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Customer Satisfaction and Stock Returns Risk

Over the past decade, several studies have argued that customer satisfaction has high relevance for financial markets because it has a significant impact on stock returns. However, little attention has been given to understanding the impact of customer satisfaction on the risk of stock returns. The finance literature suggests that investors that judge performance only in terms of returns place more resources than warranted in risky opportunities, forgo profitable opportunities, and apply misguided performance evaluations. Accordingly, this study develops, tests, and finds empirical support for the hypotheses that positive changes (i.e., improvement) in customer satisfaction result in negative changes (i.e., reduction) in overall and downside systematic and idiosyncratic risk. Using a panel data sample of publicly traded U.S. firms and satisfaction data from the American Customer Satisfaction Index, the study demonstrates that investments in customer satisfaction insulate a firm's stock returns from market movements (overall and downside systematic risk) and lower the volatility of its stock returns (overall and downside idiosyncratic risk). The results are robust to alternative measures of risk, model specifications, and concerns related to sample composition criteria raised in some recent studies. Therefore, the results indicate that customer satisfaction is a metric that provides valuable information to financial markets. The robust impact of customer satisfaction on stock returns risk indicates that it would be useful for firms to disclose their customer satisfaction scores in their annual report to shareholders.

Keywords: customer satisfaction, systematic risk, idiosyncratic risk, downside risk, relationship marketing

Customer satisfaction is viewed as a measure of the size, loyalty, and the quality of the customer base of a firm (Fornell et al. 2006; Morgan and Rego 2006). It is also viewed as a measure of a country's economic health (Fornell et al. 1996) and a metric to affirm the fundamental principle of capitalist free markets, in which investors reward firms that meet customer needs better than competition (Fornell et al. 2006). Not surprisingly, firms have invested considerable resources in measuring customer satisfaction, and it is viewed as the largest item of the annual market intelligence budget (Wilson 2002).

The public availability of data from the American Customer Satisfaction Index (ACSI) has given rise to a large body of work that explores the financial impact of customer satisfaction. Most of these studies show that customer satisfaction has a strong positive impact on both accounting measures of returns (e.g., Gruca and Rego 2005) and stock returns (e.g., Aksoy et al. 2008). However, there is an ongoing debate about whether customer satisfaction provides information for the financial markets (including financial analysts and institutional investors) beyond that reflected in

accounting metrics (see Fornell, Mithas, and Morgenson 2009; Jacobson and Mizik 2009).

Although a large body of literature has explored the impact of customer satisfaction on stock returns, little attention has been paid to its impact on stock returns risk. Stock returns risk is a key component of shareholder value that matters to financial markets (Barber and Odean 2000) and main street managers (Grinblatt and Titman 1998). Investors that judge performance only in terms of returns place more resources than is warranted in risky opportunities, forgo profitable opportunities, and apply misguided performance evaluations (Markowitz 1952). Not surprisingly, it is a statutory requirement for financial analysts to articulate the risk of investing in a stock to investors (U.S. Securities and Exchange Commission 2002). The purpose of this article is to examine the impact of customer satisfaction on stock returns risk. The study makes the following contributions.

First, this study contributes to the limited literature on the impact of customer satisfaction on stock returns risk (e.g., Aksoy et al. 2008; Fornell et al. 2006; Gruca and Rego 2005) by exploring both dimensions of stock returns risk: systematic risk, or the degree to which a firm's stock returns are a function of market returns, and idiosyncratic risk, or the volatility in stock returns that cannot be explained by market movements. Although prior studies have examined the effect of customer satisfaction on systematic risk, its impact on idiosyncratic risk remains unexplored.¹ Idiosyncratic risk accounts for approximately 80% of the variation

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¹Aksoy and colleagues (2008) and Fornell and colleagues (2006) use a portfolio approach, and thus idiosyncratic risk is diversified away, and the impact of customer satisfaction on it is not estimated.

in a firm's stock returns, and financial analysts tend to use idiosyncratic risk when issuing their rating of the risk of investment in a stock (Lui, Markov, and Tamayo 2007). High idiosyncratic risk can put the survival of a firm at risk, hamper efforts to acquire or divest firm stock, and affect the value of stock options (e.g., Clayton, Hartzell, and Rosenberg 2005). Therefore, examining the impact of customer satisfaction on idiosyncratic risk is responsive to recent calls to demonstrate the relevance of marketing for financial markets (e.g., Rust et al. 2004).

Second, this study complements prior literature by exploring the impact of customer satisfaction on downside systematic and idiosyncratic risk. Downside systematic risk represents the degree to which stock returns are sensitive to the downturns in stock market (Ang, Chen, and Xing 2006). The impact of customer satisfaction on downside systematic risk indicates the extent to which investments in customer satisfaction can insulate a firm against stock market downturns (see Petkova and Zhang 2005). Downside idiosyncratic risk represents the volatility in stock returns when a firm's stock returns are negative. The impact of customer satisfaction on downside idiosyncratic risk indicates the degree to which customer satisfaction lowers the volatility of potential losses from investing in a firm's stock (Markowitz 1959). This is important because investors are typically more concerned about the prospect of losses than gains from investments (see Gul 1991; Harvey and Siddique 2000).

Third, this study contributes to the theoretical literature on customer satisfaction by developing hypotheses that outline the impact of customer satisfaction on systematic risk and idiosyncratic risk. As such, this study complements prior literature that investigates customer satisfaction's impact on stock returns (Morgan and Rego 2006), its attitudinal benefits (Homburg, Koschate, and Hoyer 2005), and organizational outcomes (Luo and Homburg 2007).

Fourth, this study presents empirical analyses that take into account concerns related to the use of (1) alternative measures of risk, (2) inclusion of accounting variables, and (3) sample composition in studies that use stock market-based data (see Bali and Cakici 2008; Fama 1998). We find that customer satisfaction lowers overall and downside systematic and idiosyncratic risk. These results are robust to the concerns highlighted in prior research and indicate that customer satisfaction provides valuable information to financial markets, which complements the information contained in accounting measures. The results speak directly to the Financial Accounting Standards Board (1978), which recommends that firms should provide nonfinancial information to investors that can help them assess the amount, timing, and uncertainty of prospective cash receipts. As such, customer satisfaction is a valuable metric that should be considered for disclosure in a firm's annual report, and it should be among the list of key performance drivers in communications to financial markets.

This study also contributes to the recent efforts to highlight the relevance of marketing initiatives to senior management (Rust et al. 2004). Firms are increasingly using customer satisfaction as an implementation performance metric (Kaplan and Norton 1996) and as a measure of

competitive advantage (Morgan, Anderson, and Mittal 2005). Therefore, financial markets want to know whether customer satisfaction is a relevant metric given its myriad uses. Moreover, because chief executive officer (CEO) compensation is influenced by customer satisfaction (Ittner, Larcker, and Rajan 1997), its impact on risk is critical in an environment in which pay for performance is increasingly important in the eyes of shareholders.

Marketing Strategy and Stock Returns Risk

Although there is conceptual recognition that marketing-related investments, such as brand building, serve to reduce risk (e.g., Srivastava, Shervani, and Fahey 1997), little empirical work has demonstrated this benefit. An early study finds that some marketing strategy variables reduce risk (measured as variance in return on investment), while others inflate it (Bharadwaj and Menon 1993). Madden, Fehle, and Fournier (2006) find that a portfolio of strong brands has a much lower systematic risk than a portfolio without strong brands. McAlister, Srinivasan, and Kim (2007) find that advertising and research-and-development (R&D) investments are associated with lower systematic risk.² Finally, Sorescu and Spanjol (2008) find that while incremental innovations are unrelated to risk, breakthrough innovations lead to higher risk.

Three recent studies have examined whether customer satisfaction reduces risk. First, Gruca and Rego (2005) find that customer satisfaction has a negative effect on systematic risk. However, they do not test whether the impact of customer satisfaction on systematic risk is robust to alternative models used to calculate systematic risk. Such analyses are important because research in finance shows that the results of studies that use stock market data tend to depend on the models used to calculate the variables based on stock returns (Fama 1998; see also Aksoy et al. 2008).

Second, Fornell and colleagues (2006) find that a portfolio of firms with above-average customer satisfaction and increases in customer satisfaction not only produces excess returns but also produces systematic risk less than one; that is, there is no risk premium. However, they do not examine the impact of changes in customer satisfaction on the changes in systematic risk at the individual firm level. Thus, the likelihood that increases in customer satisfaction do not affect a firm's systematic risk is not ruled out.

In a third study, Aksoy and colleagues (2008) find that there is no difference between the systematic risk of a portfolio of firms with high and increasing customer satisfaction and a portfolio of firms with low and decreasing customer satisfaction. Analysis of the impact of customer satisfaction on systematic risk at the firm level is also important to ascertain whether customer satisfaction provides information beyond accounting variables (e.g., leverage) that is likely to affect systematic risk.

²Systematic risk is also labeled as market risk, or beta. To be consistent with the marketing literature, we label it as systematic risk (McAlister, Srinivasan, and Kim 2007).

To the best of our knowledge, the preceding studies do not investigate the impact of customer satisfaction on idiosyncratic risk. Because high idiosyncratic risk indicates high uncertainty about expected cash flows, it can put the survival of a firm at risk, and therefore it is important to managers and employees (Grinbaltt and Titman 1998). Moreover, because incentives are frequently tied to stock returns, managers are concerned about idiosyncratic risk (Pace 1999). High idiosyncratic risk can inhibit strategic moves, such as acquisitions and divestures, because potential partners are likely to be wary of being acquired by or acquiring a firm with a high degree of uncertainty over its future cash flows (see Clayton, Hartzell, and Rosenberg 2005). Not surprisingly, there is substantial empirical evidence to suggest that idiosyncratic risk is a relevant risk metric (e.g., Ang et al. 2006; Guo and Savickas 2008). Indeed, recent research in accounting has suggested that financial analysts should track a firm's idiosyncratic risk when issuing their rating of the risk associated with investment in a stock (e.g., Lui, Markov, and Tamayo 2007).

Finally, prior studies have not examined the impact of customer satisfaction on the downside systematic risk and downside idiosyncratic risk. A negative impact of customer satisfaction on downside systematic risk could underscore its value as a marketing investment that insulates a firm from market downturns (see Ang, Chen, and Xing 2006). Similarly, a negative impact of customer satisfaction on downside idiosyncratic risk could underscore its value as an investment that lowers the risk of negative stock returns.

Relating Customer Satisfaction to Stock Returns Risk

The key theoretical argument for making investments to increase customer satisfaction is that satisfied customers are more likely to reward the firm by staying with it longer. Several studies have shown that customer satisfaction enhances customer retention and therefore generates a loyal and stable customer base (e.g., Anderson and Sullivan 1993; Bolton 1998; Fornell 1992; Mithas, Jones, and Mitchell 2004; Mittal and Kamakura 2001). We use the results of these studies and develop our hypotheses.

Customer Satisfaction and Systematic Risk

Firms that can cushion themselves from the impact of market movements and deliver consistent cash flows typically enjoy lower systematic risk. We propose that increases in customer satisfaction engender customer loyalty, which in turn cushions a firm's cash flows from the impact of market movements.

Higher customer satisfaction engenders customer loyalty because it indicates a superior value proposition for the customer (e.g., Mittal and Kamakura 2001). Increases in customer satisfaction also increase product usage, which generates experience with the product and reduces the customer's perceived risk (Bolton, Kannan, and Bramlett 2000). Greater customer loyalty along with the lower perceived risk and superior value proposition facilitates the formation of close relationships in which the customer has

greater commitment to the firm (Gustofsson, Johnson, and Roos 2005).

When market downturns occur, firms compete more intensely, and customers are likely to be tempted by competitive offers. However, highly satisfied customers who have greater commitment to a firm are less likely to consider other firms because the superior value provided by the firm is valuable to them during downturns (e.g., Heide and Weiss 1995). This is because, during downturns, customers are under pressure to secure offerings that provide greater value in terms of better utility or lower costs (see Soberman and Gatignon 2005). Indeed, Noordeweir, John, and Nevin (1990) find that customers tend to purchase more from suppliers with which they have a greater commitment, especially in conditions of high uncertainty, such as market downturns. This suggests that increases in customer satisfaction lower the vulnerability of a firm's cash flows to market downturns.

In contrast, firms with declining customer satisfaction suffer from insecure cash flows during market downturns because their customers are more likely to switch if other suppliers provide marginally better offerings or lower prices. This is because declining customer satisfaction scores indicate that a firm's customers do not perceive it as providing them with a value proposition that is attractive enough to turn down competitive offers, which are more likely during market downturns. Therefore, the firm's cash flows are likely to be severely affected by market downturns. Because the stock price is the discounted value of expected cash flows, greater sensitivity of expected cash flows to market returns translates into higher systematic risk. Thus, increases in customer satisfaction are likely to lower the sensitivity of a firm's stock returns to market movements in general and to market downturns in particular. Therefore, we expect the following:

H₁: A positive change in customer satisfaction results in a negative change in a firm's (a) systematic risk and (b) downside systematic risk.

Customer Satisfaction and Idiosyncratic Risk

Idiosyncratic risk reflects stock returns volatility, which is affected primarily by a firm's actions. We propose that customer satisfaction facilitates a firm's ability to understand its customers, which in turn reduces the volatility in its cost and revenue streams, thus lowering its overall and downside idiosyncratic risk.

Increases in customer retention stemming from increases in customer satisfaction foster a stable customer base. In turn, a stable customer base promotes a firm's ability to learn about its customers, their unique requirements, and their demand patterns (see Tuli, Kohli, and Bharadwaj 2007). As a firm becomes more familiar with customer demand patterns, it can anticipate changes in customer demand and adjust its production cycle accordingly, lowering the mismatch between firm inventory and customer orders (Bharadwaj, Bharadwaj, and Bendoly 2007). Thus, firms that deliver higher customer satisfaction are likely to have lower volatility in inventory costs.

Greater knowledge of the customer base also reduces the variance in a firm's customer service costs that might occur because of the rejection of unsuitable offerings, a result of a poor understanding of customer requirements (Anderson, Fornell, and Lehmann 1994). Such product returns are not trivial, as exemplified by the \$13.8 billion spent by the U.S. electronics industry in 2007 due to customer product returns (Lawton 2008). Indeed, firms that increase their customers' satisfaction have far fewer customer complaints and higher customer retention (Bolton 1998; Brown et al. 2005). Consequently, such firms have lower costs of customer recovery and are less reliant on discount pricing to retain customers.

Highly satisfied customers also provide positive word of mouth for a firm (Lam et al. 2004). Positive word of mouth engenders greater credibility among customers and serves as a low-cost channel for retaining customers (Villanueva, Yoo, and Hanssens 2008). It may also serve as a counter-weighing strategy rather than the traditional policy of firms to confront advertising attacks with advertising retaliation (Steenkamp, Hanssens, and Dekimpe 2005). Thus, positive word of mouth enhances a firm's advertising and promotional efficiency, which in turn reduce its marketing-related costs (Luo and Homburg 2007).

Highly satisfied customers are also likely to continue purchasing and even to increase their purchases from a firm (e.g., Rust, Zahorik, and Keiningham 1994, 1995). Lower volatility in costs and greater stability of revenues result in more stable cash flows and are likely to lower idiosyncratic risk. Because customer satisfaction is perceived as a measure of customer loyalty and quality and because satisfied customers are likely to increase their purchases from a firm (Mittal and Kamakura 2001), increases in customer satisfaction can be perceived as a signal of higher future revenues. Therefore, increases in customer satisfaction are likely to allay concerns related to negative cash flows—that is, to lower the downside idiosyncratic risk of a firm. Formally,

H₂: A positive change in customer satisfaction results in a negative change in a firm's (a) idiosyncratic risk and (b) downside idiosyncratic risk.

Method

Measures

Dependent variables. We use the Fama–French three-factor model to obtain the measures of systematic and idiosyncratic risk (Fama and French 1993). For each firm, we estimate Equation 1 using the daily observations for the four quarters for which customer satisfaction is measured. In Equation 1, β_{mi} represents the systematic risk for a firm, and we obtain the idiosyncratic risk by calculating the standard deviation of residuals from this model:

$$(1) \quad (R_{it} - R_{ft}) = \alpha_{it} + \beta_{mi}(R_{mt} - R_{ft}) + \beta_{si}(SMB)_t + \beta_{hi}(HML)_t + E_{it},$$

where

R_{it} = daily return on stock of firm i on day t ,
 R_{ft} = daily risk-free return on day t ,

R_{mt} = daily return on a value-weighted market portfolio on day t ,

$(SMB)_t$ = Fama–French size portfolio on day t , and

$(HML)_t$ = Fama–French market-to-book ratio portfolio on day t .

$$(2) \quad R_{it} = [(D_{it} + P_{it}) - P_{i(t-1)}]/P_{it}, \text{ and}$$

$$(3) \quad R_{mt} = (L_t - L_{(t-1)})/L_{(t-1)},$$

where

D_{it} = dividends from stock i on day t ,

P_{it} = split-adjusted price of stock i on day t , and

L_t = market price-adjusted index of a value-weighted market portfolio comprising all stocks on NASDAQ, AMEX, and NYSE markets on day t .

We obtain downside systematic risk (β_{dmi}) from Equation 4 for observations in which excess market returns are negative (see Ang, Chen, and Xing 2006):

$$(4) \quad (R_{it} - R_{ft}) = \alpha_{dit} + \beta_{dmi}(R_{mt} - R_{ft}) + \beta_{dsi}(SMB)_t + \beta_{dhi}(HML)_t + E_{dit},$$

where $(R_{mt} - R_{ft}) < 0$.

We measure downside idiosyncratic risk as the standard deviation of the residuals obtained from Equation 5 for observations in which excess firm returns are negative. This measure corresponds to the concept of semivariance—that is, the variance in negative returns from investing in a stock (see Markowitz 1959):

$$(5) \quad (R_{it} - R_{ft}) = \alpha_{drit} + \beta_{drmi}(R_{mt} - R_{ft}) + \beta_{drsi}(SMB)_t + \beta_{drhi}(HML)_t + E_{drit},$$

where $(R_{it} - R_{ft}) < 0$.

Customer satisfaction. We use the ACSI database (<http://www.theacsi.org>) to obtain customer satisfaction scores. The ACSI collects customer satisfaction data from more than 50,000 customers through telephone interviews. The overall customer satisfaction scores are scaled from 0 to 100 and have been released in the public domain since 1994 (for a detailed discussion of the ACSI methodology, see Fornell et al. 1996). In the current study, we include only the firms that are listed on three U.S.-based stock exchanges (NASDAQ, NYSE, and AMEX). We use the natural logs of customer satisfaction for each firm because this lowers the influence of extreme values (e.g., Anderson, Fornell, and Rust 1997).

Control variables. The Appendix outlines the control variables, their definitions, and the literature supporting their inclusion in the models. We control for the effects of R&D investments with the ratio of R&D to total assets. In addition, we follow research in accounting and finance and use total assets, return on assets, dividend payouts, financial leverage, and liquidity as control variables. To control for competitive activity in an industry, we use the Herfindahl concentration index (see Hou and Robinson 2006). To control for the systematic effects across time, we use year dum-

mies that correspond to the year in which the customer satisfaction score was measured.

Data Collection

We use four different sources to collect data for the current study. The customer satisfaction metric comes from the ACSI database. The ACSI collects and releases data on an annual basis, but it does so throughout the year in different quarters for firms in different industries. For example, scores for firms in the manufacturing durables category are released in the second quarter, and scores for firms in the retail sector are released in the fourth quarter. We obtained the customer satisfaction scores from the fourth quarter of 1994 to the fourth quarter of 2006. Because our objective is to test the effect of changes in customer satisfaction on changes in risk and because our models control for the lagged values of the dependent variables, we use firms for which at least three years of customer satisfaction data are available.

We obtained data for firms' stock prices from the University of Chicago's Center for Research in Security Prices. We obtained data for the value-weighted market portfolio, the Fama–French size and market-to-book ratio factors, Treasury bond rates, and the momentum factor from the data library maintained by Kenneth French.³ For the accounting measures, we used Standard & Poor's COMPUSTAT quarterly data file. Following Jacobson and Mizik (2009), we align the quarterly COMPUSTAT data with the annual ACSI data.

Combining the data sets yields 1318 pooled time-series and cross-sectional observations for the customer satisfaction scores and both overall and downside systematic and idiosyncratic risk. That is, we estimated 1318 regressions using the Fama–French three-factor model to calculate the dependent variables. In line with the finance literature, we find that, on average, the Fama–French three-factor model explains 21% of the variance in stock returns (e.g., Goyal and Santa-Clara 2003). That is, idiosyncratic risk accounts for 79% of the variance in stock returns of the firms in this sample. These observations come from 29 different Standard Industrial Classification (SIC) two-digit industry groupings. As we show in Table 1, the largest group of observations is from the utilities industry (SIC 49), which has 255 observations.

Table 2 outlines the descriptive statistics and correlations between the variables. As we also show in Table 2, the correlations between customer satisfaction and systematic risk, downside systematic risk, idiosyncratic risk, and downside idiosyncratic risk are in the expected direction for both levels and first differences of variables.

Model and Estimation Procedure

We assess the impact of changes in customer satisfaction on changes in risk measures because it lowers the potential problems associated with autocorrelation and removes the impact of time-invariant unobservable factors (e.g., Jacob-

³See http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

TABLE 1
Sample Distribution Across Industries

SIC Code	Industry Name	Observations
01	Agriculture production crops	9
20	Food and kindred products	188
21	Tobacco products	7
22	Textile mill products	6
23	Apparel and other finished products	30
27	Printing, publishing, and allied	10
28	Chemicals and allied products	43
29	Petroleum refining and other industries	30
30	Rubber and miscellaneous plastic products	23
35	Industrial, commercial machinery, and computer equipment	47
36	Electrical and other electrical equipment, excluding computers	40
37	Transportation equipment	72
42	Motor freight transportation and warehouse	6
45	Transportation by air	75
47	Transportation services	7
48	Communications	57
49	Electric, gas, and sanitary services	255
52	Building material, hardware, and garden retail	12
53	General merchandise stores	98
54	Food stores	66
56	Apparel and accessory stores	8
57	Home furniture and equipment stores	8
58	Eating and drinking places	36
59	Miscellaneous retail	19
60	Depository institutions	46
63	Insurance carriers	36
70	Hotels and other lodging places	35
73	Business services	33
99	Conglomerates	16

son and Mizik 2009). However, note that using a changes model carries the cost of not being able to estimate the effects of levels of customer satisfaction on the levels of risk measures. Subsequently, we test levels models and find that our substantive conclusions are robust to this specification. Because past stock returns risk predicts future risk, we include the lagged differences in the dependent variable in the model (Lui, Markov, and Tamayo 2007). The inclusion of the lagged dependent variable also controls for inertia, persistence, and different initial conditions (see Mizik and Jacobson 2004).

Systematic Risk Model

$$(6) \quad \Delta\beta_{miT} = \gamma_{m1}(\Delta\beta_{mi(T-1)}) + \gamma_{m2}(\Delta CS_{iT}) + \gamma_{m3}(\Delta R\&D_{iT}) + \gamma_{m4}(\Delta X_{iT}) + \Delta\epsilon_{iT},$$

where

$$\begin{aligned} \Delta\beta_{miT} &= \beta_{miT} - \beta_{mi(T-1)}, \\ \beta_{miT} &= \text{systematic risk of firm } i \text{ for year } (T), \\ CS_{iT} &= \text{log of customer satisfaction score of firm } i \text{ for year } (T), \end{aligned}$$

TABLE 2
Descriptive Statistics and Correlation Matrix

Variables	Observations	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
Levels of Variables															
1. Systematic risk	1318	.91	.45	1.00											
2. Downside systematic risk	1318	.91	.55	.77	1.00										
3. Idiosyncratic risk	1318	1.80	1.07	.28	.24	1.00									
4. Downside idiosyncratic risk	1318	1.24	.81	.29	.29	.93	1.00								
5. Customer satisfaction	1318	4.32	.09	-.27	-.23	-.22	-.21	1.00							
6. Leverage	1297	.28	.23	.20	.22	.17	.18	-.36	1.00						
7. R&D-total assets ratio	1118	.01	.04	-.01	-.04	.17	.15	.18	-.25	1.00					
8. Return on assets	1269	.13	.08	-.22	-.17	-.30	-.29	.24	-.40	-.25	1.00				
9. Total assets	1288	9.65	1.45	.05	.08	-.31	-.25	-.16	.27	-.09	-.21	1.00			
10. Dividends	1283	.03	.04	-.05	-.03	-.05	-.03	.28	.04	-.04	.16	.16	1.00		
11. Liquidity	1179	1.25	.69	.14	.07	.16	.14	.11	-.22	.07	-.03	-.32	-.08	1.00	
12. Herfindahl index	1318	.19	.19	-.06	-.05	-.06	-.06	-.12	-.01	.01	.03	.07	-.02	.00	1.00
Changes in Variables															
1. Systematic risk	1162	-.01	.44	1.00											
2. Downside systematic risk	1162	.00	.66	.68	1.00										
3. Idiosyncratic risk	1162	-.01	.81	.27	.20	1.00									
4. Downside idiosyncratic risk	1162	.00	.74	.27	.26	.86	1.00								
5. Customer satisfaction	1162	.00	.04	-.06	-.07	-.06	-.05	1.00							
6. Leverage	978	.00	.01	-.01	-.11	.05	.06	-.02	1.00						
7. R&D-total assets ratio	1116	.00	.04	-.07	-.03	-.18	-.20	.05	-.08	1.00					
8. Return on assets	1133	.07	.20	-.02	.04	-.05	-.03	.00	-.06	-.25	1.00				
9. Total assets	1130	.00	.02	.00	.03	.03	.09	.07	-.01	-.06	-.09	1.00			
10. Dividends	1034	-.01	.34	-.02	.02	.01	-.02	-.01	-.05	.03	-.04	-.04	1.00		
11. Liquidity	1143	.00	.09	.14	.10	.30	.33	-.03	.04	-.23	.18	.18	.08	1.00	
12. Herfindahl index	1162	.00	.07	-.04	-.03	.01	.00	-.07	-.01	.05	-.05	-.01	.02	-.04	1.00

Notes: All correlations in italics are significant at the 90% level.

$R\&D_{iT}$ = R&D scaled by total assets of firm i for year (T) ,

X_{iT} = control variables for firm i for year (T) , and
 ε_{iT} = random error term.

Downside Systematic Risk Model

$$(7) \Delta\beta_{dmiT} = \gamma_{dm1}(\Delta\beta_{dmi(T-1)}) + \gamma_{dm2}(\Delta CS_{iT}) + \gamma_{dm3}(\Delta R\&D_{iT}) \\ + \gamma_{dm4}(\Delta X_{iT}) + \Delta\zeta_{iT},$$

where

$\Delta\beta_{dmiT} = \beta_{dmiT} - \beta_{dmi(T-1)}$,
 β_{dmiT} = downside systematic risk of firm i for year (T) , and the other symbols have the usual meanings.

Idiosyncratic Risk Model

$$(8) \Delta IR_{iT} = \gamma_1(\Delta IR_{i(T-1)}) + \gamma_2(\Delta CS_{iT}) + \gamma_3(\Delta R\&D_{iT}) \\ + \gamma_4(\Delta X_{iT}) + \Delta\Phi_{iT},$$

where

$\Delta IR_{iT} = IR_{iT} - IR_{i(T-1)}$,
 IR_{iT} = idiosyncratic risk of firm i for year (T) ,
 CS_{iT} = log of customer satisfaction score of firm i for year (T) ,
 $R\&D_{iT}$ = R&D scaled by total assets of firm i for year (T) ,
 X_{iT} = control variables for firm i for year (T) , and
 Φ_{iT} = random error term.

Downside Idiosyncratic Risk Model

$$(9) \Delta DIR_{iT} = \gamma_{d1}(\Delta DIR_{i(T-1)}) + \gamma_{d2}(\Delta CS_{iT}) + \gamma_{d3}(\Delta R\&D_{iT}) \\ + \gamma_{d4}(\Delta X_{iT}) + \Delta\eta_{iT},$$

where

$\Delta DIR_{iT} = DIR_{iT} - DIR_{i(T-1)}$,
 DIR_{iT} = downside idiosyncratic risk of firm i for year (T) , and the other symbols have their usual meanings.

Addressing Endogeneity

A key benefit of using a panel data set is that it enables us to control for the potential endogeneity. Equations 6–9 include three variables that are likely to be endogenous.

Lagged dependent variable. The lag of the dependent variable in Equation 6 ($\Delta\beta_{mi(T-1)}$) is correlated with the error term ($\Delta\varepsilon_{iT}$). This is because term $\varepsilon_{i(T-1)}$ is present in the differenced error term $\Delta\varepsilon_{iT}$ and is a component of the lag of the dependent variable. For example,

$$(10) \Delta\beta_{miT} = \gamma_{m1}(\Delta\beta_{mi(T-1)}) + \gamma_{m2}(\Delta CS_{iT}) + \gamma_{m3}(\Delta R\&D_{iT}) \\ + \gamma_{m4}(\Delta X_{iT}) + \Delta\varepsilon_{iT},$$

$$(11) \Delta\beta_{mi(T-1)} = \beta_{mi(T-1)} - \beta_{mi(T-2)},$$

$$(12) \beta_{mi(T-1)} = \gamma_{m1}(\beta_{mi(T-2)}) + \gamma_{m2}(CS_{i(T-1)}) \\ + \gamma_{m3}(R\&D_{i(T-1)}) + \gamma_{m4}(X_{i(T-1)}) + \varepsilon_{i(T-1)}, \text{ and}$$

$$(13) \Delta\varepsilon_{iT} = \varepsilon_{iT} - \varepsilon_{i(T-1)}.$$

Similarly, the lagged dependent variables in Equations 7–9 are endogenous.

Customer satisfaction. Prior research has argued that customer satisfaction should be treated as endogenous. For example, a firm's investments in relationship-building activities, such as customer loyalty programs and customer service employee training, can affect customer satisfaction (e.g., Srinivasan and Moorman 2005). These factors also require dedication of substantial resources, which in turn can influence a firm's stock returns risk. As such, customer satisfaction is highly likely to be correlated with the error term. In addition, it can be argued that the lack of stability in a firm's operations might affect its performance with the customer and lower its customer satisfaction score. That is, riskier firms are likely to underperform their less risky counterparts and to have lower customer satisfaction. Therefore, customer satisfaction is likely to be endogenous.

R&D. Because managers may be forward looking, R&D investments are endogenous in a model with stock returns risk as the dependent variable (McAlister, Srinivasan, and Kim 2007). Following Arellano and Bond (1991), we use the lagged-level values of endogenous variables as instruments for their first differences (for applications of this method, see Gupta 2005; Narasimhan, Dutta, and Rajiv 2006). For example, in Equation 6, $\beta_{mi(T-2)}$ and other lags can be used as an instrument for $\Delta\beta_{mi(T-1)}$ under the following condition (Arellano and Honore 2001):

$$(14) E[\varepsilon_{i(T-1)}, \varepsilon_{i(T-2)}] = 0.$$

This is because

$$(15) \beta_{mi(T-2)} = \gamma_{m1}(\beta_{mi(T-3)}) + \gamma_{m2}(CS_{i(T-2)}) \\ + \gamma_{m3}(R\&D_{i(T-2)}) + \gamma_{m4}(X_{i(T-2)}) + \varepsilon_{i(T-2)}.$$

Under the condition in Equation 14, $\beta_{mi(T-2)}$ is a valid instrument for $\Delta\beta_{mi(T-1)}$ for the following reasons:

1. It is correlated with $\Delta\beta_{mi(T-1)}$, because $\Delta\beta_{mi(T-1)} = \beta_{mi(T-1)} - \beta_{mi(T-2)}$.
2. It is not correlated with the error term $\Delta\varepsilon_{iT}$ in Equation 6, because $\Delta\varepsilon_{iT} = \varepsilon_{iT} - \varepsilon_{i(T-1)}$ (i.e., it does not contain $\varepsilon_{i(T-2)}$).

Similarly, $CS_{mi(T-1)}$ and further lags can be used as instruments for ΔCS_{miT} , and $R\&D_{mi(T-1)}$ and further lags can be used as instruments for $\Delta R\&D_{miT}$. We test for the validity of the instruments using the Hansen (1982) test of overidentifying restrictions. The null hypothesis in this test is that the model specification meets the moment condition specified in Equation 14, and therefore instruments are valid. After selecting the instruments, we use the generalized method of moments estimator, which yields unbiased and consistent estimates (see Arellano and Bond 1991; Arellano and Honore 2001).

Results

Table 3 outlines the results of the models. Because we use first differencing and the lagged values of dependent variables, the sample size for overall and downside system-

TABLE 3
Customer Satisfaction Lowers Systematic and Idiosyncratic Risk

	Systematic Risk	Downside Systematic Risk	Idiosyncratic Risk	Downside Idiosyncratic Risk
$\Delta(\text{Dependent Variable})_{i(t-1)}$	-.01	-.05	-.07*	-.16***
$\Delta[\log(\text{Customer Satisfaction})]_{it}$	-1.88**	-3.76***	-3.42**	-2.31**
$\Delta(\text{Leverage})_{it}$	.76**	.89*	4.06***	3.64***
$\Delta(\text{R\&D Ratio})_{it}$	-3.10**	-7.80***	-.26	1.24
$\Delta(\text{ROA})_{it}$	-1.21**	1.14	-5.36***	-3.02***
$\Delta(\text{Total Assets})_{it}$	.16*	.37**	.10	.01
$\Delta(\text{Dividends Paid})_{it}$	-1.36	4.75**	.51	.13
$\Delta(\text{Liquidity})_{it}$	.11	-.12	.19	-.10
$\Delta(\text{Industry Concentration})_{it}$	-1.30***	-1.26**	1.80**	1.18**
N	806	806	806	806
Wald's chi-square	100.23 (20)***	92.32 (20)***	601.28 (20)***	412.16 (20)***
Hansen test	107.37 (110)	107.65 (127)	106.67 (110)	107.45 (127)

* $p < .10$.

** $p < .05$.

*** $p < .01$.

atic and idiosyncratic risk models is 806 observations (129 firms). As Table 3 shows, across models, we fail to reject the null hypotheses for the Hansen test. Thus, the instruments used in the estimation are valid.

Overall and Downside Systematic Risk

The results support H_{1a} and H_{1b} ; a positive change in customer satisfaction results in a negative change in systematic risk ($-1.88, p < .05$) and in a negative change in downside systematic risk ($-3.76, p < .01$). The results of the control variables are largely in line with prior work in marketing and finance. We find that high financial leverage enhances systematic risk ($.76, p < .05$) and downside systematic risk ($.89, p < .10$). This supports the argument that firms with greater financial strength (i.e., lower leverage) are less affected by market downturns and thus are likely to have lower systematic risk (see Lie 2005). We also find that the changes in R&D investments have a significant effect on systematic risk ($-3.10, p < .01$) and downside systematic risk ($-7.80, p < .01$).

We find that changes in return on assets lower systematic risk ($-1.21, p < .05$) and that dividend payouts tend to enhance downside systematic risk ($4.75, p < .05$). This suggests that financial markets do not reward firms that are not willing to reinvest their earnings to secure future cash flows in market downturns. Finally, we find that increasing industry concentration lowers systematic risk ($-1.30, p < .01$) and downside systematic risk ($-1.26, p < .05$).

Idiosyncratic Risk and Downside Idiosyncratic Risk

Consistent with H_{2a} and H_{2b} , we find that a positive change in customer satisfaction results in a negative change in idiosyncratic risk ($-3.42, p < .05$) and a negative change in downside idiosyncratic risk ($-2.31, p < .01$). The results for the other control variables are largely in line with the finance literature. We find that increases in leverage increase the perceptions of financial concerns and therefore

increase idiosyncratic risk ($4.06, p < .01$) and downside idiosyncratic risk ($3.64, p < .01$). Similarly, increases in a firm's earnings (return on assets) soothe investors' concerns and therefore lower idiosyncratic risk ($-5.36, p < .01$) and downside idiosyncratic risk ($-3.02, p < .01$).

We find that increases in industry concentration increase idiosyncratic risk ($1.80, p < .05$) and downside idiosyncratic risk ($1.18, p < .05$). An explanation for this could be that increases in industry concentration indicate that several firms are exiting an industry (e.g., Dobrev, Kim, and Carroll 2002). Moreover, as industries become more concentrated, they become likely targets for government scrutiny and regulation. In turn, this could raise concerns about the attractiveness of an industry and uncertainty over future earnings of the firms in it. As a result, firms in such industries are likely to have greater idiosyncratic risk.

Sensitivity Analyses

To draw policy implications and communicate the value of marketing actions to financial markets, we assess the robustness of our results. This is especially important because prior work in finance has shown that conclusions drawn from an analysis of abnormal returns and risk measures can change when factors such as sampling aspects and models used to measure returns and/or risk are changed (see Bali and Cakici 2008; Fama 1998).

Removing potential outliers. To test whether the results are driven by outliers, we removed observations with residuals in the top and the bottom five percentiles. As we show in Table 4, there are no changes in the substantive conclusions of the current study.⁴

⁴In addition to removing the potential outliers, we test the sensitivity of our conclusions to recent research, which indicates that customer satisfaction has little effect on stock returns after removing firms from the computer and Internet sector (SICs 37, 59, and 73) and the utilities sector (SIC 49) from the sample (Jacobson and Mizik 2009). Our results are largely consistent when we use such sensitivity analyses.

TABLE 4
Assessing the Robustness of Results

	Removing +/-5% Tile Residuals				Removing Observations in Which Stock Price Is Less Than \$2			
	Systematic Risk	Downside Systematic Risk	Idiosyncratic Risk	Downside Idiosyncratic Risk	Systematic Risk	Downside Systematic Risk	Idiosyncratic Risk	Downside Idiosyncratic Risk
$\Delta[\log(\text{CUSAT})]_{it}$	-5.13***	-3.63***	-3.67***	-2.44***	-2.52***	-2.55**	-4.28***	-3.18***
$\Delta(\text{Leverage})_{it}$	.93***	1.24***	2.74***	2.25***	.75**	.90**	3.34***	1.81***
N	725	725	725	725	796	796	796	796
Wald's chi-square	159.64 (20)***	143.22 (20)***	1419.93 (20)***	949.98 (20)***	100.35 (20)***	101.77 (20)***	799.53 (20)***	584.18 (20)***
Hansen test	97.63 (110)	102.75 (127)	98.06 (110)	105.69 (127)	103.82 (110)	106.30 (127)	105.38 (110)	103.23 (127)
Estimating Levels Model				Using Unanticipated Changes Calculated from Residuals				
	Systematic Risk	Downside Systematic Risk	Idiosyncratic Risk	Downside Idiosyncratic Risk	Systematic Risk	Downside Systematic Risk	Idiosyncratic Risk	Downside Idiosyncratic Risk
$\log(\text{CUSAT})_{it}$	-.82***	-.84***	-2.33***	-1.88***	-.86***	-1.06***	-1.35***	-.87**
$(\text{Leverage})_{it}$	.00	.18*	.29***	.27***	.57***	.72***	2.96***	2.47***
N	869	869	869	869	869	869	869	869
R ²	.32	.16	.63	.51	.29	.14	.65	.53
Carhart (1997) Model				Ang et al. (2006) Model				
	Systematic Risk	Downside Systematic Risk	Idiosyncratic Risk	Downside Idiosyncratic Risk	Systematic Risk	Downside Systematic Risk	Idiosyncratic Risk	Downside Idiosyncratic Risk
$\Delta[\log(\text{CUSAT})]_{it}$	-1.41*	-3.57***	-3.37**	-2.24**	-2.91***	-3.21*	-3.91***	-2.45***
$\Delta(\text{Leverage})_{it}$	.95**	1.54***	4.09***	3.67***	.73*	.68	3.96***	3.67***
N	806	806	806	806	806	806	806	806
Wald's chi-square	74.81 (20)***	94.86 (20)***	588.73 (20)***	401.44 (20)***	64.42 (20)***	44.07 (20)***	581.85 (20)***	393.12 (20)***
Hansen test	108.50 (110)	106.11 (127)	107.11 (110)	104.79 (127)	110.40 (110)	109.51 (127)	103.21 (110)	104.12 (127)
Boulding and Staelin (1995) Method				Non-CAPM Risk Measures				
	Systematic Risk	Downside Systematic Risk	Idiosyncratic Risk	Downside Idiosyncratic Risk		Standard Deviation of Stock Returns	Downside Standard Deviation of Stock Returns	Dispersion in Analyst Earnings Forecast
$\Delta\rho[\log(\text{CUSAT})]_{it}$	-1.91***	-4.27***	-.89*	-1.33**	$\Delta[\log(\text{CUSAT})]_{it}$	-4.62***	-3.26***	-5.75**
$\Delta\rho(\text{Leverage})_{it}$	.56**	.76**	1.51***	2.08***	$\Delta(\text{Leverage})_{it}$	4.24***	3.63***	3.68***
N	660	660	660	660	N	806	806	733
Wald's chi-square	69.71 (17)	56.54 (17)	284.33 (17)	283.19 (17)	Wald's chi-square	643.49 (20)***	432.97 (20)***	95.72 (22)***
					Hansen test	110.22 (110)	103.70 (127)	89.13 (88)

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

Removing stocks with price less than \$2. Low-priced stocks tend to exhibit behavior that is contrary to the normal behavior of the majority of stocks (Ball, Kothari, and Shanken 1995; Hertz et al. 2002). To address this issue, we conducted the analyses by removing the stocks from the sample that had a year-end stock price of less than \$2. As we show in Table 4, our substantive conclusions do not change when we remove these observations.

Using a level's model. Although we use the changes model along with the generalized method of moments estimator, we also test to determine whether our conclusions are robust to the use of levels models:

$$(16) \quad \beta_{miT} = \gamma_{m1}(\beta_{mi(T-1)}) + \gamma_{m2}(CS_{iT}) + \gamma_{m3}(R\&D_{iT}) \\ + \gamma_{m4}(X_{iT}) + \varepsilon_{iT},$$

$$(17) \quad \beta_{dmiT} = \gamma_{dm1}(\beta_{dmi(T-1)}) + \gamma_{dm2}(CS_{iT}) + \gamma_{dm3}(R\&D_{iT}) \\ + \gamma_{dm4}(X_{iT}) + \zeta_{iT},$$

$$(18) \quad IR_{iT} = \gamma_1(IR_{i(T-1)}) + \gamma_2(CS_{iT}) + \gamma_3(R\&D_{iT}) \\ + \gamma_4(X_{iT}) + \Phi_{iT}, \text{ and}$$

$$(19) \quad DIR_{iT} = \gamma_{d1}(DIR_{i(T-1)}) + \gamma_{d2}(CS_{iT}) + \gamma_{d3}(R\&D_{iT}) \\ + \gamma_{d4}(X_{iT}) + \eta_{iT}.$$

We test our hypotheses by estimating Equations 16–19 using a seemingly unrelated regressions approach that allows for correlations between error terms across these models (Wooldridge 2006). As we show in Table 4, our substantive conclusions remain unchanged when using the levels model rather than the changes model.

Using unanticipated changes in independent variables. Because customer satisfaction is highly autocorrelated (.91, $p < .001$), changes in it are likely to be unexpected (Jacobson and Mizik 2009). An alternative method to measure unexpected changes is to regress a variable on its lags and use the residuals as a measure of unanticipated changes (see Jacobson 1987). We calculate unanticipated values of customer satisfaction and the control variables using this method and use the following models:

$$(20) \quad \beta_{miT} = \gamma_{m1}(\beta_{mi(T-1)}) + \gamma_{m2}(\delta CS_{iT}) + \gamma_{m3}(\delta R\&D_{iT}) \\ + \gamma_{m4}(\delta X_{iT}) + \varepsilon_{iT},$$

$$(21) \quad \beta_{dmiT} = \gamma_{dm1}(\beta_{dmi(T-1)}) + \gamma_{dm2}(\delta CS_{iT}) + \gamma_{dm3}(\delta R\&D_{iT}) \\ + \gamma_{dm4}(\delta X_{iT}) + \zeta_{iT},$$

$$(22) \quad IR_{iT} = \gamma_1(IR_{i(T-1)}) + \gamma_2(\delta CS_{iT}) + \gamma_3(\delta R\&D_{iT}) \\ + \gamma_4(\delta X_{iT}) + \Phi_{iT}, \text{ and}$$

$$(23) \quad DIR_{iT} = \gamma_{d1}(DIR_{i(T-1)}) + \gamma_{d2}(\delta CS_{iT}) + \gamma_{d3}(\delta R\&D_{iT}) \\ + \gamma_{d4}(\delta X_{iT}) + \eta_{iT},$$

where

δCS_{iT} = unanticipated changes in customer satisfaction,

$\delta R\&D_{iT}$ = unanticipated changes in R&D, and

δX_{iT} = unanticipated changes in control variables.

Consistent with the preceding analyses, we estimate these models using a seemingly unrelated regressions approach. As we show in Table 4, our substantive conclusions remain unchanged when using this method.

Taking momentum into consideration. Studies in finance routinely use the Carhart (1997) model that includes the momentum factor to assess the robustness of their results to the use of the Fama–French three-factor model (outlined in Equation 1). The momentum factor is defined as the difference in the returns of firms with high and low prior stock performance (“up” minus “down”) during day t (Carhart 1997). Specifically, we use the following model to measure systematic and idiosyncratic risk (rather than Equation 1):

$$(24) \quad (R_{it} - R_{ft}) = \alpha_{it} + \beta_{mi}(R_{mt} - R_{ft}) + \beta_{sit}(SMB)_t \\ + \beta_{hi}(HML)_t + \beta_{ui}(UMD)_t + E_{it},$$

where $(UMD)_t$ is the momentum factor on day t and the other symbols have their usual meanings. As we show in Table 4, our substantive conclusions do not change when using the Carhart (1997) model to calculate the risk measures.

Taking aggregate volatility into consideration. Recent work in finance has argued that aggregate volatility (i.e., volatility in market movements) is an additional factor that should be included in capital asset pricing models (CAPMs) (e.g., Ang et al. 2006):

$$(25) \quad (R_{it} - R_{ft}) = \alpha_{it} + \beta_{mit}(R_{mt} - R_{ft}) + \beta_{vit}(dVIX)_t \\ + \beta_{sit}(SMB)_t + \beta_{hit}(HML)_t + \beta_{uit}(UMD)_t + E_{it},$$

where

$(dVIX)_t$ = changes in market volatility on day t ,

β_{mit} = systematic risk, and the other symbols have their usual meanings.

As we show in Table 4, our substantive conclusions do not change when using Ang and colleagues' (2006) model to calculate the risk measures.

Using Boulding and Staelin's (1995) method. An alternative method for addressing endogeneity arises from the work of Boulding and Staelin (1995, pp. G227–30). This method involves first-differencing and rho-differencing the variables and using the lagged values of the differences of endogenous variables as instruments. Because we use the differences between lagged values as instruments (rather than levels of lagged values), the effective sample size in these models is 660. We follow this approach and find that our substantive conclusions remain unchanged (see Table 4).

*Non-CAPM-based risk measures.*⁵ We derive the risk measures used in this study from CAPM-based models. Though widely used, some assumptions underlying CAPM can be considered too restrictive. For example, CAPM assumes that investors have unrestricted access to capital and that there are no transaction costs in buying and selling stocks. It can be argued that the effects of customer satisfaction on multiple dimensions of risk we observed in this study are bound by the assumptions of CAPM. Therefore, we calculate non-CAPM-based measures of overall

⁵We thank an anonymous reviewer for suggesting the use of non-CAPM-based measures of risk.

risk—that is, the standard deviation of a firm's excess returns ($R_{it} - R_{ft}$) in year t . We calculate the downside risk as the standard deviation of a firm's negative returns in year t . As we show in Table 4, our substantive conclusions do not change when using the non-CAPM measures of risk.

In addition, we follow the accounting literature and measure the perceived risk (or uncertainty) of a firm's stock as the standard deviation of analysts' earnings forecasts (e.g., Lang and Lundholm 1996). This requires that at least four analysts follow a firm in a given fiscal year. As a result, the sample size for this risk measure is 733 (122 firms). Following prior literature in accounting, we also use the number of analysts following a firm as a control variable (e.g., Jones 2007). As we show in Table 4, our substantive conclusions remain unchanged when using the dispersion in analysts' earnings forecasts, a non-CAPM metric, as a measure of risk.

Discussion, Implications, and Future Research Directions

A recent survey of chief marketing officers (CMOs) finds that marketing accountability and customer orientation are among the top three requirements for a successful CMO (Rooney 2008). This study explores both of these issues. Research on customer orientation outcomes measured as customer satisfaction has occupied a prominent status in marketing. Recently, the research has been expanded to link marketing-related actions that drive customer satisfaction to financial outcomes, such as stock returns (e.g., Anderson, Fornell, and Mazvancheryl 2004) and cash flows (e.g., Gruca and Rego 2005), thus addressing the accountability requirement of CMOs. However, research in marketing has seldom examined the impact of customer satisfaction on different dimensions of stock returns risk, a key aspect of shareholder value. We take the first step in this direction and contribute to the research on the marketing–finance interface. The current study has several implications for recent efforts to communicate the value of marketing strategy to both financial markets and main street managers.

This study contributes to the recent debate on the value relevance of customer satisfaction beyond the accounting measures (e.g., Fornell, Mithas, and Morgenson 2009; Jacobson and Mizik 2009). We present results that show that customer satisfaction is a relevant metric for financial markets because it lowers a firm's overall and downside systematic and idiosyncratic risk. Recent research in accounting has shown that financial analysts tend to use risk metrics, such as systematic and idiosyncratic risk, when issuing the risk rating of stocks (Hong and Sarkar 2007; Lui, Markov, and Tamayo 2007). As a result, identifying factors that influence these metrics is important because financial analysts can also use customer satisfaction to assess the risk of a stock. Portfolio managers can also use the results of the current study when analyzing firms to be included in a portfolio. For example, because customer satisfaction reduces both overall and downside systematic risk, firms that increase their customer satisfaction can be used to reduce a portfolio's exposure to market movements. Similarly, investors that seek average but consistent returns (e.g., pension funds, government funds) can invest in firms that increase their customer satisfaction scores.

The focus on multiple dimensions of risk in this study suggests that the empirical literature in marketing needs to go beyond systematic risk and take into consideration idiosyncratic risk along with downside systematic and idiosyncratic risk. Senior managers actively attempt to manage idiosyncratic risk because it has a direct impact on a firm's survival and the value of its stock options (e.g., Pace 1999). Idiosyncratic risk also matters to investors because high idiosyncratic risk lowers subsequent returns (see Ang et al. 2006). Downside systematic risk and idiosyncratic risk are also important because they reflect the value of a stock in hedging investments from market downturns. In analyzing the impact of marketing initiatives on stock performance, further research should take into account the multiple dimensions of risk.

The Financial Accounting Standards Board (1978) recommends that firms provide nonfinancial information to investors that can help them assess the amount, timing, and uncertainty of future cash receipts. This study presents customer satisfaction as a metric that affects the systematic and idiosyncratic risk and thus can provide valuable information for investors beyond the accounting measures. This suggests that perhaps firms should report customer satisfaction in their annual reports and in communications to financial analysts (e.g., Wiesel, Skiera, and Villanueva 2008).

Prior research has documented the myriad uses of customer satisfaction, including its use as a management control tool and in determining CEO bonus contracts. The financial markets are also interested in CEO compensation and performance because they influence the value of their investment. The findings of this study should provide succor to main street managers because their investments in measuring and monitoring customer satisfaction are worthwhile. By communicating the firm's performance on customer satisfaction to financial markets, managers now have a chance to influence the investment community about the quality of the customer base and the management that delivers such a customer base. Consequently, this should enable the firm to earn higher multiples and improve the compensation of senior management.

Limitations and Conclusions

Because we use secondary data compiled from multiple sources, some limitations must be kept in mind. The study uses SIC as an indicator for industry. A potential drawback is that SIC can include firms that are not direct competitors, leading to misaggregation of firms. However, this misaggregation is unlikely to be systematically different across industries and thus is unlikely to bias our results (Aggarwal and Samwick 1999).

This study develops hypotheses to examine the impact of customer satisfaction on multiple dimensions of risk and uses data from multiple secondary data sources to test these hypotheses. The results across multiple methods and sensitivity analyses strongly suggest that customer satisfaction contributes to the creation of shareholder wealth by lowering the overall and downside market and idiosyncratic risk. Given the importance of risk to managers and financial markets, this study can serve as a springboard for further research.

APPENDIX
Definitions, Measures, and Literature Sources for Control Variables

Variable	Definition	Quarterly COMPUSTAT Data Items	Prior Literature Support
R&D investments	The ratio of R&D expenditures to the total assets of a firm	(DATA4/DATA44)	McAlister, Srinivasan, and Kim (2007)
Return on assets	The ratio of operating income to total assets	(DATA21/DATA44)	Hong and Sarkar (2007)
Total assets	The logged value of total assets of a firm	Log(DATA44)	Beaver, Kettler, and Scholes (1970)
Leverage ratio	The ratio of total long-term debt to the sum of long-term debt and the market value of equity of a firm	$(DATA51)/[DATA51 + (DATA14 \times DATA61)]$	Hong and Sarkar (2007)
Dividends payout	The ratio of cash dividends to firm market capitalization	$(DATA89)/(DATA14 \times DATA61)$	McAlister, Srinivasan, and Kim (2007)
Liquidity	The current ratio of a firm	$(DATA40)/(DATA49)$	Beaver, Kettler, and Scholes (1970)
Competitive intensity	The SIC four-digit concentration index of firm revenues	Herfindahl concentration index using DATA2	Hou and Robinson (2006)

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