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The Long-Term Stock Market Valuation of Customer Satisfaction

Firm valuation has been an important domain of interest for finance. However, most financial models do not include customer-related metrics in this process. Studies in marketing have found that one particular customer metric, customer satisfaction, improves the ability to predict future cash flows, long-term financial measures, stock performance, and shareholder value. However, most of these studies predominantly employ models that are not directly used in finance practice. This article extends existing literature by examining the impact of customer satisfaction on firm valuation by employing multiples and risk-adjusted abnormal return models borrowed directly from the practice of finance. Data include 3600 firm-quarter observations from the American Customer Satisfaction Index, COMPUSTAT, and Center for Research in Securities Prices databases from 1996 to 2006. The results indicate that a portfolio of stocks consisting of firms with high levels and positive changes in customer satisfaction will outperform the other three possible portfolio combinations (low levels and negative changes, low levels and positive changes, and high levels and negative changes in customer satisfaction) along with Standard & Poor's 500. Initially, the stock market undervalues positive satisfaction information, but the market adjusts in the long run.

Keywords: customer satisfaction, firm valuation, stock returns, abnormal returns, financial models

Researchers and managers have questioned the ability of professional analysts to predict the financial performance of firms effectively (e.g., Fama 1970, 1991; Malkiel 1973; Schwed 1940). Lev and Zarowin (1999) show that U.S. firms' earnings have become less correlated with stock prices and attribute this to the failure to account for intangible assets. Although it is relatively straightforward to calculate the economic value added of tangible assets, such as plant and equipment, intangible assets are more difficult to value because they have no physical form and cannot easily be associated with future expected cash flows. Examples range from brand names (e.g., Coca-Cola) to patents (e.g., Pfizer) to technological expertise (e.g., Microsoft). What is the potential incremental impact of such intangible assets on the measurement of firm performance?

Marketers have recently proposed that much of the problem with predicting firm performance is that the models analysts use lack intangible and nonfinancial customer-based metrics (Gupta, Lehmann, and Stuart 2004; Hogan et al. 2002). Analysts tend to focus on measuring tangible data reported in a firm's financial statements. However, advocates of nonfinancial metrics argue that intangible assets, such as customer and brand elements, are critical elements of firm value (Aaker and Jacobson 2001; Amir and Lev 1996; Srivastava, Shervani, and Fahey 1998). According to Gupta and Lehmann (2003, p. 10), "This interest in intangibles arises from the recognition that [the] market value of the largest 500 corporations in the United States is almost six times the book value."

One such intangible asset found to influence firm value is customer satisfaction (Anderson, Fornell, and Mazvancheryl 2004; Fornell 2001; Fornell et al. 2006; Gruca and Rego 2005). Customer satisfaction has been shown to positively affect both equity prices and valuation ratios, such as Tobin's q and market-to-book ratio (Anderson, Fornell, and Mazvancheryl 2004; Ittner and Larker 1996). Gruca and Rego (2005) find that customer satisfaction creates shareholder value through its effect on fundamental value drivers by increasing future cash flow growth and reducing its variability. Fornell and colleagues (2006) show that a portfolio of firms with high customer satisfaction generated a cumulative return of 40% between February 1997 and May 2003 and outperformed major stock indexes, such as the Dow Jones Industrial Average and Standard & Poor's (S&P) 500.

Yet, although both theory and preliminary empirical investigations tend to support the link between customer satisfaction and shareholder value, economists or analysts at large investment banks do not widely use consumer satisfaction data when projecting a company's future stock performance (Keiningham et al. 2005). Williams and Viser (2002, p. 195) illustrate this point, asserting that "customer satisfaction with services is now not very important to any of the major parties involved. It is relatively unimportant for investors." Thus, despite the popularity of different approaches to understanding the true value of a company,

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ISSN: 0022-2429 (print), 1547-7185 (electronic)

Journal of Marketing
Vol. 72 (July 2008), 105–122

the efficacy of including intangible measures with financial measures remains under debate. With these issues in mind, using financial models, we address the question, Does customer satisfaction affect firm valuation in the long run?

This research extends the work of Ittner and Larker (1996), Anderson, Fornell, and Mazvancheryl (2004), Gruca and Rego (2005), and Fornell and colleagues (2006) in four ways. First, prior studies have examined the relationship between satisfaction and shareholder value exclusive of other firm-level financial models traditionally used to forecast future stock performance. We employ several financial metrics and models most commonly used in the practice of finance by analysts. Our models determine the incremental benefit of including satisfaction data to measure the effect on expected asset returns. Second, researchers have examined the relationship between satisfaction and raw market value (Ittner and Larker 1996) and the relationship between satisfaction and Tobin's q (Anderson, Fornell, and Mazvancheryl 2004). We concentrate on the increase or decrease in a company's share price using data over a ten-year period. Third, because returns are likely to vary with risk factors, we examine the risk-adjusted abnormal stock returns associated with customer satisfaction. Fourth, analysts at institutional securities firms do not believe in investment strategies that have not been rigorously tested for multiple start–end dates (referred to in the investment industry as "backtesting") (Gradwohl 2007). We conduct such an analysis to ensure that our findings are not based on fortuitous market timing.

Value of Intangible Assets

The ascendancy of shareholder power has led managers to focus increasingly on value creation as the most important metric of corporate performance (Copeland, Koller, and Murrin 2000). Thus, focusing on shareholder value has become a long-term objective that managers address to add incremental value (Day and Fahey 1988). Researchers and managers have begun to study the effect of intangible marketing variables, such as brand equity and customer satisfaction, on firm value (Luo 2007; Luo and Donthu 2006; See 2006). Srivastava, Shervani, and Fahey (1998) suggest that such market-based assets increase shareholder value by accelerating and enhancing the level and lowering the volatility of cash flows. They developed a marketing–finance interface framework that allows firms to develop and manage market-based assets that arise from relationships between the firm and entities in its external environment.

There is indeed a growing recognition that a significant proportion of the market value of firms today lies in intangible assets. For example, Capraro and Srivastava (1997) show that the market-to-book ratio for *Fortune* 500 companies averages 3.5, suggesting that more than 70% of the market value of the *Fortune* 500 firms lies in their intangible assets. Nakamura (1999) provides different measures of the magnitude of intangible assets in today's economy and estimates the capitalized value of intangible assets to be in excess of $6 trillion. Finance professionals are also slowly beginning to recognize the need to include nonfinancial measures in firm valuation (*Investor Relations Business* 2003; Kaplan and Norton 1992).

Researchers in the marketing domain have pointed to the need to employ intangible or nonfinancial customer-based metrics in financial models to predict firm stock performance (Gupta, Lehmann, and Stuart 2004; Hogan et al. 2002). Advocates of these metrics have argued that intangible assets, such as various brand and customer elements, are critical to firm value (Aaker and Jacobson 2001; Amir and Lev 1996; Srivastava, Shervani, and Fahey 1998). For example, Kohli and Leuthesser (2001, p. 75) report that "the Coca-Cola brand is worth more than half the market value, and a staggering 10 times the book value, of its parent company. The value of the Microsoft brand is about one-fifth of the company's market value and more than 150 percent of its book value." Furthermore, research supports a link between customer equity, represented by aggregate customer lifetime value across customers (Blattberg, Getz, and Thomas 2001; Rust, Lemon, and Zeithaml 2004; Zeithaml et al. 2006), and the market valuation of a firm (Gupta, Lehmann, and Stuart 2004).

Customer Satisfaction and Shareholder Wealth

Prior research in the field of marketing has found support for the role of customer satisfaction (American Customer Satisfaction Index [ACSI]) on firm economic performance, such as return on assets (ROA) and return on equity (ROE) (Anderson, Fornell, and Mazvancheryl 2004; Fornell et al. 2006), and on models aimed at conducting company valuation (Fornell et al. 1996). As Fornell (2003, p. 28) states, "In 1994, we thought ACSI could be of help in the investment arena, and today we have the data to prove it. If financial reports included information about the quality of customer relationships, there would be a much better understanding of the link between the firm's current condition and its future capacity to generate shareholder wealth."

Why is customer satisfaction likely to have a positive impact on a company's value? A great deal of research demonstrates the favorable responses that customer satisfaction is likely to elicit. For example, customer satisfaction has been found to have a positive effect on a company's relationship with its customers (Bolton, Lemon, and Verhoef 2004). Furthermore, there is substantial evidence to suggest that the strength of a firm's customer relationships is an important indicator of firm performance (Ambler et al. 2002; Bell et al. 2002; Berger et al. 2002; Blattberg and Deighton 1996; Hogan, Lemon, and Rust 2002; Rust, Lemon, and Zeithaml 2004). The market orientation literature also finds that companies that have a stronger market orientation (Porter 1996; Pralahad and Krishnan 1999) and view customers as a priority as part of the company culture (Deshpandé, Farley, and Webster (1993) exhibit superior performance.

More specifically, research has found that customer satisfaction has a measurable impact on purchase intentions (Bolton and Drew 1991), customer retention (Mittal and Kamakura 2001), reduced customer defections (Anderson 1996), share of wallet (Cooil et al. 2007; Keiningham, Perkins-Munn, and Evans 2003), increased receptiveness to

cross-selling efforts (Fornell 1992), reduced complaints (Bolton 1998; Fornell 1992), and word of mouth (Anderson 1998). The service–profit chain has also proposed a positive chain of effects from employee satisfaction to customer satisfaction to loyalty, firm revenue, and profitability (Heskett, Sasser, and Schlesinger 1997). Johnson and Gustafsson (2000) find that profits can be increased by building revenues through improvements to customer service, customer satisfaction, and customer retention. The return-on-quality framework initially proposed by Rust, Zahorik, and Keiningham (1995) also provides additional insight into these relationships. They explicitly show that firms that invest in quality improvements aimed at enhancing customer satisfaction can contribute to the bottom line in two ways. The first is a downstream approach that focuses on revenue-enhancing outcomes of increased satisfaction, and the second focuses on cost efficiencies as a result of processes employed to achieve a certain level of quality and, thus, satisfaction. There is current debate on which of these routes to profitability yields higher returns. Rust, Moorman, and Dickson (2002) find that firms that primarily adopt a revenue expansion emphasis perform better than those that emphasize cost reduction. Mittal and colleagues (2005) find that the association between customer satisfaction and financial performance is stronger when a firm is able to achieve a dual emphasis on revenue expansion and cost reduction, particularly in the long run.

Given that satisfaction is linked to long-term customer cash flows and value creation, we expect that there is a positive relationship between customer satisfaction and firm stock performance. One of the earliest studies that explored the link between satisfaction and a firm's market value was that of Ittner and Larker (1996). However, their findings were mixed and inconclusive. More recently, Anderson, Fornell, and Mazvancheryl (2004) found a positive association between the ACSI and Tobin's q (Tobin 1969), the ratio of price to book value, and equity prices using ACSI data from 1994 to 1997. It is proposed that a firm that creates market value greater than its replacement costs increases shareholder wealth through more efficient use of its resources. These findings are bolstered by the research of Gruca and Rego (2005), who use ACSI and COMPUSTAT data to find that satisfaction creates shareholder value by increasing future cash flow growth and reducing its variability. Fornell and colleagues (2006) test the ability of customer satisfaction to generate excess returns using ACSI and COMPUSTAT data. They conducted an event study and examined stock market reactions to announcements of customer satisfaction information immediately after the announcement. The results suggest that companies that are better than their competitors in terms of satisfying customers generate superior returns at lower systematic risk. However, news about changes in customer satisfaction was not found to have an immediate impact on stock prices.

Historically, however, the inclusion of customer satisfaction into firm valuation models has encountered resistance for several reasons. First, consumer attitudinal data are believed to provide little additional information beyond what is contained in other commonly used data sources to forecast performance.[1] For example, two measures of consumer attitudinal data, the Index of Consumer Sentiment maintained by the University of Michigan and the Conference Board's Consumer Confidence Index, are closely followed measures designed to reflect and project economic activity. In research using the University of Michigan's Consumer Confidence Index, Carroll, Fuhrer, and Wilcox (1994) find that though the index aids in the prediction of economic activity, when combined with other widely available and commonly used forecasting data, it did not provide much additional benefit.[2]

Second, it is widely believed that investors do not value customer satisfaction information. As Williams and Viser (2002, p. 195) argue, "Customer satisfaction is not seen by investors as one of the newly important intangible assets when they are called upon to evaluate a business. Investors no longer believe there is any competitive advantage in satisfying customers." However, Williams and Viser, along with other researchers (Laing 2000; McNamee 2001), note that there has been an increasing call for including intangible assets in companies' financial reports. Even so, firms still report little of this type of information (Drozd 2004). In addition, customer satisfaction is rarely referenced in articles as a desired intangible asset in companies' financial reports, which further exacerbates this situation.

Third, Keiningham and colleagues (2005) contend that large institutions are so driven by near-term financial performance that they lack patience for longer-term efforts designed to enhance customer loyalty. In addition, Williams and Viser (2002) argue that chief executive officers (CEOs) are forced to manage for the short run because of their short average tenure. For example, a recent study of 476 of the world's largest public and private companies found that almost half of all CEOs had held their positions for fewer than three years, with approximately two-thirds holding the position for fewer than five years (study by Drake Beam Morin reported in *Hong Kong Business* 2000). Williams and Viser argue (p. 196) that because CEOs have less time to "ensure themselves either a lucrative retirement or another top job," they attempt to increase share prices in the short run and, further, that "there are many factors that have a much more direct and fast effect on share price than customer satisfaction figures."

Fourth, research analysts are skeptical of the impact of customer satisfaction data on the evaluation of a firm's performance. As Gupta, Lehmann, and Stuart (2004, p. 8) note, "Financial analysts are now quite skeptical of nonfinancial metrics." An article in the *Wall Street Journal* (Hilsenrath 2003, p. A2) supports this assertion, noting with regard to the ACSI that "[m]any stock analysts aren't convinced that the university's customer satisfaction index, in and of itself, is all that important." Tom Goetzinger, a Morningstar analyst, said that he was familiar with the ACSI but did not place too much importance on it unless there were signifi-

[1]Piger (2003) notes that consumer confidence data are not viewed as aiding in the prediction of economic activity.

[2]Note that the consumer confidence index addressed in these studies is distinct from the ACSI.

cant score movements: "In general, I've always been leery of telephone surveys" (qtd. in Hilsenrath 2003, p. A2).

Despite all the skepticism, the evidence suggests that nonfinancial metrics indeed contribute to a better understanding of firm value. For example, when Amir and Lev (1996) examined tangible and intangible assets of independent wireless communications companies, they found that on a stand-alone basis, financial information (e.g., earnings, book values, cash flows) was largely irrelevant for stock valuation. Nonfinancial indicators, such as population size (a growth proxy) and market penetration (an operating performance measure), were highly value relevant. However, when combined with nonfinancial information, earnings contributed to the explanation of stock prices, highlighting the complementarities between financial and nonfinancial data.

Contribution of Research

Our research builds primarily on the work of Fornell and colleagues (2006), who study instant ensuing reactions of the stock market to the release of customer satisfaction data. They find that there are no reactions, even when examining reactions 5–15 days surrounding the announcement. However, it is possible that the market initially misreacts to such information but adjusts over a longer period. Therefore, this article focuses on the long-term risk-adjusted returns of customer satisfaction using 3600 firm-quarter observations. Using the ACSI scores from December 1996 to August 2006, we determine whether the stock market appropriately values the benefits of customer satisfaction. If investors are more likely to underreact to the economic value added of customer satisfaction, strategies that exploit this lack of reaction should have excess returns.

An efficient capital market sets prices on the basis of expectations of the future. However, it is difficult to identify when the market forms and changes expectations about customer satisfaction. Prior studies that analyzed the impact of customer satisfaction on security returns did not find an immediate reaction to changes in ACSI scores and concluded that any strategy to classify firms into high or low customer satisfaction must be based not only on score changes in time but also on levels. Accordingly, we examine the impact of customer satisfaction on firm performance by forming stock portfolios based on a compound measure of customer satisfaction: whether a firm's ACSI score is above or below the national average and whether the percentage change is negative or positive over time. The former measure assesses how well a firm does compared with the rest of the market in the cross-section in terms of satisfaction, and the latter measure assesses how well a firm does compared with its own history of customer satisfaction.

We examine four portfolios (high versus low customer satisfaction levels and increase versus decrease in customer satisfaction levels) and compare them with one another and with the S&P 500 index. We show that a $100 investment in a portfolio of firms with high customer satisfaction and an increase in customer satisfaction more than triples to $312. To put our results in perspective, the same $100 investment in the S&P 500 grows only to $205. The performance of a portfolio of firms with low customer satisfaction and a decrease in customer satisfaction is significantly weaker, with the $100 investment actually decreasing to $98.

When examining the risk-adjusted performance, we find that the high-customer-satisfaction portfolio has abnormal returns ranging from 5% to 7% annually, depending on the risk-adjustment model. A zero net investment portfolio, formed by buying stocks with high customer satisfaction and short selling those with low customer satisfaction, has a significant, positive abnormal return ranging from 11% to 14% per year. The results indicate that (1) high customer satisfaction brings positive excess returns after we adjust for various risk factors and (2) there is consistent evidence of a misreaction by the stock market to the intangible value implied in customer satisfaction (although the market fails to react immediately to customer satisfaction–related information, it adjusts over time).

In the next section, we discuss the sample selection procedures and our research methodology, and we present some descriptive statistics. Then, we present our main findings. The following section contains robustness tests, and the final section summarizes the findings and offers several conclusions.

Data and Research Methodology

We measure customer satisfaction using the ACSI, which was developed by the National Quality Research Center of the Stephen M. Ross Business School at the University of Michigan. The index measures the quality of goods and services purchased in the United States produced by both domestic and foreign firms with substantial U.S. market shares and is a national barometer of customer satisfaction (Fornell et al. 1996). The ACSI reports scores on a 0–100 scale and produces indexes for ten national-level economic sectors, 43 industries, and more than 200 companies and federal or local government agencies. The measured companies, industries, and sectors in the index are broadly representative of the U.S. economy serving U.S. households.[3] The national average ACSI score has been shown to correlate with gross domestic product, personal consumption expenditure, and the stock market, which has resulted in the ACSI becoming an important indicator of economic performance for the macro economy.

We match the ACSI sample of NYSE-, AMEX-, and NASDAQ-listed U.S. firms that are specified as ordinary common shares with monthly returns from the Center for Research in Securities Prices (CRSP) and with nonnegative book values of equity available from the quarterly merged COMPUSTAT data, also maintained by CRSP. In addition, we obtain several data items listed in the Appendix, such as sales or book value of assets, that are required to calculate several accounting profitability measures or valuation multiples from the COMPUSTAT data set. The period in this study covers the third calendar quarter of 1996 through the first quarter of 2006, which is a period with market ups and downs, including the stellar rise of the late 1990s and the

[3]The sales volume of surveyed firms represents more than 40% of the U.S. gross domestic product (Fornell et al. 1996).

ensuing correction in security prices. A total of 151 unique firms and 3600 firm-quarter observations are studied. The number of firms in each quarter averages 92 and ranges from 78 to 114.

The ACSI was first published in October 1994. Since then, it has been updated quarterly, on a rolling basis, with new data for one or more of the measured sectors replacing data collected the prior year. The ACSI data for a calendar quarter t are released with a lag. Typically, the results are made publicly available on the third Tuesday of February (fourth-quarter results from the previous year), May (first-quarter results), August (second-quarter results), and November (third-quarter results).

Customer satisfaction data have been shown not to move stock prices on or around the public release date of the data (Fornell et al. 2006; Ittner and Larcker 1998), and it has been suggested that it is necessary to consider both levels and changes in ACSI scores because the stock market does not seem to respond immediately to changes in the score. As such, we classify firms into four categories on the basis of two signals related to customer satisfaction: the level and percentage change in the ACSI score. To remove the impact of systematic economywide sentiment changes, we base our portfolio formation on national average–adjusted ACSI scores.[4] That is, our measure of customer satisfaction is the original ACSI score scaled by the national average.

More specifically, we classify each firm into one of the four groups as follows (firms are reclassified every quarter when new ACSI data are released):

1. Above/below the national average–adjusted ACSI score mean.
2. Positive/negative percentage change in national average–adjusted ACSI score.

The final portfolio allocation is an intersection of these two signals, resulting in four distinct portfolio groups:

- Portfolio High: Positive signals on both ACSI level and change. This is the optimal portfolio in terms of customer satisfaction. It consists of firms with both high levels of and increasing customer satisfaction scores.
- Portfolio Low: Negative signals on both ACSI level and change. This is the least optimal portfolio in terms of customer satisfaction on both fronts. It consists of firms with both low levels of and decreasing customer satisfaction scores.

The other two portfolios constitute a gray area, with conflicting signals in terms of levels and change in customer satisfaction. That is, these portfolios contain firms with either increasing customer satisfaction or high levels of customer satisfaction, but not both:

- Portfolio 2: Negative signal on ACSI level but positive signal on change. This portfolio consists of firms with low but increasing customer satisfaction scores.
- Portfolio 3: Positive signal on ACSI level but negative signal on change. This portfolio consists of firms with high but decreasing customer satisfaction scores.

At the end of February, May, August, and November, new portfolios are recalculated as outlined previously with the release of new ACSI data. For example, the first portfolio is formed at the end of November 1996 (from the third-quarter 1996 ACSI results). Portfolio returns are tracked monthly for the next three months (December 1996, January 1997, and February 1997). The last portfolio is formed at the end of May 2006 (from the first-quarter 2006 ACSI results), and the portfolio returns are tracked for June, July, and August 2006. There are 117 monthly value weighted portfolio returns from December 1996 to August 2006.[5] Although portfolios are reformed every three months, a firm can stay in the same portfolio for the entire 117 months of the test period. In the end, hypotheses about the impact of customer satisfaction on shareholder wealth can be tested using the monthly series of the four portfolio returns we formed.

The market values of securities are derived from a combination of the exogenous economic environment in which the company operates and the corporate decision process within that environment. Both systematic and firm-specific factors affect the value and, thus, the return of corporate securities in such a setup. We track returns of portfolios instead of tracking returns of a specific firm because we can diversify away idiosyncratic risks and attribute portfolio performance specifically to customer satisfaction.

As with the ACSI data, we use lagged quarterly COMPUSTAT data in our analysis. On average, there is a 23-calendar-day difference between the end of a COMPUSTAT fiscal quarter and the actual report date of financial statements for the sample of firms in our study. The reason for using lagged data is to ensure that any investor forming a portfolio at a given time has full access to the publicly available ACSI and COMPUSTAT accounting data.

The left-hand side of Table 1 reports summary statistics on our proposed portfolios. Note that portfolios do not necessarily comprise an equal number of firms. For each portfolio, the numbers reported in the table are time-series average values of cross-sectional median firm values. That is, we define portfolio values as the median of firm values each quarter and then report the time-series average of these cross-sectional medians. For example, Portfolio High has a national average–adjusted ACSI score of 1.08 and an average of 33 stocks. It averages $10,631 million in sales and has an average market value of equity equal to $12,018 million.[6] Portfolio Low scores less on customer satisfaction, but it has higher average sales and higher average market value of equity than Portfolio High. Both portfolios have a similar amount of financial leverage; the ratio of short- and

[4]The national-level average is available from the ACSI, and the aggregation is done using sales data (i.e., a sales-adjusted averaging is used) by the index provider.

[5]Portfolio weights are based on prior month market capitalization of firms that make up a specific portfolio. Our conclusions are insensitive to value or equal weighting. This is to be expected because large capitalization firms are typically included in the ACSI.

[6]For the definitions of the variables we use in Tables 1 and 2, refer to the Appendix.

TABLE 1
Customer Satisfaction Portfolio Descriptive Statistics: Firm Characteristics, Customer Satisfaction, Profitability Measures, and Valuation Ratios

	Portfolio Firm Averages									
Portfolio	ACSI	Number of Firms	Sales (in Millions of Dollars)	Market Value (in Millions of Dollars)	Leverage	ROA	ROE	Market to Book Assets	Market to Book Equity	Price Earnings
High	1.08	33	10,631	12,018	.319	.143	.129	1.548	2.371	18.259
2	.96	12	12,400	10,483	.320	.106	.109	1.139	1.828	14.553
3	1.06	29	12,102	13,353	.321	.159	.152	1.673	2.787	18.308
Low	.94	18	13,482	13,473	.320	.101	.105	1.150	1.755	15.077

long-term total debt to book value of assets for either portfolio is slightly above 30%.

The portfolio ranking we report in this study is not necessarily in monotonic order. According to our two signals for customer satisfaction, Portfolios High and Low have consistent signals, whereas Portfolio 2 and 3 have conflicting signals. Therefore, whether customer satisfaction creates excess shareholder wealth should be tested only on the difference between Portfolios High and Low. As we expected, Portfolio 2 (negative signal on level but positive signal on change) has a low national average–adjusted ACSI score. Conversely, Portfolio 3 (positive signal on level but negative signal on change) has an ACSI score of 1.06, which is slightly lower than Portfolio High. When we examine the descriptive statistics, such as sales, market value of equity, and financial leverage ratios of these two portfolios, in general, they are at par with their "High" or "Low" counterparts used in prior studies. Thus, our portfolios do not reflect radical departures from studies in the literature.

Empirical Results

Customer Satisfaction and Valuation Ratios

Previous research on customer satisfaction has indicated a positive impact on firm value. In Table 1, we report two widely used accounting measures of profitability and three relative valuation ratios for the portfolios. The methodology used to calculate these values is the same used in the rest of Table 1; that is, the numbers reported are time-series average values of cross-sectional median firm values.[7] The results show that Portfolio High has a higher return than Portfolio Low on both the book value of assets (ROA) and the book value of equity (ROE). The annualized ROA on Portfolio High is 14.3%, whereas the annualized ROA on Portfolio Low is 10.1%. Similarly, ROE for Portfolios High and Low are 12.9% and 10.5%, respectively.

Customer satisfaction has been shown to positively affect equity prices and relative valuation ratios, such as Tobin's q and market-to-book ratio (Anderson, Fornell, and Mazvancheryl 2004; Ittner and Larker 1996). Table 1 echoes this; the ratio of market to book value of asset (MBA) for Portfolio High is above 1.5, suggesting that roughly 35% of its market value lies in intangible assets. Conversely, only 13% of the value of assets lies in intangibles for Portfolio Low (MBA of 1.15).

In relative valuation, the value of an asset is derived from the pricing of comparable assets, standardized using a common variable such as earnings. The price-to-earnings (PE) ratio, a measure of the earnings multiple of a stock, is one of the most widely used valuation multiples. Another widely used multiple is the ratio of market to book value of equity (MBE), with firms selling at a discount on book value being considered undervalued relative to comparable firms. A casual inspection of the MBE ratio for high- and low-satisfaction portfolios suggests that neither is selling at a discount to its book equity. However, an MBE ratio of almost 2.4 suggests that investors value Portfolio High more than Portfolio Low. A relatively higher PE ratio of 18.3 versus 15.1 confirms this intuition.

Higher measures of accounting profitability and market valuation ratios for Portfolio High in Table 1 are in accordance with prior research and hint at the positive relationship between customer satisfaction and shareholder wealth. However, they are for expositional purposes only and should be taken with caution. Strictly speaking, when employing such measures, we must either explicitly or implicitly control for differences across portfolios for fundamental drivers of value: growth, risk, and timing of cash flows. In its simplest form, controlling for these differences can range from the naive method of using some sort of an average (e.g., industry averages) to sophisticated methods in which the relevant sources of differences are identified and controlled for directly.

If, as is often stated, the value created by customer satisfaction is not capitalized by remaining off the balance sheet, the book value is understated by standard accounting principles. Thus, a valuation ratio, such as the MBE, will be overstated. As such, there are, for example, two ways of interpreting the observation that Portfolio High has a higher MBE ratio than Portfolio Low. Assuming that the two portfolios are comparable to each other, one interpretation is that the difference in ratios identifies mispricing, suggesting that Portfolio High is indeed overvalued. The other is that the stock market realizes the value created by customer satisfaction and thus reflects this view in the market value of equity. However, without knowing the extent of the understatement of the book value, identifying which of these interpretations is correct is not possible. For example, accounting profitability measures and valuation multiples for Portfolio 3 (high but decreasing customer satisfaction) are at par with the multiples for Portfolio High. Similarly, the relative valuation of Portfolio 2 resembles that of Portfolio Low. In the following section, we focus on stock returns to shareholders and directly account for risk using several models of expected returns widely used in practice.

Customer Satisfaction and Stock Returns

This article is at the junction of marketing theory and the branch of empirical corporate finance that is directed toward explaining how various decisions and events affect the value of existing corporate equity claims. As such, the focus of our research is on equity returns. The emphasis is on the role of security markets and the underlying security pricing process.

The efficient markets hypothesis predicts that the market price at any given time is an unbiased estimate of the true value of the firm and that deviations of market price from the true value are random. A direct implication of the efficient markets hypothesis is that it is impossible to find under- or overvalued stocks consistently using any investment strategy. However, a large body of empirical work shows that the market is slow to incorporate publicly available information into equity prices. For example, over long

[7]Conclusions are insensitive to the averaging technique. For example, we alternatively define a ratio for a portfolio as the aggregate value (i.e., sum[numerator]/sum[denominator]) across firms in each portfolio and then analyze a time-series average of these aggregate ratios.

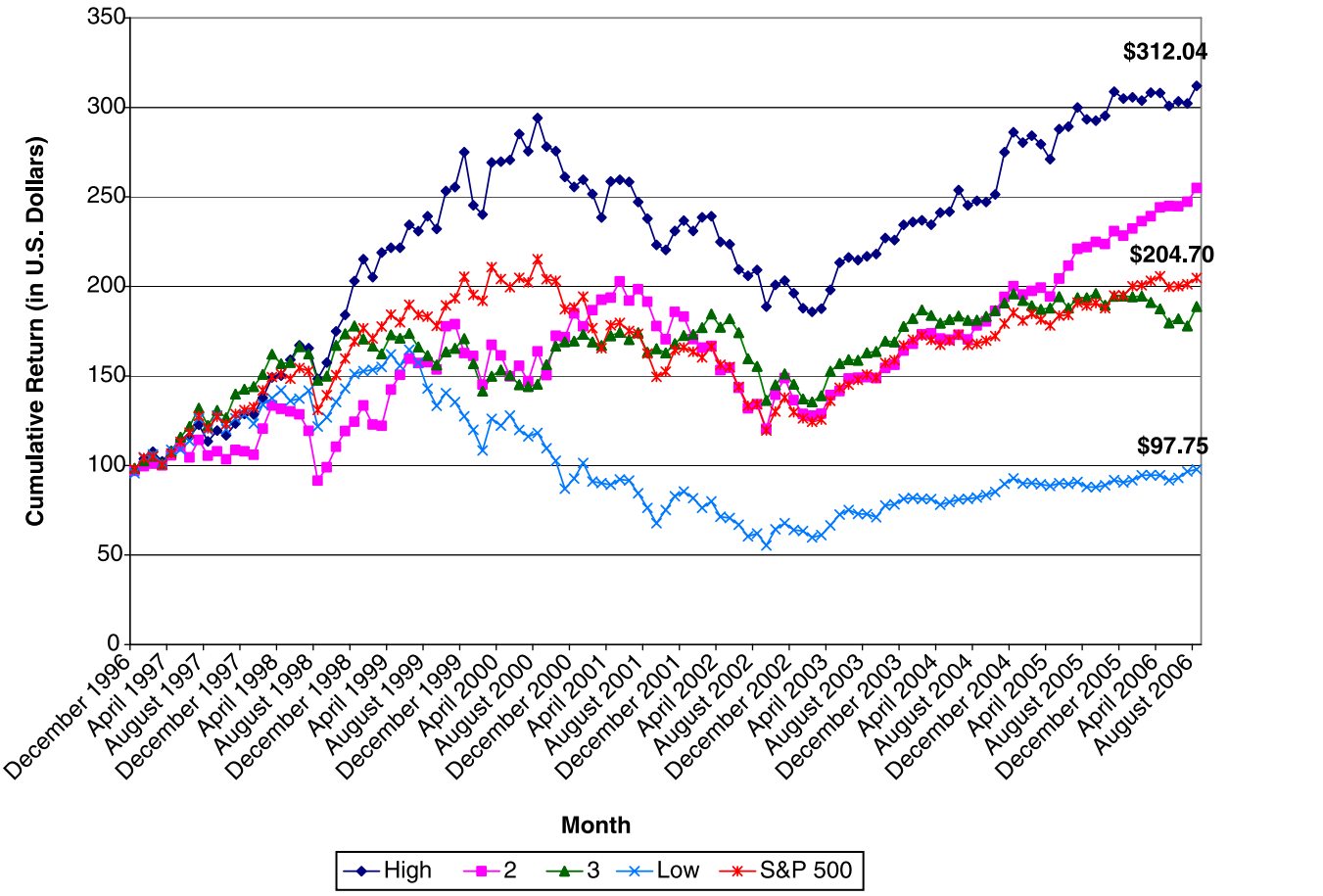
horizons, stock returns are negatively related to prior stock returns (De Bondt and Thaler 1985, 1987). In addition, stock returns are positively related to price-scaled indicators of fundamental value, such as the book-to-market ratio (e.g., Fama and French 1992; Lakonishok, Shleifer, and Vishny 1994).

As an alternative, several behavioral models postulate that security prices are determined by both risk and expectational errors. In a review of behavioral finance models, Hirshleifer (2001) postulates that any mispricing is likely to be most pronounced in firms with a high degree of information asymmetry and when rational arbitrage is less likely to be effective. Daniel and Titman (2006) argue that investors misreact to intangible information but not to tangible information, such as accounting measures of prior performance. Furthermore, Yalçın (2008) shows that analyst coverage is more important among growth than value stocks, supporting the view that investors are more prone to decision biases when it comes to pricing difficult-to-value growth stocks for which information is relatively more ambiguous.

The evidence presented in the preceding section is in line with two recent articles that support the intuition that customer satisfaction should be considered an intangible asset that creates real economic value. Gruca and Rego (2005) find that customer satisfaction creates shareholder value by increasing future cash flow growth and reducing its variability, and Fornell and colleagues (2006) show that a portfolio of firms with high customer satisfaction outperforms major stock indexes.

Figure 1 illustrates the striking performance of Portfolio High compared with both the low-satisfaction portfolio and the overall market. An investment of $100 in Portfolio High at the beginning of December 1996 more than triples to $312 by August 2006. The average monthly return is 1.08% (almost 13% annualized), with a t-statistic of 2.66 (the standard error for the average is corrected for autocorrelation in the monthly stock return series). Conversely, an investment of $100 in Portfolio Low decreases to $98 by the end of the investment horizon. The average return of Portfolio Low is an insignificant .15% per month. During the same period, $100 invested in the S&P 500 index grows to $205; a passive investment strategy of holding the market index performs far better than Portfolio Low but returns significantly less than Portfolio High. Unlike the results on multiple valuation ratios in Table 1, the figure clearly illustrates the superiority of Portfolio High over all the other three portfolios considered. The average monthly return for Portfolio 2 is .99% (t-statistic = 1.91), and the average monthly return for Portfolio 3 is .63% (t-statistic = 1.57). As the figure shows, cumulative performance of Portfolios 2 and 3 along

FIGURE 1
Customer Satisfaction Portfolio Cumulative Returns Versus the S&P 500 Index Cumulative Return



with the S&P 500 index falls well between Portfolio High and Portfolio Low.

Risk-Adjusted Abnormal Portfolio Returns

Do stocks of firms with high customer satisfaction perform better than expected? To address whether customer satisfaction truly creates shareholder value, the focus needs to be on excess (abnormal) returns. In general, a failure to control for overall market performance and risk leads to accepting high-risk investment strategies and rejecting low-risk ones because the former should produce higher returns than the market and the latter should produce lower returns than the market, without implying any abnormal returns. The ACSI itself is biased toward large capitalization stocks that make up a significant proportion of the overall market. Therefore, it is not surprising to observe portfolio strategies based on the ACSI sample of firms to covary significantly with the market. For example, prior studies have reported that the value in a portfolio of firms with high ACSI scores grew when the stock market grew and decreased, albeit with some degree of insulation, as the market dropped in value. Therefore, it is crucial that we judge the performance of our proposed portfolios by their risk-adjusted abnormal returns. In this section, we use three of the most widely used risk-based rational expectations models to control for risk and calculate abnormal returns.

The capital asset pricing model (CAPM) predicts a positive linear relationship between an asset's expected rate of return and its covariance risk with the market. To control for market risk, we run the following single-index market model regression using monthly portfolio returns over the full sample:

$$(1) \qquad R_{p,t} - R_{f,t} = a_p + m_p MKT_t + e_{pt},$$

where $R_{p,t}$ is the rate of return of portfolio p in month t, $R_{f,t}$ is the one-month risk-free interest rate, and MKT_t is the return on the overall market index (CRSP value-weighted NYSE/AMEX/NASDAQ index) in excess of the risk-free interest rate. Under the null hypothesis, there are no abnormal returns, and therefore, the intercept of Equation 1 should be zero.

Alternative Risk Models

The Fama–French three-factor model. Fama and French (1996) argue that a three-factor model that incorporates size (SMB) and value (HML) risk factors as well as the market (MKT) factor can explain almost all pricing anomalies with the exception of momentum returns. The HML factor is the return difference on value (high book-to-market) and growth (low book-to-market) stocks. Thus, a "value stock" should have a positive exposure to HML, whereas a "growth stock" should have a negative exposure to it. Consequently, we repeat our abnormal return tests using Equation 2:

$$(2) \qquad R_{pt} - R_{ft} = a_p + m_p MKT_t + s_p SMB_t + h_p HML_t + e_{p,t},$$

where SMB_t is the size factor, defined as the return differential between portfolios of small and large market capitalization stocks; HML_t is the value factor, which equals the return difference between portfolios of stocks with high and low book-to-market ratios; and the rest are as defined previously. The intercepts from these regressions can be interpreted as abnormal portfolio returns relative to the Fama–French three-factor model.

Carhart four-factor model. We also estimate the abnormal portfolio returns with the Carhart four-factor model, which includes a momentum factor as an additional risk factor:[8]

$$(3) \qquad R_{pt} - R_{ft} = a_p + m_p MKT_t + s_p SMB_t + h_p HML_t + u_p UMD_t + e_{p,t},$$

where UMD_t is the momentum factor, which is defined as the return difference between portfolios of past winners and losers. The intercepts from these regressions can be interpreted as abnormal portfolio returns relative to the four-factor model.

The coefficients other than the intercept (a_p) in Equations 1, 2, or 3 provide estimates of a portfolio's exposure to systematic risk factors. These coefficients indicate systematic risk sensitivities similar to those of the broader market index when m_p equals 1 and when s_p, h_p, and u_p equal zero (Fama and French 2004). We correct the standard errors in the equations for heteroskedasticity and autocorrelation using Newey and West's (1987) procedure.

Equations 1–3 can be viewed as predictive regressions, and the intercept term can be treated as a "forecast error" (i.e., the abnormal return beyond the return implied by the particular risk model). We control for the simultaneous arrival of information about systematic factors by including contemporaneous systematic risk factors, such as the market, size, book-to-market, and momentum factor returns. By forming portfolios on customer satisfaction scores, other firm-specific factors are reasonably diversified away, and we can concentrate on the impact of customer satisfaction on equity returns and, thus, on shareholder wealth. Although a firm could potentially be in all four portfolios over the period investigated, the resultant portfolios can be viewed as mutual funds with changing compositions but identities of their own.

Table 2 shows average monthly portfolio excess returns (in excess of the risk-free rate) and abnormal returns using the market (CAPM) model, the Fama–French three-factor model, and the Carhart four-factor model. The results indicate that higher customer satisfaction leads to higher excess and abnormal returns. Portfolio High has an average excess return of .78% per month and an abnormal return anywhere from .42% to .56% per month, all statistically significant, indicating that the portfolio performs better than expected given its risk level. Conversely, Portfolio Low has a negative, albeit marginally significant, abnormal return, suggesting that its average stock return is below what would be expected given its risk level. Moreover, Portfolios 2 and 3, which consist of firms with conflicting customer satisfaction signals, perform as expected. That is, abnormal returns on either portfolio using any of the risk-based models are statistically not different from zero.

[8]Carhart (1997) shows the importance of momentum in expected return measures.

TABLE 2
Customer Satisfaction Portfolios and Excess Returns Using Risk-Based Financial Models

	Excess Returns		CAPM Adjusted Excess Returns		Fama–French Three-Factor Model Adjusted Excess Returns		Carhart Four-Factor Model Adjusted Excess Returns	
Portfolio	**Average**	**t-Statistic**	**Alpha**	**t-Statistic**	**Alpha**	**t-Statistic**	**Alpha**	**t-Statistic**
High	.0078	1.95**	.0042	1.75*	.0056	2.92***	.0050	2.49***
2	.0070	1.35	.0031	.70	.0000	.00	–.0001	–.02
3	.0034	.85	.0008	.23	–.0012	–.45	–.0007	–.26
Low	–.0014	–.27	–.0057	–1.62*	–.0061	–1.70*	–.0037	–1.19
High–Low	.0092	2.30**	.0099	2.71***	.0117	2.74***	.0088	2.22**

*$p < .10$.
**$p < .05$.
***$p < .01$.

A zero net investment portfolio (High–Low) is formed by buying stocks in Portfolio High and short selling those in Portfolio Low. This portfolio has an average monthly excess return of .92%. The portfolio performs exceptionally well, with a significantly positive monthly abnormal return ranging from .88% to 1.17% (11%–14% annualized).

Table 3 summarizes risk parameter estimates associated with the various risk factors in the Carhart four-factor model. The results show that the model explains a significant portion of the portfolios' risk (as reported by adjusted R^2). For example, 76% of the total volatility of the high-satisfaction portfolio is due to the four systematic risk factors identified in the Carhart model. On average, both Portfolio High and Portfolio 3 are less risky than the overall market (market factor, $m_p < 1$), Portfolio Low is equal in risk to the overall market ($m_p = .998$), and Portfolio 2 is more risky than the market ($m_p = 1.143$). In addition, all four portfolios load negatively on SMB (size factor), suggesting that these are indeed large capitalization stock portfolios. Neither the high-satisfaction nor the low-satisfaction portfolio loads significantly on HML (book-to-market factor), suggesting that these portfolios are similar to "average" stocks, which can be classified neither as value nor as growth. Conversely, Portfolios 2 and 3 are similar to value stocks and load positively on HML. The main difference between Portfolios High and Low is the way they load on the momentum risk factor (UMD). Portfolio High has a marginally positive exposure to UMD, whereas Portfolio Low loads significantly negatively on it, suggesting that Portfolio Low is out of favor among investors.

The Carhart four-factor model explains only 15.5% of the total variation in Portfolio High–Low returns. Even after we account for four different risk factors, there is an abnormal (risk-adjusted) .88% per month return (a significant 10.56% per year). The only risk factor that is significant in this portfolio is UMD, suggesting that there is a significant momentum effect present in stock returns of this hedge portfolio. In summary, our results provide strong evidence that high and increasing customer satisfaction leads to abnormally high stock returns, indicating that the stock market is slow to recognize the full extent of the intangible value created.

TABLE 3
Customer Satisfaction Portfolio Risk Estimates Using the Carhart Four-Factor Model

Portfolio		Alpha	MKT Beta, m_p	SMB Beta, s_p	HML Beta, h_p	UMD Beta, u_p	Adjusted R^2
High	Estimate	.0050	.855	–.352	–.068	.059	.761
	t-statistic	2.49**	14.66**	–6.75**	–.89	1.64	
2	Estimate	–.0001	1.143	–.264	.500	.008	.547
	t-statistic	–.02	9.34**	–2.10*	2.36*	.08	
3	Estimate	–.0007	.771	–.249	.337	–.048	.604
	t-statistic	–.26	9.95**	–3.35**	3.77**	–1.18	
Low	Estimate	–.0037	.998	–.290	.112	–.232	.689
	t-statistic	–1.19	12.65**	–3.32**	.90	–3.18**	
High–Low	Estimate	.0088	–.143	–.062	–.180	.290	.155
	t-statistic	2.22*	–1.37	–.70	–1.25	3.45**	

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

Robustness Tests

In addition to employing multiple models to control for systematic risk factors, we examine three other areas to verify the robustness of our results. First, economic activity can affect company valuations through changes such as interest rates and earnings growth. Second, outliers may largely influence portfolio returns. Third, the start and end dates for our portfolios' creation may produce results that are due to luck of the draw. We discuss the effect of these three issues in this section.

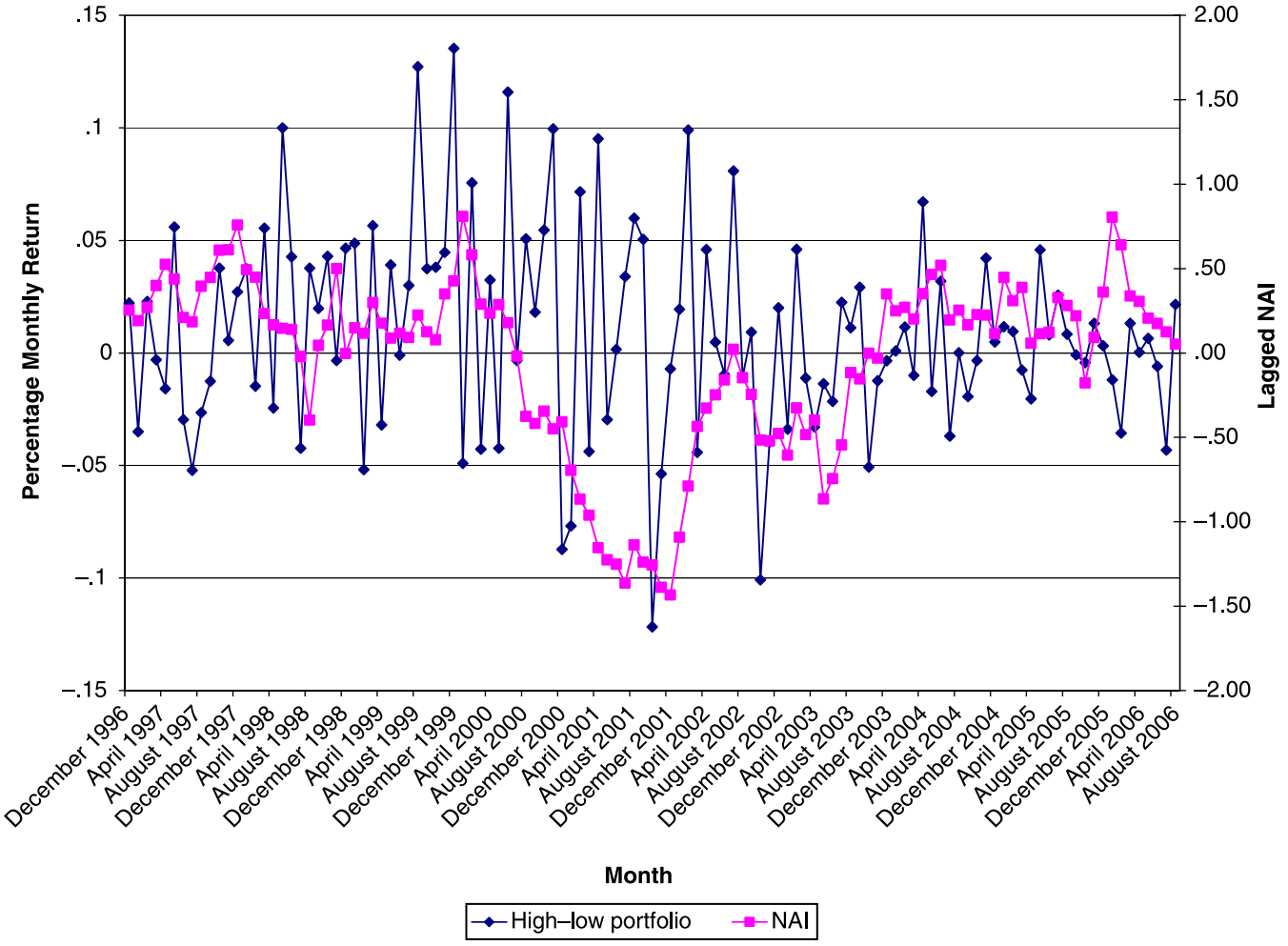
Economic Activity, Customer Satisfaction, and Stock Returns

Information about the state of the economy and the level of interest rates affects company valuations. For example, a weakening of the economy can negatively impact earnings growth, though the effect is likely to be largest for cyclical firms. However, firms with a highly satisfied customer base will likely realize higher revenues from repeat purchase and cross-selling when the economy is expanding. In addition, to a certain extent, such firms might be insulated from the negative effects of an economic downturn.

Figure 2 plots the monthly series of Portfolio High–Low returns from December 1996 to August 2006. As we reported previously, the average is positive overall, but the time-series variation of the portfolio return is volatile. Some months have large positive returns, and some have large negative returns. On the same graph (right-hand-side y-axis), we plot the Chicago Federal Reserve Bank three-month moving average National Activity Index (NAI), lagged by one month. The NAI is a monthly index of a weighted average of 85 indicators of national economic activity. A negative value for the index indicates that the national economy is growing below average, and a positive value indicates that the national economy is growing above average.[9] Month-to-month movements of the NAI can be volatile, so the index's three-month moving average provides a more consistent picture of national economic growth.

[9]For more information on the NAI, see the Web page of the Federal Reserve Bank of Chicago at http://www.chicagofed.org/economic_research_and_data/cfnai.cfm.

FIGURE 2
High–Low Customer Satisfaction Portfolio Monthly Returns in Periods of High or Low Economic Activity



To test the performance of the portfolios across different states of the economy, we divide the time-series observations into two according to whether the (lagged) three-month moving average NAI is positive (economy expanding above average) or negative (economy expanding below average). There are 44 months in which the index is negative and 73 months in which the index is positive. Table 4 shows average monthly excess returns and abnormal returns and risk parameter estimates using the Carhart four-factor model.[10] Unlike in Table 3, Table 4 corrects for heteroskedasticity only for the reported t-statistics because the monthly series we have in either subsample do not need to be contiguous.

Panel A in Table 4 shows that Portfolio Low registers a greater loss in value than Portfolio High following months of below-average economic growth. However, the difference in performance between the two is insignificant. The average excess returns and abnormal returns of Portfolios High and Low are practically zero in this subsample. There is also no difference in the risk parameter estimates across these two portfolios in the below-average economic growth sample.

A casual inspection of Figure 2 suggests that, on average, Portfolio High–Low return is positive following months of above-average economic growth and negative

[10]The CAPM and the Fama-French three-factor model yield similar conclusions and thus, for the sake of brevity, are omitted here. However, these results are available on request.

TABLE 4
Customer Satisfaction Portfolios, Excess Returns, and Risk Estimates Based on the Level of National Economic Activity

A: Low Economic Activity

			Carhart Four-Factor Model Estimates					
Portfolio		Excess Returns	Alpha	MKT Beta, m_p	SMB Beta, s_p	HML Beta, h_p	UMD Beta, u_p	Adjusted R^2
High	Estimate	–.0066	.0010	.765	–.222	–.049	.044	.792
	t-statistic	–.94	.28	10.14***	–2.31**	–.34	.62	
2	Estimate	–.0048	–.0031	1.219	–.396	.630	.056	.536
	t-statistic	–.45	–.30	5.09***	–1.23	2.02**	.40	
3	Estimate	.0010	.0029	.621	–.348	.394	–.148	.575
	t-statistic	.15	.54	4.75***	–2.24**	2.60**	–2.32**	
Low	Estimate	–.0083	.0023	.888	.068	–.262	–.080	.719
	t-statistic	–.75	.26	6.20	.27	–1.22	–.89	
High–Low	Estimate	.0017	–.0013	–.122	–.290	.213	.123	.205
	t-statistic	.23	–.13	–.69	–1.09	.78	1.02	

B: High Economic Activity

			Carhart Four-Factor Model Estimates					
Portfolio		Excess Returns	Alpha	MKT Beta, m_p	SMB Beta, s_p	HML Beta, h_p	UMD Beta, u_p	Adjusted R^2
High	Estimate	.0165	.0058	.925	–.388	–.110	.034	.716
	t-statistic	3.35***	1.78*	8.61***	–4.77***	–.74	.41	
2	Estimate	.0141	.0036	1.140	–.174	.212	–.288	.558
	t-statistic	2.20**	.79	7.81***	–.99	1.16	–1.55	
3	Estimate	.0049	–.0048	.967	–.258	.185	–.142	.691
	t-statistic	.98	–1.64*	11.25***	–2.46**	1.26	–1.70*	
Low	Estimate	.0028	–.0081	1.084	–.340	.389	–.138	.749
	t-statistic	.49	–2.48**	12.24***	–4.54***	3.53***	–1.36	
High–Low	Estimate	.0138	.0139	–.158	–.048	–.500	.172	.219
	t-statistic	2.89***	2.73***	–1.06	–.42	–2.60**	1.26	

*$p < .10$.
**$p < .05$.
***$p < .01$.

following months of below-average growth. Panel B of Table 4 verifies this; the average excess return of Portfolio High–Low is 1.38% (t-statistic = 2.89), and the Carhart four-factor model abnormal return is 1.39% (t-statistic = 2.73) per month. Portfolio High's average excess return is significantly larger than that of Portfolio Low following months of above-average economic growth. The only risk factor loading that is statistically significant for Portfolio High–Low is the book-to-market factor; a highly negative factor loading on HML indicates that Portfolio High–Low behaves like a typical growth firm following months of economic expansion.

The results in this section give more credence to the positive relationship between customer satisfaction and shareholder wealth. Firms with high and increasing customer satisfaction can indeed leverage this resource to provide larger returns to shareholders in periods of economic expansion. In addition, there is some weak evidence that indicates that the intangible value of having highly satisfied customers might dampen the negative impact of an overall economic downturn.

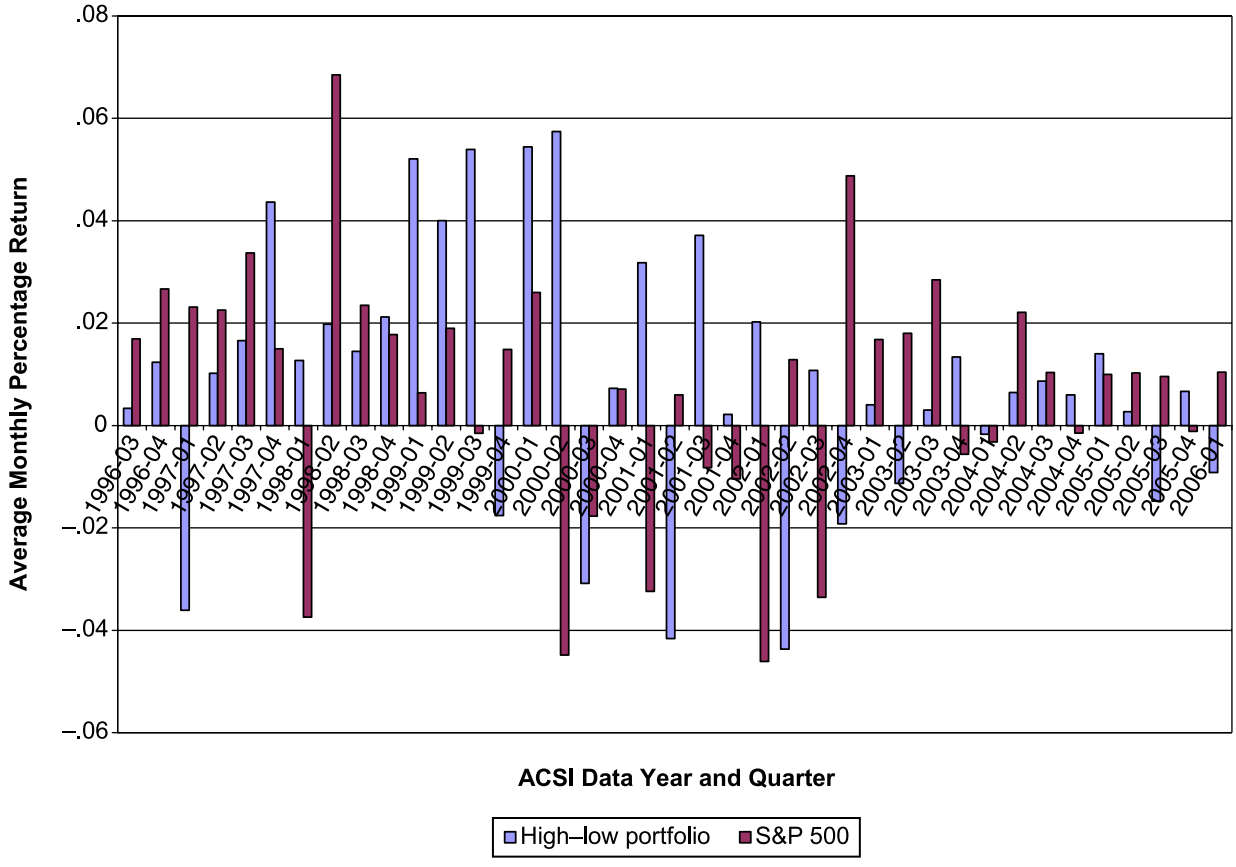
The Impact of Outliers on Portfolio Returns

Figure 2 shows that month-to-month movements in Portfolio High–Low can be volatile. Note that each of 39 portfolio formation dates in our analysis is followed by a three-month tracking period, resulting in 117 test months overall. To ensure that the results documented previously are not colored by the idiosyncrasies of outliers, we compare the average three-month return in each tracking period with the average on the S&P 500 index in Figure 3. Because the monthly series are volatile, the three-month average provides a more consistent picture of performance. Figure 3 shows that of the 39 cases, only 10 are negative. Although there are some large negative returns of Portfolio High–Low, the frequency of occurrence of such events is not significantly larger than the occurrence of large negative returns in the S&P 500 index.

Alternative Start and End Dates

The start and end dates of our portfolios under discussion were determined by the date the ACSI was formed and the time we started writing this article. A knowledgeable investor may claim that these dates are arbitrary or based on convenience. Such an investor might wonder what would happen if he or she chose different start and end dates and then followed our method in creating portfolios. For example, if this investor started on January 1999 and needed to withdraw funds on December 2002, would he or she still be best served to invest in Portfolio High?

FIGURE 3
High–Low Customer Satisfaction Portfolio Average Three-Month Returns Versus the S&P 500 Index Average Returns



Indeed, personal interviews we conducted with senior executives at one of the largest institutional securities firms confirmed the skepticism of the institutional research community toward findings regarding stock performance that have not undergone rigorous testing of multiple start–end dates (referred to in the industry as "backtesting"). Ben-Ami Gradwohl, managing director at the ModelWare division of Morgan Stanley, stresses the imperative of backtesting, stating, "The investment community is awash with investment ideas that may initially appear sensible, but turn out to rely on false premises or a deficient implementation. Only a rigorous and realistic backtest of the investment hypothesis, which should include periods of adverse investment environments, may provide some confidence in the potential performance of the investment process. Finally, a detailed performance and risk attribution analysis is critical to identifying the degree of insight in the specific investment hypothesis" (Gradwohl 2007).

To investigate such questions, we calculated the returns of each portfolio and the S&P 500 for various holding periods from a one-quarter minimum holding period (Table 5, Panel A) to a seven-year minimum holding period (Table 5, Panel F). Holding period refers to the minimum amount of time between the start and the end dates. A one-quarter minimum holding period produces 1653 possible start–end date combinations, and a seven-year holding period produces only 144 possible start–end date combinations. At the end of each end date, each portfolio is assigned a finishing position from first to fifth place. First place indicates that it produced the highest returns for its given start–end date combination, and fifth place indicates that it produced the lowest returns. Each panel in Table 5 also shows each portfolio method's sum of growth. Sum of growth refers to the sum of returns for all possible start–end dates per minimum holding period.

These six panels in Table 5 show that Portfolio High outperforms Portfolio 3, Portfolio Low, and the S&P 500 in terms of average wins, average finishing position, and sum of growth for all six minimum holding lengths. The only question is whether Portfolio High performed better than Portfolio 2. At first glance, it appears that these two portfolios are equal in performance. Portfolio 2 may even hold a slight edge in performance. However, Portfolio 2 has a much greater chance of finishing in fourth or fifth place than Portfolio High. In addition, the average returns for Portfolio High are greater than Portfolio 2 (i.e., the sum of growth for Portfolio High is much greater than that for Portfolio 2). The final reason to choose Portfolio High is that its market beta (see Table 3) is much lower than that of Portfolio 2. In other words, if an investor is not convinced that Portfolio High outperforms Portfolio 2, he or she should feel comfortable that the same returns will be achieved with Portfolio High as with Portfolio 2, but with much less risk.

Conclusions, Limitations, and Further Research

In line with prior studies, the results of this research indicate that customer satisfaction is a valuable intangible asset that generates positive returns. We show that investing in a portfolio of firms with high and increasing customer satisfaction is far superior to investing in a portfolio of firms with low and decreasing customer satisfaction. Furthermore, it also beats the S&P 500 index.

It is known that riskier portfolio strategies are accompanied by potential higher returns. Thus, whenever returns are examined, a risk adjustment is necessary. The CAPM, the Fama–French three-factor model, and the Carhart four-factor model all adjust for various risk factors. The results indicate no significant differences between portfolios in terms of their exposure to risk factors, such as market size or book-to-market. The only risk factor that turns out to be significant is momentum (winner/loser effect). High-customer-satisfaction portfolios tend to have more in-favor stocks, and low-customer-satisfaction portfolios tend to have more out-of-favor stocks. Thus, any future analysis in this domain needs to incorporate this risk factor in the analysis. Nonetheless, even after we adjust for relevant risk factors, the results indicate a positive risk-adjusted return for high customer satisfaction.

Another issue is the timing of the reaction of Wall Street to the release of customer satisfaction information. Fornell and colleagues (2006) test the ability of customer satisfaction to generate excess returns by conducting an event study that examines stock market reactions to announcements of customer satisfaction information immediately after the announcement. They find that companies that are better than their competitors in terms of satisfying customers generate superior returns at lower systematic risk. However, news about changes in customer satisfaction was not found to have an immediate impact on stock prices. This could potentially be due to several reasons: (1) The market already expects satisfaction information, and thus there is no "surprise" factor from the announcement and, therefore, no reaction, or (2) customer satisfaction is a new concept for analysts, and thus the market is slow to respond. Our results indicate that the intangible value created by high customer satisfaction is more likely to be undervalued by Wall Street. The risk-adjusted abnormal returns we document indicate that the market initially undervalues positive customer satisfaction information but adjusts over time.

These results have important implications for research analysts and portfolio managers alike. Customer satisfaction is found to have an important influence on firm value and thus can be used actively in portfolio strategies to generate superior returns. Forming portfolios on the basis of satisfaction data, especially when such data are publicly available, has the potential to generate valuable excess returns.

Marketing is frequently criticized for its inability to quantify its added value to business. Because of the more intangible nature of marketing and difficulty in terms of quantifying its impact, expenditures on improving the customers' experience are sometimes considered unnecessary or even useless. However, this research clearly demonstrates the superior returns to shareholders that investments in customer satisfaction can provide.

A limitation of this research is the reliance on the publicly available ACSI data, which tend to include only larger firms. It is not clear whether the relationships documented

TABLE 5
Customer Satisfaction Portfolio Returns Using Alternative Holding Periods

A: May Sell After 3 Periods (1 Quarter, n = 1653)

Portfolio	5th Place	4th Place	3rd Place	2nd Place	1st Place	Average	% Wins	Sum of Growth
High	32	141	398	509	573	2.12	34.66%	595.67
2	165	95	204	576	613	2.17	37.08%	506.00
3	265	480	374	247	287	3.11	17.36%	235.74
Low	1103	192	113	96	149	4.21	9.01%	–221.67
S&P 500	88	745	564	225	31	3.38	1.88%	213.00

B: May Sell After 12 Periods (1 Year, n = 1404)

Portfolio	5th Place	4th Place	3rd Place	2nd Place	1st Place	Average	% Wins	Sum of Growth
High	19	78	344	446	517	2.03	36.82%	579.58
2	114	65	160	535	530	2.07	37.75%	491.59
3	208	411	339	206	240	3.10	17.09%	227.38
Low	993	160	88	66	97	4.34	6.91%	–221.58
S&P 500	70	690	473	151	20	3.46	1.42%	203.34

C: May Sell After 24 Periods (2 Years, n = 1104)

Portfolio	5th Place	4th Place	3rd Place	2nd Place	1st Place	Average	% Wins	Sum of Growth
High	5	44	276	351	428	1.96	38.77%	523.21
2	59	32	125	469	419	1.95	37.95%	446.67
3	135	322	306	146	195	3.05	17.66%	203.99
Low	842	107	49	49	57	4.47	5.16%	–217.09
S&P 500	63	599	348	89	5	3.57	.45%	174.31

D: May Sell After 36 Periods (3 Years, n = 840)

Portfolio	5th Place	4th Place	3rd Place	2nd Place	1st Place	Average	% Wins	Sum of Growth
High	0	21	199	252	368	1.85	43.81%	440.27
2	22	18	81	396	323	1.83	38.45%	379.07
3	73	239	280	124	124	3.02	14.76%	175.85
Low	698	56	30	32	24	4.63	2.86%	–202.00
S&P 500	47	506	250	36	1	3.67	.12%	135.62

E: May Sell After 60 Periods (5 Years, n = 420)

Portfolio	5th Place	4th Place	3rd Place	2nd Place	1st Place	Average	% Wins	Sum of Growth
High	0	2	57	137	224	1.61	53.33%	301.31
2	0	2	37	195	186	1.65	44.29%	257.42
3	6	147	172	87	8	3.13	1.90%	118.06
Low	403	10	4	1	2	4.93	.48%	–128.69
S&P 500	11	259	150	0	0	3.67	.00%	95.03

F: May Sell After 84 Periods (7 Years, n = 144)

1st Place	5th Place	4th Place	3rd Place	2nd Place	1st Place	Average	% Wins	Sum of Growth
High	0	0	0	34	110	1.24	76.39%	175.82
2	0	0	8	102	34	1.82	23.61%	141.18
3	0	98	38	8	0	3.63	.00%	61.49
Low	144	0	0	0	0	5.00	.00%	–39.54
S&P 500	0	46	98	0	0	3.32	.00%	67.75

in this study would be similar for non-ACSI companies (especially those that are smaller in scale). The ACSI reports an "All Others" score for every industry, which is an aggregate of a representative number of customer interviews from each of potentially hundreds of smaller companies within the industry. However, individual company

scores within the All Others category cannot be derived without additional data collection. Furthermore, investigation could be undertaken to examine the reasons underlying a lack of immediate stock market reaction to the announcement of customer satisfaction data. For example, alternative ways of measuring the "expected" satisfaction data could be used to measure the impact of customer satisfaction announcements.

Nonetheless, we believe that these results present compelling evidence of the importance of intangible assets—in particular, customer satisfaction—to the market valuation of firms. Furthermore, these results indicate a need to incorporate customer satisfaction information into financial models designed to guide investment strategies.

Appendix
Data Construction and Quarterly COMPUSTAT Data Items

We use balance sheet (BS), income statement (IS), and statement of cash flows (SCF) data items from the S&P's quarterly COMPUSTAT data set to build the numbers we report in Table 1. As we mix and match data items from these three sources of financial statements, a few notes are in order. For example, BS data items are snapshot figures for a firm at a given point in time. Conversely, IS data items are for a specific fiscal quarter. Finally, the SCF data items are year-to-date figures at the end of a given fiscal quarter. We first difference the SCF data items used to calculate values relevant for a given fiscal quarter. Then, to negate the effects of possible seasonality in financial statements, we cumulate IS and differenced SCF items at the end of a given fiscal quarter over the last four fiscal quarters. No such adjustment is needed for BS data items. Specifically, we define the items reported in Table 1 as follows: An item number stands for S&P's COMPUSTAT quarterly data item numbers, which we define subsequently. "Cumulative" denotes that the data item used is either an IS or a differenced SCF item:

- Sales = net sales, defined as (Cumulative Item 2);
- Market Value = market value of equity at the end of a fiscal quarter, defined as (Item 14 × Item 61);
- Leverage = total debt scaled by the book value of assets, defined as (Item 45 + Item 51 + Item 55)/(Item 44);
- ROA = return on assets, or operating income before depreciation scaled by the book value of assets, defined as (Cumulative Item 21)/(Item 44);
- ROE = return on equity, or income before extraordinary items scaled by the book value of equity, defined as (Cumulative Item 25)/(Item 52 + Item 59 – Item 55);
- MBA = the ratio of market to book value of assets (as a proxy for Tobin's q), defined as [Item 44 – (Item 52 + Item 59 – Item 55) + Item 14 × Item 61]/(Item 44);
- MBE = the ratio of market to book value of equity, defined as (Item 14 × Item 61)/(Item 52 + Item 59 – Item 55); and
- PE = the price-to-earnings ratio, defined as (Item 14 × Item 61)/(Cumulative Item 25).

The following is a list of specific quarterly COMPUSTAT data items:

Item 2 = sales (net) (in millions of dollars),
Item 14 = price – close – third month of fiscal quarter (in dollars and cents),
Item 21 = operating income before depreciation (in millions of dollars),
Item 25 = income before extraordinary items – available for common (in millions of dollars),
Item 44 = assets – total (in millions of dollars),
Item 45 = debt in current liabilities (in millions of dollars),
Item 51 = long-term debt – total (in millions of dollars),
Item 52 = deferred taxes and investment tax credit (in millions of dollars),
Item 55 = preferred stock – carrying value (in millions of dollars),
Item 59 = common equity – total (in millions of dollars), and
Item 61 = common shares outstanding in millions of dollars.

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