Institute for
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Germany

Series:
Scientific Working Papers
No.: W 127e

Institut für Marktorientierte Unternehmensführung

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Customer Satisfaction, Analyst Stock Recommendations, and Firm Value

Mannheim 2009

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ABSTRACT

Although managers are interested in the financial value of customers and researchers point out the importance of stock analysts who advise investors, no studies seem to have explored the implications of customer satisfaction for analyst stock recommendations. On the basis of a large-scale longitudinal dataset, the authors find that positive changes in customer satisfaction not only improve analyst recommendations but also lower dispersion in those recommendations for the firm. These effects are stronger when product market competition is high and financial market uncertainty is large. Also, analyst recommendations at least partially mediate the effects of changes in satisfaction on firm abnormal return, systematic risk, and idiosyncratic risk. Analyst recommendations represent a mechanism through which customer satisfaction affects firm value. Thus, if analysts pay attention to Main Street customer satisfaction, then Wall Street investors should have good reason to listen and follow. Overall, our research reveals satisfaction's impact on analyst-based outcomes and firm value metrics and calls attention to the construct of customer satisfaction as a key intangible asset for the investor community.

Keywords: Customer Satisfaction, Financial Analysts, Competition, Marketing-Finance, Stock Recommendations, Return, Risk

CONTENTS

1 Introduction

Corporate managers are interested in understanding the financial value of customers and the relevance of market-based assets to the investor community (Gupta, Lehmann, and Stuart 2004; Lehmann and Reibstein 2006; Srinivasan and Hanssens 2009). For example, according to *Marketing Science Institute* reports, linking key marketing metrics to the investor community such as stock analysts represents top-priority issues on CMOs' agenda (www.MSI.org).

Stock analysts (e.g., brokerage firms, banks, or private researchers) play indispensable roles in financial markets as they "gather and process information about a firm and issue recommendations and forecasts to investors" (Chen and Matsumoto 2006, p. 658). In simplest words, analysts deliver extra value to investors by (1) analyzing publicly available information more skillfully than general financial market participants, and (2) collecting costly firm-specific private information that is not available to the public but may signal a firm's customer base quality and future financial strength (Ivkovic and Jegadeesh 2004; Womack 1996).

Indeed, analysts' stock recommendations are so important that they provide incremental value over accounting profitability. Jegadeesh et al. (2004, p. 1083) document that "change in stock recommendations is a robust return predictor that appears to contain information over a large range of other predictor variables including earnings, growth, valuation multiples, size, trading, and others." Despite the potential importance of financial analysts as indicated by the finance and accounting research (Howe, Unlu, and Yan 2009), marketing literature has thus far neglected to study the impact of key marketing instruments on analysts. (Analogously, finance and accounting research on analysts has thus far neglected marketing constructs.)

Nevertheless, marketing scholars echo the theoretical importance of financial analysts. For example, Srinivasan and Hanssens (2009, p. 293) emphasize that "investors trade company shares because their expectations [as gauged by analysts' recommendations and forecasts] of these companies' future earnings differ… The importance of this earning expectation is evident every quarter when companies' earnings announcements are followed by sometimes drastic stock price adjustments when the actual earnings deviate from expectations." Similarly, Kimbrough et al. (2009, p. 318) note that "analysts can provide credible sources of information in aiding investors' interpretation of firms' intangible investment." Other studies allude to the importance of analysts' forecasts, surmising that if analysts are doubtful of non-financial, off-balance sheet assets, stock recommendations are bound to be deficient (Kim and

McAlister 2007; Whitwell, Lukas, and Hill 2007), and the information content of customer satisfaction would be misevaluated by investors (Fornell et al. 2006, p. 11).

To our knowledge, there are no published studies across marketing, accounting, and finance disciplines that have explicitly connected a key marketing construct of customer satisfaction to analysts' stock recommendations. This research gap is of high importance for two key reasons. First, the literature appears to call for research explicitly testing "whether customer satisfaction provides information for the Wall Street community such as *financial analysts*" (Tuli and Bharadwaj 2009, p. 3). Second, given the information intermediary role of analysts in the stock market, analyst recommendations might be one possible channel for stock market reactions to the information content of changes in customer satisfaction. Yet, the notion of whether stock recommendations may act as a mechanism through which intangible assets such as customer satisfaction affect firm value has been neglected in the literature.

Therefore, our study addresses this gap by investigating the following questions. (1) Are positive changes in customer satisfaction of a firm related to positive changes in analyst stock recommendations for the firm? (2) Do positive changes in customer satisfaction result in lower dispersion in stock recommendations? (3) Can these effects on stock recommendations vary across different situations of product market competition and financial market uncertainty? And (4) to what extent is customer satisfaction's possible impact on firm value channelled by analyst stock recommendations?

The key contributions of this paper are as follows. To the best of our knowledge, we are among the first to theorize and test financial analysts' reactions to a core marketing metric of customer satisfaction. Thus, for researchers, we help promote a more complete understanding of the impact of customer satisfaction and activate attention for the construct of customer satisfaction as an important market-based intangible asset for the investor community. In addition, we contribute to the nascent research stream on the marketing–finance interface by showing why financial analysts should track customer satisfaction in forming their stock recommendations. Interestingly, our study uncovers new mechanisms that explain the financial impact of customer satisfaction. That is, stock recommendation might play a mediating role between customer satisfaction and firm value.

Also, our work extends related studies by Jacobson and Mizik (2007, 2009) in three ways. First, while they examine the direct impact of satisfaction on stock returns (without mediating effects), we examine the indirect impact (with mediating effects of recommendations). Second, their work focuses on stock returns in the value-relevance of satisfaction, whereas we

investigate both stock returns *and* risks (systematic and idiosyncratic) as firm valuation metrics. Third, while they examine subsample nuances (computer and Internet sector) in the satisfaction-return link, we examine heterogeneity with moderated effects (product market competition and financial market uncertainty) in the satisfaction-recommendation-value link. Thus, our work complements and advances their studies. By suggesting that recommendation is a channel through which news of satisfaction might reach investors, we reveal reasons for satisfaction's impact on firm value largely ignored (Ittner, Larcker, and Taylor 2009; Fornell, Mithas, and Morgeson 2009; O'Sullivan, Hutchinson, and O'Connell 2009).

Moreover, our work has important practical implications, especially for marketing managers and financial analysts. If a positive link exists between customer satisfaction, analyst recommendation, and firm value, CMOs may better communicate firm competitive advantages in terms of customer satisfaction to the Wall Street community. In addition, our study of non-financial information and analyst recommendations directly speaks to the Financial Accounting Standards Board (FASB). Because firms are required by FASB to disclose non-financial information to investors that help them gauge the growth and volatility of future cash receipts (Gupta 2009; Kimbrough 2007), our work may encourage firms to proactively announce changes in customer satisfaction to the public and report the size and quality of customer base of the firm in annual reports and SEC 10-K/10-Q filings to the Wall Street community.

1.1 Background and Hypotheses

Figure 1 provides an overview of the relationships in our theoretical framework. This framework suggests that (a) changes in customer satisfaction of a firm have an impact on changes in analyst stock recommendations and dispersion in stock recommendations for the firm, (b) product market competition and financial market uncertainty moderate the link between customer satisfaction and analyst recommendations, and (c) recommendations at least partially mediate the relations between customer satisfaction and firm value. In this framework, customer satisfaction is first related to the intermediate outcome of analyst stock recommendations, and then to firm value as reflected by stock return and risk.

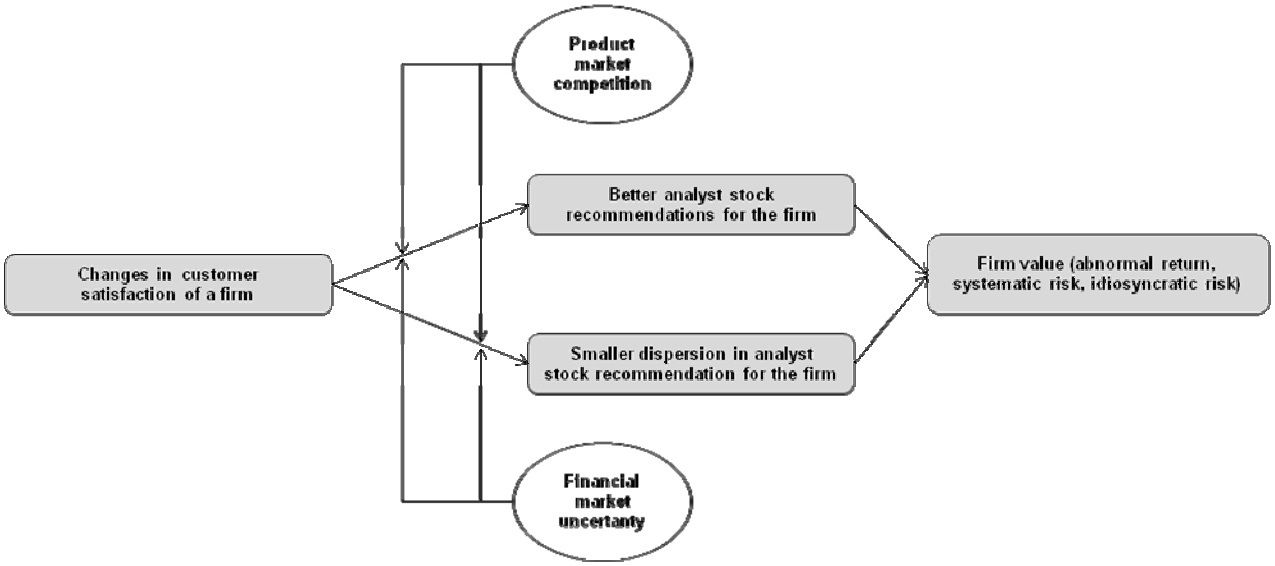

Figure 1: Conceptual Framework

1.2 Analyst Stock Recommendations

Financial analysts are information intermediaries between firms and investors. For firms, analysts serve as information disclosure agents. For investors, analysts provide expectations of firms' future cash flows. Analysts help reduce the information asymmetry between firms and investors, and their stock recommendations should influence investors' buy-hold-sell decisions (Barber et al. 2001). Ivkovic and Jegadeesh (2004) suggest that "the value contained in stock recommendations can broadly be attributed to two sources. First, analysts might be skilled at analyzing the value relevance of public information (more so than general investors). Second, analysts might possess the ability to gather a wide variety of information not readily available to investors and to efficiently process that information" (p. 434).

Formally, analyst stock recommendations refer to the investment opinion financial analysts provide to investors regarding whether a given stock is worth buying or selling (Ivkovic and Jegadeesh 2004; Womack 1996). In essence, Wall Street brokerage firms employ analysts to examine firm fundamentals, compile public and private information, and predict the prospects of firm future earnings and investment potential. These predictions form the basis for issuing specific stock recommendations to investors. The common ratings of the resultant recommendations are "strong buy," "buy," "hold," "under-perform," and "sell" (from most to least favorable). Thus, analyst stock recommendations capture forward-looking information that helps investors gauge future cash flows and firm value**.**

Both trade press and academic research confirm the importance of analyst recommendations. Investors reward firms with favorable analyst recommendations and punish those with unfavorable recommendations (Forbes 2009). For example, as stock analysts release buy-recommendations for Metalico Inc., a firm specialized in recycling scrap, its stock price soars on Wall Street (*BusinessWeek* 2008). For most firms listed in S&P 400, 500, and 600 indexes, Goff et al. (2008) report that stock prices generally hike up (decrease) in responses to upgrades (downgrades) in analyst recommendations. Even during financial crises, investors who follow analysts' sell-recommendations suffer fewer losses (*Wall Street Journal* 2009).

Echoing this, scholarly research in finance and accounting has shown the incremental value of stock recommendations over firm earnings. For instance, pointing out strong and persistent stock market reactions, Womack (1996, p. 164) finds that that "the stock price adjusts either up 5% for changes to *buy*-recommendations or down 11% for changes to *sell*-recommendations." Barber, Lehavy, McNichols, and Tureman (2001) support that a strategy based on the highest recommendations can yield an annualized return of 18.8% that is significantly greater than the broad financial markets. As such, Jegadeesh and Kim (2004, p. 1) note that "in spite of any inherent biases, the extant literature finds that analyst recommendations do add value." In accounting, Howe, Unlu, and Yan (2009) conclude that "analyst recommendations contain additional information content: changes in recommendations forecast future returns" (p. 1). A more detailed review of studies on analyst recommendations is provided in the web-based Appendix A. Thus, a rich literature suggests that analyst recommendations are critical financial metrics to the Wall Street community.

Interestingly, anecdotal evidence suggests that real stock analysts may indeed scrutinize intangibles such as customer satisfaction and reflect this information in their recommendations. On the basis of in-depth interviews with 63 analysts from 40 brokerage firms, Whitwell, Lukas, and Hill (2007) find that analysts pay attention to firm intangibles such as customer satisfaction and loyalty, since "such assessment can lead to more reliable valuations of the firm" (p. 86), and because ignoring intangibles is bound to generate deficient and less credible recommendations. Furthermore, through content analyses of 105 recommendation reports, Breton and Taffler (2001) find that after accounting for earnings, "non-financial information factors such as customers- and products-related strategies are the most significant drivers of analyst recommendations, because non-financial information indicates the quality of corporate management and future cash flow prospects" (p. 91).

Indeed, prior studies in accounting have shown the importance of intangible R&D information for analysts. Barth, Kasznik and McNichols (2001) find that analysts spend more efforts to follow firms with higher intangible assets. Barron et al. (2002) show that analyst forecast disagreement is also related to firm intangibles. Amir, Lev, and Sougiannis (2003, p. 635) find that "analysts do get intangibles: they compensate for the intangibles-related information deficiencies of financial reports." More recently, Kimbrough (2007) finds that analyst coverage affects the market evaluation of intangibles such as R&D. Following this line of research, we propose the associations between analyst recommendations and another intangible of customer satisfaction to be as follows.

1.3 Customer Satisfaction and Analyst Stock Recommendations

A central part of our logic for associations between customer satisfaction and analyst recommendations is that (1) customer satisfaction provides information content of the prospects (i.e., growth and volatility) of firm future cash flows (Anderson et al. 2004; Gruca and Rego 2005), and (2) analysts issue stock recommendations based on prospects of firm future cash flows (Chen and Matsumoto 2006; Womack 1996).

More specifically, prior literature suggests that customer satisfaction affects the size and growth of firms' cash flows. In basic terms, satisfaction leads to positive customer outcomes such as customer loyalty (Fornell et al. 2006), word of mouth (Luo 2009), and willingness to pay (Homburg et al. 2005) which, in turn, enhance future net cash flows, i.e., "more cash" (Aksoy et al. 2008; Anderson et al. 2004). Also, negative customer outcomes (e.g., complaints, defection rates, negative word of mouth) and resulting negative cash flow developments are less likely when high customer satisfaction exists (Luo and Homburg 2008, p. 32). In addition, positive changes in satisfaction may help foster valuable market-based intangible assets that can promote "faster market penetration, i.e., faster trials, referrals, and adoptions" (Srivastava et al. 1998, p. 8), thus likely resulting in accelerated cash flows for the firm.

This reasoning suggests that customer satisfaction information can serve as an indicator of more promising future firm profits (enhanced and accelerated future cash flows). Accounting literature also suggests that analysts, as expert information intermediaries, release stock recommendations to investors based on the prospects of firms' future cash flows (Chen and Matsumoto 2006). That is, the better the prospects (more and faster cash) of firms' future cash flows, the greater likelihood for analysts to issue more favorable recommendations ("buy" or

at least "hold" recommendations) rather than unfavorable "sell" recommendations (Jegadeesh et al. 2004; Thomas 2002). Therefore, this discussion suggests that to the extent that satisfaction results in better prospects of firm future cash flows, positive changes in satisfaction should lead analysts to recommend "hold" or "buy" a firm's stock. On the other hand, decreasing satisfaction should bode for negative customer reactions and subsequent declines in future cash flows, thus leading analysts to recommend "sell" in this case. Therefore,

H_1: *All else equal, positive changes in customer satisfaction of a firm positively influence changes in analyst stock recommendations for the firm.*

In addition, past studies point out that customer satisfaction affects the uncertainty and volatility of firm cash flows. Gruca and Rego (2005, p. 116) note that "customer satisfaction insulates firms from their competitors' efforts and external environmental shocks, leading to a reduction in the variability of future cash flows." Indeed, insofar as higher satisfaction helps to increase price tolerance and customer retention, positive changes in satisfaction should "reduce the volatility and the risk associated with anticipated future cash flows" (Anderson et al. 2004, p. 173). Furthermore, improvements in satisfaction can "reduce the sensitivity of a firm to volatile market downturns" (Tuli and Bharadwaj 2009, p. 7). Specifically, firms with higher satisfaction tend to have a superior value proposition and more intimate customer knowledge and, thus, suffer less from insecure cash flows during market downturns. Indeed, positive changes in customer satisfaction may help develop market-based assets that can enhance prospects of a firm's future cash flows via "lowered volatility and vulnerability of cash flows" (Srivastava et al. 1998, p. 8).

This logic suggests that customer satisfaction information can serve as an indicator of reduced uncertainty and vulnerability of firms' future cash flows ("safer" future cash). Prior accounting literature also indicates that the less uncertain the firms' future cash flow prospects, the greater the likelihood that analysts would agree on stock recommendations, thus the smaller would be the dispersion in analyst recommendations (Chen and Matsumoto 2006; Womack 1996). Therefore, to the extent that satisfaction reduces the uncertainty of firm future cash flows (Gruca and Rego 2005), positive changes in customer satisfaction should lead to lowered dispersion in analysts' stock recommendations. Hence,

H_2: *All else equal, positive changes in customer satisfaction of a firm negatively influence dispersion in stock recommendations for the firm.*

1.4 The Moderating Role of Product Market Competition and Financial Market Volatility

Previous research in marketing has found that, especially in highly competitive environments, key marketing variables such as market orientation and customer satisfaction drive important customer outcomes such as loyalty (e.g., Jaworski and Kohli 1993). In such environments, a higher customer satisfaction of a firm relative to competitors is more likely to both enhance positive outcomes such as customer repurchases and reduce negative effects such as consumer complaints, thus resulting in more sizable, faster, and safer future cash flows (Anderson et al. 2004; Fornell, Rust, and Dekimpe 2009). Consequently, in case of high product market competition, positive changes in customer satisfaction of a firm would more likely translate into favorable stock recommendations for the firm.

Furthermore, in product markets with a low level of competition, i.e., without many alternative sellers/suppliers, customers may retain their relations with the sellers even in the face of low customer satisfaction (Luo and Homburg 2007). In this case, investments aimed at enhancing satisfaction are less likely to justify the 'trade-off' expenses to achieve it and may pay off less (Wallace et al. 2004). As such, in low rather than high market competition, positive changes in customer satisfaction of a firm would less likely translate into favorable recommendations in the form of more "buy" recommendations and smaller dispersion. Thus,

H_3: *The impact of changes in customer satisfaction on analyst stock recommendations and the dispersion in stock recommendations is stronger given high product market competition compared to low product market competition.*

Prior finance and accounting literature suggests that the degree to which analysts can accurately gauge firm investment potential depends on both firm-specific and financial market-wide information. Bailey et al. (2003) imply that analyst recommendations are determined by not only firm-idiosyncratic customer satisfaction information but also market volatility information because both factors may "affect the difficulty in forming analyst forecasts beyond the current quarter" (p. 2487).

More specifically, in financial markets with high (vs. low) volatility, greater uncertainties may increase the difficulty of forming analyst recommendations (Bailey et al. 2003). Thus, in highly volatile markets, firms are more motivated to communicate intangible information such as satisfaction to analysts and the financial community in order to signal firms' true

future cash flow prospects (which help analysts to mitigate the "forecasting time horizon" problem, Tuli and Bharadwaj 2009). If so, then analysts are more likely to pick up and more accurately account for the communicated intangible information of satisfaction in their recommendations in highly (vs. lowly) volatile financial markets. Also, during volatile times, the financial community may recognize that "A greater portion of the firm value lies in intangibles, rather tangible assets… Investors thus may bank on companies rich in intangible assets such as brands" (*BusinessWeek* 2009, p. 64). Consequently, analysts may spend more effort to cover firms with higher intangible asset of customer equity and reflect more customer satisfaction information in their recommendations in high rather than low financial market uncertainty (Barth et al. 2001). This discussion suggests that an interplay might exist:

***H*$_4$:** *The impact of changes in customer satisfaction on analyst stock recommendations and the dispersion in stock recommendations is stronger in high financial market uncertainty compared to low financial market uncertainty.*

1.5 The Mediating Role of Analyst Stock Recommendations

Thus far, we have hypothesized the impact of customer satisfaction on recommendations. As discussed above, recommendations directly link to abnormal returns (Womack 1996). Besides returns, Gintschel and Markov (2004) report that announcements of recommendations also affect risk. That is, more favorable recommendations are associated with smaller vulnerability of future cash flows and, thus, lower systematic and idiosyncratic risk of the firm (McAlister et al. 2007).

Given that customer satisfaction affects recommendations which affect firm value, it is reasonable to expect a "chained" relationship: from satisfaction to the intermediate outcome of recommendations, then to firm return and risk. This chain implies that because analysts are information intermediaries between firms and investors, their recommendations likely act as an informational channel through which news of satisfaction passes and reaches investors (and thus stock prices ultimately). Indeed, as Kimbrough (2007, p. 1196) suggests that "most of the information needed to evaluate a firm's intangible such as R&D activities is held privately," we believe that insofar as analysts can effectively account for firm-specific information such as customer base quality and satisfaction (Ivkovic and Jegadeesh 2004), their recommendations would more reliably reflect the true value of the firm (Kim and McAlister 2007), and the information content of customer satisfaction can be more likely

captured by stock return and risk. The more the firm enjoys favorable recommendations with higher satisfaction (given that well-informed investors trade stocks based on cash flow prospects reflected in recommendations, Womack 1996), the more likely the information content of satisfaction may pass through recommendations and then contribute to firm value (McAlister et al. 2007).

In contrast, if analysts ignore vital market-based assets such as customer satisfaction, that disregard would contribute to undependable stock recommendations and assessment of true firm value (Jegadeesh et al. 2004) and, thus, generate insignificant associations between customer satisfaction and firm return or risk (Tuli and Bharadwaj 2009). Hence, analyst recommendations may represent an intermediate mechanism accounting for the presence or absence of the impact of customer satisfaction on firm return and risk.

Just as prior studies suggest analyst attention and coverage (Amir, Lev, and Sougiannis 2003; Barth et al. 2001) as mechanisms for market reactions to R&D (Aboody and Lev 1998; Kimbrough 2007), we suggest analyst recommendations as mechanisms for market reactions to another intangible of customer satisfaction. That is, analyst recommendations may channel the effects of customer satisfaction information on firm value. Nevertheless, satisfaction can affect firm value via other channels. For example, prior research has suggested that satisfaction also affects willingness-to-pay and word-of-mouth (Anderson and Mittal 2000) which significantly influence firm return and risk (Godes and Mayzlin 2004; Luo 2009). As such,

H_5: *Analyst stock recommendations at least partially mediate the associations between changes in customer satisfaction and firm return and risk.*

2 Methodology

2.1 Data

In testing the hypotheses, we collect data on customer satisfaction, analyst recommendations, firm value, and a set of control variables. There are multiple sources involved, including the American Customer Satisfaction Index (ACSI), Institutional Brokers' Estimate System (I/B/E/S), the Center for Research of Securities Prices (CRSP), and COMPUSTAT. We summarize the data sources and measures in Table 1.

Variables	Measures	Data Source	Literature Support
Analyst stock recommendation	The investment opinion provided by financial analysts to investors regarding whether a given stock in financial markets is worth buying or selling, i.e., "strong buy," "buy," "hold," "under-perform," and "sell"	I/B/E/S	Chen and Matsumoto (2006); Womack (1996)
Customer satisfaction	The overall consumption experience of customers surveyed in the American Consumer Satisfaction Index (ACSI), more than 200 customers per firm for nearly 200 companies are surveyed each year	ACSI	Fornell et al. (2006)
Firm value	Two most common kinds of firm value measures are return and risk. While return is the magnitude and speed of firm future cash flows (i.e., firm-specific abnormal return beyond what is normally expected from financial markets), risk refers to the vulnerability or volatility of cash flows (i.e., systematic and idiosyncratic risks)	CRSP COMPUSTAT	Srinivasan and Hanssens (2009); McAlister et al. (2007); Tuli and Bharadwaj (2009)
Analyst coverage	Number (in natural log) of financial analysts following or covering the stock of the firm	I/B/E/S	Barron et al. (2002)
Analyst earnings forecast errors	Differences (in absolute values) between the latest analysts' median consensus forecasts before the earnings announcements and the firms' actual earnings per share scaled by stock prices	I/B/E/S	Barth et al. (2001); Thomas (2002)
Analyst expertise	The firm-specific experience of the financial analysts working at the brokerage firm	I/B/E/S	Ertimur, Sunder, and Sunder (2007); Bradshaw (2004)
Total asset	Firms' reported total assets from the start and end of the fiscal year (Data #6)	COMPUSTAT	Anderson et al. (2004)
ROA	The ratio of a firm's operating income (Data #21) to its book value of total assets	COMPUSTAT	Jacobson and Mizik (2009)
ROA variability	The standard deviation of the reported prior five years ROA	COMPUSTAT	Rego, Billett, and Morgan (2009)
Advertising investment	Advertising expenses (Data #45 in the COMPUSTAT data source) divided by sales revenue (Data #12)	COMPUSTAT	McAlister et al. (2007)
R&d investment	Research and development expenses (Data #46) divided by sales	COMPUSTAT	Luo and Homburg (2007)
Financial leverage	The ratio of long-term book debt (Data #9) to total assets.	COMPUSTAT	Tuli and Bharadwaj (2009)
Dividend	The ratio of cash dividends to firm market capitalization [Data #89/(Data #14*Data #61)]	COMPUSTAT	McAlister et al. (2007)
Liquidity	The current ratio of a firm (Data #40/Data #49)	COMPUSTAT	Tuli and Bharadwaj (2009)
Product market competition	Herfindahl industry concentration index	COMPUSTAT	Hou and Robinson (2006)
Financial market uncertainty	Degree of uncertainty and fluctuation of the general stock market returns	CRSP COMPUSTAT	Sarkar and Schwarts (2009)

Table 1: Data and Measures

2.2 Measuring Customer Satisfaction

Customer satisfaction is measured by ACSI (www.theacsi.org), a data source developed by the National Quality Research Center at the University of Michigan. ACSI assesses the

perceived overall consumption experience of goods or services based on over 50,000 customers every year (Anderson and Mansi 2009; Fornell and colleagues 2006).

We have ACSI data for this project over twelve years (1995 to 2006). Because ACSI offers satisfaction data quarterly for each company once a year (Fornell, Rust, and Dekimpe 2009; Tuli and Bharadwaj 2009), we needed a careful mechanism to merge ACSI with I/B/E/S, CRSP and COMPUSTAT quarter by quarter. For example, for firms with ACSI scores reported in the first quarter, we use only analyst recommendation and forecasting data for the same *quarter* before the actual earnings announcements. We apply the same procedure for the other three quarters in order to more precisely merge customer satisfaction, analyst recommendation, firm value and covariates data. As a result of merging ACSI with I/B/E/S, CRSP, and COMPUSTAT data sources, we had 1,126 pooled firm-year observations. Because of using changes in the variables, we lost one year of observations and had 1,032 usable observations for the final dataset.

Note that in line with Jacobson and Mizik (2009), not all firms had observations available for all variables, i.e., in an unbalanced panel. These firms represent 24 different two-digit major groups on the basis of SIC codes. Each major group has an average number of 47 firm-year observations (an average, each sector covers about 5 firms and 9.4 years). We find that the largest group in ACSI is the utilities sector (SIC 49) with 305 observations, while furniture (SIC 57) and tobacco sectors (SIC 21) are among the sectors with the smallest number of observations (Jacobson and Mizik 2009, p. 85; Tuli and Bharadwaj 2009, p. 17). In ACSI sample, firms can be added (Amazon.com added in Q4:2000) or dropped (US West dropped in Q1:2001) over time, and companies (e.g., GM) may have multiple brands as noted by Anderson et al. (2004) and Ittner, Larcker, and Taylor (2009). Although the whole sample is unbalanced and some firms only have ACSI scores for more recent year, we failed to find significantly different results by using sub-samples (e.g., 1995-2002, 1995-2004, vs. 1995-2006). Table 2 summarizes the statistics of customer satisfaction, while Figure 2 visually presents the movement of satisfaction over time.

	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum
1995	78.110	6.271	76.657	79.563	56.000	90.000
1996	77.502	6.391	76.011	78.993	60.500	90.000
1997	76.199	5.825	74.840	77.558	60.000	86.000
1998	76.282	5.886	74.899	77.665	60.000	88.000
1999	75.701	6.118	74.321	77.080	61.000	88.000
2000	76.451	6.555	75.011	77.891	61.000	90.000
2001	74.307	6.958	72.948	75.667	59.000	89.000
2002	74.943	6.633	73.695	76.191	53.000	88.000
2003	75.845	5.967	74.743	76.947	55.000	90.000
2004	74.942	5.940	73.868	76.015	56.000	88.000
2005	75.574	5.985	74.527	76.621	58.000	91.000
2006	75.333	5.783	74.274	76.391	63.000	88.000

Table 2: Data for Customer Satisfaction

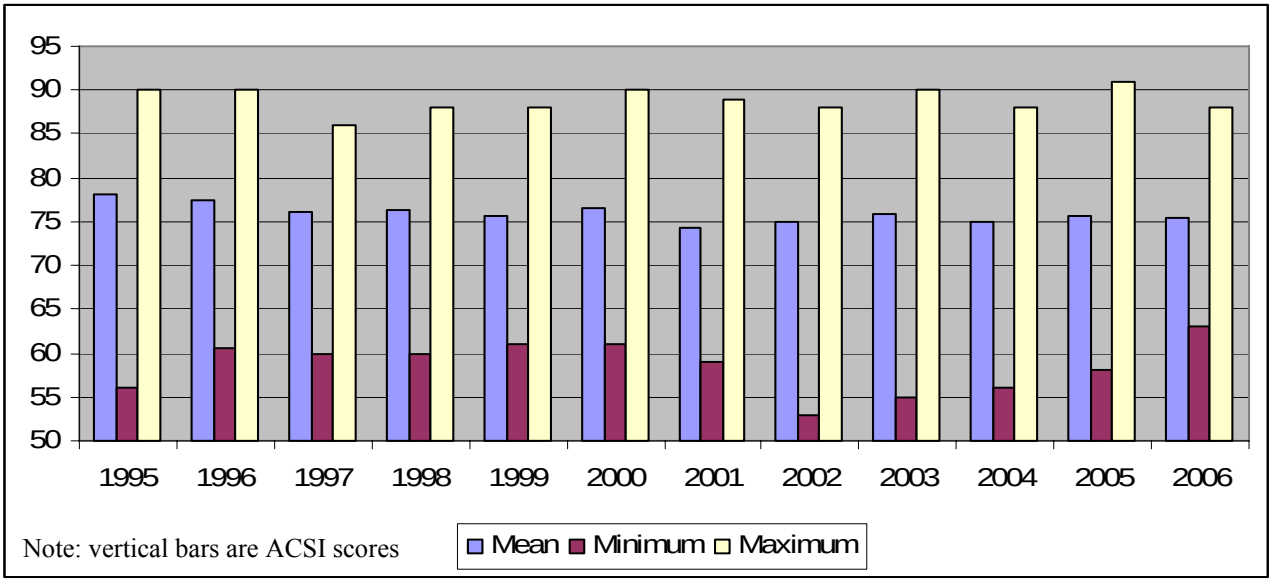

Figure 2: Customer Satisfaction over Time

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2.3 Measuring Analyst Stock Recommendations

We obtain data on financial analysts' stock recommendations from I/B/E/S. In essence, I/B/E/S provides information of analyst recommendations, earnings forecasts, and other financial items for publicly traded companies. I/B/E/S covers more than 45,000 companies from 70 markets worldwide with data back to 1976. Matchable with ACSI and COMPUSTAT

data sources, I/B/E/S offers comprehensive data on analysts' stock recommendations and earnings forecasts and, thus, presents a unique opportunity for testing the role of customer satisfaction in forming guidance for investment decisions in financial markets. Since there are often multiple financial analysts following each firm in the ACSI sample, and each analyst may provide multiple recommendations for each firm, we originally collected a total of 31,968 observations for the firms covered by both ACSI and the I/B/E/S.

According to I/B/E/S, *analyst stock recommendations* are measured as the median consensus of buy-hold-sell recommendations provided by analysts for stock investors. This measure is in a reversed Likert scale (1=strong buy, 2=buy, 3=hold, 4=under-perform, and 5=sell). We transformed this reverse coding so that a larger number indicates better stock recommendations in a more straightforward fashion (i.e., in our new coding, 5=strong buy and 1=sell). In addition, *recommendation dispersion* is measured as the reported standard deviation of recommendations issued by analysts to investors from I/B/E/S. These measures of recommendations are widely used in finance and accounting (Howe, Unlu, and Yan 2009; Womack 1996). Table 3 reports the summary statistics of analyst stock recommendations. In general, the higher the analyst recommendations or the lower their dispersion, the better firms' future cash flow prospects (Barber et al. 2001; Thomas 2002).

	Analyst stock Recommendations	**Dispersion in Analyst stock Recommendations**	**Analyst Earnings Forecast Error**	**Analyst Coverage/Following**
Mean	3.594	1.026	0.224	15.882
Median	3.667	1.108	0.067	14.000
Maximum	5.000	2.217	11.547	45.000
Minimum	1.292	0.662	0.000	1.000
Std. Dev.	0.549	0.576	0.674	8.017
Skewness	0.247	0.183	9.903	7.225

Table 3: Data for Analysts' Stock Recommendations and Earnings Forecasts

2.4 Measuring Firm Value

Prior marketing studies (Srivastava et al. 1998; Srinivasan and Hanssens 2009) have suggested that the two most common kinds of firm value measures are stock price-based return and risk. Particularly, return is the magnitude and speed of firm future cash flows, i.e.,

abnormal return beyond what is normally expected from financial markets. Risk refers to the vulnerability or volatility of cash flows, i.e., systematic and idiosyncratic risks of the firm.

To measure expected return from financial markets, we have the extended Fama-French-Carhart model (Fama and French 1993) at the firm level:

$$(1) \quad R_{it} - R_{ft} = \beta_{0i} + \beta_{1i}(R_{mt} - R_{ft}) + \beta_{2i}SMB_t + \beta_{3i}HML_t + \beta_{4i}MOM_t + \psi Log(h_{it}) + \varepsilon_{it},$$

$$h_{it} = \alpha_0 + \alpha_1 \varepsilon_{it-1}^2 + \gamma_1 h_{it-1}, \qquad \varepsilon_{it} \mid (\varepsilon_{it-1}, \varepsilon_{it-2}, \ldots) \sim N(0, h_{it}),$$

where R_{it} = returns for firm i on time t, R_m = average market returns, R_f = risk-free rate, SMB = size effects, HML = value effects, MOM = Carhart's momentum effects, β_{0i} = the intercept, h_{it} = conditional volatility, and ε_{it} = model residual. Note that this model accounts for not only risk-return tradeoffs (with ψ parameter) but also serial correlation and conditional heteroskedasticity in stock prices (with h_{it}, α_1, and γ_1 parameters, Bollerslev 1986; Schwert and Seguin 1990; Lundblad 2007). Although our hypothesis testing results are robust to both, the extended model has a better fit than non-extended Fama-French-Carhart model (based on BIC and model R^2).

Abnormal returns (AR_{it}) is then calculated as the difference between the observed returns and the expected returns:

$$(2) \quad ASR_{it} = (R_{it} - R_{ft}) - \left[\hat{\beta}_{0i} + \hat{\beta}_{1i}(R_{mt} - R_{ft}) + \hat{\beta}_{2i}SMB_t + \hat{\beta}_{3i}HML_t + \hat{\beta}_{4i}MOM_t + \hat{\psi}Log(\hat{h}_{it})\right],$$

Systematic risk of the firm is the estimated coefficient β_{1i} in equation 1. *Idiosyncratic risk* is the conditional standard deviation (volatility h_{it}) of the model residuals from this equation (McAlister et al. 2007; Tuli and Bharadwaj 2009). Data for stock prices are obtained from CRSP. Data for Fama-French factors and momentum (R_m, R_f, MKT, SMB, HML, MOM) are available at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. We also find robust results with downside systematic and idiosyncratic risks (Tuli and Bharadwaj 2009).

2.5 Measuring Control Variables

We have a comprehensive set of firm- and industry-level covariates, closely following the widely-used models of financial analyst metrics (Jegadeesh et al. 2004; Thomas 2002) and stock risks in finance (Ferreira and Laux 2007), accounting (Lui, Markov, and Tamayo 2007),

and marketing (McAlister et al. 2007; Rego et al. 2009; Tuli and Bharadwaj 2009). This allows us to control for factors that are supported in the literature and calibrate the extent to which customer satisfaction contirbutes new informaton in explaining analyst recommendations and firm value. The covariates are measured as follows.

Product market competition is measured as the Herfindahl industry concentration index, which is the sum of squared market shares of the firms in the industry derived from sales revenue (Data #12 from COMPUSTAT), on the basis of Standard Industrial Classification (SIC) codes. That is, $Herfindahl_j = \sum_{i}^{I} s_{ij}^2$, where s_{ij} is the ratio of firm's sales to the total sales of industry j to which firm i belongs (Hou and Robinson 2006, p. 1933). The lower the industry concentration index, the higher the product market competition.

Financial market volatility is the degree of uncertainty and fluctuation of the broad stock market returns (AMEX/NYSE/NASDAQ indexes). We measure it with the conditional return volatility in the extended Fama-French-Carhart model at the *market* level.

(3) $$R_{mt+1} - R_{ft+1} = \beta_0 + \beta_1(R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 MOM_t + \psi Log(\omega_{it+1}) + \phi_{it+1},$$

$$\omega_{t+1} = \alpha_0 + \alpha_1 \phi_t^2 + \gamma_1 \omega_t, \qquad \phi_{t+1} \mid (\phi_t, \phi_{t-1}, \ldots) \sim N(0, \omega_{t+1}),$$

where ω_{t+1} = the latent conditional variance of residual terms, or the measure of financial market volatility. We obtain the daily stock market return from CRSP and French's website.

Analysts' *earnings forecast errors* are gauged as the differences (in absolute values) between the latest analysts' median consensus forecasts (MEDEST) before the earnings announcements and the firms' actual earnings per share scaled by stock prices. We collect the data from I/B/E/S. Analysts' earnings forecast errors are important for stock recommendations and firm valuation in finance and accounting literature (Barth et al. 2001; Lui, Markov, and Tamayo 2007).

Analyst coverage is measured as the number (in natural log) of financial analysts following or covering the stock of the firm (Barron et al. 2002). Because analyst coverage affects the cost of equity financing, it may affect stock recommendations and firm value.

Following prior accounting studies (Ertimur, Sunder, and Sunder 2007, p. 583), we measure *analyst expertise* as the firm-specific experience of the financial analysts working at the brokerage firm. The more forecasting experience an analyst has, the more accurate the issued stock forecast and recommendations should be (Barth et al. 2001; Chen and Matsumoto 2006).

Firms' *advertising* investment is measured as advertising expenses (Data #45 in the COMPUSTAT data source) divided by sales revenue (Data #12). Prior studies (McAlister et al. 2007) found that advertising affects systematic risk and return.

R&D investment is measured as research and development expenses (Data #46) divided by sales. Prior studies found that R&D affects systematic risk and analyst recommendations (Barth et al. 2001; McAlister et al. 2007; Thomas 2002).

Total assets are measured as firms' reported total assets from the start and end of the fiscal year (Data #6). This covariate controls for size effects of analyst recommendations.

Firm dividend is the ratio of cash dividends to firm market capitalization [Data #89/(Data #14*Data #61)] from COMPUSTAT. Because dividend payment is valued by analysts and investors, it would influence recommendations and firm value.

Liquidity is the current ratio of a firm (Data #40/Data #49) from COMPUSTAT. We control for this variable because compared to fixed assets, liquid assets are related to less volatile returns and thus preferred by investors (McAlister et al. 2007).

Firm financial leverage is the ratio of long-term book debt (Data #9) to total assets. Prior financial studies have linked leverage to analyst earnings forecasts (Thomas 2002) and firm risk (Lui, Markov, and Tamayo 2007).

Firm profitability (ROA) is measured as the ratio of a firm's operating income (Data #21) to its book value of total assets.

ROA variability is measured as the standard deviation of the reported prior five years of ROA in COMPUSTAT. Profitability and ROA variability contain firm fundamentals information, thus likely affecting stock recommendations and firm value (Jacobson and Mizik 2009).

2.6 Model Specifications

Because we used a cross-sectional time-series dataset, there are several issues to be accommodated in the model specifications. First, we control for observable and unobservable heterogeneity. Regarding observable heterogeneity, we have included many (firm-, analyst-, industry-level) covariates to rule out these multi-level alternative explanations of the modeling results. To accommodate firm-specific unobservable heterogeneity, we model the impact of changes in satisfaction on changes in analyst recommendations and firm value (McAlister et al. 2007; Tuli and Bharadwaj 2009) as follows:

(4) $$\Delta ln(ARR_{it}) = \delta_0 + \delta_1 \Delta ln(ACSI_{it}) + \delta_2 \Delta ln(ACSI_{it}) \text{ x } (\Delta PMC_{it}) + \delta_3 \Delta ln(ACSI_{it}) \text{ x } (\Delta FMV_{it}) + \delta_{covariates}(Covariates_{it}) + \varpi_{it1},$$

(5) $$\Delta ln(ARD_{it}) = \xi_0 + \xi_1 \Delta ln(ACSI_{it}) + \xi_2 \Delta ln(ACSI_{it}) \text{ x } (\Delta PMC_{it}) + \xi_3 \Delta ln(ACSI_{it}) \text{ x } (\Delta FMV_{it}) + \xi_{covariates}(Covariates_{it}) + \varpi_{it2},$$

where ΔARR_{it} = changes in stock recommendations, ΔARD_{it} = changes in recommendation dispersion, $\Delta ACSI_{it}$ = changes in customer satisfaction, ΔPMC_{it} = changes in product market competition, ΔFMV_{it} = changes in financial market volatility, δ_0 = the intercept, ξ_0 = the intercept, ϖ_{it}=the residual term with a variance σ^2_{ϖ}.

Furthermore, our model accommodates the possible biases of heteroskedasticity, serial correlation, and interdependent errors across the two equations above. Specifically, we employ the generalized method of moments (GMM) approach to simultaneously estimate equations 4 and 5. This simultaneous approach not only addresses the non-independent error issue but also improves statistical efficiency. Because it relies on moment conditions rather than full density, GMM provides heteroskedasticity-consistent and asymptotically correct standard errors for statistical inferences. According to the econometrics literature (Hamilton 1994), GMM uses the White heteroskedasticity and autocorrelation robust covariance matrix Φ_{HAC} as follows:

(6) $$\hat{\Phi}_{HAC} = \hat{\Gamma}(0) + \left(\sum_{j=1}^{T-1} k(j,q)(\hat{\Gamma}(j) + \hat{\Gamma}'(j)) \right), \quad \hat{\Gamma}(j) = \frac{1}{T-k} \left(\sum_{t=j+1}^{T} Z_{t-j}' \varpi_t \varpi_{t-j}' Z_t \right),$$

where ω = vector of White residuals, q = the bandwidth, k = the kernel, and Z_t = a k x p matrix in the GMM approach (Hamilton 1994, pp. 409-22).

To test the mediating role of analyst recommendation in satisfaction's possible impact on firm value, we follow the three-step mediation regression approach recommended by Baron and Kenny (1986). In step one, analyst recommendation is regressed against ACSI as specified by equations 4 and 5. In step two, firm value is regressed against ACSI as follows:

(7) $$\Delta ln(FV_{it}) = \Omega_0 + \Omega_1 \Delta ln(ACSI_{it}) + \Omega_2 \Delta ln(ACSI_{it}) \text{ x } (\Delta PMC_{it}) + \Omega_3 \Delta ln(ACSI_{it}) \text{ x } (\Delta FMV_{it}) + \Omega_{covariates}(Covariates_{it}) + \varpi_{it3},$$

where ΔFV_{it} = changes in firm value. As discussed, firm value is measured by abnormal return (AR_{it}), systematic risk ($\Delta\beta_{it}$), and idiosyncratic risk (Δh_{it}).

Finally, in step three, firm value is regressed against recommendations and ACSI as follows:

$$(8)\ \Delta ln(FV_{it}) = \Omega_{d0} + \Omega_{d1}\Delta ln(ACSI_{it}) + \Omega_{d2}\Delta ln(ACSI_{it}) \times (\Delta PMC_{it}) + \Omega_{d3}\Delta ln(ACSI_{it}) \times (\Delta FMV_{it}) + \Omega_{d4}\Delta ln(ARR_{it}) + \Omega_{d5}\Delta ln(ARD_{it}) + \Omega_{dcovariates}(Covariates_{it}) + \varpi_{it4}.$$

Note that the covariates here include ΔROA. Thus, our results have corrected for changes in accounting profitability in testing the satisfaction-recommendation-value link.

3 Results

3.1 Results on the Effect of Customer Satisfaction on Analyst Stock Recommendations

H_1 predicts that positive changes in satisfaction positively influence changes in analyst recommendations for the firm. As Table 4 shows, the coefficient of satisfaction is positive and significant (δ=1.306, p<.01). As such, H_1 is supported by the data. Thus, all else equal, we find evidence for the notion that firms with higher customer satisfaction are associated with more positive analyst stock recommendations.

	Changes in Analyst Stock Recommendations	Changes in Analyst Stock Recommendations	Changes in Analyst Stock Recommendations
Intercept	-11.252***	-8.336***	-15.398***
ΔAnalyst Coverage	1.017	1.086	1.103
ΔAnalyst Earnings Forecast Errors	0.293	0.307	0.316
ΔAnalyst Expertise	0.568*	0.575*	0.572*
ΔTotal Asset	0.153**	0.146**	0.139**
ΔROA	1.982**	1.936**	1.957**
ΔROA Variability	-0.133	-0.126	-0.128
ΔAdvertising Investment	3.605***	3.662***	3.651***
ΔR&D Investment	2.109*	2.231*	2.217*
ΔFinancial Leverage	-0.783*	-0.762*	-0.802*
ΔDividend	1.023**	1.125**	1.108**
ΔLiquidity	0.092	0.086	0.083
ΔCustomer Satisfaction (ACSI)	1.306***	1.293***	1.286***
ΔProduct Market Competition (PMC)		-0.033*	-0.031*
ΔFinancial Market Uncertainty (FMU)		-0.875**	-0.906**
ΔACSI x ΔPMC			0.708**
ΔACSI x ΔFMU			0.495*
R-squared	0.21	0.27	0.32
Change in R-squared		0.06***	0.05***
F-statistic	10.615	17.556	19.128
Schwarz Bayesian Information Criterion	2.472	2.207	1.838
N	1032	1032	1032

Note: * $p<.10$, ** $p<.05$, *** $p<.01$. For ease of exposition, we have multiplied all coefficients related to PMC by -1, because PMC is measured in a reversed order with Herfindahl industry concentration index (i.e., the lower the concentration index, the higher the product market competition).

Table 4: Results for the Impact of Customer Satisfaction Changes on Analyst Stock Recommendations

H_2 predicts that positive changes in satisfaction of a firm negatively influence dispersion in analyst recommendations for the firm. As Table 5 shows, the coefficient of satisfaction is negative and significant (ξ=-0.713, $p<.05$). As such, H_2 is supported. Thus, we find empirical support that firms with higher customer satisfaction are associated with smaller dispersion (fewer disagreements) among analyst stock recommendations.

	Changes in Dispersion in Analyst Stock Recommendations	Changes in Dispersion in Analyst Stock Recommendations	Changes in Dispersion in Analyst Stock Recommendations
Intercept	-9.326***	-12.104***	-13.587***
ΔAnalyst Coverage	0.781	0.802	0.775
ΔAnalyst Earnings Forecast Errors	1.202**	1.241**	1.226**
ΔAnalyst Expertise	-0.195	-0.181	-0.193
ΔTotal Asset	0.211**	0.232**	0.225**
ΔROA	-1.055*	-1.131*	-1.128**
ΔROA Variability	0.087	0.076	0.082
ΔAdvertising Investment	2.182**	2.035**	2.066**
ΔR&D Investment	1.893*	1.866*	1.859*
ΔFinancial Leverage	0.072	0.063	0.069
ΔDividend	-0.926**	-0.918**	-0.907**
ΔLiquidity	0.027	0.053	0.036
ΔCustomer Satisfaction (ACSI)	-0.713**	-0.692**	-0.685**
ΔProduct Market Competition (PMC)		-0.052	-0.057
ΔFinancial Market Uncertainty (FMU)		0.458*	0.446*
ΔACSI x ΔPMC			-0.415**
ΔACSI x ΔFMU			-0.071
R-squared	0.16	0.24	0.28
Change in R-squared		0.08***	0.04**
F-statistic	9.138	13.226	18.037
Schwarz Bayesian Information Criterion	2.605	2.535	2.006
N	1032	1032	1032

Note: * $p<.10$, ** $p<.05$, *** $p<.01$. For ease of exposition, we have multiplied all coefficie related to PMC by -1, because PMC is measured in a reversed order with Herfindahl indus concentration index (i.e., the lower the concentration index, the higher the product mar competition).

Table 5: Results for the Impact of Customer Satisfaction Changes on Dispersion in Analyst Stock Recommendations

3.2 Results on the Moderating Role of Product Market Competition and Financial Market Volatility

H_3 predicts that the impact of changes in satisfaction on analyst recommendations and dispersion is stronger in high product market competition. As Table 4 shows, the coefficient of customer satisfaction changes x product market competition is positive and significant

(δ=.708, p<.05). Therefore, the positive impact of satisfaction on analyst recommendations is stronger when competition is high in product markets.

In addition, Table 5 shows that the coefficient of customer satisfaction changes x product market competition is negative and significant (ξ=-.415, p<.05). Therefore, the negative impact of satisfaction on recommendation dispersion is stronger in high product market competition compared to low product market competition. Hence, H_3 is supported.

H_4 predicts that the impact of changes in satisfaction on analyst recommendations and dispersion is stronger in high financial market uncertainty. As Table 4 shows, the coefficient of customer satisfaction x financial market is positive and marginally significant (δ=.495, p<.10). Thus, when financial market uncertainty is high, there is a stronger positive association between satisfaction and analyst recommendations.

However, Table 5 indicates that the coefficient of customer satisfaction changes x financial market uncertainty is not significant statistically (p>.05). Therefore, H_4 is partially supported for stock recommendations only, but not for recommendation dispersion. Also, including interaction items explains significantly more variance of analyst recommendations and dispersion. As reported in Tables 4 and 5, adding interactions of satisfaction changes x product market competition and satisfaction changes x financial market uncertainty leads to an incremental R-squared of .05 (p<.01) for changes in recommendations and .04 (p<.05) for changes in dispersion.

3.3 Results on the Mediating Role of Customer Satisfaction

H_5 predicts that analyst recommendations at least partially mediate the associations between satisfaction and firm value. According to Baron and Kenny (1986), to establish mediation, satisfaction must affect recommendations, and recommendations must affect firm value. As discussed earlier, satisfaction affects recommendations. Also, results in Table 6 suggest that recommendations affect firm value (except the dispersion–systematic risk association). As reported in Table 6, because inclusion of recommendations in the model reduces the strength of the effects of satisfaction on abnormal return (from Ω=.893, p<.05 to Ω=.712, p<.10, only marginally significant), our data support a partial mediating role of recommendations.

In addition, entering recommendations leaves the impact of satisfaction on systematic risk no longer significant (from p<.05 to p>.10), thus supporting a full mediation. Also, inclusion

of recommendations reduces the effects of satisfaction on idiosyncratic risk (from Ω=-3.452, p<.01 to Ω= -2.618, p<.05), again supporting a partial mediation role of recommendations. Therefore, H_4 is supported by the data. Also, the inclusion of mediating effects of recommendations significantly improves the fit of the full models as presented in Table 6.

	Firm Value: Abnormal Return		**Firm Value: Systematic Risk**		**Firm Value: Idiosyncratic Risk**	
Mediation Effects						
Changes in Analyst Stock Recommendations		0.217***		-0.518**		-0.865***
Changes in Dispersion in Analyst Stock Recommendations		-0.091**		0.062		0.277**
ΔCustomer Satisfaction (ACSI)	0.893**	0.712*	-1.896**	-0.526	-3.452***	-2.618**
ΔACSI x ΔPMC	0.429**	0.415**	-1.084**	-0.895*	-1.426***	-1.107**
ΔACSI x ΔFMU	0.067*	0.021	0.046	0.031	-0.210**	-0.163*
ΔProduct Market Competition (PMC)	-0.047	-0.032	1.277***	1.281**	-1.815**	-1.823**
ΔFinancial Market Uncertainty (FMU)	-0.327**	-0.336**	1.215**	1.237**	0.064	0.032
ΔAnalyst Coverage	0.026	0.017	-0.021*	-0.026*	0.008	0.002
ΔAnalyst Earnings Forecast Errors	0.063	0.051	0.137	0.115	0.106	0.085
ΔAnalyst Expertise	0.167*	0.169*	-0.576	-0.502	-0.869*	-0.871*
ΔTotal Asset	0.386***	0.355***	0.163*	0.166*	0.121	0.109
ΔROA	2.677***	2.681***	-1.237**	-1.241**	-5.358***	-5.354***
ΔROA Variability	-1.681*	-1.679*	1.581**	1.579**	3.028**	3.022**
ΔAdvertising Investment	0.055**	0.042*	-4.927***	-4.233**	-3.637***	-3.145**
ΔR&D Investment	0.046**	0.037*	-3.116**	-3.107**	-2.557**	-2.036*
ΔFinancial Leverage	0.138	0.120	0.758**	0.762**	4.562***	4.027**
ΔDividend	1.071	1.063	-1.358	-1.316	0.517	0.505
ΔLiquidity	0.156	0.142	0.107	0.082	0.186	0.163
R-squared	0.26	0.35	0.43	0.48	0.45	0.59
Change in R-squared		0.09***		0.05**		0.14***
F-statistic	8.576	9.208	7.553	8.829	8.638	9.716
N	1032	1032	1032	1032	1032	1032

Table 6: Results for the Mediating Role of Analyst Stock Recommendations in the Impact of Customer Satisfaction Changes on Firm Value

Specifically, adding changes in recommendations leads to an incremental R-squared of .09 (p<.01) for abnormal return, .05 (p<.05) for systematic risk, and .14 (p<.01) for idiosyncratic

risk, thus explaining significantly more variance of firm value metrics. We do not find a threat of multicollinearity problem because the largest variance inflation factor is 2.76 in the full models.

These mediation results are interesting because they reveal finer-grained evidence for the presence or absence of the impact of customer satisfaction on firm value, i.e., depending on the mediating role of recommendations ignored in the satisfaction literature. We calculate that satisfaction's direct effects on abnormal return are 0.712, while its indirect effects via recommendations are 0.348 = [1.306 x 0.217 + (-0.713) x (-0.091)] (see Tables 4, 5, and 6 for the corresponding coefficients). While satisfaction's direct effects on systematic risk are insignificant, its indirect effects via analyst recommendations are -0.677 = 1.306 x (-0.518). Also, satisfaction's direct effects on idiosyncratic risk are -2.618, and its indirect effects via recommendations are -1.327 = [1.306 x (-0.865) + (-0.713) x 0.277], thus expanding satisfaction's risk-reduction benefits by 34% [=1.327/(1.327+2.618)]. In addition, we conducted the Sobel test for mediation in order to assess whether the indirect mediation effects are statistically significant (Sobel 1982). The standard Sobel test model is: $z_{value} = ab / \sqrt{a^2 s_b^2 + b^2 s_a^2 + s_a^2 s_b^2}$, where a and s_a are coefficient and standard error for the impact of independent variable on mediator, and b and s_b are coefficient and standard error for the impact of mediator on the dependent variable. We find that Sobel test results are consistently significant (smallest z_{value} = 2.98, $p<.05$) for all indirect mediation effects (except the mediation role of dispersion in the satisfaction-systematic risk link). Thus, by and large, satisfaction' indirect effects through the mediating role of recommendations are significant. In accordance with Jacobson and Mizik (2009), we surmise that the mediating role of recommendations may serve as a mechanism that channels the effects of satisfaction on firm return and risk. We also extend Tuli and Bharadwaj's (2009) study of direct effects by revealing satisfaction's *indirect* effects (via recommendations) in boosting abnormal return and reducing systematic and idiosyncratic risks, thus uncovering more complete impact of customer satisfaction.

3.4 Customer Satisfaction and Accurate Analyst Forecasts

A major topic in finance and accounting literature is how to gain an understanding when analysts' earnings forecasts are more accurate, i.e., to lower forecasting errors. The importance of raising accuracy in analyst forecasts is straightforward, given that an

enhancement may lead to a superior forecast of earnings that "could provide an important advantage to investors in generating abnormal returns" (Loh and Mian 2006, p. 456). Consequently, an interesting test would examine whether changes in customer satisfaction led to more or less accurate analyst forecasts. Studies in the accounting and finance literature have noted that a key determinant of analyst forecast accuracy is the valuation of intangible assets. For example, a disregard of spending on R&D can lead to severe forecast errors, whereas high attention to such spending leads to more accurate analyst forecasts (Lev 2001). Consistent with this literature, one may expect that picking up customer satisfaction information, another element of firm intangible assets, should lead to a higher level of earnings forecast accuracy. Additional analyses suggest that changes in satisfaction are indeed associated with smaller earnings forecast errors (b=-0.028, $p<.05$) or more accurate earnings forecasts, even after accounting for ROA, analyst coverage, analyst expertise, and other covariates in this study. We also conduct additional data analyses surrounding alternative measures of customer satisfaction relative to competition, other analyst-based metrics such as analyst coverage, different modelling techniques, as well as unit root and structural break tests. The results are provided in the web-based Appendix B.

4 Discussion and Implications

How strongly is customer satisfaction related to analyst stock recommendations and to what extent is satisfaction's impact on firm value channelled by recommendations? On the basis of a large-scale longitudinal dataset, we find that after accounting for ROA, positive changes in satisfaction not only improve analyst recommendations but also lower dispersion in recommendations for the firm. These effects are heterogeneous across different conditions of product market competition and financial market uncertainty. In addition, analyst recommendations at least partially mediate the effects of changes in customer satisfaction on firm abnormal return, systematic risk, and idiosyncratic risk. Analyst stock recommendations may represent a conduit through which intangible assets such as customer satisfaction affect firm value. If analysts pay attention to Main Street customer satisfaction, then Wall Street investors should have good reason to listen and follow. The design and findings of our study have a number of research and practical implications.

4.1 Research Implications

Our study makes several contributions to marketing research. First, on a broader level, it advances the research stream on the marketing-finance interface. We usher in an important set of financial analyst-based metrics directly from finance and accounting literature. These metrics (analyst stock recommendations, recommendation dispersion, earning forecast accuracy, and downgrades in recommendations and earning forecasts) may enlarge the scope of marketing research because they add a new perspective of marketing's impact on the investor community (Gupta, Lehmann, and Stuart 2004). Our works brings together two different streams of research in disparate disciplines to examine how customer satisfaction in the marketing domain can influence analyst recommendations in the finance domain. For marketing researchers it appears crucial to understand the reactions of analysts to customer satisfaction information, since analysts provide investors with expert guidance. Similarly, for finance and accounting researchers our study raises awareness of non-financial assets, which help analysts provide more precise earnings forecasts and stock recommendations to investors.

Furthermore, with respect to the customer satisfaction literature in particular, our study contributes to previous knowledge by uncovering additional roles that satisfaction can play. The extant literature thus far has rarely linked satisfaction to outcomes on the analyst side. In this sense, we provide a vital, stock analyst-based aspect of understanding how and why customer satisfaction should affect firm stock prices ultimately, i.e., via its indirect effects on analyst recommendations. This study is important because until now there has been not much evidence about whether stock analysts paid attention to firms' customer satisfaction information.

Also, by revealing that stock recommendation may be an informational pathway through which news of satisfaction reaches investors, we help explain "why financial markets might under-appreciate marketing assets and strategies" (Jacobson and Mizik 2009, p. 13)—that is, whether analysts neglect the information content of changes in customer satisfaction and fail to reflect this intangible information in their recommendations to investors. Intuitively, if analysts ignore vital market-based assets such as customer satisfaction, that negligence would contribute to undependable stock recommendations and assessment of true firm value and, thus, likely would lead to insignificant associations between satisfaction and firm value. On the other hand, if analysts can effectively account for firm-specific information such as

satisfaction and issue recommendations reflecting the true value of the firm, then the information content of satisfaction would be more likely reflected in changes in stock return and risk. In this sense, our results with analyst recommendations help extend the studies by Jacobson and Mizik (2009), Ittner, Larcker, and Taylor (2009), and Fornell, Mithas, and Morgeson (2009). That is, we reveal evidence that the mediating role of analyst recommendations may partially account for the presence or absence of the impact of satisfaction on firm value.

Beyond stock return and risk, analyst recommendations are of interest to the investor community and thus can be used to examine the financial relevance of customer satisfaction. We show that for firms in high market competition, analysts release even more favorable stock recommendations resulted from changes in customer satisfaction. Our findings also reveal that when financial market uncertainty is high, positive changes in satisfaction have an even greater impact on analyst recommendations. As such, these findings explicitly address the relevance of customer satisfaction among the investor community beyond marketers. Future marketing researchers may employ these metrics to test whether the information content of customers and brands is reflected in analyst recommendations and, if it is, show the underlying reasons and analysts-based evidence for the financial impact of marketing actions, consumer mindsets, brand equity, and customer lifetime value (Gupta 2009; Kumar 2008; Srinivasan, Vanhuele, and Pauwels 2009). As market-based intangible assets become more relevant than balance sheet assets in firm value creation (Lehmann 2004; Lehmann and Reibstein 2006), we believe that the marketing profession could improve managerial activities by examining marketing's direct impact on firm value *and* its indirect impact via information intermediaries of financial analysts and their recommendations.

A related implication is that financial market volatility sheds more light on the bearing of customer satisfaction for the investor community. Customer information can be more critical in economic downturns. More specifically, when financial markets are clouded with turbulence and stomach-churning volatility, stock analysts should attend to the non-financial metric of customer satisfaction, because doing so can help more accurately gauge firm future cash flows and the long-term investment value of firm stocks with reduced "forecasting time horizon" bias (Aksoy et al. 2008; Barth et al. 2001; Fornell, Rust, and Dekimpe 2009). To the extent that analysts' earnings forecasts and stock recommendations are more accurate, they are also more reliable as a benchmark for the long-term performance effects of marketing actions and assets.

Beyond the marketing discipline, our work has some implications for the accounting profession and financial reporting of intangibles under the guidelines of FASB. Accounting researchers have supported "the value-relevance of nonfinancial information in intangibles such as R&D, customer-based creation, franchise, and brand development" as well as the "disclosure implications of customer acquisition costs" (Amir and Lev 1996, pp. 4-5). Yet, because nonfinancial intangibles are complex and difficult to quantify, we agree with Tuli and Bharadwaj (2009, p.16) that "The role of stock analysts is a critical one: evaluating the tangible and intangible assets of firms and then marking recommendations to investors based on their evaluations" (Tuli and Bharadwaj 2009, p.16). We also add that FASB may further guide the accounting profession in improving financial reporting and stock forecasting by leveraging the non-financial information of customer satisfaction. Especially when product market competition is high and financial market volatility is large, stock analysts and industry experts should expend extra effort and become more motivated to collect, analyze, and disseminate firms' customer satisfaction changes over time.

4.2 Managerial Implications

Our study offers a number of implications for managers, analysts, and investors. First of all, marketing managers are under mounting pressure to show the financial accountability of marketing strategies (Ambler 2003; Lehmann 2004; Rust et al. 2004). Finding customer satisfaction's significant effect on stock recommendations as well as its direct and indirect impact on firm value has implications for firm communication. CMOs should more effectively communicate the positive effects of intangibles such as customer satisfaction on recommendations and firm stock return/risk, in order to make a stronger case for marketing accountability among top executives inside the boardroom.

In communicating to external stakeholders, CMOs should more proactively disclose (more so than competitors) the quality, improvements, and long-term health of firms' customer satisfaction to the public in SEC 10-K/10-Q filings. Such corporate announcements may help the firms conform to FASB guidelines and signal the financial community their superior future cash flows (stronger growth and lower volatility) relative to product market rivals.

Moreover, because "a principle way in which information is disseminated to financial market participants is through the opinions of stock analysts" (Sorescu and Subrahmanyam 2006, p. 139), managers should encourage financial analysts to (a) more strongly emphasize

the information content of customer satisfaction as a key market-based intangible asset, and (b) increase the practices of training and learning on how to systematically include customer satisfaction in firm evaluations and earnings forecasts (Kim and McAlister 2007). Investments in such training programs may pay off if analysts' stock recommendations more accurately gauge firm long-term cash flow prospects for investors.

With respect to investors on Wall Street, our results imply that, holding other things constant, they should–if they rationally follow analysts' advice –(1) pick up stocks to buy and hold in their portfolios when companies deliver higher customer satisfaction, (2) sell stocks in their portfolios if companies are burdened with greater customer dissatisfaction over time, and (3) rebalance and adapt their portfolios based on the interplay between customer satisfaction changes over time and the settings of both product market competition and financial market volatility.

In conclusion, our research investigates links between customer satisfaction, analyst stock recommendations, and firm value. Previous studies have neglected this issue even though it has important implications for both academics and practitioners. We hope our findings not only reveal analyst-based mechanisms for satisfaction's impact on firm value, but also heighten the need for stock analysts and investors to attend to this market-based asset.

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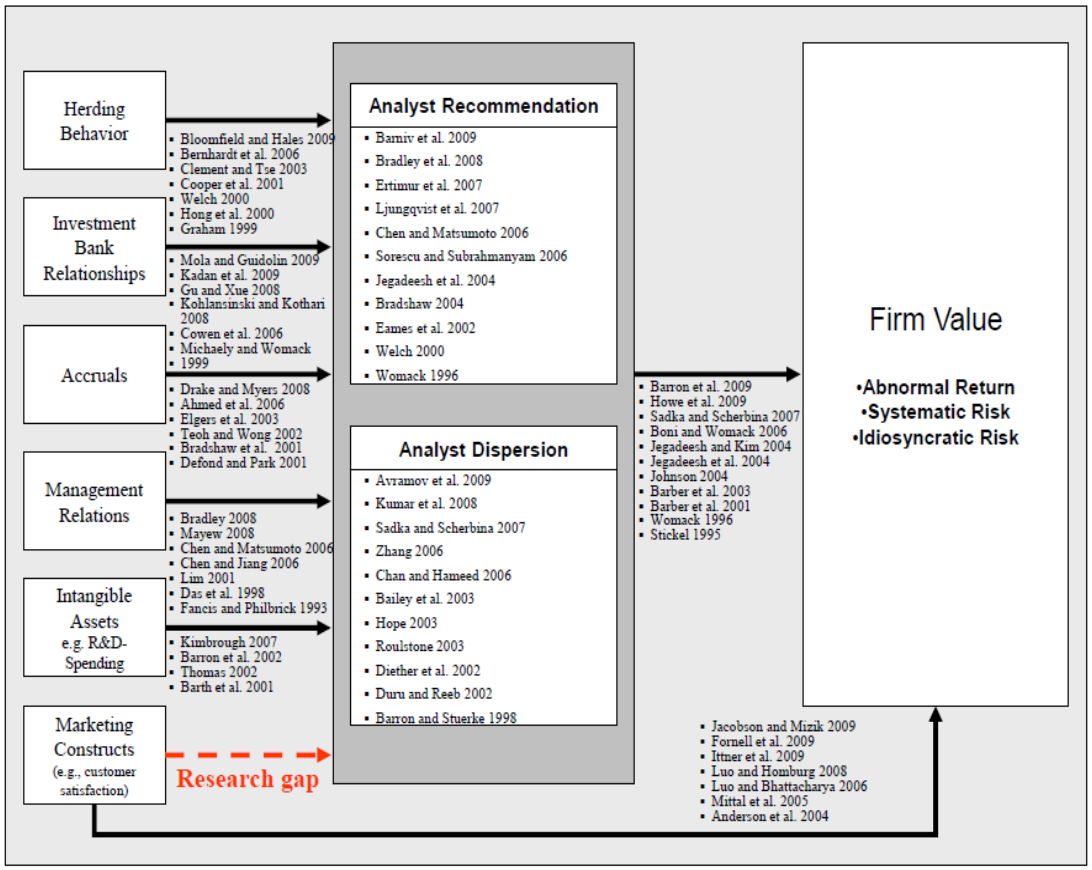
Web Appendix A

As indicated in the Figure below, analyst recommendations have been studied in their role in connecting firms' intangible assets, accruals, and management relations to firm value in the accounting and finance literature.



Web Appendix B Additional Results

We checked our results with several additional steps. First, we employed an alternative measure of customer satisfaction. That is, we use relative customer satisfaction of a firm to its competitors, proxied with the ratio of changes in customer satisfaction to those in the industry. We find that relative customer satisfaction also results in better analyst stock recommendations ($b=1.186$, $p<.01$) and smaller dispersion in recommendations ($b=-0.593$, $p<.05$), adding more evidence for the relations between customer satisfaction and analyst stock recommendations.

Moreover, we use other analyst-based metrics such as analyst coverage, downgrades in analyst stock recommendation revisions, and downgrades in analyst earnings forecast revisions. Consistent with Barth et al. (2001), we find that customer satisfaction changes are

positively related to analyst coverage (b=1.608, p<.01), thus supporting the notion that analysts may spend more efforts to follow firms with higher intangible assets. The additional results with probit models (1= downgrades, 0= otherwise) suggest that changes in customer satisfaction are also associated with lower likelihood of downgrades in stock recommendation revisions (b=-0.461, p<.01) and lower likelihood of downgrades in analyst earning forecast revisions (b=-0.339, p<.05), as expected.

We also test the robustness of our results with different modeling approaches. Because analyst stock recommendations are measured with on a 5-point scale, we apply the ordered probit models. Additional results suggest that the positive impact of changes in customer satisfaction on analyst stock recommendations still holds (b=0.728, p<.01). Furthermore, as our panel data is in a multi-level structure (i.e., firms nested within industries), we ran hierarchical linear models and fail to reject our conclusion. Because our two analyst recommendation variables are related, we choose to present the GMM simultaneous estimation results as reported. Thus, these steps present further empirical evidence on direct implications of customer satisfaction information for stock analysts.

We also formally test the first differences using two most common unit root tests: Augmented Dickey-Fuller test (ADF) and Kwiatkowski-Phillips- Schmidt-Shin test (KPSS). The general model of ADF test is: $\Delta y_t = \alpha y_{t-1} + \sum_{t=1}^{k} \beta_t \Delta y_{t-1} + \gamma x_t + \varepsilon_t$, and the ADF test statistic is: $t_\alpha = \hat{\alpha} / [se(\hat{\alpha})]$. Results show that all ADF test statistics (ranging from -6.608 to -11.257) are significant (p<.05) and that all KPSS test statistics (ranging from 0.136 to 0.296) are significant (p<.05), as expected. Thus, a unit root can be rejected at a 95% confidence level (Dekimpe and Hanssens 1995; Luo 2009). We also conduct structural break tests because a series with two stationary regimes separated by a structural break can be evolving and thus threaten the validity of results (Perron 1990). Specifically, by using rolling-window unit-root, CUSUM-sq, and bounds tests, we fail to find evidence of structural breaks in the first differences data (Pauwels and Hanssens 2007; Pesaran et al. 1985). As such, unit root or structure break is not a concern in our study with differences models, revealing additional support for results robustness.

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