Expert Systems with Applications 39 (2012) 99–106

Contents lists available at ScienceDirect

Expert Systems with Applications

journal homepage: www.elsevier.com/locate/eswa

Measuring the efficiency of customer satisfaction and loyalty for mobile phone brands with DEA

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ARTICLE INFO

Keywords:
Customer satisfaction
Customer loyalty
DEA
Mobile phone sector
Turkey

ABSTRACT

The concept of customer satisfaction and loyalty (CS&L) has attracted much attention in recent years. A key motivation for the fast growing emphasis on CS&L can be attributed to the fact that higher customer satisfaction and loyalty can lead to stronger competitive position resulting in larger market share and profitability. Using a data envelopment analysis (DEA) approach, in this study we analyzed and compared CS&L efficiency for mobile phone brands in an emerging telecommunication market, Turkey. The constructs of European Customer Satisfaction Index (ECSI) model are treated and used as input and output indicators of our DEA model. Drawing on the perceptual responses of 251 mobile phone users, the DEA models reveal that from the top six mobile phone brands in Turkey, Nokia features as the most efficient brand followed by LG and Sonny Ericsson in terms of CS&L efficiency, while Motorola, Samsung and Panasonic rank as the least efficient brands.

1. Introduction

Over the past two decades, organizations of all types have increasingly acknowledged the importance of customer satisfaction and loyalty. The marketing literature suggests that the long term success of a firm is clearly based on its ability to rapidly respond to changing customer needs and preferences (Narver & Slater, 1990; Webster, 1992). A key motivation for the increasing emphasis on customer satisfaction is that higher customer satisfaction can lead to have a stronger competitive position resulting in higher market share and profitability (Fornell, 1992), reduced price elasticity, lower business cost, reduced failure cost, and mitigated cost of attracting new customers (Chien, Chang, & Su, 2003).

The principal focus of this study is on evaluating the efficiency of customer satisfaction and loyalty (CS&L) for existing mobile phone brands in Turkish mobile phone sector. Since the early 1990s, with the launch of the mobile phones, there has been a remarkable development both in their product sophistication and their rapid and widespread adoption. With more than three billion subscribers around the world, the extent of mobile phone diffusion in emerging markets has been increasingly larger than that in developed countries (Kalba, 2008). Turkey, being one of the fastest emerging market economies in the world, adopted mobile phone technology in 1994. Since then, there has been a considerable increase in the level of mobile phone ownership, where the number of mobile phone users in the country is expected to reach around 70 million by the end of 2013, representing a penetration rate of over 90% (RNCOS, 2010). The significant rise in mobile phone usage can partially be attributed to the fact that Turkey has the youngest population in Western Europe. Turkey currently has the 6th largest young mobile phone user base in the world, with more than 11 million subscribers under the age of 25, providing a very lucrative market for mobile phone companies (Euromonitor International, 2010). It should however be noted that the penetration in this market at present is still below the EU average, indicating that the mobile phone sector is not saturated yet, and there is still space for new investors. Currently, there exist nearly more than 10 major mobile phone companies operating in the Turkish mobile phone sector, each having a relatively large product line. As of 2010, the top five mobile phone brands were Nokia, Samsung, LG, Motorola and Sony Ericsson and together they account for nearly 75% of overall market sales. As a new comer, iPhone is rapidly increasing its market share, but as of the start of this study, did not have a significantly large presence. In terms of market share, Nokia has been undisputedly the market leader (36.4% of sales) with Samsung featuring second (19.5%) and LG ranking third (10.1%) (Patron Turk, 2010).

Commensurate to its widespread diffusion globally, there has been a growing worldwide academic interest in mobile phone

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doi:10.1016/j.eswa.2011.06.041

usage which focuses mainly on examining its contribution to social life, user preferences and its ergonomic features (Bagchi, Kirs, & Lopez, 2008). A number of empirical studies were also conducted within the context of Turkish mobile phone sector. The topics of these studies ranged from examining motivation of use (Dedeoglu, 2004; Ozcan & Kocak, 2003) to mobile phone selection (Isiklar & Buyukozkan, 2007), from customer satisfaction (Turkyilmaz & Ozkan, 2007) to brand loyalty (Simsek & Noyan, 2009).

The methodology used in study to evaluate the relative CS&L efficiency of mobile phone brands is based on data envelopment analysis (DEA). The traditional DEA technique has long been utilized as an invaluable tool in the field of operations research and management science to solve problems in wide range of industries (Hu, Lai, & Huang, 2009; Lee, 2009; Lin, Lee, & Chiu, 2009) as well as in not-for-profit organizations (Mahajan, 1991; Wu, Liang, & Chen, 2009; Zhang, Huang, Lin, & Yu, 2009); but its diffusion into the field of marketing and related disciplines has been relatively slow. For instance, in the marketing field, DEA has recently been employed as a powerful tool for data analysis in measuring efficiency in retailing sector (Charnes, Cooper, Learner, & Phillips, 1985; Donthu & Yoo, 1998; Keh, 2000; Keh & Chu, 2003; Thomas, Barr, Cron, & Slocum, 1998), evaluating website marketing efficiency (Shuai & Wu, 2011), benchmarking marketing productivity (Donthu, Hershberger, & Osmonbekov, 2005; Kamakura, Ratchford, & Agrawal, 1988), and measuring relative market efficiency (Murthi, Srinivasan, & Kalyanaram, 1996) or service quality (Athanassopoulos, 1997; Soteriou & Staurinides, 1997). The assessment of CS&L has always been a major research item on the agenda of researchers in the marketing and related fields, because the issue of how efficiently a firm manages its marketing processes and their relationship with their customers is central to its ability to gain competitive edge vis-à-vis its rivals. The DEA approach adopted in this study illustrates how differences in CS&L efficiency between various mobile phone brands can be ascertained empirically, and thus helps management determine proper policies and courses of action.

The rest of the paper is organized as follows. Section 2 reviews the recent literature on customer satisfaction and customer loyalty studies. Section 3 provides an in-depth description of our research methodology. Section 4 presents the results of our analysis. The last section (Section 5) summarizes our findings, describes managerial implications of the study and provides the concluding remarks.

2. Background literature

While customer satisfaction has been defined in various ways, the high-level conceptualization that appears to have gained the widest acceptance states that satisfaction is a customer's post-purchase evaluation of a product or service (Cronin & Taylor, 1992; Westbrook & Oliver, 1991). Customer satisfaction is also generally assumed to be a significant determinant of repeat sales, positive word-of-mouth, and customer loyalty. It has also long been considered as one of the key antecedents of creating brand loyalty (Cronin, Brady, & Hult, 2000; Dick & Basu, 1994; Fornell, Michael, Eugene, Jaesung, & Barbara, 1996; Syzmanski & Henard, 2001). Satisfied customers return and buy more, and they tell other people about their experiences, both positive and negative (Fornell et al., 1996).

Building on Hirschman's (1970) exit-voice theory, weakly dissatisfied consumers would be of primary importance to a firm. While strongly dissatisfied consumers generally choose the exit option (i.e., they leave the firm), the weakly dissatisfied customers tend to stay loyal to the firm and rather employ the voice option, which implies overt complaints as an attempt to change the firm's practices or offerings (Fornell & Wernerfelt, 1988). Thereby, proper handling of customer complaints may ensure that weakly dissatisfied consumers remain loyal, and serve as an exit barrier (Fornell, 1992; Halstead & Page, 1992). The impact of loyal customers is considerable; for many industries the profitability of a firm increases proportionally with the number of loyal customers and up to 60% of sales to new customers can be attributed to the word of mouth referrals (Reichheld & Sasser, 1990).

Within the existing literature on customer satisfaction research, various customer satisfaction models were developed based on a cumulative view of satisfaction. To this end, a number of customer satisfaction indices (CSIs) were designed with most prominent of those being Swedish Customer Satisfaction Barometer (SCSB), the American Customer Satisfaction Index (ACSI) and European Customer Satisfaction Index (ECSI). Of these CSIs, we employed the ECSI model as the backbone of our CS&L efficiency model in this study due to its recent popularity in the literature and its comprehensiveness in CS&L coverage. The ECSI is a structural model based on the assumptions that customer satisfaction is derived by a number of factors such as perceived quality, perceived value, expectations of customers, and image of a firm. These factors are the antecedents of overall customer satisfaction (Turkyilmaz & Ozkan, 2007). The model also estimates the results when a customer is satisfied or not. The four antecedents of customer satisfaction may also have direct effects on customer loyalty (Johnson, Gustafsson, Andreassen, Lervik, & Cha, 2001). Each construct in the ECSI model is a latent construct which is operationalized by multiple indicators (Chien et al., 2003; Fornell, 1992). The underlying constructs of the ECSI model are explained as follows:

The *image* construct evaluates the underlying image of the company. Image refers to the brand name and the kind of associations customers obtain from the product/company (Andreassen & Lindestad, 1998). Martensen, Kristensen, and Grønholdt (2000) argue that image is an important dimension of the customer satisfaction model. Image is a consequence of being reliable, professional and innovative, having contributions to society, and adding prestige to its user. It is anticipated that image has a positive effect on customer satisfaction, customer expectations and customer loyalty.

Customer expectations are the consequences of prior experience with the company's products (Rotondaro, 2002). This construct evaluates customer expectations for overall quality, for product and service quality, and for fulfillment of personal needs. The customer expectations construct is expected to have a direct and positive relationship with customer satisfaction (Anderson, Fornell, & Lehmann, 1994).

Perceived quality is evaluation of recent consumption experience by the market served. This construct evaluates customization and reliability of a given product or service. Customization is the degree to which a product or service meets a customer's requirements, and reliability is the degree to which firm's offering is reliable, standardized, and free from deficiencies. Perceived quality is expected to have a positive effect on customer satisfaction (Fornell et al., 1996).

Perceived value is the perceived level of product quality relative to the price paid by customers. Perceived value is the rating of the price paid for the quality perceived and a rating of the quality perceived for the price paid (Fornell et al., 1996). Perceived value structure provides an opportunity for comparison of the firms according their price-value ratio (Anderson et al., 1994). In the model, perceived value is expected to have a positive impact on satisfaction.

Customer satisfaction construct indicates how much customers are satisfied, and how well their expectations are fulfilled. This construct evaluates overall satisfaction level of customers,