maintains its relative position i.e. efficiency ranking in comparison to other dealers during the four-year time period. Related with the second research question, we also conduct additional window analysis to identify the role model of inefficient dealers in the network.

There are several expected contributions of this study. First, by using analytical techniques, we attempt to understand and analyze the complex phenomenon of the impact of marketing capabilities on firm performance that is underserved by statistical procedures. Second, we take an applied economics view and show that organizational marketing efforts make some firms more competitive than others. Third, the introduction of efficiency methods to examine the impact of marketing capabilities in a B2B context proves the value of benchmarking as a tool, empirically.

The organization of the paper is as follows. In the next section, we introduce the industry background of this study. Next, we explain the conceptual model, first by emphasizing the different theoretical perspectives of benchmarking marketing capabilities in the literature, then by identifying the marketing capabilities that are going to be used in our empirical analysis. In the method section, we describe the data set, input and output factors, and also the procedures of parametric and nonparametric analyses. After we give the results of our analyses, we discuss their theoretical, empirical, and managerial implications. Limitations and suggestions for future research conclude the paper.

2. Industry background

This study examines North American office furniture industry dealers that target large to middle-size installations in the commercial, medical, and government sectors. The context is an interest-
from the manufacturer’s typical interest in dealer performance benchmarks such as efficient resource management of employees, facilities, and financial assets that emphasize business continuity, the efficiency in the complex marketing process has recently gained popularity as another benchmarking method (e.g., Dutta et al., 1999; Eid, Trueman, & Ahmed, 2006). The success of a dealer also depends on how it acquires skills and capabilities that can generate leads and hence convince customers to purchase products from that dealer. In this study, the marketing capability function of dealers is analyzed both as a factor affecting business performance and a method of benchmarking dealer performance.

3. Conceptual model

3.1. Definition of benchmarking process

A general definition of benchmarking is the process of evaluating and emulating the products, services, and processes of best performing organizations. Comparing the way a company performs a specific activity with that of its competitor enables that company to learn how to lower costs, reduce defects, increase quality, improve performance or even identify some best practices linked to company excellence (Donthu et al., 2005). Eight steps are employed in the benchmarking process (e.g., Camp, 1989, 1995; Garvin, 1993): 1) identify processes, activities or factors to benchmark and their primary characteristics, 2) determine what form is to be used: generic, functional, competitive or internal, 3) determine who or what the benchmark target is: firm, industry, or process, 4) determine specific benchmark values by collecting and analyzing information from surveys, interviews, business or trade publications, and other sources of information, 5) determine the best practice for each benchmarked item, 6) evaluate the process to which benchmarks apply; and establish objectives or improvement goals, 7) implement plans and monitor results, and 8) recalibrate internal base benchmarks.

Benchmarking is not regarded as a competitive analysis; it focuses on learning and forms the basis for change. The organization conducting the benchmarking analysis uses the information found in the process to establish priorities and target process improvements that can change business practices. Therefore, specifically, benchmarking is defined as a market-based learning process through which a firm seeks to identify best practices that produce superior results in other firms and to replicate these practices to enhance its own competitive advantage (e.g., Camp, 1995; Mittelstaedt, 1992).

Over time, the focus of benchmarking has moved from a content-focus to a process-focus perspective on the firm capabilities to produce superior performance outcomes (e.g., Andersen, 1999; Ralston, Wright, & Kumar, 2001). Regarding the firm capabilities, a report prepared by Enterprise Marketing Management (EMM) Group indicates that despite its importance, marketing has been the least benchmarked of all the major business processes and capabilities. However, as the marketing’s role in firm strategic decisions increases, benchmarking has become an important process for companies in imitating and learning from leading firms’ marketing practices.

3.2. Theoretical perspectives of benchmarking

There are three major theoretical perspectives that support the view that benchmarking firm capabilities can offer a basis for sustainable competitive advantage of the firm. The first perspective is the resource-based view (RBV) which pinpoints heterogeneity in the amount, value, inimitability, and nonsubstitutability of a firm’s resources and capabilities as the major cause of interfirm performance deviations (Amit & Shoemaker, 1993; Barney, 1991; Wernerfelt, 1984). According to RBV, a firm is viewed as a bundle of resources and capabilities with firms differing in their bundles. The literature on the RBV tries to identify firm specific factors that underlie the competitive advantage of firms (e.g., Wernerfelt, 1984; Grant, 1991).

There is a distinction between capabilities and resources. For example, Helfat and Peteraf (2003) provide separate definitions for these two terms but Peteraf and Bergen (2003) use the terms ‘resources’ and ‘capabilities’ inclusively and interchangeably. According to Day (1994), resources are defined as tangible and intangible factors a firm uses to achieve its business objectives, whereas capabilities are complex bundles of skills and collective learning exercised through organizational processes that ensure superior coordination of functional activities. Firm capabilities represent the ability of a firm to efficiently combine several resources to engage in productive activity and reach a certain objective (Amit & Shoemaker, 1993). New capabilities arise as management discovers how to improve and exploit firm specific resources in the most efficient and effective way (Mahoney & Pandian, 1992).

In the literature, it is claimed that for a firm to enjoy a competitive advantage among its competitors, it must have the power and control over superior capabilities (Dutta et al., 1999). As Blois and Ramirez (2006) address, firm capabilities become distinctive competencies when they create value for the firm in ways that competitors find impossible or difficult to imitate. For example, Wu, Yeniyurt, Kim, and Cavusgil (2006) mention that since IT-enabled supply chain capabilities are firm specific and hard-to-copy across organizations, they lead to superior firm performance. According to RBV theory, to have a sustainable competitive advantage, a firm’s capabilities should not be mobile and imitable (Peteraf, 1993); and Dutta, Kamakura, and Ratchford (2004) state that to the extent capabilities are tacit, complex, and firm specific, they become both imperfectly imitable and mobile. Therefore, since benchmarking is a continuous, higher-order learning capability, which is rare, valuable, inimitable, and nonsubstitutable, benchmarking based improvements in a firm’s stock of marketing capabilities can constitute a source of sustainable competitive advantage (Dickson, 1992).

The second perspective is the market orientation, which deals with the firm’s ability to learn about its market environment and use this knowledge in its strategy formation (e.g., Hunt & Morgan, 1995; Jaworski & Kohli, 1993; Narver & Slater, 1990; Slater & Narver, 1994). In the literature, market orientation and its positive relationship with organizational performance constitute one of the important cornerstones of modern marketing thought. A market-oriented business examines ways to become better equipped to deliver customer value and attain sustainable competitive advantage, continuously (e.g., Guenzi & Troilo, 2006). Tuominen, Rajala, and Muller (2004) also find that there is a strong relationship between market orientation and customer-centric approach of marketing function of a firm in a B2B context. Firms adopting a market-oriented strategy expect to gain competitive advantage that drives performance. Competitive advantage through market orientation relies on capabilities that are hard to duplicate and encompass the essence of the RBV of the firm (Day, 1994). In the market orientation literature, benchmarking is regarded as a market-based learning tool enabling a firm to develop and deploy resources and capabilities that are appropriate for their market environment (Slater & Narver, 1995), and therefore can help create successful market-driven firms (Day, 1994; Slater & Narver, 1995).

The third theoretical perspective that supports the view of benchmarking firm capabilities is the organizational learning theory. Celuch, Kasouf, and Peruvemba (2002) discuss that the relative roles of market orientation’s emphasis on information use and organizational learning’s emphasis on learning orientation together with their impact on the organization success provide a fertile arena for research. Researchers indicate that benchmarking can increase managers’ and employees’ awareness of the external environment in order to both reach a shared understanding of the capabilities required to
achieve better performance (e.g., Camp, 1995; Zairi, 1998) and guide the investments of the firm in capability improvements (e.g., Brockett, Golden, Sarin, & Gerberman, 2001; Camp, 1989). In relation to this view, organizational learning refers to the generation of new ideas that have the potential to re-shape the strategy of organizations (Huber, 1991). It is formally defined as the development of knowledge, insights, and associations among past, current, and future actions (Fiol & Lyles, 1985). Organizational learning indicates that a firm’s market inspection must be more timely and accurate than that of its competitors to enable market-based learning as a source of sustainable competitive advantage (e.g., Dickson, 1992; Teece et al., 1997). Weerawardena and O’Cass (2004) discuss that market-based learning enables the company to relate firm capabilities to the external environment to anticipate the market needs before its competitors, and to create long-term relationships with customers and suppliers. Vorhies and Morgan (2005) also characterize benchmarking as a continuous process of reducing the extent of perceptual bias (e.g., Dickson, 1992; Winter, 2000), facilitating a firm’s motivation, and realizing the opportunities of market surveillance (e.g., Levinthal & Myatt, 1994).

3.3. Identification of marketing capabilities for benchmarking

In assessing the marketing capabilities to be used further in this study, we follow the first step of the benchmarking process. Due to the fact that capabilities refer to the ability of a firm to transform several resources (inputs) into certain objectives (outputs) for sustainable advantage, and the notion of benchmarking in marketing is comparatively new, relevant marketing capabilities have to be listed for this study from a detailed understanding of the office furniture industry and the extant marketing literature (e.g., Dutta et al., 2005; Vorhies & Morgan, 2005).

We follow the identification process by taking the marketing capabilities described by Vorhies and Morgan (2005) as our reference set. Using cross-sectional survey data, Vorhies and Morgan (2005) address eight marketing capabilities positively and directly relating to firm performance. The marketing capabilities include product development, the process to develop and manage product and service offerings; pricing, the strategy to extract the optimal revenue from firm’s sales; channel management, the course of action to establish and maintain the channels of distribution that effectively and efficiently deliver value to end-user customers; marketing communications, the ability to manage customer value perceptions; selling, the activity to fulfill customer orders; market information management, the practice to acquire and use market knowledge; marketing planning, the ability to create marketing strategies that optimize the match between the firm’s resources and its marketplace; marketing implementation, the process to transform marketing strategy into realized resource deployments.

To choose the relevant marketing capabilities for our research and industry context, we conducted field interviews with managers from the office furniture company providing the data. Then, we analyzed the industry dynamics and searched the previous literature in line with our theoretical perspectives. As an example, one theme from the industry dynamics influencing our choice is that a dealer is a “selling organization” that requires skills and capabilities that can generate leads and then convince customers to purchase products from the dealership. Regarding the previous literature, it has been addressed that market orientation strategy of an organization is mostly manifested in its market information processing and responding activities. Besides, market orientation is concerned with the firms’ marketing capabilities including creating and managing customer communications and relationships (Kohli & Jaworski, 1990; Tuominen et al., 2004). However, market orientation by itself is seldom sufficient to trigger communication and information-processing related capabilities and hence a special focus on organizational learning culture is needed for an unbiased market information management and higher level learning orientation (i.e., generative, double-loop learning) (Celuch et al., 2002). On the whole, we narrow down the choice set based on the processes described above and focus on three distinct capabilities that contribute the most to generate sales in the office furniture industry: 1) marketing communications, 2) selling, and 3) market information management.

3.3.1. Marketing communications

This capability is related to the firm’s ability to manage customer value perceptions (e.g., McKee, Conant, Varadarajan, Rajan, & Mokwa, 1992; Ritter, 2006). Since we have a B2B context, the resources to manage the customer value perceptions can be different from those of the firms operating in a business-to-consumer context. Resources available to a dealer to establish and manage its image or reputation include advertising, promotions, and the showroom. Advertising is an effective method of projecting dealer identity along with promotions and give-aways (Melewar & Saunders, 2000). Additionally, the showroom of the dealer contributes to the customer’s perception of the firm and the important strategic decisions of a showroom image include its architecture, exterior design, interior design, signs, logos, display, and name.

3.3.2. Selling

This capability includes the processes, by which the firm acquires and fulfills customer orders (e.g., Shapiro, Szywotzky, & Doyle, 1997). Resources related to selling capability include personnel expenses for team selling, training, and order automation technology (Vorhies & Morgan, 2005). Major marketing cost categories include sales force management, sales personnel, and customer support including travel, and entertainment costs. Often a common target for trimming in response to declining sales, selling expenses are termed “sticky,” with costs increasing 0.55 percent for every 1 percent increase in sales and decreasing only 0.35 percent for every 1 percent decrease in sales (White & Dieckman, 2005).

3.3.3. Market information management

This capability includes the processes by which firms learn about their markets and use the market knowledge (e.g., Day, 1994; Menon & Varadarajan, 1992). Resources for market information and marketing implementation capabilities relate to investment in customer relationship including the company’s knowledge of the customer, overall customer service systems, responsiveness, and the ability to meet expectations (Vorhies & Morgan, 2005). Customers in successful relationships with firms become valuable “part-time marketers” who give referrals and spread positive word-of-mouth, add to marketing influence without causing a burden on marketing and sales budgets. Loyal customers become less price sensitive as they also value relationship dimensions such as trust, commitment, and convenience (Gummesson, 2004). Reinitz, Kraft, and Hoyer (2004) stress managing the various stages of the customer relationship from customer acquisition, retention, and relationship termination.

We view customer relationship management in a B2B dealer composed of three parts relating to the acquisition and retention of customers: customer knowledge, customer service, and customer satisfaction. Customer knowledge is defined as activities to gain insight about customer tastes and their evolving needs (Mithas, Krishnan, & Fornell, 2005). To effectively initiate and manage customer relationships, firms should develop capabilities related to the knowledge management processes. Knowledge management process is concerned with the activities directed towards creating and leveraging the market intelligence. (Payne & Frow, 2005). Dealers can define customer expectations through customer focus groups, surveys, and interviews. In a B2B complex sale, understanding and measuring customer deliverables through proposals, orders, and installation punch lists are suggested practices.
Customer service and specifically complaint management is an essential part of maintaining customer relationships. Because, in B2B markets, the few number of customers and the prospect of a long-term relationship lead to a greater dependence of firms on individual customers (Homburg & Fürst, 2005). Dealer resources relating to customer service include processes for issue identification and resolutions as well as methods to encourage customers to speak out, seek assistance or file a complaint.

Customer relationship management relates to the retention of customers and the determination of customer satisfaction through surveys and job completion forms (Zablah, Bellenger, & Johnston, 2004). Customer satisfaction has significant implications for the economic performance of firms through increased customer loyalty and reduced likelihood of customer defection (Gummesson, 2004). Having a process in place to track customer satisfaction provides valuable information for maintaining customer relationships.

In the first part of this paper, we propose our conceptual model adopted from Dutta et al. (1999). It draws on resource-based perspective of firm capabilities, specifically analyzing the impact of marketing capabilities on the firm’s financial performance. Therefore, we have an input–output model, as depicted in Fig. 1, in which the relationship between the inputs and the output is mediated by marketing capabilities embedded in dealerships. In the second part, we propose an integrated benchmarking model adopted from Ross and Droge (2002). In this model, we aim to benchmark the temporal performance of dealers. In the next section, we introduce the methods that are used in the first and second part of this research.

4. Method

4.1. Sample and data

To test both of these models in a dealership network, we need data on a dealer’s resources and its financial performance. Our study examines forty-five American dealers of a leading office furniture manufacturer. Of the forty-five dealers, one is in Mexico, one is in Canada, and the remaining forty-three are in the United States. All of the dealers operate in a defined geographical region and they have different competitive environments and regulatory requirements. For example, a dealer in Chicago is required to use unionized labor for delivery and installation, whereas another dealer in Kansas does not. The data spans four years and includes self-reported financial information gathered from secondary data sources and supplier generated customer management scores gathered from survey data. The total number of observations is 155 since some firms are opened and closed during this time period.

4.2. Operationalizations of input-output factors

Fig. 1 demonstrates that there exist four variables to measure the industry specific resource investments in marketing capabilities that serve as inputs in the analyses. These input measures are identified via a qualitative content analysis based on the interviews with managers of the office furniture supplier in our context and industry reports (i.e., BIFMA, 2006). We measure investment in marketing communication capability through two variables—advertising and showroom expenses. Investment in selling capability is a sum of marketing expenses. We measure the investment in market information management through annual scores from a supplier generated assessment of customer relationship management processes. The first three inputs are derived from the financial information provided by the dealers in response to a supplier request for benchmarking information. It becomes highly difficult to benchmark costs in a context where different companies treat expenses differently (White & Dieckman, 2005). In our context, to handle this difficulty and minimize potentially misleading results, the primary office furniture product supplier provides detailed instructions to the dealers and reviews the financial information for differences in accounting. Descriptions of each input variable are as follows:

1. Advertising expense includes expenditures directly relating to paid advertising and promotions by the dealer—but does not include those provided by suppliers.
2. Marketing expense includes costs for sales, design labor, travel, entertainment, and customer support service.
3. Showroom occupancy expense includes rent, utilities, and signage for the display portion of dealer facilities.
4. Investment in customer relationship management includes activities relating to the company’s knowledge acquisition about the customer, ability to determine and meet customer expectations, and overall effectiveness of customer service systems. The subsections under this scale are knowledge and expectations, customer relationship management and satisfaction. These subsections are scored on a scale from zero to four where zero indicates no systematic approach and poor performance and four indicates a sound systematic approach and excellent performance. To earn a four on any item, the dealer must exhibit strong evidence of industry benchmark leadership in that area. We take the average of these three scores to assign an overall score to each dealer for customer relationship management.

Building on the concept that a firm’s capability is the ability to deploy resources (inputs) to achieve objectives (outputs), the selection of the output for our study relates to one of the main goals of marketing (Dutta et al., 1999). As the focus of our study is on the functional relationship between marketing capabilities and sales, we use total sales in dollar amount as the output to indicate the financial performance of a dealer. Its description is as follows:

1. Total sales include total revenue of dealers acquired through the sale of products and services.

4.3. Analyses techniques

In this research, we illustrate the use of a stochastic and a deterministic approach to assess marketing efficiency in a dealership network. In a marketing context, it is important for firms to assess how efficient they implement their actions or to compare their capabilities to a certain benchmark. In this study, we examine how dealers in a distribution network transform its investments in marketing strategy related inputs to a successful firms performance as output (i.e., total sales) through the efficient use of marketing capabilities. As Dutta et al. (2004) proposes this examination requires rigorous estimation of those capabilities specified and then benchmarking them relative to competitors. Therefore, in order to estimate how efficiently a dealer utilizes its marketing capabilities, we employ a stochastic approach, namely Stochastic Frontier Analysis (SFA); and then to benchmark them relative to other dealers in the same network, we employ...
extensions of a deterministic approach, namely Data Envelopment Analysis (DEA).

By using SFA methodology, we aim to answer our first research question. SFA estimates the efficient frontier of dealers through an input-output model, where the efficiency of a dealer in utilizing its marketing capabilities is measured by the distance of the amount of its realized sales to the efficiency frontier. The intuition of why we choose to use this technique is simple. Since we have a single output and multiple inputs, we could have run a multiple regression to understand the impact of marketing resources on firm’s financial performance; however while doing this we also want to understand how efficient the firm is in the utilization of marketing capabilities, and this is the actual purpose of this study. SFA is different from a multiple regression in the sense that it contains two error terms, namely a performance error term for each dealer and an efficiency error term, which is bounded at zero. Values of this efficiency error term for each dealer estimate its relative efficiency, and this technique complements the RBV literature through proposing a measure of marketing capabilities by linking resources to capabilities (Dutta et al., 1999).

Given the data requirements of this technique, the application of SFA to the aggregate panel data employed in this research (Dutta et al., 2004) ideally serves our purposes.

By using DEA, we aim to answer our second and third research questions, regarding the trends and stability of dealer performance. DEA has become a widespread analytical tool for evaluating the relative efficiency of comparable firms (Seiford, 1996). As a mathematical tool for relating outcomes to input features developed by Charnes, Cooper, and Rhodes (1978) as CCR model, and extended by Banker, Charnes, and Cooper (1984) as BCC model, DEA evaluates the relative efficiencies of a homogenous set of decision making units (DMUs) (i.e. the dealers in a distribution network). The main difference between the SFA and DEA is that in DEA models the process under assessment is assumed to be fully characterized by the observed inputs and outputs, i.e. they are free of measurement errors; whereas in SFA models, this assumption is relaxed, and measurement errors are incorporated in the productivity assessment (Moorman & Lehmann, 2004). A fundamental assumption behind the DEA technique is that if a given DMU is producing “Y” units of output with “X” units of input then other “similar” DMUs should also be able to do the same if they were to operate efficiently (Grewal, Levy, Mehrrotia, & Sharma, 1999). Based on this assumption, some extensions of DEA analysis, evaluation of efficiency trends over time through window analysis (Charnes, Cooper, Lewin, & Seiford, 1994), and a generalization of the Mann Whitney rank sum statistic (Kruskal Wallis rank test) (Sueyoshi & Aoki, 2001), are conducted to analyze the efficiency trends among dealers and also whether there occurs a shift in the efficiency frontier over the four-year time period.

### 4.3.1. Procedures for parametric estimation

Battese and Coelli (1995) suggest using a time invariant random effect panel model of SFA. In modeling marketing capabilities, we use Cobb Douglas (C–D) formulation (Kumbhakar & Lovell, 2000) and specify the sales frontier (Dutta et al., 1999) as follows:

\[
\ln(Sales_i) = \alpha + \beta_1 \ln(AdvExp_i) + \beta_2 \ln(MktgExp_i) + \beta_3 \ln(ShowroomExp_i) + \beta_4 \ln(InvCustRel_i) + \nu_i
\]

The subscript “i” represents the dealers, \(\nu_i\) represents the random error term with \(N(0, \sigma^2)\) reflecting stochasticity in the environment (Dutta et al., 2004) and \(\mu_i\) represents the technical efficiency error term, which is independently and identically distributed with non negative truncations of the \(N(\mu_i, \sigma^2)\) distribution as proposed by Stevenson (1980). In the time invariant model, the technical efficiency term denoted by \(\mu_i\) is assumed to be constant over time. The maximum likelihood estimation of the model (1) provides estimators for \(\alpha, \beta_i\), and the variance parameters \(\sigma^2\) and \(\gamma = \sigma^2/(\sigma^2 + \sigma^2)\). The estimation is conducted using the STATA (8.0) software.

### 4.3.2. Procedures for non-parametric estimation

#### 4.3.2.1. Performance trends over time.

Through four-year time period, we attempt to evaluate time series performance of dealers using DEA methods as non-parametric approaches. This approach is especially appropriate for detecting trends in performance and their significance (Brockett & Golany, 1996). We use the DEA software by Kamakura to execute a variable returns and output oriented DEA model of dealer efficiency for each year (an exemplary portion of dealers is demonstrated Table 1).

Then, we form a columnar rank order matrix, in which the efficiency scores in periods 1–4 for each dealer are ordered (ascending) and assigned a relative ranking. The process is completed for 45 dealers, resolving ties by using midranks. The columnar rank order matrix from the efficiency scores of a sample of dealers is depicted in Table 2.

In order to answer our second research question, we calculate our test statistic using the technique from Ross and Droge (2002) shown below:

\[
S = \sum_{j=1}^{n} \sum_{t=1}^{k} TV_{ij}
\]

\[
E(s) = 0.25nk(k + 1)^2
\]

\[
Var(s) = \frac{n}{144} k^2 (k^2 - 1) (k + 1)^2 \frac{k(k + 1) + 144}{144} \frac{1}{\sum_{j=1}^{n} (d_{ij} - \overline{d})^2}
\]

where;

- \(n\): number of dealers
- \(k\): number of years
- \(d_{ij}\): number of ties
- \(V_i\): ranking of dealer \(j\) at time \(t\)

Given the panel form of our data set and window analysis developed by Charnes et al. (1994), we can carry the efficiency analysis through longer time periods. For each time period, the projection vector including those efficient dealers can be calculated for each inefficient dealer; and we can observe which of the efficient dealers appear most frequently in the reference set of inefficient dealers.

### Table 1

**Generated dealer efficiencies (exemplary).**

<table>
<thead>
<tr>
<th>Period</th>
<th>D-1</th>
<th>D-2</th>
<th>D-3</th>
<th>D-4</th>
<th>D-15</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>0.726</td>
<td>0.865</td>
<td>1.000</td>
<td>0.867</td>
<td>1.000</td>
</tr>
<tr>
<td>2000</td>
<td>0.899</td>
<td>0.829</td>
<td>0.871</td>
<td>0.824</td>
<td>1.000</td>
</tr>
<tr>
<td>2001</td>
<td>1.000</td>
<td>0.781</td>
<td>1.000</td>
<td>0.715</td>
<td>1.000</td>
</tr>
<tr>
<td>2002</td>
<td>0.672</td>
<td>0.635</td>
<td>0.918</td>
<td>0.653</td>
<td>1.000</td>
</tr>
</tbody>
</table>

* “D” stands for dealer and it has a particular number in order to identify the dealer.

### Table 2

**Dealer rankings (exemplary).**

<table>
<thead>
<tr>
<th>Period</th>
<th>D-1</th>
<th>D-2</th>
<th>D-3</th>
<th>D-4</th>
<th>D-15</th>
<th>(\Sigma V_i)</th>
<th>(\Sigma PV_i)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>2.0</td>
<td>4.0</td>
<td>3.5</td>
<td>4.0</td>
<td>2.5</td>
<td>16.0</td>
<td>16</td>
</tr>
<tr>
<td>2000</td>
<td>3.0</td>
<td>3.0</td>
<td>1.0</td>
<td>3.0</td>
<td>2.5</td>
<td>12.5</td>
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<tr>
<td>2001</td>
<td>4.0</td>
<td>2.0</td>
<td>3.5</td>
<td>2.0</td>
<td>2.5</td>
<td>14.0</td>
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<td>2002</td>
<td>1.0</td>
<td>1.0</td>
<td>2.0</td>
<td>1.0</td>
<td>2.5</td>
<td>7.5</td>
<td>30</td>
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reference set represents an indicator of whether the efficient dealer is a self evaluator or a role model for other inefficient dealers to emulate. So, in the identification of role models for the inefficient dealer, we apply a simple procedure, in which we count the number of existence of each efficient dealer on the frontier of inefficient dealer.

4.3.2.2. Stability over time. To statistically examine whether there occurs a shift in the efficiency frontier resulted from the DEA procedure; a useful method is to apply a Kruskal Wallis (KW) rank test. The shift in the efficiency frontier also implies whether dealers maintain the same relative rankings over time. In order to make a statistical linkage between DEA and the KW rank test, this study considers a dynamic process from the first period to the fourth period. According to the DEA scores depicted in Table 1, all the projected dealers are ranked (Rn) in a single series, where the smallest score is ranked as rank = 1 and the largest as rank = N (Sueyoshi & Aoki, 2001). This research follows the ascending order suggested by Kruskal and Wallis (1952). Based on this procedure, the rank sum matrix is created as in Table 3.

Using the Kruskal Wallis (KW) nonparametric test, the KW test statistic is calculated as below:

\[ H = \frac{12}{nk(n+1)} \left( \sum \frac{R_i^2}{k} + \sum \frac{R_j^2}{k} + \ldots + \frac{R_m^2}{k} \right) - 3[n(k+1)] \]  

(5)

5. Results

5.1. Measurement of marketing capability model

When we analyze the results of SFA, as demonstrated in Table 4, all of the input factors are significant and of expected sign except the negative impact of advertising expenditure on the total sales (β1 = −0.074; p = 0.000). The total variance of the model is caused by the variance of technical inefficiency term (γ1 = 1). Moreover, λk, the mode of the truncated normal distribution is significantly different from zero, providing statistical evidence that the distribution of the random variable λk has a non zero mean and truncated below zero (Kwon & Lee, 2004).

The calculated \( z = -1.845 \) (p = 0.033) enables us to verify that the estimated frontier has a significant inefficiency component that affects the performance of the dealers.

5.2. Dealership network performance trends

To detect the performance trends of dealers over time we solve for Eqs. (2)–(4) and find that S = 769.5, E(s) = 850 and Var(s) = 944.44. Since the normalized \( z = -2.62 \) (p = 0.004) there exists a trend in the dealers’ performances over time. When we observe the efficiency score of the dealers, which happen to exist during the four-year time period, we find that not a single dealer shows an increase in efficiency each year, whereas ten out of thirty five dealers show a continuous decrease in efficiency over time. The efficiency score trend is unstable for the rest; however, across four years these dealers experience decrease in efficiency more frequently than an increase. Therefore, it can be concluded that dealers in our context have a decreasing trend in terms of their efficiency rankings over time.

In order to detect the stability of efficiency ranking over time, we use Eq. (5) and find \( H = -316.727 \). The chi-square value at is around 43.773 (p = 0.05), which leads us to conclude that dealers are stable and they maintain their relative positions over time. This finding is interesting to researchers and practitioners from the organizational learning perspective. We expect that dealers participating in benchmarking activities generate and acquire new ideas to reshape their strategy that would lead to a competitive advantage. However, our results suggest that relative rankings among dealers do not change on a frequent basis, emphasizing the resource-based view that marketing and learning capabilities provide a sustainable competitive advantage.

Table 3

<table>
<thead>
<tr>
<th>Period</th>
<th>D-1</th>
<th>D-2</th>
<th>D-3</th>
<th>D-4</th>
<th>D-5</th>
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<td>126.5</td>
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<td>126.5</td>
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<td>14.0</td>
<td>104.0</td>
<td>20.0</td>
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Table 4

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<th>Estimate</th>
<th>p-value</th>
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<tr>
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<tr>
<td>AdvExp</td>
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<tr>
<td>MktgExp</td>
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<td>ShowroomExp</td>
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<td>InvCustRel</td>
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<td>λk</td>
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<td>0.000</td>
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<td>G2</td>
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<td>Γ</td>
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Table 5

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<td>6</td>
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<td>10</td>
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</tbody>
</table>

5 Some of the dealers are either opened or closed during the four-year time period.
advantage for some of the firms that cannot be easily beaten by their competitors.

5.3. Role model identification

Generally, the efficiency frontier is composed of the dealers with the best performance among the bunch. In the first part of our analyses, we estimate this frontier whereas in the second part, we identify the efficient and inefficient dealers. In addition, we observe that dealers have a decreasing efficiency trend over time; however their relative positioning measured through rankings is generally sticky through time. Out of 45 dealers, 16 are found to be efficient. Approximately, this makes up one third of the whole set, which is quite high, but we have to be cautious with this result since it is based on our assumption of variable returns to scale which put less restrictions on the weight of inputs and output. We see that, out of the 16 efficient dealers, D_3, D_24, and D_12 appeared in the reference set most often (74, 68, and 61 times, respectively).

We extend the idea of best-performing dealers by recognizing “role model” dealers for each inefficient dealer (Ross & Droge, 2002). We identify those efficient dealers that frequently appear in the reference sets of inefficient dealers during the four-year time period. The maximum number of appearances for each efficient dealer is six in our case, and therefore we determine our cut off level as the maximum number of appearances for each efficient dealer (depicted in columns) are compared to the inefficient dealers (depicted in rows). The columns show the frequency with which each efficient dealer appears in the reference set. Therefore, in this table, the role models, i.e. the best performers among the efficient dealers can be recognized easily. As an example, for D_26, Table 5 reports that D_12 and D_17 appeared 5 and 6 times, respectively (Fig. 2). The final row of Table 5 shows the column totals for the efficient dealers. Given that we have 45 dealers in total, with a maximum of 6 appearances, the maximum column total can be 270 (45 * 6). It is seen that D_3, D_12, D_17, D_24 have the highest column totals (48 or more).

6. Discussion and conclusions

In this research, we propose a conceptual model to examine the relationship between the marketing capabilities and firm performance, and an integrated benchmarking model to investigate the firm performance over time in a dealership network. Both parametric and nonparametric analyses are conducted based on four-year data of 45 dealers to answer the research questions. The results provide further understanding of the role of marketing capabilities and the benchmarking of marketing capabilities as an organizational learning tool in a B2B context.

The first substantive result from SFA analysis is the importance of the inputs, marketing expense and investment in customer relationship in estimating the sales frontier. Marketing expense includes the selling and design expenses including customer support services such as travel and entertainment; whereas investment in customer relationship includes the knowledge the customers require and their expectations, customer relationship management, and customer satisfaction. In a setting with complex industrial products like office furniture, design, along with other services related to selling are of great importance for the end customer. Therefore, although dealers sell similar products provided by a single supplier, sales services become critical inputs in the decision making process of a consumer to make the actual purchase from a dealer. In addition, building a long-term relationship with the customer is another important factor to build a reputable image for the dealer.

The importance of a dealer, which plays an intermediary role in this network, also explains the negative relationship between the advertising expenditure and sales. In this setting, the party who has to care more about advertising should be the manufacturer. In addition, the end consumers are less likely to be affected by the advertising effort of the dealer than other service promoting components like an outstanding salesforce who contribute to sales services. Our results are indeed similar to what Dutta et al. (1999) find in a semiconductor industry setting with different operationalizations of the data.4

Another significant variable in our sales frontier is the showroom occupancy expense. This item is also one of the differentiating factors among dealers. Each company has its own way of displaying similar products in a different showroom. In this industrial setting, showroom constitutes another essential part in consumers’ decision making process to choose among the dealers.

The first part of our study has important implications for RBV through defining marketing capabilities in an input–output model, where it concludes that a dealer can transform its resources (inputs) into a single output (objective) more or less efficiently based on its specific marketing capability functions, which are identified as marketing communications, selling, and market information management for our context. Ours is also one of the first studies to allow the manager to understand the importance of benchmarking marketing capabilities over time. In the second part, through measuring temporal performance, it is found that movements in marketing capabilities are likely to yield high versus low performance across dealers. This finding is coherent with market orientation strategy of the firms by suggesting that a dealer’s strategy focusing on market orientation can be enhanced through a more efficient marketing capability function and also through market-based learning from competitors (Slater & Narver, 1995). In addition, the non-parametric tests and visual inspection of the rank order matrix provide that there is a decreasing trend in the efficiency rankings of the dealers through a four-year time period. In addition, it is found dealers maintain their relative positions with respect to others. This raises an important conclusion; although some dealers are constantly outperforming others, there is a loss of efficiency overall in both high and low performers meaning that recently dealers have given less care to their marketing capabilities.

Finally, our study has also important findings corresponding to organizational learning and market orientation literature since it concludes that market-based learning is an effective strategy for the dealership network. In this study, benchmarking has been put forward as a favorable tool to enhance market-based learning (Teece et al., 1997) and facilitating the mediating role of marketing capabilities. In addition, it contributes to the literature by demonstrating the potential performance benefits of the benchmarking as a tool, empirically.

4 Dutta et al. (1999) operationalized the independent variables as stock variables in order to estimate the sales frontier. In addition, they measure customer relationship expenditure using the “receivables” of the company from its financial statements.
Our study addresses the use of extended DEA methods with rank order matrices rather than efficiency scores and also some non-parametric tests in order to measure temporal performance of dealers across years while identifying the role models of inefficient dealers. Following the conclusions of these tests, it is found that there exist 16 efficient dealers appearing five or six times on the reference set of inefficient dealers. Since the maximum number of appearances for a specific efficient dealer was found to be six, the role model of an efficient dealer is six in the whole set, five and six appearances are categorized as role models. According to this classification scheme, the possible categories of dealers are listed as follows:

Category 1: There may not be a role model for some inefficient dealers, and 23 dealers belong to this category.
Category 2: There may be only one role model for some inefficient dealers, and seven dealers (D_1, D_9, D_14, D_22, D_30, D_38) belong to this category.
Category 3: There may be two role models for some inefficient dealers, and only one dealer, which is D_26, is in this category.

Using this finding, managers of inefficient dealers in the network can identify their role models in order to set performance targets and identify the actions that will take them to the best performance level. As the number of role models increase for an inefficient dealer, it implies that the particular dealer has more flexibility in crafting its strategy to reach that objective. On the other hand, a single role model suggests an apparent choice and strategy for that inefficient dealer but at the expense of having a very limited set for comparison and action. An alternative method to identify the role models is via examining the frequency of appearance of four to six rather than five to six, but we think this would cause weaker role models to exist, which may impede operational excellence of the dealers and set lower objectives as well (Ross & Droge, 2002).

In the identification of the role models, D_1 and D_31 deserve extra attention. On contrary to our expectations, they do not appear on the frontier of inefficient dealers although they are efficient. So, these two dealers are assessed to be “uniquely efficient” among 16 efficient dealers. One obvious reason for their unique efficiency can be the way their inputs and outputs are mixed. They might have an idiosyncratic combination of inputs and outputs so that they do not appear close to other efficient dealers on the efficiency frontier and this positioning makes them unique. However, it is no longer easy or practical for others to mimic them in projecting to the frontier. Therefore, these two dealers are the unpopulated vectors that cannot become role models for the inefficient dealers due to their uncommon or idiosyncratic strategy to become efficient.

This research has specific contributions to the literature. To the best of our knowledge, this study is the first in terms of testing an integrated benchmarking theory regarding marketing capabilities of a firm in a B2B context with temporal data. First, it identifies the marketing capabilities, which are associated with more efficient dealer performance. Second, the temporal performance of dealers is measured and the role models of inefficient dealers are identified. This procedure provides useful insights for the managers of those inefficient dealers to set performance targets and try to reach them by mimicking role models. This study introduces and proves the effectiveness of two analytical procedures to examine a complex phenomenon of marketing strategy in a B2B context from an applied economics perspective; it demonstrates that organizational marketing efforts support the theoretical perspectives of RBV, market orientation, and organizational learning, and enable some firms to create sustainable competitive advantage compared to others.

6.1 Managerial implications

Our study reveals new insights for managers in two ways. First, we assess that marketing capability improvements are likely to yield higher returns for dealers. Our results reinforce the importance of competent salespeople for selling capability, and building long-term relationships with the customer through market information management in a dealership network. The statistical procedures separate high from low performers and identify managerial implications. We delineate the specific investments in developing marketing capabilities that provide the greatest influence in sales revenue. Investment in hiring and training of sales personnel and sales support services have the greatest influence on dealers’ financial performance over time. Therefore, hiring, training, and retention of sales and support personnel should become a priority for dealer management. Another insight for the marketing managers to yield higher returns can be enhancing relationships with customers through establishing knowledge management processes, effective complaint management processes, and interpreting customer satisfaction levels in addition to measuring them. In other words, managers should translate and embed the results of their performance measures into their marketing strategy and relationships with the customers. Furthermore, investment in showroom exterior and interior can positively influence the dealer’s image and reputation in a customer’s mind. Aside from this, managers should invest cautiously in advertising and promotions outside of those provided by the supplier, as they may not yield higher returns. This is due to the nature of the B2B setting, where customers are more influenced by an outstanding salesforce and purchasing experience in a dealer rather than its advertisement and promotion efforts.

Second, our study demonstrates how managers can benchmark marketing capabilities to achieve sustainable competitive advantage. We find that participation in benchmarking activities does not always translate to improvements in efficiency or ranking, thereby placing greater importance on the use of the benchmarking process to acquire beneficial information. Managers of inefficient dealers can identify role models using benchmarking data and communicate with the managers of their role model dealers. Through this, they can set performance targets and identify the actions that will take them there. In general, it is seen that there is a decreasing efficiency of trend among dealers, so more attention should be given to this problem to identify the sources of inefficiency in the network, and make use of the marketing capabilities function more effectively. Overall, it is found that the dealers without a role model are more than the other two categories. This also warrants managerial attention in the sense that either these dealers need to be shut down or consolidated with the others to improve the overall efficiency in the network.

6.2 Limitations and directions for future research

Several limitations related to the availability of the data and the analyses provide additional future research opportunities. First, this study emphasizes the marketing capabilities both in terms of their impact on financial performance and their role in benchmarking. However, the study focuses on the marketing capabilities related to the role of a dealer as a selling organization. Increasingly, dealers are becoming a service business. For example, in the office furniture industry some dealers produce and distribute furniture, and provide facility services to the dealership’s clients, including design, project management, warehousing, delivery, installation, refurbishing, and moving/relocation (OFDA, 2004a). To address this dealership role, a future study can examine other marketing capabilities such as product development, marketing planning, and marketing implementation. Likewise, our study focuses on a single output of sales, whereby examining profitability, market share or other objectives can provide further understanding of the efficient use of firm resources. Therefore, other types of firm capabilities and performance outcomes can be incorporated into both our conceptual and integrated benchmarking model to make the research more comprehensive and insightful for academic and business related purposes.
Second, pertaining to the data, short time span is a limitation. Especially for temporal performance assessment, a longer time period is likely to reveal more realistic results. In addition, in the future, the inputs and outputs used in the conceptual model and stock variables can be created from advertising, marketing and showroom expense data by fixing a coefficient in order to take into account the effect of the former year’s expense on the cumulative expenditure (Dutta, Narasimhan, & Rajiv, 1999). However, since we have a short time period, it is hard to estimate reasonable spillover effects.

Third, we have limitations regarding SFA methodology. In our estimation, we do not take into account the heteroskedasticity of error term. Given the differences in the scale of the operations, it seems reasonable to allow for heterogeneity in the variance of the composite error component (composed of random and efficiency error term). In addition, some covariates can be included, and a model searching for fixed effects can be constructed in order to make the efficiency assessment more comprehensive. In the case, where a similar study is conducted with a longer time span, the time varying technical efficiency component can be introduced into the model in order to identify the contribution of efficiency change on the marketing capability change of the dealer over time (Kwon & Lee, 2004).

Finally, our study concentrates on a specific industry. This may be a limitation to the generalizability of the results in both parts of our analysis, thus the repetition of this study across different industries can enhance its external validity. However, the main purpose of both parametric and nonparametric analyses in this research is to delineate the benefits of various technical efficiency techniques for the optimization of marketing capability efficiency in a dealership network, and therefore the tools are widely applicable to other industries. Specifically, we strongly believe in the merits of both techniques as general recipes for industries conducting a benchmarking study.

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References


