Customer Satisfaction Heterogeneity and Shareholder Value

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ABSTRACT

It is widely recognized that business growth and shareholder value are engineered on the basis of investments aimed at acquiring and retaining customers. Alongside this premise, however, the literature evidences a growing recognition that the *manner* in which important customer-based outcomes are constructed in the shorter-term has vital implications for longer-term performance. Adopting the view that customer satisfaction is a key marketplace asset, we advance a mean-variance perspective to test two conjectures: (a) objective service quality and advertising impact not only the level of customer satisfaction, but also the heterogeneity in this asset, and (b) satisfaction heterogeneity will discount the utility of the satisfaction asset in driving shareholder value, and also influence the contemporaneous volatility in shareholder value. We test these conjectures using secondary data from diverse sources describing the dynamics within the U.S. Airlines industry over a 9-year period from 1997 to 2005. The results, derived from estimating models that account for state dependence in shareholder value and satisfaction as well as the impact of several meaningful control variables, provide strong support for both conjectures. Importantly, they indicate that the return on satisfaction to shareholder value decreases by almost 70% in going from low to high satisfaction heterogeneity; at the same time, increasing levels of satisfaction heterogeneity serve to reduce the volatility in shareholder value.

Even as organizations increasingly believe in the truism that customer satisfaction is inexorably linked to long-term shareholder value, financial markets continue to press for, and reward, short-term business growth. For managers faced with crafting resource allocation decisions, resolving this critical tension requires a fine balance between the strategic marketing objectives of customer retention and customer acquisition. The hazards in this balancing act are two-fold. On the one hand is the obvious metric-driven issue that has certainly not escaped attention from scholars – What are the returns to specific marketing activities? Framed by the notions of 'offensive' and 'defensive' marketing, researchers have long investigated the returns on variables such as advertising and service quality to outcomes such as customer satisfaction, loyalty, profits, and shareholder value (e.g., Anderson, Fornell, and Mazvancheryl 2004; Fornell et al. 2006; Fornell and Wernerfelt 1987; Gruca and Rego 2005; Hauser and Shugan 1983; Kamakura et al. 2002; Pauwels et al. 2004; Peters and Venkatesan 1973; Rao, Agarwal, and Dahlhoff 2004; Rust et al. 2004a; Zeithaml 2000).

On the other hand is an aspect that has received little systematic attention and one that forms the motivation for the present investigation. Specifically, we respond to the emerging recognition that the <u>manner</u> in which important customer-based outcomes are constructed in the shorter-term has vital implications for longer-term performance. For example, Lodish and Mela (2007) find that engaging in sales promotions in consumer markets, while enhancing short-term customer acquisition and revenues, spawns a customer base that will increasingly choose previously promoted brands only when they are on promotion. Each promotion increases customer acquisition when measured in the short-term, but the brand relentlessly slips in long-term brand equity. Chandrashekaran et al. (2007) document a similar manifestation of customer vulnerability in business markets. These authors find that though close relationships between

service delivery reps and key customer contacts increases the *level* of customer satisfaction with the service providing firm, the satisfaction is actually *weakly-held*. This weakly-held satisfaction manifests because the overtly-happy customer is covertly concerned about the possibility of losing the service rep (see Bendapudi and Leone (2002) for supporting anecdotal evidence). This attitudinal incertitude, in turn, significantly lowers the translation of satisfaction to loyalty; distressingly, Chandrashekaran et al. (2007) find that the effect is greatest for long-standing and high business-volume customers.

Arguably, these instances of customer vulnerability were scarcely the intended outcomes when firms engaged in sales promotions or designed service delivery systems from a relationship marketing perspective. They highlight, however, that marketing investments made today can often produce consequences that impair a firm's ability to leverage key assets and shape long-term performance. The growing pains experienced by Starbucks vividly illustrate the nature of this evolving challenge. The 1990s saw Starbucks build a highly satisfied customer portfolio; it certainly helped to deliver a tight value proposition to a very homogeneous target market. Phenomenal growth followed, and Starbucks, like many firms that grow rapidly on the basis of superior customer satisfaction, now faced the consequence of an increasingly heterogeneous customer portfolio. That is how to continue to acquire new customers while satisfying/retaining everybody and do so in a manner that grows shareholder value? Today, Starbucks is vigorously deploying resources to do both – offering free samples, taking out newspaper ads, and passing out coupons on the street, all to lure *new* customers, while at the same time focusing on service quality, re-training baristas, installing new coffee machines, and exploring new service delivery formats, all to appease the increasingly diverse pool of *existing* customers. It appears, however, that these marketing initiatives are clearly hurting the bottom line with Starbucks recently cutting

its earnings estimates (York 2008) and posting its first-ever loss (2008 third-quarter loss of $6.7m) since it went public sixteen years ago.

Against this empirical and anecdotal backdrop, we center on the following key question: What are the implications of *current* advertising and service quality for a firm's *future* ability to leverage customer satisfaction in the evolving customer base? We draw on a broad research foundation to address our research objectives. Substantively, we draw on research on the relationship between customer satisfaction, created through emphases on various elements of marketing programs such as expenditures on advertising and service quality, and shareholder value (e.g., Anderson et al. 2004; Fornell et al. 2006; Morgan and Rego 2006), as well as research on the long-term and carryover impact of advertising (e.g., Assmus, Farley, and Lehmann 1984; Givon and Horsky 1990; Mela, Gupta, and Lehmann 1997). Methodologically, we employ a mean-variance decomposition approach to untangle (a) the impact of advertising and service quality on the <u>level and heterogeneity of satisfaction</u> in the customer base, and (b) the interplay of satisfaction level and heterogeneity as they shape the <u>level and volatility of subsequent shareholder value</u>.

We test the proposed models using secondary data from diverse sources that describe the dynamics in the U.S. Airlines industry over a 9-year period from 1997 to 2005. Four aspects of the research setting and methodology enhance the contribution of the research. First, stemming from the longitudinal nature of the data, we have an opportunity to (a) study how evolving service quality and advertising impact the level and heterogeneity in customer satisfaction, and (b) test the extent to which the satisfaction dimensions serve as leading indicators of shareholder value, while explicitly controlling for the dynamic nature of shareholder value and other key variables (e.g., cash flow, financial controls, firm size, market share). Second, because previous

studies relating to return on marketing (e.g., Rust, Lemon, and Zeithaml 2004b) have been set within the airlines industry, we have an opportunity to contribute to this knowledge base. Third, testing theory in a single industry enables one to control for environmental peculiarities that might confront individual firms (Snow and Hambrick 1980). Finally, because the data are drawn from multiple sources, we overcome the vexing problem of common-methods bias that plagues research on the factors that may impact firm performance variables such as shareholder value.

We organize the remainder of the manuscript as follows. We begin by laying out our research framework. We then present the research methodology and outline a series of tests and models to account for various sources of unobserved heterogeneity (firm-specific unobserved variables, time, state dependence, and serial correlation). Next we present the results and conclude the article with a discussion on the research limitations and implications for scholarship and practice.

RESEARCH FRAMEWORK

Consistent with our research objectives, we first center on the impact of service quality and advertising expenditures on the level and heterogeneity of customer satisfaction. We then focus on the interplay of the level and heterogeneity of customer satisfaction in the formation of the level and volatility of shareholder value.

Customer Satisfaction – Level and Heterogeneity

Model structure. Two considerations direct our satisfaction model specification. First, we recognize that customer satisfaction is a dynamic market asset, shaped over time by the actions of firms and customers in the marketplace. Broadly, a firm's actions can encompass current retention-oriented delivery of service quality, as well as past acquisition-oriented investments such as advertising. In turn, customers themselves influence satisfaction by engaging in word-

4

of-mouth based on their past experiences and the resulting satisfaction. In general, therefore, customer satisfaction can be captured by the following accrual-based time-series model:

(1)   Customer satisfaction $_{(t)}$ = f [Customer satisfaction $_{(t-1)}$; Marketing actions $_{(t, t-1)}$] + $\varepsilon_{(t)}$

where ε is an error term.

Second, we draw on research on the mean-variance decomposition of customer sentiments (e.g., Chandrashekaran et al. 2000; Chandrashekaran et al. 2007; Rust et al. 1999) to advance the thesis that *firm-specific customer satisfaction* scores (e.g., the widely-used satisfaction scores captured by the American Customer Satisfaction Index) embody information about the **level of satisfaction** among the customers as well as **heterogeneity in satisfaction** across the customer portfolio. Consistent with the mean-variance approach, satisfaction scores are viewed as realizations from a distribution of possible scores—while the satisfaction level is captured by the central tendency of that distribution, satisfaction heterogeneity is manifested in (but not equal to) the variance of that distribution. Letting *SL* and *SH* denote the satisfaction level and heterogeneity, respectively, we can therefore elaborate on equation (1) as follows:

(2) SL_t =   f [Customer satisfaction $_{(t-1)}$; Marketing actions $_{(t, t-1)}$]

(3) $\mathrm{var}(\varepsilon_t)$ = $\sigma_\varepsilon^2 + SH_t$

Consistent as well with a portfolio analysis of firm-level assets (e.g., Scherer 2004), the relevance of this perspective stems from the recognition that customer satisfaction heterogeneity can be seen as indicating diversity in customer portfolio. When there is little variance surrounding a mean level of satisfaction, it indicates a more homogeneous customer base in terms of the drivers of customer satisfaction. In contrast, increasing variance surrounding a mean level of satisfaction reflects an increasing fragmentation of the customer franchise – heterogeneity is evident in what drives customer satisfaction. As we will subsequently discuss,

this heterogeneity assumes a central role in the extent to which the level of customer satisfaction translates into subsequent outcomes such as shareholder value. Once the antecedents of *SL* and *SH* are specified, the model estimation is straightforward using iterated generalized least squares (see Amemiya (1985) for statistical aspects of the model structure and the estimation).

Impact of service quality on SL and SH. Extant research has demonstrated that service quality improvement efforts result in improved objective service quality (e.g., Rust, Moorman, and Dickson 2002; Rust, Zahorik, and Keiningham 1995), which, in turn, enhances perceived service quality and customer satisfaction (e.g., Kordupleski, Rust, and Zahorik 1993; Mittal, Ross, and Baldasare 1998; Rust et al. 1995; Zeithaml, Berry, and Parasuraman 1996). Drawing on this research, we expect that enhanced service quality will increase the level of satisfaction.

On-going service quality also influences customer expectations. As firms continue to provide high levels of service quality, the expectations evidenced across customers become more crystallized and homogeneous, and customers hold these expectations with greater conviction (see Chandrashekaran et al. 2007; Rust et al. 1999). We therefore expect that service quality will reduce customer satisfaction heterogeneity.

Impact of advertising on SL and SH. Firms deploy advertising expenditures to acquire and retain customers. To elaborate on the generative mechanism of advertising effects, we first draw on Mitra and Lynch (1995) who suggest that advertising can increase price elasticity by increasing the consideration set size, or it can decrease price elasticity by increasing the relative strength of brand preference. Depending on which effect is operating, advertising can either decrease or increase customer satisfaction. This duality arises because customer satisfaction is influenced by perceived value (Fornell et al. 1996), which can appear to be larger or smaller depending on the consumer price sensitivity. Extant research also finds that advertising has very

weak or nonsignificant *immediate* effect on customer preferences and behavior (e.g., Guadagni and Little 1983; Gupta 1988), but rather a substantial carryover effect (e.g., Clarke 1976; Mela et al. 1997). Accordingly, researchers have employed models that capture the lagged effects of advertising on market-level outcomes. We follow this lead to assess the impact of advertising on customer satisfaction.

Irrespective of whether advertising increases consideration sets sizes or increases brand preference of a focal brand, advertising is often seen as a fundamental vehicle for customer acquisition. Over time, however, a growing customer base is likely to evidence greater diversity in its composition. For instance, Mela et al. (1997) reason that the long-term impact of advertising on customer price sensitivity is likely to be stronger for non-loyal customers than for relatively loyal customers. Because loyal and non-loyal customers are likely to differ in what shapes their satisfaction, we expect advertising to lead to greater satisfaction heterogeneity.

Based on these expectations, we expand equations (2) – (3) to specify *SL* and *SH* as follows:

(4)
$$SL_t = f [SAT_{(t-1)}, \overline{SQ}_t, AD_{(t-1)}; \; \beta]$$

(5)
$$SH_t = g [\overline{SQ}_t, AD_{(t-1)}; \; \gamma]$$

where, *SAT* is the observed satisfaction, $\overline{SQ}$ denotes the vector of objective service quality indicators, *AD* denotes advertising expenditures, and β and γ denote the parameter vectors for satisfaction level and heterogeneity, respectively. To allow for the possibility of diminishing returns as $\overline{SQ}$ increases and hastening dissatisfaction as $\overline{SQ}$ decreases, we consider non-linear specifications involving service quality within the *f* [.] and *g*[.] functional forms.[1]

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[1] Equation 4 is consistent with extant approaches to capture the carryover effects of advertising, e.g., the Koyck model (where errors are serially correlated) and the partial adjustment model (where the errors are independent). We test for error correlation in the estimation. In addition, we test for firm-specific unobserved effects and time-specific effects.

Shareholder value – Interplay of Satisfaction Level and Satisfaction Heterogeneity

Consistent with the mean-variance perspective, in the specification of the shareholder value model, in addition to the level of shareholder value we consider shareholder value volatility. Thus, the mean function is used to assess shareholder value and the variance function to assess contemporaneous volatility in shareholder value (for similar treatments of performance volatility see Grewal, Chandrashekaran, and Dwyer 2008).

Four specific considerations motivate the shareholder value specification: (a) extant research that supports a main effect of satisfaction level, (b) potential interaction of satisfaction level and heterogeneity, (c) the dynamic nature of shareholder value and sources of unobserved heterogeneity, and (d) prior research that articulates the need to control for firm-specific financial variables. We discuss each consideration in turn.

Main effect of satisfaction level. Extant literature documents positive associations between customer satisfaction and diverse measures of firm performance such as return on investments, (e.g., Anderson, Fornell, and Lehmann 1994; Anderson, Fornell, and Rust 1997), operating profits (e.g., Bolton 1998; Rust, Zahorik, and Keiningham 1994), and shareholder value (e.g., Anderson et al. 2004; Gruca and Rego 2005). Reasoning that customer satisfaction should enhance customer retention (e.g., Bolton and Drew 1991; Mittal and Kamakura 2001; Oliver 1980), which in turn secures future revenues (e.g., Fornell 1992; Korupleski et al. 1993; Rust et al. 1995) and reduces costs (e.g., Rust et al. 2002), scholars suggest that customer satisfaction will enhance firm profitability and shareholder value (e.g., Anderson et al. 2004; Bolton 1998; Gruca and Rego 2005; Rust et al. 1994). Likewise, extant research suggests that increased customer satisfaction should insulate customers from competitive actions and other environmental effects, leading to a lower variability in shareholder value (Gruca and Rego

2005). Thus, consistent with extant research, we expect satisfaction level to increase the level of shareholder value and decrease the contemporaneous volatility in shareholder value.

Role of satisfaction heterogeneity. The impact of satisfaction heterogeneity on the level and volatility of shareholder value represents an important contribution of this study from a scholarly as well as a practitioner perspective. From a practitioner perspective, the issue is profound because we expect satisfaction heterogeneity to evidence effects that will warrant making important tradeoffs.

On the one hand, though focusing on a homogeneous 'niche' market sacrifices scale economies, it facilitates the creation of strong brand identity in the 'narrower' market. As a result, firms may be able to leverage customer satisfaction to a greater extent when it is associated with low heterogeneity. Furthermore, a customer base with homogeneous customer satisfaction expectation is less expensive and easier to serve than a customer base with heterogeneous customer satisfaction expectations. Thus, returns to satisfaction will be greatest when satisfaction heterogeneity is low, and will decrease as satisfaction heterogeneity increases.

On the other hand, though pursuing a larger market is often associated with greater costs to service because of the increasing possibility of market fragmentation, the customer portfolio diversity may offer risk-mitigation benefits, i.e., by hedging risks and lowering performance volatility. Taken together, these conjectures offer important insights for marketing strategy scholarship as well as for practitioners. Specifically, the dual role of satisfaction heterogeneity brings to the forefront challenges in making decisions on marketing investments that may ripple through to shape both dimensions of shareholder value, but may do so in opposite directions.

Dynamic nature of shareholder value and unobserved heterogeneity. Building on extant approaches to modeling current shareholder value (e.g., Gruca and Rego 2005), we start with the

recognition that future shareholder value, SV_{t+1}, depends on the current shareholder value, SV_t, current levels of satisfaction level, SL_t, satisfaction heterogeneity, SH_t, and control variables, $\tilde{C}_t$ (discussed subsequently). To capture our conceptual themes, we specify the following mean-variance model for shareholder value:

$$(6) \qquad SV_{t+1} = \tau_0 + \tau_\rho SV_t + \tilde{\tau}_C(\tilde{C})_t + \tau_{SL} SL_t + \tau_{SH} SH_t + \tau_{SLSH} SL_t \cdot SH_t + \upsilon_{t+1}$$

$$(7) \qquad \mathrm{var}(\upsilon_{t+1}) = \sigma_\upsilon^2 + \tilde{\delta}_C(\tilde{C})_t + \delta_{SL} SL_t + \delta_{SH} SH_t + \delta_{SLSH} SL_t \cdot SH_t$$

where, τ_ρ captures the state dependence in shareholder value, $\tilde{\tau}_C$ denotes the impact of the control variables on shareholder value, τ_{SL} denotes main effect of satisfaction level on shareholder value, τ_{SH} denotes the main effect of satisfaction heterogeneity, and τ_{SLSH} denotes the interaction between satisfaction level and satisfaction heterogeneity on shareholder value. Similarly the δ parameters are defined for shareholder value volatility.

Based on the above discussion, we expect $\tau_\rho > 0$ (i.e., shareholder value will exhibit significant state dependence), $\tau_{SL} > 0$ (i.e., a positive relationship between satisfaction level and shareholder value), $\tau_{SLSH} < 0$ (i.e., the discounting role of satisfaction heterogeneity for the relationship between satisfaction level and shareholder value), and $\delta_{SH} < 0$ (i.e., as satisfaction heterogeneity increases, shareholder value volatility decreases).

Evident from equation 6, the net impact of satisfaction level on the level of shareholder value, that is, the return on satisfaction, is:

$$(8) \qquad \eta_{SAT} = \frac{\partial SV_{t+1}}{\partial SL_t} = \tau_{SL} + \tau_{SLSH} SH_t$$

This expression reveals the portfolio perspective that underpins our research. Consistent with a portfolio 'utility' perspective (e.g., Scherer 2004), the utility of the satisfaction asset in driving shareholder value is anticipated to be a negative function of the heterogeneity within the asset.

Firm-specific control variables. We recognize prior research that articulates the role of firm-specific financial variables in models of firm performance (e.g., Lee and Grewal 2004). We follow this research and control for firm liquidity using current ratio and firm leverage using debt/equity ratio (e.g., Brealey and Myers 1988). We also control for cash flows (e.g., Gruca and Rego 2005) by including cash flow-to-total assets, along with potential influence of firm size and market share.

METHOD

Research Context: The US Airlines Industry

We sought a research context that met the following two criteria: (1) criticality of service quality for competing in the industry and (2) availability of longitudinal data on service quality indicators, advertising expenditures, customer satisfaction, shareholder value, and important control variables (such as market share, firm size, cash flow, assets, liquidity, and leverage) in the public domain. The US domestic airlines industry meets both these criteria and is thus considered an appropriate research context for our study. The airline industry is highly capital intensive, facing an increasingly deregulated environment, and operating in a highly competitive context. Similar to other service industries, airlines appear to be concerned with the quality of the service they provide and consider service quality to be critical for their performance and perhaps survival (e.g., DeSarbo, Jedidi, and Sinha 2001). In the past researchers have used the

airline industry as a context for examining different aspects of either customer satisfaction or service quality evaluations (e.g., Luo 2007; Rust et al. 2004a; Tsikriktsis and Heineke 2004).[2]

Data Sources and Measures

Objective, secondary data were used to evaluate our research hypotheses. The data covered information related to the major airlines (as classified by the US Department of Transportation - US DOT). The seven airlines that appeared over the nine year time period (1997-2005) were included in our analysis, which included American, Continental, Delta, Northwest, Southwest, United, and US Airways. Data were obtained from the US DOT reports, the American Customer Satisfaction Index (ACSI) reports, and COMPUTSTAT and Center for Research in Security Prices (CRSP) for shareholder value and financial control variables.

Service quality indicators. The service quality indicator data were obtained from the US DOT reports. We used the four indicators for service quality that US DOT records: percentage of flights that arrived on time; the number of passengers per 10,000 passengers that were denied boarding, the number of passengers per 1000 passengers that faced problems of mishandled baggage, and finally the number of consumer complaints filed with the US DOT per 100,000 passengers.[3] All airlines are required to report this data to the US DOT on a monthly basis and this information is publicly available through their reports. We aggregated this data to an annual basis.

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[2] According to the results of the American Customer Satisfaction Index (http://www.theacsi.org) the airline industry is at the bottom of the index on customer satisfaction when compared to other industries making it a conservative sample to examine our hypotheses. In addition to being a relevant industry in which to examine our research hypotheses, the use of the airline industry permitted us to use objective data from three different and highly reliable sources to capture the three major constructs in our research.

[3] We do recognize here that complaints may not be the best way to measure service quality, as they assess negative deviations only from expected service, they fail to capture the upside potential inherent in service quality. Nonetheless, when considered together with other measures, we do believe that we have a reasonable assessment of service quality.

Advertising expenditures. Annual data for advertising expenses were obtained from the CRSP. The data obtained are expressed in millions of dollars spent annually by each airline on advertising.

Customer satisfaction. Annual data for customer satisfaction evaluations for each of the airlines was obtained from the ACSI reports. ACSI is an economic indicator measuring customer satisfaction and is based on modeling of customer evaluations of the quality of goods and services purchased in the US from firms having a substantial US market share (e.g., Anderson et al. 2004; Fornell et al. 1996). The ACSI database was developed by the National Quality Research Center at the University of Michigan. The data are collected by interviewing approximately 65,000 customers annually. Customers for all firms are selected by screening a randomly selected adult in each telephone household taken from national and regional probability samples. Questions asked relate to the purchase and use of specific products and services within specified recent time periods (these periods vary according to the focal product/service). Only those individuals who qualify as customers for a specific brand/firm product purchase are then interviewed. Each ACSI evaluation for a company is based on 250 customer interviews with customers selected in the manner described above. Respondents are asked questions on fifteen measurement variables which are then used as indicators of six latent variables or constructs including the overall ACSI which can range from 0-100. The results of the interview are then formed into a national customer satisfaction score which is developed using tested, multi-equation, econometric models (Fornell et al. 1996). The ACSI has been employed in several research studies on the impact of satisfaction on subsequent firm performance, including the research of Gruca and Rego (2005) that linked customer satisfaction to the level and volatility of shareholder value.

Shareholder value.   Similar to the Gruca and Rego (2005) study, data to evaluate each airline's annual performance were obtained from COMPUSTAT. We employed Tobin's q as the indicator of shareholder value, which has often been used in various marketing studies (e.g., Anderson et al. 2004; Lee and Grewal 2004; Simon and Sullivan 1993). Tobin's q as a performance metric and a measure of shareholder value has several advantages over other measures of performance such as market-to-book value and return on investment. First, it is derived from stock market price, which reflects future performance and therefore is a forward-looking measure (e.g., Lee and Grewal 2004). Second, Tobin's q reflects a firm's long-term profitability as it captures the relationship between the replacement cost of a firm's tangible assets and the market value of the firm (Bharadwaj, Bharadwaj, and Konsynski 1999). As a result, Tobin's q is often seen as assessing intangible firm value (e.g., Rao et al. 2004). Third, Tobin's q is often used to compare firms across industries because it is not much affected by accounting conventions (Chakravarthy 1986).

We used the approximation detailed by Chung and Pruitt (1994), to compute Tobin's q as:

$$TQ = (MVE + PS + DEBT) / TA,$$

where, TQ = Tobin's q, MVE = (Closing price of shares at the end of the financial year) x (Number of common shares outstanding), PS = Liquidation value of the firm's outstanding preferred stock, DEBT = (Current liabilities - Current assets) + (Book value of inventories) + (Long-term debt), and TA = book value of total assets.

Control variables. We controlled for existing firm resources including cash flow (cash flow to assets ratio), firm market share, and firm size. Data to calculate the cash flow to assets ratio were obtained from COMPUSTAT. Market share is an imperfect surrogate (but more easily observed) for existing firm resources such as brand equity and marketing expertise (e.g.,

Boulding and Staelin 1993). To compute market share for each airline, we obtained data from the

US Department of Transportation and used the revenue passenger model where we calculated

market share as the ratio of total distance travelled by all passengers in the focal airline to total

distance travelled by passengers in all airlines.[4]

We also used two control variables to account for the financial structure of the firm.

Specifically, similar to other research using accounting variables (e.g., Lee and Grewal 2004),

we control for firm liquidity using current ratio and firm leverage using debt/equity ratio (e.g.,

Brealey and Myers 1988). A firm needs liquid assets to meet its daily payment obligations, and

liquidity ratios indicate whether a firm will be able to quickly convert its assets into cash or not

(Brealey and Myers 1988). Thus, a firm with a high liquidity ratio has relatively more assets that

can be easily converted to cash, and consequently, greater financial flexibility (e.g. Evans 1991).

Conversely, a lack of liquid resources could be a cause for concern for a firm in the short run.

Low liquidity ratios imply that the firm's financial resources are locked up and not readily

available to make payments, leading to financial distress. Alternatively, in some cases, liquidity

could be negatively related to firm performance because the firm may not be using liquid

resources to invest in growth opportunities and may be incurring opportunity costs usually

associated with liquid resources (e.g., Grewal and Tansuhaj 2001).

The financing decision, as reflected in the leverage ratio, plays a key role in organizational

strategic planning and "is concerned with determining the optimal capital structure for the

corporation" (Slater and Zwirlein 1996, p. 253). As the interest a firm pays on debt is a tax-

deductible expense, the cost of debt is generally considered lower than the cost of equity capital

and increased debt is preferred over equity in order to signal future cash flows and aggressive

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[4] As firm size (FS) and market share (MSH) are highly correlated ($\rho = .80$, $p < .01$), for shareholder value model we constructed an instrument of market share that was independent of firm size by regressing market share on firm size and taking the residual of this regression as instrumenting market share.

growth plans to the market (e.g. Varadarajan 1983). Overall, it may be good for firms to have a moderate level of debt. Table 1 presents relevant descriptive statistics.

[Insert Table 1 about here]

Data-Analytic Approach

Two important considerations guided our data analysis: (a) multicollinearity among the service quality indicators and (b) accounting for unobserved variables in the satisfaction model in addition to the shareholder value model.

Multicollinearity. We were sensitive to the issue of multicollinearity among the service quality indicators (e.g., Mason and Perreault 1991). As expected, correlations between the service quality variables were a primary cause of multicollinearity (see Table 1). Consequently, we resorted to principal components analysis to reduce the four service quality dimensions, and conducted oblique rotation to obtain the final factor loadings (e.g., Conway and Huffcutt 2003; Ford, MacCallum, and Tait 1986). Two eigenvalues (1.97 and 1.01) were greater than 1, with the third eigenvalue being .74. Thus, a two-factor solution appeared optimal. The factor loadings on the first latent factor were .91, -.71, .08, and -.76 for on-time arrival, lost baggage, denied boarding, and customer complaints respectively. The factor loadings for the second latent factor were .07, .07, .96, and -.41 for on-time arrival, lost baggage, denied boarding, and customer complaints respectively. We labeled the first factor as *ex post* service quality (POST) as variables concerning later stages of the service experience loaded heavily on it, and the second factor *ex ante* service quality (ANTE) as it primarily comprised of denied boarding that occurs earlier in the service experience. For subsequent analysis we used factor scores to compute *ex ante* and *ex post* service quality using the Anderson-Rubin method as implemented in SPSS.

Accounting for unobserved heterogeneity. Though for the satisfaction model and the

shareholder value model we explicitly considered a state dependence specification to control for

unobserved variables, we also sought to capture any additional unobserved heterogeneity through

various fixed/random effects configurations (e.g., Jacobson 1990). Specifically, we consider

three models: (1) M_x – model with only the theorized explanatory variables, (2) M_{x-f} – model

with explanatory variables and firm-specific fixed/random effects, and (3) M_{x-ft} – model with

explanatory variables, firm-specific, and time-specific fixed/random effects (note that in these

models consistent with the state-dependence configuration, we also include lagged dependent

variable as an explanatory variable). We used Bayesian Information Criterion (BIC) and

Consistent Akaike Information Criterion (CAIC) for model comparison purposes (e.g., Burnham

and Anderson 2002).[5] At the same time, we examined the pattern of effects across the various

models in order to ensure that in our search for the most parsimonious model we were not

sacrificing effect consistency. [6]

RESULTS

Customer Satisfaction – Level and Heterogeneity

Overall model tests.   Following our analysis strategy, we estimated several models to

account for possible sources of unobserved heterogeneity. The CAIC values for the three

satisfaction models (M_x, M_{x-f}, and M_{x-ft}) were 332.6, 322.8, and 338.4 respectively. Thus, model

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[5] BIC = ln(N) * NPAR - 2 *LL; CAIC = (1+ln(N)) * NPAR - 2 *LL, where N is the sample size, NPAR is the number of parameters estimated, LL is the log-likelihood value, and ln denotes the natural logarithm.

[6] We also investigated the possibility of regressor-error dependency for the model specified in Equation 6 using a latent instrumental variable approach outlined in Ebbes, Böckenholt, and Wedel (2008a); Ebbes, Wedel, and Böckenholt (2008b); Ebbes et al. (2005). Specifically, we estimated the model only for shareholder value (i.e., we only consider the mean function and do not consider the variance function for shareholder value in assessing the latent instrumental variable approach). We follow the Bayesian approach outlined in Ebbes et al. (2008a) and specify satisfaction level to be instrumented by the control variables and an intercept term which is a mixture of normal distributions. We vary the number of mixture distributions from two to seven. For all cases we do not find any evidence of regressor-error dependency.

M_{x-f} seems to be appropriate. Further, the results for BIC were consistent with those for CAIC. At the same time, from a statistical significance perspective (i.e., in terms of statistically significant and non-significant coefficients), the results from model M_{x-f} were identical to those obtained from the other models. Thus, in subsequent mean-variance function model estimation, we use the firm-specific fixed effects configuration for mean function of the satisfaction mean-variance function model.

Next, within the context of the satisfaction model, we assessed the overall fit of the two-dimensional model of satisfaction level and customer satisfaction heterogeneity. Incorporating nonlinear effects of service quality dimensions (ANTE and POST), the estimated equations for satisfaction level and satisfaction heterogeneity (see equations 4 and 5) were captured by:

$$SL_t = \beta_1 SAT_{(t-1)} + \beta_2 ANTE_t + \beta_3 ANTE_t{}^2 + \beta_4 POST_t + \beta_5 POST_t{}^2 + \beta_6 AD_{(t-1)}$$

$$SH_t = \gamma_1 ANTE_t + \gamma_2 ANTE_t{}^2 + \gamma_3 POST_t + \gamma_4 POST_t{}^2 + \gamma_5 AD_{(t-1)}$$

A likelihood-ratio test revealed that the overall two-dimensional model of satisfaction level and heterogeneity was significant, assessed by a test of the null hypothesis H_0: $\beta_1 = \beta_2 = \dots \beta_6 = \gamma_1 = \gamma_2 = \dots \gamma_5 = 0$ ($\chi^2{}_{11} = 60.03$, p < .01).

Antecedents of satisfaction level and heterogeneity. Table 2 displays the results of the estimation, and reveals the following:

[Insert Table 2 about here]

- Lagged satisfaction has a negative effect on the level of current satisfaction ($\hat{\beta}_1 = -.034$, p < .05)

- *Ex ante* service quality increases the level of satisfaction ($\hat{\beta}_2 = 2.261$, p < .01) and decreases satisfaction heterogeneity ($\hat{\gamma}_1 = -3.905$, p < .01). However, there is no evidence of nonlinear effects of *ex ante* service quality on satisfaction level or heterogeneity

18

- *Ex post* service quality displays a 'delight-inducing' pattern (see Keiningham and Vavra 2001) in terms of the level of satisfaction, in which the nonlinearity manifests in the form of *increasing returns* (positive linear and quadratic effect; $\hat{\beta}_4 = 2.86$, p < .01 and $\hat{\beta}_5 = .47$, p < .01). *Ex post* service quality, however, does not appear to influence satisfaction heterogeneity

- Advertising expenditures have a carryover effect in increasing the level of future satisfaction ($\hat{\beta}_6 = .117$, p < .10), as well as satisfaction heterogeneity ($\hat{\gamma}_5 = .309$, p < .05). These results indicate that in the context of these data, advertising has the effect of enhancing perceived value and satisfaction, while at the same time spawning heterogeneity in the acquired customer base.

Based on these results we decomposed one measure of satisfaction into satisfaction level and satisfaction heterogeneity, i.e., used the estimated coefficients of the mean function to derive the satisfaction level score and variance function to arrive at the customer satisfaction heterogeneity score for each airline for each time period.

Shareholder value – Interplay of Satisfaction Level and Heterogeneity

Overall model tests.   Following our analysis strategy, we estimated several models to account for possible sources of unobserved heterogeneity. The CAIC values for the three models for shareholder value (M_x, M_{x-f}, and M_{x-ft}) were 32.76, 42.09, and 53.99 respectively. Thus, model M_x seems to be appropriate. Further, the results for BIC were consistent with those for CAIC. Thus, we use the model M_x for hypotheses testing using a mean-variance function model configuration described in Equations 6-7.

Pattern of effects.   Table 3 displays the results of estimating Equation 6-7 using the mean variance function model, where the mean function evaluates the effect on shareholder value and variance function assesses the effect on shareholder value volatility (in order to facilitate

comparison of the net impact of satisfaction level for different values of satisfaction strength, we standardized *SL* and *SH*, that is, mean = 0, variance = 1). Four key results emerge:

- shareholder value exhibits significant state dependence ($\hat{\tau}_\rho = .213$, $p < .01$),

- satisfaction level positively influences shareholder value ($\hat{\tau}_{SL} = .104$, $p < .01$),

- satisfaction heterogeneity moderates the relationship between satisfaction level and shareholder value ($\hat{\tau}_{SLSH} = -.087$, $p < .01$).

- satisfaction heterogeneity decreases shareholder value volatility ($\hat{\delta}_{SH} = -.024$, p < .01).

[Insert Table 3 about here]

The negative interaction between *SL* and *SH* reveals the discounting role of satisfaction heterogeneity in the translation of satisfaction level to shareholder value. To shed light on the magnitude of the discounting role of satisfaction heterogeneity, we computed, and tested (via Wald tests for linear combination of parameters), the net impact of satisfaction on shareholder value at different values of satisfaction heterogeneity, that is, the return on satisfaction given by $\hat{\eta}_{SAT} = \hat{\tau}_{SL} + \hat{\tau}_{SLSH} SH_t$ (see Equation 8). The following table presents the results of testing $\hat{\eta}_{SAT}$ at low, moderate, and high levels of customer satisfaction heterogeneity (i.e., at 25$^{\text{th}}$ percentile, median, and 75$^{\text{th}}$ percentile values of *SH*; standard errors in parentheses; *: p < .01):

Level of *SH*	*Homogeneous customer-base* ←————→ *Heterogeneous customer-base*		
	Low	Moderate	High
Return on satisfaction ($\hat{\eta}_{SAT}$)	.160* (.041)	.104* (.035)	.049 (.040)

Observe that as satisfaction heterogeneity increases the translation of satisfaction to shareholder value steadily decreases. When customer satisfaction heterogeneity is low, there is a significant return on satisfaction, but by the time we arrive at high levels of satisfaction heterogeneity, the return on satisfaction is rendered statistically non-significant. Though non-

significant, at high levels of satisfaction heterogeneity, the return on satisfaction, $\hat{\eta}_{SAT}$, evidences

a reduction of nearly 70% relative to when customer satisfaction heterogeneity is low ([.160 -

.049]/.160 = .694). These findings illustrate the important role of satisfaction heterogeneity in

the satisfaction-shareholder value link.

DISCUSSION

The main objective of our research was to examine how a firm's current acquisition and

retention investments (e.g., advertising and delivery of service quality) influence the firm's

future ability to leverage customer satisfaction in the evolving customer base. To address this

objective, we were guided by contemporary marketing thought on the impact of service quality

investments on customer satisfaction (e.g., Kordupleski et al. 1993; Mittal et al. 1998; Rust et al.

2002), the carryover impact of advertising on perceived value and the customer portfolio (e.g.,

Mela et al. 1997; Mitra and Lynch 1995), and the subsequent impact of customer satisfaction on

shareholder value (e.g., Anderson et al. 2004; Fornell et al. 2006; Morgan and Rego 2006).

Methodologically, we drew on the mean-variance approach to modeling customer phenomena

(e.g., Chandrashekaran et al. 2007; Rotte et al. 2006; Rust et al. 1999). First, we suggested that

service quality and advertising would determine not only the level of customer satisfaction, but

also the heterogeneity in satisfaction across the customer franchise. Second, we theorized that

satisfaction heterogeneity would diminish the effect of satisfaction level on future shareholder

value, but also reduce the contemporaneous volatility surrounding the level of shareholder value.

We tested our conjectures using longitudinal data describing the U.S. Airlines Industry gathered

from a variety of credible sources. Results strongly supported the theorizing and revealed new

aspects of the satisfaction-shareholder value relationship.

While the results bear significance for practice as well as scholarship, it is important to recognize the limitations of the research. First, the research considered the dynamics in only one industry. Although the airline industry has been the focus of prior research on service quality (Rust et al. 2004b), exploring other industries would enable researchers to assess the boundary conditions for the ideas uncovered in the present research. Second, though we considered service quality variables that covered important aspects of the airline consumption experience, we did not have data on the actual service experience during flights. For instance, is it possible that superior service experience during the flights will mitigate the deleterious aspects of poor ex ante service attributes? Future research may explore such issues.

Implications

At a fundamental level, this research represents a cautionary tale. While certain investments may help firms grow by acquiring new customers and/or retaining existing customers, the resulting heterogeneity that they spawn has a profound impact on the utility of resulting marketplace assets such as customer satisfaction. Two key results underpin this assertion. First, while service quality increased the level of satisfaction and reduced satisfaction heterogeneity, current advertising expenditures increased satisfaction heterogeneity even as they increased the level of satisfaction. Second, satisfaction heterogeneity influences shareholder value in two important ways: (a) it reduces the translation of satisfaction to shareholder value, and (b) it reduces the contemporaneous volatility in shareholder value. Though satisfaction reliably increased shareholder value when it was associated with low levels of heterogeneity (i.e., low variance about the mean), the returns were dramatically stunted when the same satisfaction was associated with high levels of heterogeneity (i.e., high variance about the mean). Particularly interesting was the reduction in the returns to satisfaction as a function of

satisfaction heterogeneity – the translation of satisfaction to shareholder value decreased by almost 70% in going from low to high satisfaction heterogeneity.

From an academic perspective, the findings point to the value of a mean-variance perspective in understanding marketing phenomena. Though widely-accepted in the finance literature, where the "theory of mean-variance-based portfolio selection is a cornerstone of modern asset management," (Scherer 2004, p. 1) marketing scholars have been slow to adopt the view that the variation in observed responses is an important behavioral phenomenon in its own right (see Louviere 2001). In a nutshell, we found that overlooking the satisfaction heterogeneity embedded in the variance component paints a partial picture of how service quality and advertising influence critical metrics such as shareholder value.

Interestingly, our findings resonate with those uncovered by recent mean-variance analyses of other marketing phenomena (e.g., Chandrashekaran et al. 2007; Rust et al. 1999). For example, Rust et al. (1999) show that once the variance in consumer expectations are explicitly considered, some of the most common beliefs about customer-perceived quality turn out to be wrong. Rust et al. (1999, p. 77) conclude: "It is now clear that a more sophisticated view of customer expectations is required – one that considers not only the point expectation but also the likelihood across the entire distribution of possible outcomes. This distinction is not 'just academic,' because it results in predictable behavior that deviates significantly from that which was traditionally expected based on simpler models." Likewise, Chandrashekaran et al. (2007) find, at the individual customer level, that satisfaction accompanied by large variance has a smaller impact on psychological loyalty compared to satisfaction that evidences low variability.

From a practitioner perspective, the findings illuminate the need to consider the long-term consequence of engaging in growth-driven customer acquisition. While we briefly alluded to the

growing pains confronting Starbucks, a similar narrative emerges from our analysis. To aid in this discussion, we plot, in Figure 1, the two contemporaneous dimensions of satisfaction for the companies in the study. The two panels in Figure 1 (Panel A for satisfaction level and Panel B for satisfaction heterogeneity) suggest significant differences across airlines in the evolution of satisfaction level and strength. We focus on two airlines that have seen dramatic changes in fortunes during the period of our study – Southwest and Continental Airlines.

[Insert Figure 1 about here]

In the 25 years since its maiden voyage, in 1971, with service between Dallas, Houston, and San Antonio, Southwest Airlines came to win a series of accolades for its service quality and resulting customer satisfaction. By 1996, Southwest had won its fifth consecutive annual Triple Crown: Best On-Time Record, Best Baggage Handling, and Fewest Customer Complaints. Not surprisingly, by the start of the data panel (1997), the satisfaction level for Southwest is the highest among the airlines and satisfaction heterogeneity is lowest. In contrast, Continental Airlines, a much older airline, having started up in the mid 1930s, had a bumpier ride leading up to the start of the data panel. Having survived two bankruptcy filings (in 1983 and 1990), as well as the acquisition of the troubled Frontier Airlines and PeopleExpress in the mid 1980s, Continental arrived at the start of the panel with one of the lowest levels of satisfaction and the highest levels of satisfaction heterogeneity in the industry.

Fast forward to 2006 and the stories are dramatically different. Continental Airlines is the top airline on Fortune magazine's annual airline industry list of World's Most Admired Companies for three years running (2004, 2005, and 2006), and its No. 1 Most Admired U.S. Airline (Fortune 2006). Southwest, on the other hand, has not won a single award for customer satisfaction since 1996. There are undoubtedly many possible explanations for such a reversal in

fortunes – indeed, complex events are often multiply-mediated. In this discussion, we focus on the insights offered by the decomposition of satisfaction data, and juxtapose this against dramatic differences in strategy and investments in service quality that underpin customer satisfaction.

Armed with the industry's highest satisfaction levels and lowest satisfaction heterogeneity in 1996, Southwest turned soon to a widely-held belief that the key to good shareholder value was growth and services produced with low unit costs. A casual perusal of Southwest's website (http://www.southwest.com/about_swa/airborne.html) reveals the increasing actualization of this belief: while in the period 1971-1997, the words 'customer,' 'satisfied,' and 'service' appear liberally in the articulation of their history, the period 1997-2005 sees almost no mention of the very themes that led to Southwest's astounding success. Rather, the focus appears to be on growth through new routes and cost reduction. Evidence the company's articulated events of 2003: "Southwest Airlines announced that it would add performance-enhancing Blended Winglets to its current and future fleet of Boeing 737-700's. The visually distinctive Winglets improve performance by extending the airplane's range, saving fuel, lowering engine maintenance costs, and reducing takeoff noise." The focus on product to reach far-flung destinations and costs is quite evident. The results? By 2005, Southwest's customer satisfaction level has dropped below that of Continental. More importantly, however, the heterogeneity with which the customer franchise holds this satisfaction has scaled to the highest in the industry.

In contrast, Continental Airlines appears to be driven by a different motto, customer value. For example, at Continental passengers on flights that are not sold out are allowed to take their baggage on board with them. Punctuality of flying operations is promoted by a company bonus scheme: if Continental finishes in one of the first three places in the punctuality stakes in the USA, every employee receives a bonus of $65 per month. The results? Continental is more

punctual than other airlines in the USA, and in 2000 it was actually the most punctual airline. Even as this enhances customer satisfaction level and lowers heterogeneity, it helps the company to save millions in costs because of the decreased spend on servicing delayed passengers, their accommodation and onward transport.

Conclusion

We believe that our research makes important theoretical and practical contributions. From a theoretical perspective, we add to the marketing strategy literature. We theorized and found support for more complex roles of service quality and advertising in the evolution of shareholder value than prior research has uncovered. At the bottom-line, service quality and advertising have dual effects on customer satisfaction level and heterogeneity. Consequently, it becomes important for academics and managers to recognize that firm tactics and strategies not only impact customer judgments, such as satisfaction, but also the heterogeneity in this marketplace asset. Our theoretical contribution also lies in the dual role of satisfaction heterogeneity in the formation of shareholder value – it lowers the impact of satisfaction level on shareholder value and also reduces the contemporaneous volatility in shareholder value. These insights largely emerged from the mean-variance perspective to the analysis of marketing investments. We hope future research motivates other researchers to conduct mean-variance analysis of other interesting marketing phenomena.

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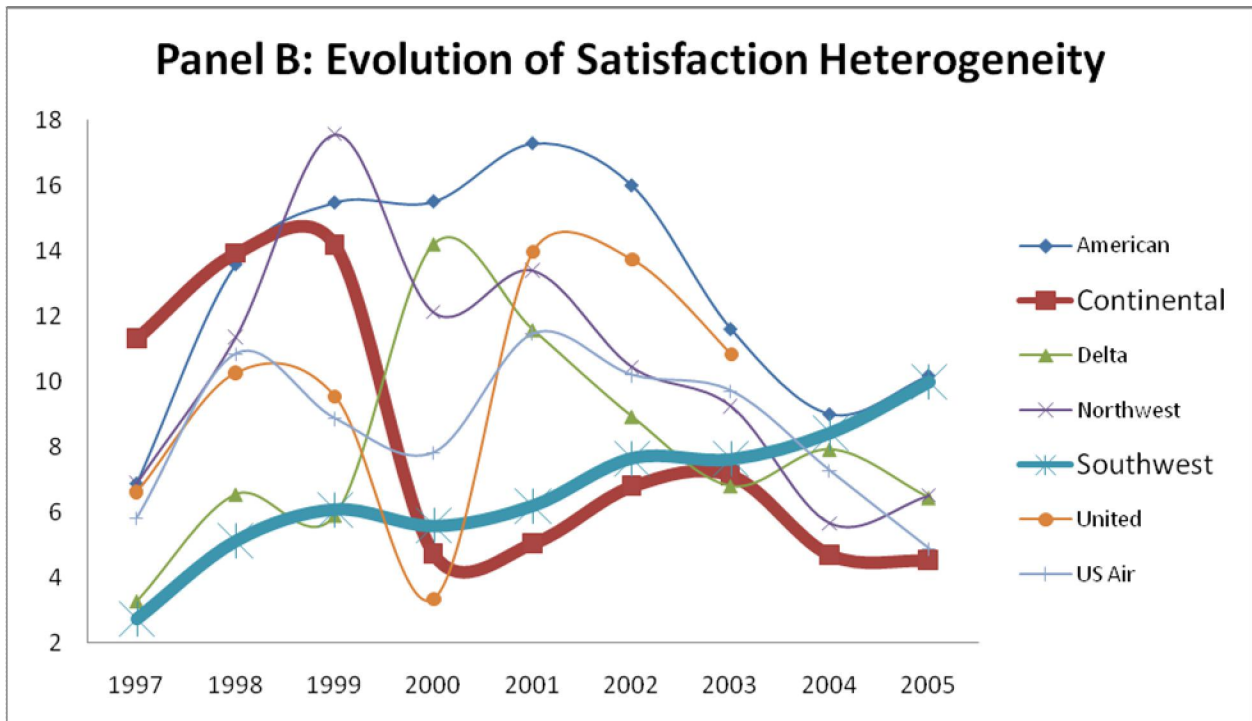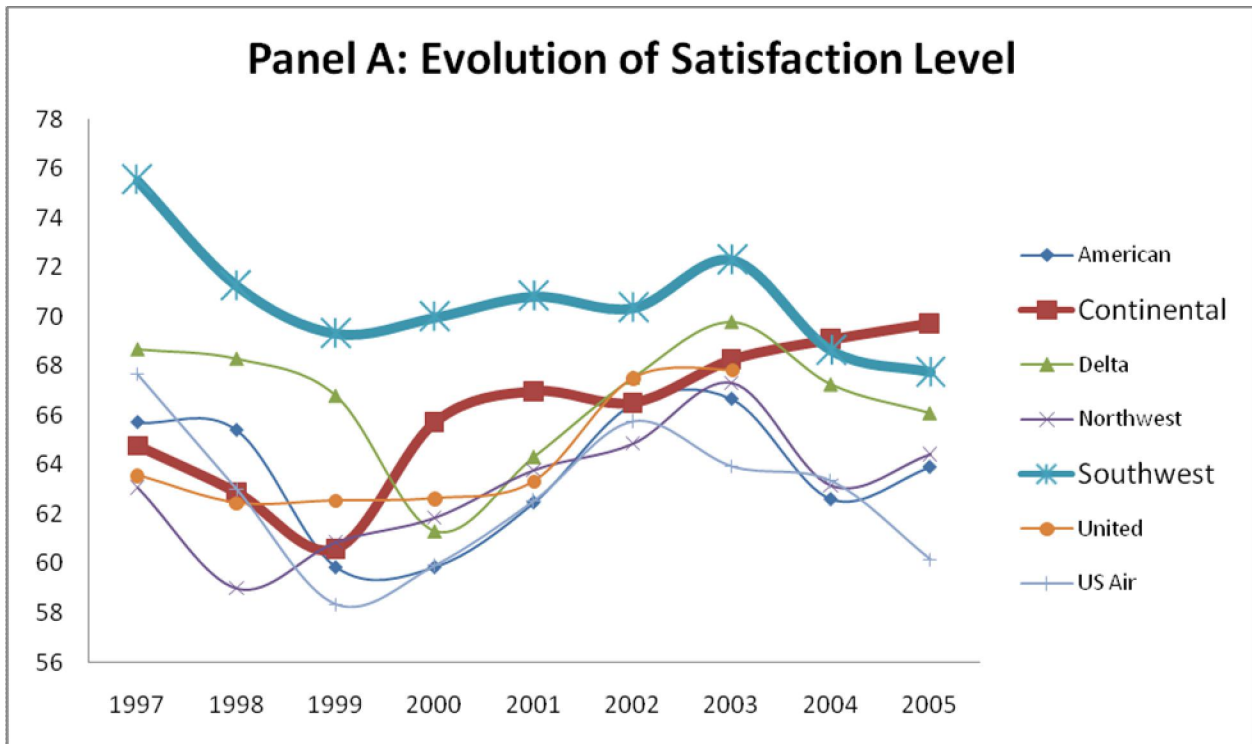
Figure 1

Panel A: Evolution of Satisfaction Level

Panel B: Evolution of Satisfaction Heterogeneity

TABLE 1
Descriptive Statistics and Bivariate Correlation Coefficients

Variable Name	SV	LIQ	LEV	CTA	MSH	FS	OT	BAG	BO	CC	ANTE	POST	SAT	SL	SH
Shareholder value (SV)															
Liquidity (LIQ)	-.03														
Leverage (LEV)	.09	.15													
Cash-to-Total-Assets (CTA)	.39**	-.04	-.17												
Market Share (MSH)	-.25	-.10	-.40**	-.24											
Firm Size (Employees: FS)	-.30*	-.11	-.36**	.07	.80**										
On Time Arrival (OT)	.09	.05	.34**	-.08	-.20	-.30*									
Baggage Misplaced (BAG)	-.10	-.26*	-.23	-.23	.14	.26*	-.49**								
On Time Boarding (BO)	.35**	.22	.08	.13	-.09	-.09	.04	-.07							
Customer Complaints (CC)	-.30*	-.11	-.32*	-.04	.17	.40**	-.64**	.24	-.23						
Ex Ante Service Quality (ANTE)	.38**	.18	.10	.10	-.09	.13	.07	.07	.96**	-.41**					
Ex Post Service Quality (POST)	.18	.15	.37**	.06	-.21	-.39**	.91**	-.71**	.08	-.77**	.11				
Satisfaction (SAT)	.52**	.25*	.32*	-.37**	-.06	-.18	.31*	-.29*	.53**	-.65**	.60**	.48**			
Satisfaction Level (SL)	.37**	.21	.33**	.19	-.08	-.25	.60**	-.45**	.71**	-.70**	.73**	.69**	.75**		
Satisfaction Heterogeneity (SH)	-.27*	-.23	-.12	.05	.26*	.37**	.05	.15	-.76**	.35**	-.82**	-.01	-.47**	-.52**	
Mean	.78	-.86	.79	.06	.11	51.59	.78	4.85	.85	1.46	.00	.00	65.34	65.35	9.13
Standard Deviation	.36	18.78	.21	.21	.04	27.38	.04	1.49	.51	1.02	1.00	1.00	4.51	3.61	3.69

** p < .01
* p < .05

Notes: *Ex ante* service quality (ANTE) and *ex post* service quality (POST) are factor scores for factor analysis of the service quality attributes, i.e., OT, BAG, BO, and CC. Satisfaction level (SL) and satisfaction heterogeneity (SH) are obtained by decomposing satisfaction (SAT) using the mean-variance function model. As firm size (FS) and market share (MSH) are highly correlated ($\rho = .80$, p < .01), for shareholder value model we constructed an instrument of market share that was independent of firm size by regressing market share on firm size and taking the residual of this regression as instrumenting market share.

TABLE 2
Drivers of Satisfaction Level and Heterogeneity: Results from the Mean-Variance Function Model

Explanatory Variables	Satisfaction dimension	
	Satisfaction Level	Satisfaction Heterogeneity
Constant	65.497** (1.002)	4.983** (1.866)
Lagged Satisfaction	-.034* (.018)	---
Ex Ante Service Quality (ANTE)	2.261** (.470)	-3.905** (1.501)
ANTE * ANTE	.175 (.321)	.795 (.860)
Ex Post Service Quality (POST)	2.863** (.438)	.168 (1.203)
POST * POST	.475** (.180)	-.524 (.423)
Lagged Advertising Expenditure * 10	.117 (.071)	.309* (.156)

** $p < .01$
* $p < .05$

Notes: The table entries are parameter estimates (standard errors in parentheses). For ease of presentation the coefficient and standard error for advertising expenditures were multiplied by 10. Satisfaction heterogeneity is modeled such that higher values indicate higher satisfaction heterogeneity. We report one-tailed tests for statistical significance.

TABLE 3
Drivers of Shareholder Value: Results from Mean-Variance Function Model

Variable Category	Explanatory Variables	Dependent Variable	
		Shareholder Value	Volatility in Shareholder Value
	Constant	.959** (.149)	.009 (.032)
	Lagged shareholder value (SV_{t-1})	.213** (.074)	---
Interplay of Satisfaction Level and Satisfaction Heterogeneity	Satisfaction Level (SL)	.104** (.035)	.010 (.008)
	Satisfaction Heterogeneity (SH)	-.072* (.036)	-.024** (.008)
	SL * SH	-.087** (.032)	-.008 (.007)
Control Variables	Liquidity * 100	-.051 (.108)	.020 (.018)
	Leverage	-.170 (.153)	.017 (.034)
	Cash-to-Total-Assets	.490** (.158)	-.028 (.038)
	Firm Size * 100	-.226* (.102)	.041* (.022)
	Market Share	-1.258 (.994)	-.139 (.169)

** $p < .01$
* $p < .05$

Notes: The table entries are parameter estimates (standard errors in parentheses). For ease of presentation the coefficient and standard error for liquidity and firm size were multiplied by 100. As firm size and market share are highly correlated ($\rho = .80$, $p < .01$), for shareholder value model we constructed an instrument of market share that was independent of firm size by regressing market share on firm size and taking the residual of this regression as instrumenting market share. We report one-tailed tests for statistical significance.