The Incremental Effect of Satisfaction on Stock Price

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This study examines the effect of published customer satisfaction data on large cap stock prices. Event analysis is applied to ten years of firm specific consumer satisfaction and stock price information between 2010 and 2019. We find that fluctuations in consumer satisfaction cause stock prices to change in predictable patterns although they do not do so instantaneously. Positive increments in customer satisfaction increase stock prices and reduce stock price volatility. Negative shifts in consumer sentiment reduce stock prices and increase stock price volatility. The observed pricing effects reinforce the importance of customer satisfaction as a forward-looking business diagnostic.

Keywords: brand equity, satisfaction, stock price, intangible assets, customer lifetime value

INTRODUCTION

Satisfaction is theoretically related to firm financial performance. The conceptual link between satisfaction and superior performance is quite straight forward. When consumers are satisfied; that is, when their expectations are met or exceeded by their experience with a product, they develop a preference for the brand (Kumar, Pozza, and Ganesh 2013; Yadav and Rai 2019). Consumers are thereafter more likely to purchase the brand and related brand extensions. Satisfied consumers may also help recruit new customers at much lower expense. The discounted future value of this brand related buying activity results in an increase in brand equity and stock price (Anderson, Fornell, and Mazvancheryl 2004; Gupta, Lehman, and Stuart 2004; Kumar and Shah 2009). More specifically, any organization which satisfies its customers should find that those customers buy more, buy longer, and are often willing to pay more at lower associated expense than people whose expectations have not been met or exceeded in the past (Keller 2009).

Empirical evidence on the theoretical linkage between satisfaction and firm financial performance has been; however, somewhat mixed. For example, Fornell et.al. (2006) find that increased levels of customer satisfaction lead to higher stock prices as well as lower investment risk (by increasing the consistency and size of future cash flows). The former authors also describe a market imperfection wherein there is a significant time delay between the public dissemination of firm satisfaction scores and

related stock price adjustments. Using the same metrics as those incorporated in the previous study, Jacobson and Mizik (2009) suggest that the fore mentioned market pricing anomaly was an artifact of one extremely profitable market sector, computers and the internet, in conjunction with the unique sampling period. The latter study does not identify satisfaction as an intangible asset integrated in a stock's price or find any corresponding market mispricing.

Not surprisingly, this lack of consistent findings coupled with the potential to obtain above market returns sparked additional research interest. Several subsequent inquiries show stock prices do benefit from increases in customer satisfaction across industries, even if they do not demonstrate a compelling time lag between when satisfaction scores are publicly disclosed and when they are reflected in stock prices (Fornell, Mithas, Morgeson, and Krishnan 2016; Sorescu and Sorescu 2016; Golovkova, Eklof, Malova, and Podkorytova 2019).

As provocative as these findings are in their own right, they raise several important and unanswered questions. First, if higher levels of customer satisfaction do result in superior financial performance, how long is the time delay before stock prices may be expected to fully reflect such information after its dissemination? Second, can the expenses associated with increasing customer satisfaction be more easily justified by firms that exhibit greater investment risk relative to the market? More predictable and consistent revenue should provide greater benefits to firms that exhibit volatile stock prices.

This study explores the former questions. First, we provide readers with some background on the formation and expected consequences associated with satisfaction prior to identifying our stock mispricing hypotheses. Next, we discuss our sampling procedure, data, and measurement techniques. Thereafter, we describe the results of our analysis before reaching conclusions on the potential incremental benefits of satisfaction on stock price. We also discuss the limitations of this study and make suggestions for further research.

BACKGROUND

Satisfaction and Information Efficiency

People contrast product performance with expected performance during and after consumption (Tse and Wilton 1988). Consumer satisfaction occurs when expected brand performance meets or exceeds perceived brand performance. The assessment of satisfaction may be holistic in low involvement circumstances, e.g. I like the brand, or more feature oriented in personally relevant situations, e.g. this brand is the best value for the money (c.f. Olsen 2007). The formation of brand expectations is a function of product related factors such as price, promotion activities, and consumer perceptions of competing products. Brand performance judgements are influenced by prior product experience and the evaluation of product characteristics, both tangible and intangible.

Whether and how well financial markets incorporate brand related satisfaction information is an interesting question. Financial markets are frequently described in terms of how quickly and accurately all relevant market information is reflected in stock prices. Many financial economists agree that security markets generally incorporate all historical stock volume and price data, i.e. security markets are at least weak form efficient and above normal stock returns should not be possible using publicly available price and volume data (Slezak 2003; Hill and Motegi 2019).

The semi-strong conceptualization of market efficiency, however, suggests higher than normal stock returns may be possible whenever other relevant forms of publicly available information are neglected or less utilized. Even while some investors could potentially profit from using such generally neglected public information, a stock's price would eventually adjust to incorporate the new information about a firm's future business prospects. Investors who profit on neglected information will continue to do so until a stock's price reflects this public but otherwise underutilized information (Ross et.al. 2016).

Strong form market efficiency requires that all relevant market information be incorporated in a stock's price. This market conceptualization suggests that insider traders could not profit from any relevant information that is nonpublic. For example, company executives who knew of an impending large corporate liability could not profit from this information by short selling the firm's stock prior to the

information being made public. Ubiquitous security market regulations prohibiting such behavior indicate most people believe that strong form market efficiency is an aspirational goal rather than a market reality.

Satisfaction and Stock Mispricing Hypotheses

We presume that security markets exhibit at least semi-strong market characteristics. If security markets do display semi-strong market characteristics, then stock analysts who utilize relevant but neglected public information could earn higher than normal market returns in the short run. Published indices of firm satisfaction data are just one of several types of such information that investors could follow and, as a consequence, derive abnormal profits (Young and Bacon 2012). Recall that consumer satisfaction is expected to be a forward-looking business indicator, i.e. higher levels of satisfaction predict brand loyal consumption behavior which increases sales, margins, and the consistency of cash flows. This proposition leads naturally to our first hypothesis.

H1: *There is a discernable link between changes in firm satisfaction and changes in firm stock price.*

Reinartz and Kumar (2000) suggest the value of investments in customer satisfaction may not be similar across firms or industries due to variations in cost structure or preexisting levels of customer satisfaction. For example, deviations from revenue projections in a capital-intensive firm will typically affect forecasted profitability, and stock price volatility, by increasing positive cash flow when demand is greater than expected and reducing cash flow when demand is less than expected. Capital-intensive firms that exhibit volatile stock prices may be able to reduce stock price volatility, market risk, by achieving more positive and predictable cash flow through increases in customer satisfaction. As a consequence, firms that exhibit more capital-intensive cost structures may be expected to exhibit a greater marginal benefit from investments in consumer satisfaction. Our second hypothesis examines this question.

H2: *Firms with greater stock price volatility experience incrementally greater benefits (or penalties) from enhanced (or diminished) customer satisfaction.*

METHOD

Sample

Previous critiques of stock mispricing studies have centered on perceived problems associated with selective sampling, i.e. the time-period and firms included in those samples. Of course, the time-period utilized in previous studies could certainly contain market mispricing anomalies or other outliers. Replicating former analyses using a different sample period could potentially alleviate this issue. The question raised about the appropriateness of the firms included in previous studies is more easily resolved. Simply taking a random sample from a list of public companies, rather than a convenience sample, avoids the problems associated with selective sampling other than those inherent to the list of public companies from which the sample is drawn.

We chose to take a random sample of Fortune 500 firms (n=140) and recorded publicly available satisfaction data for each firm across the most recent ten-year period (2010-2019). At least some annual satisfaction data was available for fifty-eight of the sampled Fortune 500 firms. Of those, forty-five had complete satisfaction indices for the entire ten-year study period. The actual incidence of firms with published satisfaction data in the Fortune 500 was 36 percent. The former proportion is not significantly different than the 41 percent incidence of the firms with published satisfaction data in our sample (t=.22).

Consumer Satisfaction Measure

The American Customer Satisfaction Index (ACSI) is a measure of consumer satisfaction that provides comparability over time as well as across firms and industrial sectors (Fornell, et.al. 1996). Firm specific consumer satisfaction data was taken from reports available at https://www.theacsi.org. To capture the multidimensional nature of customer satisfaction, ACSI assesses a variety of satisfaction

antecedents that include consumer expectations as well as several consequences often associated with consumption, such as brand loyalty. Approximately 250 customers for each of the largest companies in major industrial sectors have been surveyed annually since 1994.

This selective ASCI sampling approach was developed to ensure that the firms contributing the largest proportion of gross domestic product in each industry sector were represented in the indices. The ACSI survey itself is composed of 17 satisfaction related and 8 demographic questions. Weights for the satisfaction model are estimated using Partial Least Squares. Estimated model weights, in turn, are used to construct satisfaction index values (transformed to a 0 to 100-point scale) for each brand, firm, and industry sector. Higher index numbers reflect higher levels of consumer satisfaction.

Table 1 identifies the 45 firms which we randomly sampled from the 2019 list of Fortune 500 firms that also had ten years of ASCI data available, and summarizes the average annual change in customer satisfaction, firm market capitalization (in US dollars), and industry classification.

TABLE 1
DESCRIPTION OF SAMPLED FIRMS

Fortune 500 Firms	Average Annualized Satisfaction Change	Firm Market Capitalization	Firm Industry Classification
Expedia Group	0.14	15,804,000,000	Accommodation and Food
McDonald's	0.38	156,042,000,000	Accommodation and Food
PG&E	0.13	7,430,000,000	Energy Utilities
Southern	-0.33	73,138,000,000	Energy Utilities
Allstate	-0.13	37,767,000,000	Finance and Insurance
Progressive	-0.25	44,297,000,000	Finance and Insurance
Raymond James	0.00	12,438,000,000	Finance and Insurance
General Electric	-0.50	99,912,000,000	Manufacturing/Durable
HP	0.00	18,773,000,000	Manufacturing/Durable
Motorola Solutions	-0.14	30,498,000,000	Manufacturing/Durable
Whirpool	-0.50	9,368,000,000	Manufacturing/Durable
Campbell Soup	0.57	14,712,000,000	Manufacturing/Nondurable
Foot Locker	0.00	4,009,000,000	Manufacturing/Nondurable
General Mills	1.57	32,188,000,000	Manufacturing/Nondurable
Hershey	1.14	22,669,000,000	Manufacturing/Nondurable
Keurig Dr. Pepper	0.29	39,432,000,000	Manufacturing/Nondurable
Kraft Heinz	1.29	37,062,000,000	Manufacturing/Nondurable
Molson Coors	-0.43	12,121,000,000	Manufacturing/Nondurable
Tyson Foods	1.14	30,746,000,000	Manufacturing/Nondurable
Bed Bath & Beyond	-0.50	2,021,000,000	Retail Trade
Best Buy	0.14	22,721,000,000	Retail Trade
Burlington Stores	0,00	14,725,000,000	Retail Trade
CVS	1.00	92,329,000,000	Retail Trade
Dollar Tree	-0.75	20,921,000,000	Retail Trade
Fred Meyer (Kroger)	-0.33	22,681,000,000	Retail Trade
GameStop	-1.00	282,147,000,000	Retail Trade
Gap	0.00	6,604,000,000	Retail Trade

Fortune 500 Firms	Average Annualized Satisfaction Change	Firm Market Capitalization	Firm Industry Classification
J.C. Penney	-0.57	251,773,000,000	Retail Trade
L Brands	-0.25	5,579,000,000	Retail Trade
Macy's	-0.14	5,061,000,000	Retail Trade
Nike	-0.29	156,111,000,000	Retail Trade
O'Reilly Automotive	-0.33	32,292,000,000	Retail Trade
Ross Stores	1.00	41,218,000,000	Retail Trade
Sam's Club	0.00	328,716,000,000	Retail Trade
Target	-0.57	58,670,000,000	Retail Trade
The Home Depot	-0.14	252,189,000,000	Retail Trade
Walgreens	0.29	46,269,000,000	Retail Trade
AT&T	-1.00	279,416,000,000	Telecommunications
Comcast (Xfinity)	-2.86	200,167,000,000	Telecommunications
Windstream	-1.25	7,955,000,000	Telecommunications
CenturyLink	-2.14	15,852,000,000	Telecommunications
Facebook	25.63	612,756,000,000	Telecommunications
Alaska Air Group	1.00	8,048,000,000	Transportation
American Airlines	2.25	11,180,000,000	Transportation
Fedex	-0.25	38,774,000,000	Transportation

The average annual change in customer satisfaction indices over the ten-year period was 0.5 percent and the most recent average market capitalization of sampled firms was 79.51 billion dollars. The latter average is higher than the typical market capitalization for firms listed on the New York Stock Exchange, i.e. we used the Fortune 500 list as our sampling frame which is composed of the largest publicly held firms by revenue. The customer satisfaction index score was highest for Facebook and generally higher within the manufacturing/nondurable goods sector. Dollar Tree had the lowest customer satisfaction index score and the retail sector, in general, reflected lower customer satisfaction indices.

Stock Price Measures

Financial data on individual stock returns were obtained from Factset: https://www.factset.com/. Daily market index returns were taken from the Ken French website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/. We use two methods to measure market reactions, namely the mean adjusted raw returns and market model adjusted returns. The mean adjusted return is the difference of the returns over the news announcement window minus the average returns over the prior 30 days. For the market model, the market index return is used as a common risk factor for the U.S. stock market. The market model adjusted return is defined as the difference between the realized returns over the event window and beta times simultaneous market index returns. To be more specific, a stock's market beta (relative price volatility) was estimated using the regression in Equation 1 with the previous 60 months of return data:

$$r_{i,t} = \alpha_i + \beta_{i,1} * r_{m,t} + \varepsilon_{i,t} \quad (1)$$

where $r_{i,t}$ is the daily stock return in excess of the risk-free rate over 130 until 3 days prior to the news announcement and $r_{m,t}$ is the monthly return of the CRSP value-weighted index in excess of the risk-free rate at time t. Risk free rate is the return on a U.S. Treasury bill from Ken French's website. At least 30 days of non-missing data was required for a stock to be assigned a beta value for the given event (the publication of a stock's customer satisfaction index).

Empirical Results

We rely on standard time series and event study methodologies to examine how the stock market reacts to changes in published customer satisfaction index scores (c.f. Campbell, Lo and MacKinlay 1997).

We first assess the price change over a short news announcement window, namely a five-day trading period, from two days before to two days after customer satisfaction index announcements. We divide our sample firms into three groups, a group with positive changes in satisfaction scores, a group with negative changes in satisfaction scores, and a third group with no discernable change in satisfaction scores.

TABLE 2A
ABNORMAL RAW RETURNS OVER THE 5-DAY EVENT WINDOW

CS change	CARs (%)	t-statistic	N
Negative	-1.63473	-3.21619	108
Positive	0.69674	2.02498	102
No Change	-0.09718	-0.19713	63

Table 2A reports the cumulative abnormal raw returns (CAR) of the 3 group samples over the 5-day event window. The average abnormal return for the positive group was .69% with significant t-statistic of 2.02, $p<.05$. The average abnormal return for the negative group was -1.63% with a significant t-statistic of -3.21, $p<.05$. There was no significant observed price movement if the customer satisfaction index didn't change. The difference in returns between negative and positive groups is significant at the 99% level. Our first hypothesis is therefore supported by these results, i.e. there appears to be a direct monotonic relationship between changes in firm satisfaction measures and changes in firm stock price.

We also examine the price change over a longer news announcement window, namely a 28-day trading period, from two days until thirty days after customer satisfaction scores have been publicly announced. This allows us to determine if the market mispricing on firm specific satisfaction news persists over a longer period.

TABLE 2B
ABNORMAL RAW RETURNS OVER THE 28-DAY EVENT WINDOW

CS change	CARs (%)	t-statistic	N
Negative	-0.22256	-0.17583	108
Positive	-1.33688	-1.20475	102
No Change	-2.18664	-1.54871	63

Table 2B reports the cumulative abnormal raw returns of our 3 group samples over a 28-day event window. The average abnormal returns for all groups is not significantly different from zero. Therefore, market mispricing due to a change in customer satisfaction index scores disappears over the longer run and our presumed semi-strong market efficiency perspective is deemed appropriate.

In order to control for the stock price variability inherent to various firms, we also examine the cumulative abnormal return using the market index model. Table 3A reports the cumulative abnormal market risk adjusted returns of our 3 group samples over the 5-day event window. The average abnormal risk adjusted return for the positive group was .84% with a significant t-statistic of 2.50, $p<.05$. The average abnormal return for the negative group was -1.45% with a significant t-statistic of -3.20, $p<.05$. There was no significant price movement if the customer satisfaction index did not change.

Hypothesis 2 is supported by these findings. Firms which exhibit greater stock price variability experienced incrementally greater benefits (or penalties) by enhanced (or diminished) customer satisfaction scores. For example, a firm that has a highly volatile stock price relative to the market

experienced a smaller average price decline when customer satisfaction scores had been improved (a 1.45312 percent stock price decline for risk adjusted stock prices versus a -1.63473 percent for unadjusted stock prices).

TABLE 3A
ABNORMAL RISK ADJUSTED RETURNS OVER THE 5-DAY EVENT WINDOW

CS change	CARs	t-statistics	N
Negative	-1.45312	-3.20012	108
Positive	0.84882	2.49879	102
No Change	-0.10328	-0.24158	63

Table 3B reports the cumulative abnormal market risk adjusted returns of our 3 group samples over a 28-day event window. The average abnormal risk adjusted return for all groups is not significantly different from zero. This result is entirely consistent with the results using the abnormal average raw returns. The semi-strong market efficiency proposition again seems appropriate given these additional findings. Investors appear to incorporate public customer satisfaction data rather quickly and any opportunity to make above normal market returns based on the public disclosure of customer satisfaction data erodes rapidly.

TABLE 3B
ABNORMAL RISK ADJUSTED RETURNS OVER THE 28-DAY EVENT WINDOW

CS change	CARs	t-statistics	N
Negative	-0.12181	-0.17754	108
Positive	0.16299	0.21653	102
No Change	-0.89265	-1.08463	63

CONCLUSION

Increases in consumer satisfaction lead to higher and less volatile stock prices. Although these findings may appear somewhat at odds at first glance, they are entirely consistent with a priori theoretical expectations as well as the empirical conclusions of Fornell et.al. (2006). The observed increases in stock price are not immediate but transpire over a relatively short time horizon. Stock prices fully reflected changes in consumer satisfaction data within thirty days of publication.

The time the market took to integrate publicly available consumer satisfaction data conforms with our semi-strong market efficiency presumption. There does appear, however, to be a relatively short window of opportunity during which some investors may be able to achieve above market returns on their investments. Those investors who note satisfaction index changes and act most rapidly may be able to achieve above market returns until they, and other investors, bid up (or drive down) a stock's price until all the new information has been incorporated.

This raises several interesting questions for further research. First, do smaller cap stocks, which often have fewer followers and exhibit greater price volatility, exhibit even greater potential for abnormal market returns or a longer time horizon during which such returns may be obtained? The time lag and returns available should be inversely related to the number of people who monitor consumer satisfaction data and use this information to make stock purchase (or selling) decisions. Investors have an incentive to sell (or purchase) over (or under) valued equities as quickly as possible. Competition to do so may be reduced when there are fewer people that follow and act on consumer satisfaction information, all else being equal.

Second, how can we discern the net benefit associated with increases in customer satisfaction among consumers who are already satisfied? Increases in customer satisfaction will seldom be achieved without some increment in expense. For example, if customers value having a product always in stock, this may require additional warehousing, inventory, and staffing. At some point, increases in net revenue and reduced stock price volatility will not justify customer satisfaction enhancement. Firms that already exhibit relatively high levels of satisfaction should be less likely to see significant stock price increases for equivalent increases in consumer satisfaction.

Finally, what may be responsible for the differences in average industry consumer satisfaction scores we observed? For example, industrial sectors that employ more capital-intensive production technologies could not only take more time to change customer satisfaction levels but may also incur relatively higher expense in order to do so. Customer dissatisfaction that was derived from lower than expected levels of product quality may necessitate more costs to rectify in capital intensive industries than in other sectors which do no exhibit similar production expenses.

Our findings that stock prices increase when customer satisfaction scores rise and stock price volatility increases when customer satisfaction declines have important implications for market regulators, companies, and individuals alike. Market regulators could make satisfaction monitoring and disclosure a regular requirement, perhaps as a component of brand equity valuation. Investors could quickly and more accurately reflect future company financial performance by incorporating customer satisfaction data in stock purchase and selling activity. Managers could monitor and use customer satisfaction information about their firms and competitors, in conjunction with knowledge of the costs associated with enhancing satisfaction, to better respond to consumer preferences. Companies that do not do so are unlikely to maintain market position in the long run as the firms who do use satisfaction metrics are more likely to be successful.

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