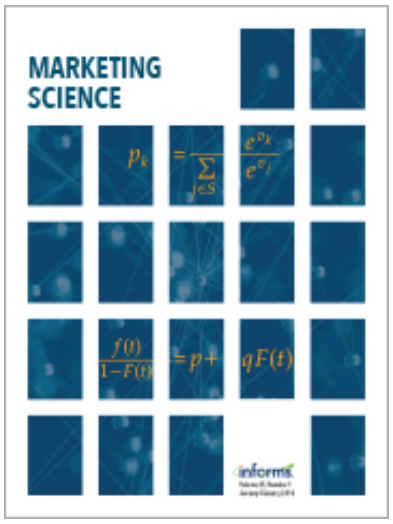

Marketing Science

Publication details, including instructions for authors and subscription information:
http://pubsonline.informs.org

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To cite this article:
Vikas Mittal, Eugene W. Anderson, Akin Sayrak, Pandu Tadikamalla, (2005) Dual Emphasis and the Long-Term Financial Impact of Customer Satisfaction. Marketing Science 24(4):544-555. https://doi.org/10.1287/mksc.1050.0142

MARKETING SCIENCE
Vol. 24, No. 4, Fall 2005, pp. 544–555
ISSN 0732-2399 | EISSN 1526-548X | 05 | 2404 | 0544

informs

DOI 10.1287/mksc.1050.0142

Dual Emphasis and the Long-Term Financial Impact of Customer Satisfaction

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This paper draws on the quality profitability emphasis framework of Rust, Moorman, and Dickson (2002) (Rust, Roland T., Christine Moorman, Peter R. Dickson. 2002. Getting returns from service quality: Revenue expansion, cost reduction, or both. *J. Marketing* **66**(October) 7–24.) to examine the association between customer satisfaction and long-term financial performance among firms that *achieve* a dual emphasis (focusing on both revenue-expansion and cost-reduction simultaneously, rather than solely emphasizing one over the other). Using a longitudinal data set of 77 firms from the United States, we test this hypothesis and find that the association between customer satisfaction and long-term financial performance is positive and relatively stronger for firms that successfully *achieve* a dual emphasis. We build on the work of Rust, Moorman, and Dickson (2002), who investigated the financial impact of engaging in the process of achieving a dual emphasis. Collectively, these studies show that while *achieving* a dual emphasis is desirable for long-run financial success, the *process of achieving* a dual emphasis may not be as financially rewarding in the short run. Firms pursuing a dual emphasis need to consider both short- and long-term consequences of their strategy.

Key words: customer satisfaction; services marketing; marketing strategy and metrics
History: This paper was received August 6, 2003, and was with the authors 12 months for 2 revisions; processed by Roland Rust.

Introduction

The beneficial impact of increasing customer satisfaction on customer behaviors such as repurchase, word-of-mouth, and cross-buying from the firm's portfolio of offerings is now well documented (Bolton and Drew 1994, Oliver 1997, Reichheld 1996, Richins 1983, Westbrook 1987). The sum effect of such behaviors is widely believed to make a major contribution to financial returns, and many studies support a positive statistical association between customer satisfaction and financial outcomes such as revenues and return on investment (Anderson et al. 1994, 1997; Bolton 1998; Rust et al. 1995, 2000).

However, increasing customer satisfaction should not be equally rewarding for all firms. In the extreme, single-minded pursuit of satisfaction may lead to overspending and misallocation of resources (Rust et al. 1995). Yet, to date, there has been little work examining factors that moderate the association between satisfaction and profitability or the boundary limits of this key strategic relationship (Zeithaml 2000).

This study looks at the potential moderating role of a firm's strategic emphasis on the association between customer satisfaction and long-term financial performance. To do so, we draw on the Rust et al. (2002) quality profitability emphasis framework that posits that firms seeking to maximize financial returns can emphasize customer satisfaction (revenue emphasis), efficiency (cost emphasis), or both (dual emphasis). They find that firms *trying to achieve* the dual emphasis do not perform as well financially as firms trying to achieve a revenue emphasis. Complementing their research, we test the hypothesis that the association between customer satisfaction and long-term financial performance should be greater for those firms that successfully *achieve* a dual emphasis—enhancing both customer satisfaction and efficiency simultaneously—rather than solely emphasizing one over the other.

This study is timely and important for two reasons. First, it is important for academics interested

in the association between satisfaction and profitability to examine the moderating factors that affect this relationship. Managers, too, require a more complete understanding of the conditions under which investments in customer satisfaction should be expected to pay off. If managers believe that their firm's strategic emphasis must be either revenue- or cost-oriented, then they may behave sub-optimally. Second, as suggested earlier, our findings are complementary to those of Rust et al. (2002), who examined the difference between firms that were in the *process of achieving* the different emphases. In contrast, we examine firms that *have successfully achieved* the different emphases. We find that achieving a dual emphasis has the strongest association with financial performance, as measured by Tobin's q.

Background

As reviewed by Zeithaml (2000) and by Rust et al. (2002), quality efforts generally tend to have a positive impact on a firm's financial performance, although the magnitude of the impact is highly variable. Insights into the nature and magnitude of this impact are available from both economy-wide and within-firm studies.

Economy-Wide Studies. Many economy-wide studies conducted at the University of Michigan's National Quality Research Center find a positive association between customer satisfaction and financial outcomes such as ROI (Anderson et al. 1994, Fornell 1992, Fornell et al. 1996) and Tobin's q (Anderson et al. 2004). Among these studies, only Anderson et al. (1997) examine the contingent nature of the association between satisfaction and ROI. They find that the association differs for goods and services: a 1% increase in satisfaction is related to a 0.37% increase in ROI for goods but only a 0.22% increase in ROI for services. They argue that this phenomenon is due to the fact that services involve higher trade-offs in quality because of their customizability.

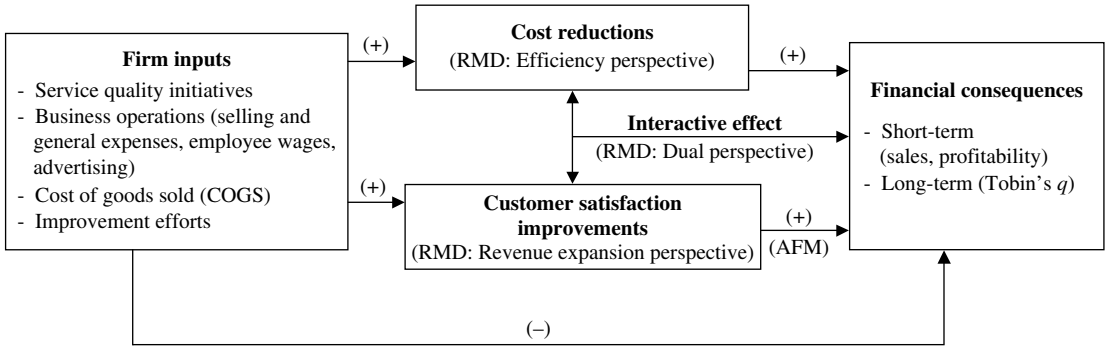
Within-Firm Studies. Several studies examine data from individual firms and report a generally positive impact of service quality and satisfaction perceptions on financial outcome. Many of these early studies examine the impact of satisfaction and service quality on either customer behaviors (Bolton 1998, Mittal and Kamakura 2001) or revenues (Ittner and Larcker 1998), although detailed studies linking firm operations to customer perceptions and financial outcomes are beginning to surface (Evangelist et al. 2002, Loveman 1998). However, these studies do not explicitly address costs associated with serving the customer base.

The return on quality (ROQ) perspective put forward by Rust et al. (1995) incorporates the costs associated with improving service and satisfaction. In the ROQ model, satisfaction and quality efforts have a positive financial impact only if the financial benefits of satisfaction improvements exceed the cost of the quality program and achieving the desired satisfaction level. ROQ argues that instead of the *revenue* impact, firms should examine the *profit* impact of satisfaction and service investments. When studies examine profitability rather than revenues alone, interesting contingencies begin to surface. Reinartz and Kumar (2000) find that long term customers—who were presumably more satisfied—were not always the most profitable customers of a firm because, in many cases, the cost of serving such customers exceeded the financial benefit generated. In an extensive study of financial institutions, Ittner and Larcker (1998) find that satisfaction is positively related to retention and revenues but not to margins. Specifically, bank branches ranking in the lowest customer satisfaction quartile do not have significantly different return on sales (margins/sales) than those ranking in the highest quartile, despite the fact that the lower quartile branches exhibit lower revenues than the higher quartile branches. This may be because the high-satisfaction branches focus only on revenue enhancement, paying less attention to the cost of satisfaction. Kamakura et al. (2002) examine several branches of a Brazilian bank and find branches that are efficient in satisfying *and* retaining customers are more profitable than branches that are inefficient at one or both.

These studies show that despite the strong positive association found in large scale studies discussed earlier, there is considerable variance in the financial impact of service quality investments—even within a given firm. Increased revenue from higher customer satisfaction is only one of many paths to profitability. Managers should also be concerned with efficiencies that emanate from process improvements. In fact, the ROQ framework (Rust et al. 1995, Figure 1) explicitly shows that firms investing in quality improvements aimed at enhancing customer satisfaction can contribute to the bottom line from two routes. The first pertains to downstream, revenue-enhancing outcomes of increased satisfaction discussed earlier. The second pertains to efficiency improvements resulting from processes employed in achieving a given level of quality, and the resulting satisfaction. The paths are outlined in Figure 1.

Figure 1 highlights three conclusions. First, a firm that overspends on customer satisfaction relative to its financial impact can see an overall negative impact of increased customer satisfaction. Second, any efficiency gains from quality improvement efforts can lead to beneficial financial consequences. Third, these

Figure 1 Understanding Satisfaction and Long-Term Firm Value



two perspectives may be mutually reinforcing, leading to a dual perspective that has only emerged recently in the marketing literature. This is reviewed in some detail next.

The Dual Emphasis

Rust et al. (2002) argue that many companies typically adopt a cost emphasis or a revenue emphasis to manage their firm, with only a handful of firms having the ability to implement a dual emphasis—simultaneously emphasizing cost reduction and revenue enhancement. The major aspects of each emphasis, as outlined by Rust et al. (2002), are summarized below.

- **Cost Emphasis**: The cost emphasis argues that financial benefits accrue from operational efficiencies and improvements that decrease costs. This view has an internal focus designed to introduce operations and systems that reduce costs via standardization, efficiency improvements, and defect reduction. This approach is typically the domain of accounting and operations management. Examples of such programs include six sigma, total quality management (TQM), and statistical process control (SPC).
- **Revenue Emphasis**: The revenue emphasis argues that improved products and services that enhance customer satisfaction lead to higher revenues and positive financial benefits. This view has an external focus designed to enhance customer satisfaction and retention. This approach is typically the domain of marketing. The revenue emphasis is exemplified in programs designed to introduce and modify products and services to exceed customer expectations, to retain consumers, and improve sales to already retained customers.
- **Dual Emphasis**: The dual emphasis argues that financial benefits accrue to firms from simultaneous cost reductions via efficiencies and revenue enhancements via customer satisfaction improvements. Rust et al. (2002) caution that in practice a dual emphasis is very difficult to implement because the efficiency and revenue enhancement perspectives stem from very different organizational philosophies. The cost emphasis is internally focused toward the firm's operations and is designed to promote efficiencies that lower costs. The revenue emphasis is externally focused toward satisfying the firm's consumers and is designed to increase revenues via spending on customers.

If achieved successfully, the dual emphasis should produce the best results with respect to profitability through simultaneously increasing revenues and decreasing costs, especially in the long run. This distinction between the long-term and short-term impact is very important from a financial standpoint. Within the finance and economic literature, such long-term, future value is often measured using quantities such as Tobin's q (Tobin 1969), and it may not be reflected in quantities such as return on assets (ROA) and return on investments (ROI). The latter are typically backward looking, whereas Tobin's q is forward looking.

Why should firms that successfully achieve a dual emphasis engender higher *long-term* value? Our explanation is best understood using the following example. Consider two firms—$\text{Firm}_{Efficient}$ and $\text{Firm}_{Not\text{-}Efficient}$—that have achieved identical satisfaction levels. Both firms are likely to reap the same revenue expansion benefits from downstream customer behaviors such as repurchase, word of mouth (WOM), new product trial, etc. However, $\text{Firm}_{Efficient}$, also has higher efficiency as well. That is, $\text{Firm}_{Efficient}$ has a dual focus. As such, $\text{Firm}_{Efficient}$ uses fewer inputs to achieve the same level of satisfaction as $\text{Firm}_{Not\text{-}Efficient}$. Due to the higher efficiency and resulting cost savings, $\text{Firm}_{Efficient}$ will likely have more unused resources available than $\text{Firm}_{Not\text{-}Efficient}$. Such extra resources can have *longer-term benefits* than the immediate positive impact on profitability. This happens because, in addition to satisfaction enhancement, a given firm is likely to have many other high net present value (NPV) projects available. Cost savings from being efficient build up a resource base that can be invested into such high NPV projects. This is likely to contribute

positively to the observed relationship between larger satisfaction and economic returns. The underlying assumption that, at any given point in time, most firms are likely to have a portfolio of projects, some among which will have higher returns than customer satisfaction, is quite reasonable. Such investments have an "accelerator" effect such that the impact of satisfaction on financial outcomes should be stronger for relatively more efficient firms. Conversely, inefficient firms can be caught in a triple whammy. First, with the same level of resources as another firm, they may achieve a lower satisfaction level due to inefficiencies. This will lower the downstream revenue benefits and further diminish economic returns. Second, managers at such firms can get disheartened and completely pull the plug on satisfaction programs, leading to a downward spiral of decreasing satisfaction and customer defection (Anderson and Mittal 2000). Third, inefficient resource utilization will ensure that they have fewer resources left to invest in additional high NPV projects. Thus, any additional benefits from investing in other high NPV projects are *un*likely to accrue, causing even lower overall economic returns.

Over time, these differences are likely to be accentuated. As efficient firms reap higher economic returns from downstream benefits and investments in higher NPV projects, they are further enabled to invest the gains in improving satisfaction and engage in other financially rewarding activities. Conversely, inefficient firms may become resource strapped, leaving gaps in satisfaction. Thus, they may lose customers to other firms having higher satisfaction levels, and a downward spiral of deteriorating customer satisfaction and retention may unfold. Similarly, they are unable to achieve the benefits of investing in higher NPV projects. Thus, over time a process similar to the "rich get richer and poor get poorer" unfolds. Based on the above discussion we posit:

Dual Emphasis Hypothesis: Firms that successfully achieve a dual emphasis—employing both a revenue emphasis (customer satisfaction) and a cost emphasis (efficiency)—should exhibit greater long-term financial performance than firms with either a revenue or cost emphasis only.

Note that the above hypothesis is complementary to the work of Rust et al. (2002) in a subtle, yet important, way. While those authors examine differences among firms engaged in the *pursuit of* the dual emphasis, we examine differences among firms that *attain* the dual emphasis. To be sure, for most firms the pursuit of a dual emphasis is likely to be a daunting task. Often firms have a dominant culture that may facilitate cost reduction or revenue enhancement but not both. The clash between these two opposing philosophies can set up nonreinforcing dynamics such that a pursuit of the dual approach is ineffective. Due to this possibility, it could be the case that many firms that *pursue* the dual perspective have negative financial returns but only those firms that successfully *achieve* the dual perspective witness positive financial returns. In contrast with Rust et al. (2002), who examine the impact of *pursuing* a dual emphasis, we examine the impact of *achieving* a dual emphasis.

Research Setting and Data Description

To test our hypothesis, we require a measure of customer satisfaction to gauge a firm's success at achieving a revenue emphasis and a measure of overall efficiency to assess the degree to which a firm achieves a cost emphasis. As described in this section, we employ firm-level customer satisfaction measures from the American Customer Satisfaction Index database compiled at the University of Michigan Business School, match these observations with appropriate financial data, and calculate a measure of efficiency for each firm in our sample using data envelopment analysis (DEA).

Customer Satisfaction

Firm level satisfaction measures for the study were obtained from the American Customer Satisfaction Index (ACSI) database. The ACSI was developed in 1994 by the University of Michigan Business School's National Quality Research Center with support from the American Society for Quality Control. It measures satisfaction from a broad cross-section of industries representing 43% of the US GDP.

A representative sample of approximately 250 current customers from each firm is interviewed each year. A different sample of consumers is contacted each year. All respondents have purchased specific goods or services from the firm in a defined period of time. For a given year, the database contains more than 200,000 customer surveys (see Fornell et al. 1996 for a complete description). Twenty-five industries from the retail, finance/real estate/insurance, durable manufacturing, nondurable manufacturing, basic services, and transportation/communications/utilities sectors are included in the data set used for this study. The following industries are represented in the sample (a subset of the firms in the sample is noted in parentheses): apparel (Liz Claiborne, Levi Strauss); athletic shoes (Nike, Reebok); automobiles (Chrysler, Honda); banks (Wells Fargo, Key Bank); brewing (Anheuser-Busch); department stores (Federated, May); discount stores (K-Mart, WalMart); fast food (McDonald's, Wendy's); food processing (Dole Foods, Heinz, Kellogg, Quaker Oats); hotels (Promus); household appliances (Maytag, Whirlpool); soft drinks (Coca-Cola, Pepsico); personal care (Dial, Colgate-Palmolive); personal computing (Compaq,

Dell); pet foods (Ralston); service stations (Mobil, Texaco); supermarkets (Kroger, Safeway); tobacco (Phillip Morris); telecommunications-long distance (MCI, Sprint); telecommunications-local (BellSouth, US West).

In the ACSI measurement system, customer satisfaction is a latent variable calculated from survey responses using a partial least square method of weighting. Satisfaction is based on manifest variables included in the survey to which the interviewed customer provides answers in the phone survey (see Fornell 1992 for a completed description of the methodology). The resultant satisfaction score ranges from 0 to 100, with 100 representing the highest level of satisfaction. The satisfaction measure used in the study is the mean of the average annual index for each firm, and it is calculated as a simple average of the mean annual rating for each firm obtained from ACSI. A key advantage of this satisfaction measure is the methodological consistency across all the firms. That is, exactly the same survey instrument, interviewing methodology, and statistical techniques are applied to create the satisfaction index, which ensures that variation in observed satisfaction scores cannot be attributed to methodological differences. Overall, we have customer satisfaction data on 77 firms whose customers participated in the ACSI survey at the University of Michigan. The span of the data set is from 1994 to 2000. Once combined with the efficiency and financial measures described below, there is a total of 399 usable observations.

Efficiency

We measure a firm's efficiency focus using data envelopment analysis (DEA), a technique developed in the operations research literature. DEA has been widely used in contexts such as evaluation of school districts (Bessent et al. 1982), power plants (Athanassopoulos et al. 1999), and bank branches (Soteriou and Zenios 1999). This approach for measuring efficiency is fully reviewed in Charnes et al. (1994) and in Norman and Stoker (1991). Within a satisfaction context, it has been used to compare the efficiency of resource utilization among different branches of a bank (Frei and Harker 1999, Kamakura et al. 2002).

DEA is a mathematical programming technique to measure the relative efficiency of multiple decision-making units, or DMUs (firms in our application) producing multiple outputs from multiple inputs. Efficiency for a decision-making unit is measured by comparing the inputs it needs to those needed by a combination of the most efficient units operating under similar conditions to produce the same levels of outputs. This set of efficient units operating under similar conditions form one facet of the production efficiency frontier. DEA compares the inputs and outputs of all DMUs, identifies the most efficient set of DMUs to which a particular one will be compared, and creates a "virtual" production unit as a convex combination of the units in the efficiency frontier. This "virtual" production unit serves as a benchmark for the unit under evaluation. The main advantage of this model, relative to traditional measures of productivity such as output/input ratios, is that it evaluates each DMU in comparison only to other units operating at the same scale levels.

To assess the efficiency focus of each firm in producing customer satisfaction, the satisfaction measure from the ACSI was used as the output variable. To identify the input variables we attempted to obtain measures on all those variables that are theoretically linked to customer satisfaction and on which data were public. From these data, the set of relevant input variables was identified using a regression analysis. By using this approach, we do not claim to have identified the "correct" set of satisfaction inputs, nor have we included the "exhaustive" set of satisfaction inputs. Although we chose the initial set of inputs based on theoretical justification, we were naturally limited by the available secondary data for the firms in our data set. The input variables included in our model are summarized in Table 1. A brief description and the logic for inclusion of each variable follow:

- *Advertising expenses*: A higher level of advertising is likely to generate positive brand equity, which in turn leads to positive satisfaction by insulating customers from isolated negatively disconfirming events (cf. Anderson and Sullivan 1993). Therefore, it is expected that advertising expenses should be positively related to customer satisfaction.
- *Number of employees*: It is expected that the number of employees at a firm will be positively related to customer satisfaction. A higher number of employees can lead to higher customer satisfaction by enabling the firm to provide customized and differentiated service and by providing better-quality products. This is especially true for firms whose final output has a larger service component (Anderson et al. 1997).
- *Selling and general expenses*: Higher selling and general expenses should also be positively associated with higher customer satisfaction. The logic is identical to the previous point.
- *Cost of goods sold*: In general, cost of goods sold should be positively related to overall satisfaction, because higher-quality goods offered for consumption to consumers should also cost the firm more. In efficient markets, firms having higher cost of goods sold may be competing in high-quality tier markets, where satisfaction levels are found to be generally higher than for low-quality tiers. As an example, consider a multiline firm such as Ford, where the relative satisfaction with its high-quality tier line (e.g., Continental) is higher than its low-quality tier line (e.g., Escort).

Advertising expenses were obtained from Competitive Media Services (Ad$Summary 1993–1997). This source is useful, as it provides expense data aggregated at the company level that is appropriate for our purposes. The remaining measures—number of employees, selling and general expenses, and cost of goods sold—were obtained from COMPUSTAT. We created ratio variables by dividing each with the total firm sales. Thus, the variable created is a percentage, with the numerator being the input variable and the denominator being total firm sales. Doing so enables us to control for firm size, where total sales is a surrogate of firm size.

Next a regression analysis (see Table 1) was conducted to ascertain whether or not these inputs are statistically related to satisfaction in our sample. If, indeed, these are inputs to creating satisfaction, they should be statistically related to satisfaction. As seen in Table 1, all of the coefficients are statistically significant and are in the correct direction. The only exception is number of employees/sales, which had a negative coefficient. However, note that the square term of this variable is very large and statistically significant, indicating that it has a nonlinear relationship with overall satisfaction. A plot shows that over the range of the data we have, the impact of increasing number of employees/sales is positive with increasing returns. The R^2 of 36.83% indicates that these inputs account for a reasonably high amount of variability in the output measure customer satisfaction.

In the next step we conducted a DEA to estimate the relative efficiency with which each firm translates these inputs in creating the desired outcome, customer satisfaction. In DEA, for each DMU (a firm), a virtual input and output are formed using weights u_i for outputs and v_j for inputs. In our case, each firm is a DMU and has only one output, CS (customer satisfaction). We have four inputs: NE, the ratio of number of employees to the sales of the firm; CG, the ratio of the cost of the goods sold to the sales of the firm; AE, the ratio of the advertising expenses to the sales of the firm; and SGE, the ratio of the sales and general expenses to firm sales.

Table 1 Inputs to Customer Satisfaction: Regression Analysis

Independent variables	Regression coefficient	Std. error	*P*-value
Intercept	63.63	5.07	0.0001
Number of employees/sales	−474.34	117.32	0.001
(Number of employees/sales)^2	300,231.20	88,923.74	0.001
Cost of goods sold/sales	16.76	5.65	0.004
Advertising expenses/sales	44.75	14.15	0.002
Selling and general expenses/sales	18.18	9.45	0.058
Model $F = 8.28$; $p < 0.0001$			
$R^2 = 36.83\%$			

For any firm k,

Virtual output: $u_1 \cdot \mathrm{CS}_k$
Virtual input: $v_1 \cdot \mathrm{NE}_k + v_2 \cdot \mathrm{CG}_k + v_3 \cdot \mathrm{AE}_k + v_4 \cdot \mathrm{SGE}_k$.

Then, the weights are determined, using linear programming so as to maximize the ratio,

$$\frac{\text{Virtual output}}{\text{Virtual input}}.$$

The data consist of the five variables (four inputs and one output) NE, CG, AE, SGE, and CS for each one of the 77 firms. We apply a basic DEA model (Charnes et al. 1994) to solve the following fractional programming problem for each firm to obtain values for the input "weights" v_i $(i = 1, 2, 3, 4)$ and output weights u_j $(j = 1)$ as variables

For firm k,

$$\text{Max} \quad \theta = \frac{u_1 \cdot \mathrm{CS}_k}{v_1 \cdot \mathrm{NE}_k + v_2 \cdot \mathrm{CG}_k + v_3 \cdot \mathrm{AE}_k + v_4 \cdot \mathrm{SGE}_k},$$

$$\text{subject to} \quad \frac{u_1 \cdot \mathrm{CS}_j}{v_1 \cdot \mathrm{NE}_j + v_2 \cdot \mathrm{CG}_j + v_3 \cdot \mathrm{AE}_j + v_4 \cdot \mathrm{SGE}_j} \le 1, \quad (j = 1, 2, \ldots, 77)$$

$$v_1, v_2, v_3, v_4, u_1 \ge 0.$$

The constraints mean that the ratio of the "virtual output" to "virtual input" should not exceed 1 for any firm. The objective is to obtain weights (v_i and u_i) that maximize the ratio for firm k. The above fractional program can be replaced by the following linear programming problem:

For firm k,

$$\text{Max} \quad \theta = p_1 \cdot \mathrm{CS}_k,$$

$$\text{subject to} \quad w_1 \cdot \mathrm{NE}_k + w_2 \cdot \mathrm{CG}_k + w_3 \cdot \mathrm{AE}_k + w_4 \cdot \mathrm{SGE}_k = 1,$$

$$p_1 \cdot \mathrm{CS}_j \le w_1 \cdot \mathrm{NE}_j + w_2 \cdot \mathrm{CG}_j + w_3 \cdot \mathrm{AE}_j + w_4 \cdot \mathrm{SGE}_j \quad (j = 1, 2, \ldots, 77).$$

The resultant output provides a ratio-scaled measure of a firm's efficiency ranging from 0 to 1, such that 0 represents the most inefficient firm and 1 represents the most efficient firm with respect to the virtual frontier. In our sample, the average efficiency score was 0.78 with a standard deviation of 0.12.

Note that this measure was based on the average of the time series data. This was done to ensure consistency across each year. We also tried to construct a separate efficiency measure for each year, but the high number of missing data entries precluded it from being a stable measure. Moreover, from a conceptual standpoint, it seems reasonable to expect that the relative efficiency of a firm within an industry is more

likely to be stable over a 4- to 5-year window than to change from year to year.

Long-Term Financial Performance

To measure long-term financial performance of a firm, we use Tobin's q (Tobin 1969). Tobin's q is the ratio of the firm's market value to the current replacement cost of the firm's assets. Intuitively, replacement cost (the denominator) is a logical measure of alternative uses of the firm's assets. A firm that creates market value greater than the replacement costs of its assets is presumably using its assets more effectively. Thus, a firm that does not create incremental value will have a Tobin's q of 1 while firms creating incremental value will have a Tobin's $q > 1$.

Tobin's q has gained wide acceptance as a measure of a firm's economic performance. As it is based on capital market valuations, Tobin's q is forward-looking, appropriately incorporates firm risk, and circumvents the aberrations that tax laws and accounting conventions may have on accounting-based profitability measures such as return on equity or return on assets. As such, it is directly comparable across industries, whereas accounting measures may not be so easily compared (Montgomery and Wernerfelt 1988). Accounting measures are also not risk-adjusted and do not properly capture Ricardian rents that are expected to be realized over the long-run (see Smirlock et al. 1984 for a detailed discussion). And, empirically, simulations show that Tobin's q has smaller average errors and greater correlation with true measures than do accounting rates of return (McFarland 1988). For these reasons, the use of Tobin's q has become increasingly prevalent in the industrial organization and marketing literature (Bharadwaj et al. 1999, Anderson et al. 2004, Simon and Sullivan 1993).

Of course, there are challenges when using Tobin's q. In particular, estimating the replacement value of tangible assets is complex and can be difficult to compute (Hall et al. 1988). In addition, the denominator of q excludes intangible assets from its calculations. These intangible assets do contribute to the value of a firm, but estimates of replacement costs for these assets are obviously not a part of the denominator. In extreme cases, not accounting for the replacement value of an intangible asset may result in "overestimation" of a firm's true q.

In the methodology and data sections that follow, we utilize prescribed methods for calculating q and controlling for potential factors that have been shown to minimize these limitations as far as possible. The actual measure of Tobin's q used in the present study is obtained from the database constructed by Anderson et al. (2004), which uses Chung and Pruitt's (1995) approximation of the NBER method of Hall et al. (1988).

Analysis and Results

The descriptive statistics along with the correlation matrix of all the variables is shown in Table 2. Reassuringly, all the correlations are in the expected direction. For instance, satisfaction and financial performance are positively correlated.

To analyze our data set, we require a methodology that minimizes potential bias due to unobserved fixed, random, and time-varying effects. We also require an approach that provides the statistical benefits of pooling firms and industries together without giving up the ability to allow individual firm- and industry-level estimates to vary cross-sectionally.

An approach that meets our needs is hierarchical linear modeling (HLM) (Raudenbush and Bryk 2002). From an intuitive standpoint, HLM operates by "borrowing" information from across firms and industries to improve firm- and industry-level estimates. It also provides a means of controlling for the unobservable effects described above. To do so, we specify a model with three levels. The first level captures time-varying effects within a firm from period-to-period; the second models firm-specific effects within an industry; and the third estimates industry-specific effects across the sample.

HLM subsumes both OLS and random-coefficient approaches as special cases. A single-level hierarchical model with one common variance component is equivalent to OLS. A two-level hierarchical model with variance partitioned into within-group and between-group variance is equivalent to a random coefficients model. However, a traditional OLS model using fixed-effects dummies for firms and industries is unsuitable, as it does not allow for firm- and industry-specific variance in model coefficients, nor does it account for random time-varying effects. A random-coefficients model would be a candidate approach if we had only two levels of error variance, but our data set presents us with a three-level problem. An HLM approach enables us to capture all of these aspects of the data and provides us with the most straightforward methodological solution, given

Table 2 Descriptive Statistics: Means, Standard Deviations, and Correlations

	Mean	Std. dev.	1	2	3	4	5	6
(1) Tobin's q	2.33	1.68	1					
(2) Annualized stock return	0.125	0.38	0.43**	1				
(3) Customer satisfaction	0	6.13	0.23**	0.13**	1			
(4) Efficiency	0	0.12	0.23**	0.15**	0.25**	1		
(5) Time	3.46	1.68	0.08***	−0.24**	−15**	−0.05$^{n.s.}$	1	
(6) Herfindahl index	0.11	0.10	0.08***	0.14**	0.08***	0.29**	0.002$^{n.s.}$	1

n.s. $= p > 0.10$; * $= p < 0.05$; ** $= p < 0.01$; *** $= p < 0.10$.

the nature of the estimation challenge. Moreover, it models the *non*independence of error terms, because for each firm the yearly observations should have highly correlated residuals in a regression. Although this problem could be solved with repeated measures ANOVA, the repeated measures alone would not account for the nesting of the sampling. The nesting implies that there also should be correlated residuals across yearly observations for a firm.

Conceptually, our data include information sampled at three levels: Level 1 is time (sampled as years within a firm); Level 2 is firm (sampled from within an industry); and Level 3 is industry. At Level 1, we have a model for the financial performance of a firm in a given industry for a given year. Any variables that vary with time are included in the Level 1 model as predictors. Included at Level 2 are predictors that vary with the firm, but not with time, and at Level 3 predictors that vary by industry, but not by firm or time. To formulate the model, it is simplest to start with more general notation. Hence, our Level 1 model Equation (1) includes time as a trend variable and a set of time-varying covariates and is subscripted for the ith year, the jth firm, and the kth industry.[1]

For notational convenience, we label all of these time-varying covariates as TVCOV in the model description. Note that each of the parameters in model 1 is allowed to vary by firm and industry since they have j and k subscripts, respectively, and note that we write model 1 as if there is only one time-varying covariate, but extension to a set of time-varying covariates simply implies a set of β_{2jk}.

At Level 2 (models 2a–2c), we have a model that includes the parameters from model 1 as dependent variables. Model 2 incorporates an intercept, a random error term, and the nontime-varying covariates, L2COV. These are variables at the firm level that do not vary with time (e.g., efficiency).

The Level 3 models are written at the level of the industry. At Level 3, we can incorporate covariates that vary only at the industry level (e.g., Herfindahl Index). Notice that since Level 2 is a model for the parameters of Level 1 and Level 3 is a model for the parameters of Level 2, by successive substitution, we can arrive at a single combined model that includes variables from all three levels.

[1] In our data we have 77 firms or Level 2 groups with each firm having 5–6 observations. In education where HLM is extensively used, typically Level 2 consists of a class with 20–60 students. A potential concern is whether we have enough observations in each Level 2 group to obtain reliable estimates. In a recent paper, Mass and Hox (2004) show that Level 2 groups with 5 observations perform equally well as groups with more observations.

The models are summarized below:

Level 1: *Across Time Within a Firm*

$$y_{ijk} = \beta_{0jk} + \beta_{1jk} time_{ijk} + \beta_{2jk} TVCOV_{ijk} + \varepsilon_{ijk} \quad (1)$$

Level 2: *Across Firms Within an Industry*

$$\begin{aligned} \beta_{0jk} &= \gamma_{00k} + \gamma_{01k} L2COV_{jk} + \mu_{0jk} \\ \beta_{1jk} &= \gamma_{10k} + \gamma_{11k} L2COV_{jk} + \mu_{1jk} \\ \beta_{2jk} &= \gamma_{20k} + \gamma_{21k} L2COV_{jk} + \mu_{2jk} \end{aligned} \quad (2)$$

Level 3: *Across Industries*

$$\begin{aligned} \gamma_{00k} &= \alpha_{000} + \alpha_{001} L3COV_k + r_{00k} \\ \gamma_{10k} &= \alpha_{100} + \alpha_{101} L3COV_k + r_{10k} \\ \gamma_{20k} &= \alpha_{200} + \alpha_{201} L3COV_k + r_{20k} \\ \gamma_{01k} &= \alpha_{010} + \alpha_{011} L3COV_k + r_{01k} \\ \gamma_{11k} &= \alpha_{110} + \alpha_{111} L3COV_k + r_{11k} \\ \gamma_{21k} &= \alpha_{210} + \alpha_{211} L3COV_k + r_{21k} \end{aligned} \quad (3)$$

More specifically, then, we consider models that incorporate the following variables:

Dependent variable:

y_{ijk} = Tobin's q for a firm in a particular year

Predictor variables:

$time_{ijk}$ = year in which Tobin's q is measured (1999, 2000, or 2001), centered so that ($time_{ijk}$ = year − 1999)

$TVCOV_{ijk}$ = indicates time-varying (Level 1) covariates and includes Customer Satisfaction

$L2COV_{jk}$ = indicates Level 2 factors and includes efficiency

$L3COV_k$ = indicates Level 3 factors and includes Herfindahl Index

Details of estimation for this type of model are discussed in a number of sources (e.g., Raudenbush and Bryk 2002, Singer and Willett 2003). We used Proc Mixed in the SAS software to estimate the model using a restricted maximum likelihood procedure.

Note that in our model we include both time and time^2 as recommended by Singer and Willett (2003). They argue that when there is reason to suspect that the dependent variable has an underlying time-varying component, it is advisable to include time as a covariate. We have data from 1994 to 2000, a time period when the U.S. economy went through a boom during the initial years but started to "cool off" after 1998. Collectively, the time ($+ve$ coefficient) and time^2 ($-ve$ coefficient) variables capture that trend; while the overall growth rate of the market was positive, it has started to cool off.[2]

[2] To ensure that this held true for our data, we plotted the predicted value of Tobin's q based on the time and time^2 variables alone.

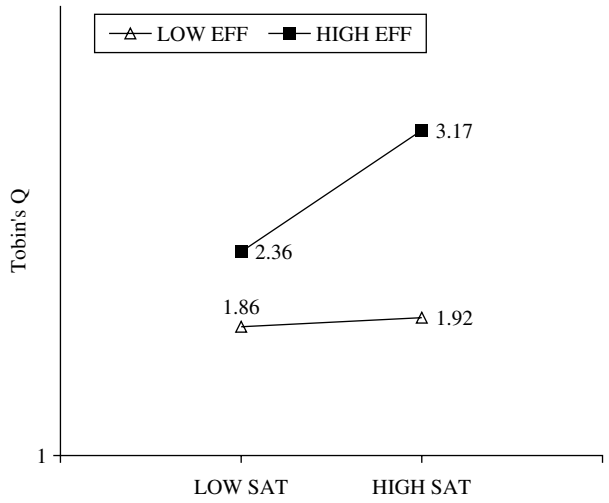
We estimate a series of nested models. The baseline model (M1) is the model estimated in most large-scale studies and includes only customer satisfaction. A rival model including both efficiency and satisfaction is estimated (M2). The final model (M3) included both the main effects as well as the interactive effect of efficiency and satisfaction. We conducted two sets of analyses, one with Tobin's q as the dependent variable and the other with annualized stock return as the dependent variable.

Tobin's q. Model 1 confirms results of most previous large-scale studies, showing a statistically significant and positive association between satisfaction and Tobin's q. It is consistent with the revenue enhancement perspective. Model 2 shows that both the revenue enhancement perspective (SAT) and efficiency perspective (EFF) are statistically associated with Tobin's q.

However, in Model 3, a different picture emerges. The statistically significant interaction between satisfaction and efficiency ($\beta_{SAT\times EFF} = 0.301$, $p < 0.01$) indicates support for the dual perspective. Thus, H1 is fully supported. Importantly, the main effect of satisfaction ($\beta_{SAT} = 0.041$, $p < 0.01$), as well as the main effect of efficiency ($\beta_{EFF} = 2.23$, $p < 0.01$) remain statistically significant.[3] In other words, achieving a revenue enhancement perspective has a significant long-term impact on firm value. More importantly, the significant interaction shows that achieving a dual emphasis yields higher benefits from revenue-enhancing activities. Compared to rival models, M3 has the lowest AIC (1,440.6) and BIC (1,444.4). Hence, M3 fits the data better than M1 and M2. The standardized coefficients show that the impact of achieving a revenue enhancement perspective is roughly the same as achieving an efficiency perspective (0.25 versus 0.28). More importantly, their interactive effect is equally strong (0.24).

To visually examine this effect, we create four groups of firms by creating mean splits on both of the predictor variables. The cell means of the resulting groups are summarized in Figure 2. For firms having low efficiency, the slope going from low to high satisfaction is virtually flat. Among firms having high efficiency, the slope is positive and steeper when going from low to high satisfaction.

Figure 2 The Dual Perspective and Tobin's q



Annualized Stock Return. Results for the annualized stock return are very different. Only in M1 does satisfaction have a statistically significant main effect on stock returns. However, in Models 2 and 3, no main or interactive effects of satisfaction or of efficiency emerge.

Alternative Model Specifications. We also estimated a number of rival specifications. First, we estimated a model including the square term of satisfaction, SAT^2, in the model. This is consistent with assertions that the impact of satisfaction on financial performance may be nonlinear. In this model, the SAT × EFF interaction remained statistically significant and positive ($p < 0.05$) although the coefficient for SAT^2 was nonsignificant ($p > 0.30$). Furthermore, this rival model provided a worse fit to the data with an AIC = 1,455.3 and BIC = 1,459.8.

Second, we estimated a model where the effect of industry is modeled as a fixed effect, analogous to more traditional cross-sectional models (e.g., Bharadwaj et al. 1999). In the present model (M3), the industry is included by specifying the error structure to recognize that firms are nested within industries. Essentially, this sets up an error structure that recognizes that firms within a single industry have errors that are more likely to be correlated to each other. The model where industry is modeled as a fixed effect provided a worse fit to the data with AIC = 1,504.6 and BIC = 1,500.9. Reassuringly, the substantive results were very similar to those reported here with the SAT × EFF interaction statistically significant and positive ($p < 0.05$).

Third, to understand the extent to which autocorrelation is addressed in the longitudinal data we also ran checks on the estimated error structure using the Durbin-Watson statistic. The Durbin-Watson statistic for the HLM specification, M3, was 1.06 compared

The model was highly significant and showed an n-shaped trend confirming that they adequately capture the underlying temporal trend in Tobin's q.

[3] Multicollinearity is always a concern in a model with multiplicative interactions. We mean-centered the variables to address it. In addition, we calculated the Variance Inflation Factor (VIF) for SAT, EFF, and SAT × EFF interaction in an OLS setting. They were all well below the traditional cutoff of 6 (VIF's < 1.5) indicating that multicollinearity is not a concern in this model.

Table 3 Financial Impact of Revenue-Expansion, Efficiency, and Dual Perspective

	Tobin's q				Annualized stock return		
			M3				
Independent variable	M1	M2	Unstandardized	Standardized	M1	M2	M3
Intercept	1.08**	1.15**	1.13**	1.13**	0.044[a]	0.057[a]	0.058[a]
Time	0.76**	0.75**	0.73**	0.73**	0.105*	0.101***	0.101***
Time^2	−0.098**	−0.097**	−0.093**	−0.093**	−0.023**	−0.022**	−0.022**
SAT (revenue enhancement perspective)	0.049**	0.042**	0.041**	0.25**	0.006*	0.004[a]	0.004[a]
EFF (efficiency perspective)		1.88**	2.23**	0.28**		0.217[a]	0.233[a]
SAT × EFF (dual perspective)			0.301**	0.24**			0.005[a]
HI (control)	0.602[a]	−0.05[a]	−0.11[a]	−0.12[a]	0.49**	0.41**	0.41**
Model χ^2	106.23	99.54	80.62		1.04	1.01	0.05
P-value	0.0001	0.0001	0.0001		n.s.[a]	n.s.[a]	n.s.[a]
AIC	1,452.6	1,445.6	1,440.6		355.3	355.5	361.7
BIC	1,459.4	1,452.3	1,444.4		362.1	362.2	368.5

[a]n.s. $= p > 0.10$.
* $= p < 0.05$; ** $= p < 0.01$; *** $= p < 0.10$.

to 0.51 for an econometric model with fixed effects only. Another model including the lagged dependent variable had a Durbin-Watson statistic of 1.74 implying a serial autocorrelation of zero. Reassuringly, the key results from all these models are the same, indicating the robustness of the phenomenon investigated. Specifically, for the model including the lagged Tobin's q, the estimate for satisfaction ($\beta_{\text{SAT}} = 0.02$, $p < 0.10$), efficiency ($\beta_{\text{EFF}} = 1.76$, $p < 0.01$) and satisfaction × efficiency interaction ($\beta_{\text{SAT}\times\text{EFF}} = 0.27$, $p < 0.01$) are very similar to M3. We also estimated a model including an instrumental variable for Tobin's q. Specifically, the fitted values from an equation estimating Tobin's $q_{(t)}$ = Tobin's $q_{(t-1)}$ were used as the instrumental variable. The estimates of satisfaction ($\beta_{\text{SAT}} = 0.02$, $p < 0.10$), efficiency ($\beta_{\text{EFF}} = 1.77$, $p < 0.01$), and satisfaction × efficiency interaction ($\beta_{\text{SAT}\times\text{EFF}} = 0.26$, $p < 0.01$) are very similar to M3 as well.

Summary and Future Research

We find that the association between customer satisfaction and long-term financial performance is positive and relatively stronger for firms that successfully achieve a dual emphasis, successfully achieving both customer satisfaction and efficiency simultaneously. In doing so, we build on recent empirical research supporting a positive association between customer satisfaction and financial performance by investigating a key factor moderating the financial impact of customer satisfaction. We believe that this is a natural, but important, step forward in this area of inquiry as it evolves from establishing the strength of key main effects to exploration of the nomological network in which the central constructs of customer satisfaction and financial performance are embedded.

For managers, our findings indicate that a focus on achieving revenue via customer satisfaction or efficiency through cost reductions alone may be suboptimal strategies for the long run. Specifically, comparing results related to Tobin's q (a measure of long-run financial performance) and annualized stock return (a measure of short-run performance), it is clear that firms that focus only on improving satisfaction are going to have increases in short-term performance, although in the long-run, a focus on satisfaction improvement alone is unlikely to be a winning strategy. Rather, we find that the greatest long-term financial returns accrue to firms that successfully achieve both. For the typical firm in our database with a market value of \$46 B, a one-point increase in customer satisfaction as measured by ACSI is worth \$1.613 B in market value to a high-efficiency firm, while a one-point increase in ACSI for a low-efficiency firm adds \$298 M in market value.

We believe this to be an important finding, given the widespread belief that successful firms must focus either on customer satisfaction *or* low costs (Porter 1980) and that attempts to achieve a dual emphasis will leave a firm "stuck in the middle." In addition, our findings indicate that increasing customer satisfaction, in and of itself, should not always be an overriding goal of the firm's strategy. Firms following such a myopic approach are less likely to realize anticipated long-run economic returns than firms that also strive to be efficient (Rust et al. 1995).

Although they pertain to the long run, our results may not apply equivocally to the short run. Specifically, our study is silent about the process of trying to achieve a dual emphasis. As Rust et al. (2002) show, while firms are *in the process of achieving/implementing* a dual emphasis, their financial performance can suffer. Because the dual emphasis requires a simul-

Appendix. Variables and Underlying Constructs

	Underlying construct	Source	Rationale for inclusion in model
(1) Tobin's *q*	Long-term financial performance	COMPUSTAT	Dependent measure
(2) Annualized stock return	Short-term financial performance	COMPUSTAT	Dependent measure
(3) Customer satisfaction	Achievement of revenue emphasis	American Customer Satisfaction Barometer	Measures achievement of revenue enhancement perspective
(4) Efficiency	Achievement of efficiency emphasis	Constructed from DEA analysis	Measures achievement of cost efficiency perspective
(5) Time/time^2	Temporal variability in dependent variable	Coding for time	Captures temporal trend in the dependent variable
(6) Herfindahl Index	Measure of industry concentration	COMPUSTAT	Control for industry concentration

taneous implementation of two opposing management philosophies (Rust et al. 2002), its pursuit can be very challenging for most firms. Hence, managers must carefully weight the "in process" consequences against the long-term benefits of a dual emphasis. For researchers, an important question is to identify conditions that can facilitate or hinder the implementation of a dual emphasis.

The satisfaction efficiency construct needs more research. Issues that need to be examined include (1) defining alternative measures of satisfaction efficiency; (2) elucidating firm-level and industry-level antecedents of satisfaction efficiency; and (3) developing theoretically motivated hypotheses about how these antecedents can affect efficiency and/or moderate the effect of efficiency on downstream constructs such as satisfaction and financial performance. In particular, it will be useful to develop measures of efficiency that are impervious to a firm's relative size, as measured by sales or revenues. Moreover, criterion factors other than customer satisfaction could also be included to calculate relative efficiency of firms. For instance, employee satisfaction, revenues, and other such factors could be used to develop a multidimensional "output" variable for measuring firm efficiency.

This study also has implications for research on the resource-based view of the firm (Slotegraaf et al. 2003). Possession of nonphysical resources such as organizational information (Moorman 1995), creativity (Moorman and Miner 1997), and customer satisfaction are not unconditional guarantees of profitability. Rather, the relative efficiency of the resource utilization process may moderate their impact on financial outcomes. Managers should view efficiency as the "hidden" engine that can substantially spur their firm's financial performance. Yet, the concept of firm efficiency and its antecedents are not well understood within the marketing literature. More research is needed to examine factors that drive the efficiency of a firm. For instance, characteristics of customers (e.g., Kivetz 2003, Villas-Boas 2004) as well as the nature of customer-firm interaction (e.g., online or offline; Danaher et al. 2003) may influence the relative efficiency with which the firm can satisfy their needs. Examining such antecedents of efficiency is an immediate research priority.

Acknowledgments

The authors would like to thank Alexandra Durcikova, Rahul Govind, and Wei Lou for their research assistance and Lawrence Feick for his detailed feedback and help.

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