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Although managers are interested in the financial value of customers and researchers have pointed out the importance of stock analysts who advise investors, no studies to date have explored the implications of customer satisfaction for analyst stock recommendations. Using a large-scale longitudinal data set, 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. In addition, 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, Wall Street investors should have good reason to listen and follow. Overall, this research reveals the impact of satisfaction 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 interface, stock recommendations, return, risk

Customer Satisfaction, Analyst Stock Recommendations, and Firm Value

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; Luo 2009; Srinivasan and Hanssens 2009). For example, according to Marketing Science Institute, linking key marketing metrics to the investor community, such as stock analysts, represents a top-priority issue on chief marketing officers' (CMOs') agendas (www.MSI.org).

Stock analysts (e.g., brokerage firms, banks, private researchers) play indispensable roles in financial markets because they "gather and process information about a firm and issue recommendations and forecasts to investors" (Chen and Matsumoto 2006, p. 658). In the simplest terms, 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 and colleagues (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 in finance and accounting research (Howe, Unlu, and Yan 2009), thus far, marketing literature has neglected to study the impact of key marketing instruments on ana-

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lysts. (Analogously, finance and accounting research on analysts has 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 and colleagues (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 nonfinancial, off-balance-sheet assets, stock recommendations are bound to be deficient (Kim and McAlister 2007; Whitwell, Lukas, and Hill 2007), and investors will misevaluate the information content of customer satisfaction (Fornell et al. 2006, p. 11).

To our knowledge, no published studies across marketing, accounting, and finance disciplines have explicitly connected the 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 that explicitly tests "whether customer satisfaction provides information for the Wall Street community such as *financial analysts*" (Tuli and Bharadwaj 2009, p. 3, emphasis added). 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 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 do analyst stock recommendations channel customer satisfaction's possible impact on firm value?

The key contributions of this research 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 (Anderson, Fornell, and Mazvancheryl 2004; Luo and Homburg 2008). 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. 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.

In addition, 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, while their work focuses on stock returns in the value relevance of satisfaction, 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 that have largely been ignored (Fornell, Mithas, and Morgeson 2009a, b; Ittner, Larcker, and Taylor 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 among customer satisfaction, analyst recommendation, and firm value, CMOs may be able to better communicate firm competitive advantages in terms of customer satisfaction to the Wall Street community. In addition, our study of nonfinancial information and analyst recommendations speaks directly to the Financial Accounting Standards Board (FASB). Because the FASB requires that firms disclose nonfinancial information to investors that helps 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 the firm's customer base in annual reports and Securities and Exchange Commission 10-K/10-Q filings to the Wall Street community.

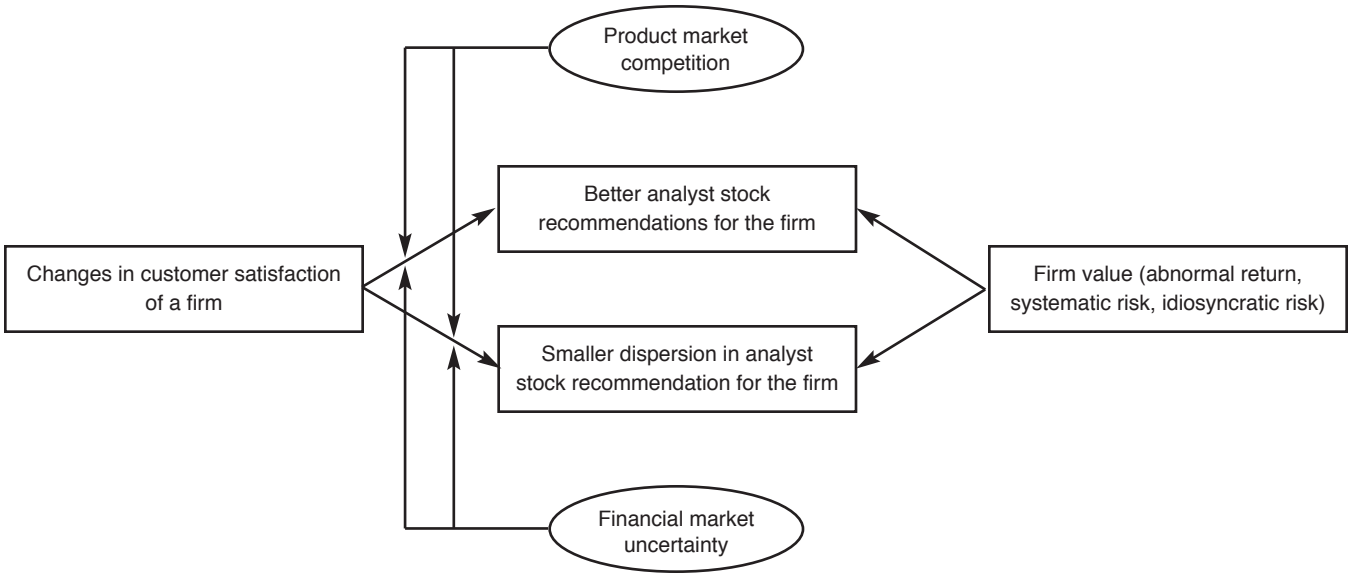
BACKGROUND AND HYPOTHESES

Figure 1 provides an overview of the relationships in our theoretical framework. This framework suggests that (1) changes in customer satisfaction of a firm have an impact on changes in analyst stock recommendations and dispersion in stock recommendations for the firm, (2) product market competition and financial market uncertainty moderate the link between customer satisfaction and analyst recommendations, and (3) recommendations at least partially mediate the relationship 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.

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, and sell decisions (Barber et al. 2001). Ivkovic

Figure 1
CONCEPTUAL FRAMEWORK



and Jegadeesh (2004, p. 434) 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."

Formally, analyst stock recommendations refer to the investment opinions 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," "underperform," 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 (Murphy 2009). For example, when stock analysts release buy recommendations for Metalico Inc., a firm that specializes in recycling scrap, its stock price soars on Wall Street (Marcial 2008). For most firms listed in Standard & Poor's 400, 500, and 600 indexes, Goff and colleagues (2008) report that, in general, stock prices hike up (decrease) in response to upgrades (downgrades) in analyst recommendations. Even during financial crises, investors who follow analysts' sell recommendations suffer fewer losses (Stewart 2009).

Echoing this, scholarly research in finance and accounting has shown the incremental value of stock recommendations over firm earnings. For example, pointing out strong and persistent stock market reactions, Womack (1996, p. 164, emphasis added) finds that "the stock price adjusts either up 5% for changes to *buy*-recommendations or down 11% for changes to *sell*-recommendations." Barber and colleagues (2001) show that a strategy based on the highest recommendations can yield an annualized return of 18.8%, which is significantly greater than the broad financial markets. As such, Jegadeesh and colleagues (2004, p. 1084) 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, p. 1) conclude that "analyst recommendations contain additional information content: changes in recommendations forecast future returns." We provide a more detailed review of studies on analyst stock recommendations in Appendix A. Thus, a rich literature suggests that analyst recommendations are critical financial metrics to the Wall Street community.

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, p. 86) find that analysts pay attention to firm intangibles such as customer satisfaction and loyalty because "such assessment can lead to more reliable valuations of the firm" 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, p. 91) 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." Indeed, prior studies in accounting have shown the importance of intangible research-and-development (R&D) information for analysts. Barth, Kasznik, and McNichols (2001) find that analysts exert

greater efforts to follow firms with higher intangible assets. Barron and colleagues (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, in the next subsection, we propose and discuss the associations between analyst recommendations and the intangible asset of customer satisfaction.

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, Fornell, and Mazvancheryl 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 has suggested 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, Koschate, and Hoyer 2005), which in turn enhance future net cash flows (i.e., "more cash"; see Aksoy et al. 2008; Anderson, Fornell, and Mazvancheryl 2004). In addition, negative customer outcomes (e.g., complaints, defection rates, negative word of mouth) and resultant negative cash flow developments are less likely to occur 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, Shervani, and Fahey 1998, p. 8), which likely results 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 is the likelihood that analysts will 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 that investors hold or buy a firm's stock. Conversely, decreasing satisfaction goes hand in hand with negative customer reactions and should result in subsequent declines in future cash flows, thus leading analysts to issue sell recommendations in this case. Thus:

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

In addition, prior studies have pointed 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 levels of satisfaction helps increase price tolerance and customer retention, positive changes in satisfaction should "reduce the volatility and the risk associated with anticipated future cash flows" (Anderson, Fornell, and Mazvancheryl 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 levels of 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 firms develop market-based assets that can enhance future cash flow prospects through a "reduction in the volatility and vulnerability of cash flows" (Srivastava, Shervani, and Fahey 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 has also indicated that the less uncertain the firms' future cash flow prospects, the greater is the likelihood that analysts will agree on stock recommendations, and thus, the smaller is 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. Thus:

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

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; Luo, Rindfleisch, and Tse 2007). In such environments, a higher level of customer satisfaction of a firm relative to competitors is more likely both to enhance positive outcomes, such as customer repurchases, and to reduce negative effects, such as consumer complaints, thus resulting in more sizable, faster, and safer future cash flows (Anderson, Fornell, and Mazvancheryl 2004; Fornell, Rust, and Dekimpe 2010). Consequently, in the case of high product market competition, positive changes in customer satisfaction of a firm are more likely to 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 relationships 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, Giese, and Johnson 2004). As such, in low (versus high) market competition, positive changes in customer satisfaction of a firm are less likely to 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 than given low product market competition.

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

More specifically, in financial markets with high (versus 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 to signal firms' true future cash flow prospects (which can help analysts mitigate the "forecasting time horizon" problem; see Tuli and Bharadwaj 2009). If so, analysts are more likely to pick up and more accurately account for this communicated intangible information of satisfaction in their recommendations in highly (versus less) volatile financial markets. In addition, 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" (Farrell 2009, p. 64). Consequently, analysts may spend more effort to cover firms with the higher intangible asset of customer equity and reflect more customer satisfaction information in their recommendations in high than in low financial market uncertainty (Barth, Kasznik, and McNichols 2001). This discussion suggests the following interplay:

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 than in low financial market uncertainty.

The Mediating Role of Analyst Stock Recommendations

Thus far, we have offered hypotheses on the impact of customer satisfaction on recommendations. As we discussed, recommendations are directly linked to abnormal returns (Womack 1996). In addition to returns, Gintschel and Markov (2004) report that announcements of recommendations affect risk. That is, more favorable recommendations are associated with lesser vulnerability of future cash flows and, thus, lower systematic and idiosyncratic risk of the firm (McAlister, Srinivasan, and Kim 2007).

Given that customer satisfaction affects recommendations, which in turn affect firm value, it is reasonable to expect a "chained" relationship: from satisfaction to the intermediate outcome of recommendations and 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, ultimately, stock prices). Indeed, 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"; thus, 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 more reliably reflect the true value of the firm (Kim and McAlister 2007), and the information content of customer satisfaction is more likely to be captured by stock return and risk. The more the firm enjoys favorable recommendations with higher levels of satisfaction (given that well-informed investors trade stocks on the basis of cash flow prospects reflected in recommendations; Womack 1996), the more likely the information content of satisfaction is to pass through recommendations and thus contribute to firm value (McAlister, Srinivasan, and Kim 2007).

In contrast, if analysts ignore vital market-based assets such as customer satisfaction, such 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). Therefore, 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, Kasznik, and McNichols 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 the intangible asset of customer satisfaction. That is, analyst recommendations may channel the effects of customer satisfaction information on firm value. Nevertheless, satisfaction can affect firm value through 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.

METHODOLOGY

Data

In testing the hypotheses, we collect data on customer satisfaction, analyst recommendations, firm value, and a set of control variables. Multiple sources are 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.

Table 1
DATA AND MEASURES

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," "underperform," and "sell")	I/B/E/S	Chen and Matsumoto (2006); Womack (1996)
Customer satisfaction	The overall consumption experience of customers surveyed in the ACSI; more than 200 customers per firm for nearly 200 companies are surveyed each year	ACSI	Fornell et al. (2006)
Firm value	The two most common kinds of firm value measures are return and risk. 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), and risk refers to the vulnerability or volatility of cash flows (i.e., systematic and idiosyncratic risks)	CRSP COMPUSTAT	Srinivasan and Hanssens (2009); McAlister, Srinivasan, and Kim (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, Kasznik, and McNichols (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, Fornell, and Mazvancheryl (2004)
Return on assets (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, Srinivasan, and Kim (2007)
R&D investment	R&D 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, Srinivasan, and Kim (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)

Measuring Customer Satisfaction

Customer satisfaction is measured by the ACSI (www.theacsi.org), a data source developed by the National Quality Research Center at the University of Michigan. The ACSI assesses the perceived overall consumption experience of goods or services based on more than 50,000 customers every year (Anderson and Mansi 2009; Fornell et al. 2006).

We have ACSI data for this project over a 12-year period (1995–2006). Because the ACSI offers satisfaction data quarterly for each company once a year (Fornell, Rust, and Dekimpe 2010; Tuli and Bharadwaj 2009), we needed a careful mechanism to merge ACSI data with I/B/E/S, CRSP, and COMPUSTAT data quarter by quarter. For example, for firms with ACSI scores reported in the first quarter, we only use analyst recommendation and forecasting data for the same quarter before the actual earnings announcements. We apply the same procedure for the other three quarters 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 1126 pooled firm-year observations. Because of changes in the variables, we lost one year of observation, which left us with 1032 usable observations for the final data set.

Note that in line with Jacobson and Mizik (2007), not all firms had observations available for all variables (i.e., in an unbalanced panel). These firms represent 24 different two-digit major groups based on Standard Industrial Classification (SIC) codes. Each major group has an average number of 47 firm-year observations (on average, each sector covers approximately 5 firms and 9.4 years). We find that the largest group in the ACSI is the utilities sector (SIC 49) with 305 observations, while furniture (SIC 57) and tobacco (SIC 21) are among the sectors with the smallest number of observations (Jacobson and Mizik 2007, p. 85; Tuli and Bharadwaj 2009, p. 17). In the ACSI sample, firms can be added (Amazon.com added in the fourth quarter of 2000) or dropped (U S West dropped in the first quarter of 2001) over time, and companies (e.g., General Motors) may have multiple brands, as Anderson, Fornell, and Mazvancheryl (2004) and Ittner, Larcker, and Taylor (2009) note. Although

the whole sample is unbalanced and some firms have ACSI scores only for more recent years, we failed to find significantly different results by using subsamples (e.g., 1995–2002 and 1995–2004 versus 1995–2006). Table 2 summarizes the statistics of customer satisfaction, and Figure 2 visually presents the movement of satisfaction over time.

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, and it covers more than 45,000 companies from 70 markets worldwide with data back to 1976. Comparable to 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. Because 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 31,968 observations for the firms covered by both the ACSI and the I/B/E/S.

Table 2
DATA FOR CUSTOMER SATISFACTION

	M	*SD*	*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

According to I/B/E/S, analyst stock recommendations are measured as the median consensus of buy, hold, and sell recommendations that analysts provide for stock investors. This measure is in a reversed Likert scale (1 = "strong buy," 2 = "buy," 3 = "hold," 4 = "underperform," and 5 = "sell"). We transformed this reverse coding so that a larger number indicates better stock recommendations in a more straightforward manner (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 that analysts issue 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 are firms' future cash flow prospects (Barber et al. 2001; Thomas 2002).

Measuring Firm Value

Prior marketing studies (Srinivasan and Hanssens 2009; Srivastava, Shervani, and Fahey 1998) have suggested that the two most common kinds of firm value measures are stock price–based return and risk. In particular, 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).

Figure 2
CUSTOMER SATISFACTION OVER TIME

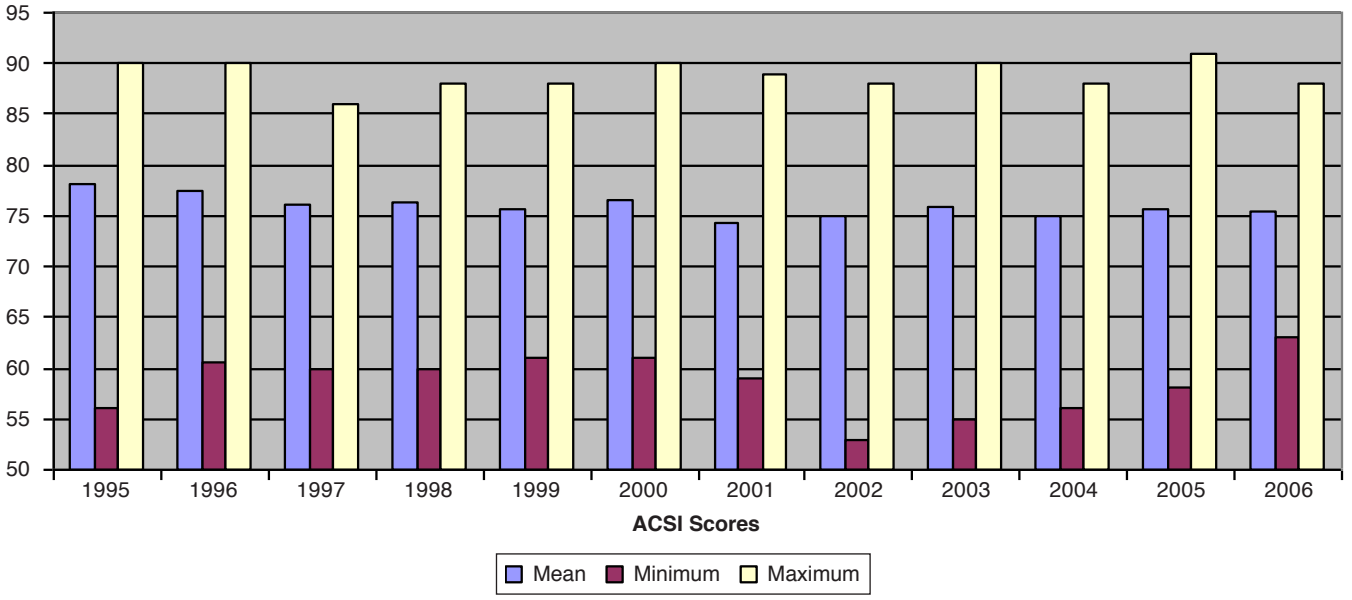


Table 3
DATA FOR ANALYSTS' STOCK RECOMMENDATIONS AND EARNINGS FORECASTS

	Analyst Stock Recommendations	*Dispersion in Analyst Stock Recommendations*	*Analyst Earnings Forecast Error*	*Analyst Coverage/ Following*
M	3.594	1.026	.224	15.882
Mdn	3.667	1.108	.067	14.000
Maximum	5.000	2.217	11.547	45.000
Minimum	1.292	.662	.000	1.000
SD	.549	.576	.674	8.017
Skewness	.247	.183	9.903	7.225

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

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

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

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

We then calculate abnormal returns (AR_{it}) as the difference between the observed returns and the expected returns:

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

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, Srinivasan, and Kim 2007; Tuli and Bharadwaj 2009). We obtained data for stock prices from CRSP. Data for Fama–French–Carhart 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).

Measuring Control Variables

We have a comprehensive set of firm- and industry-level covariates that closely follow the widely used models of financial analyst metrics (Jegadeesh et al. 2004; Thomas 2002) as well as stock risks in finance (Ferreira and Laux 2007), accounting (Lui, Markov, and Tamayo 2007), and marketing (Luo and Bhattacharya 2009; McAlister, Srinivasan, and Kim 2007; Rego, Billett, and Morgan 2009; Tuli and Bharadwaj 2009). This enables us to control for factors that are supported in the literature and calibrate the extent to which customer satisfaction contributes new information to explaining analyst recommendations and firm value. Next, we discuss our measurement of the covariates.

We measure product market competition 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 SIC codes. That is, $Herfindahl_j = \Sigma_i^I s_{ij}^2$, 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 is 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:

$$(3)\quad R_{mt} - R_{ft+1} = \beta_0 + \beta_1(R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + B_4 MOM_t + \psi Log(\omega_{it+1}) + \phi_{it+1},$$

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

where ω_{t+1} is 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 Web site (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html).

We gauge analysts' earnings forecast errors 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, Kasznik, and McNichols 2001; Lui, Markov, and Tamayo 2007).

We measure analyst coverage 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, Kasznik, and McNichols 2001; Chen and Matsumoto 2006).

We measure firms' advertising investments as advertising expenses (Data #45 in the COMPUSTAT data source) divided by sales revenue (Data #12). Prior studies (McAlis-

ter, Srinivasan, and Kim 2007) have found that advertising affects systematic risk and return.

We measure investment in R&D as R&D expenses (Data #46) divided by sales. Prior studies have found that R&D affects systematic risk and analyst recommendations (Barth, Kasznik, and McNichols 2001; McAlister, Srinivasan, and Kim 2007; Thomas 2002).

We measure total assets 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 analysts and investors value dividend payment, it influences 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 with fixed assets, liquid assets are related to less volatile returns, and thus investors prefer them (McAlister, Srinivasan, and Kim 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).

We measure firm profitability in terms of return on assets (ROA), or the ratio of a firm's operating income (Data #21) to its book value of total assets.

We measure ROA variability 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).

Model Specifications

Because we used a cross-sectional time-series data set, there are several issues to be accommodated in the model specifications. First, we control for observable and unobservable heterogeneity. Regarding observable heterogeneity, we include many (firm-, analyst-, and industry-level) covariates to rule out these multilevel 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, Srinivasan, and Kim 2007; Tuli and Bharadwaj 2009) as follows:

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

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

where ΔARR_{it} are changes in stock recommendations, ΔARD_{it} are changes in recommendation dispersion, $\Delta ACSI_{it}$ are changes in customer satisfaction, ΔPMC_{it} are changes in product market competition, ΔFMV_{it} are changes in financial market volatility, δ_0 and ξ_0 are the intercepts, and ϖ_{it} is 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 Equations 4 and 5. Specifically, we employ the generalized method of moments (GMM) approach to estimate Equations 4 and 5 simultaneously. This simultaneous approach not only addresses the nonindependent 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:

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

$$\hat{\Gamma}(j) = \frac{1}{T-k}\left(\sum_{t=j+1}^{T} Z_{t-j}'\varpi_t\varpi_{t-j}'Z_t\right),$$

where ω is the vector of White residuals, q is the bandwidth, k is the kernel, and Z_t is a k × p matrix in the GMM approach (Hamilton 1994, pp. 409–422).

To test the mediating role of analyst recommendation in satisfaction's possible impact on firm value, we follow the three-step mediation regression approach that Baron and Kenny (1986) recommend. In Step 1, we regress analyst recommendation against the ACSI as specified by Equations 4 and 5. In Step 2, we regress firm value against ACSI as follows:

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

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

Finally, in Step 3, we regress firm value against recommendations and ACSI as follows:

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

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

RESULTS

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 ($\delta = 1.306$, $p < .01$). As such, the data support H_1. Thus, all else being equal, we find evidence for the notion that firms with higher levels of customer satisfaction

Table 4
RESULTS FOR THE IMPACT OF CUSTOMER SATISFACTION CHANGES ON 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	.293	.307	.316
ΔAnalyst expertise	.568*	.575*	.572*
ΔTotal asset	.153**	.146**	.139**
ΔROA	1.982**	1.936**	1.957**
ΔROA variability	–.133	–.126	–.128
ΔAdvertising investment	3.605***	3.662***	3.651***
ΔR&D investment	2.109*	2.231*	2.217*
ΔFinancial leverage	–.783*	–.762*	–.802*
ΔDividend	1.023**	1.125**	1.108**
ΔLiquidity	.092	.086	.083
ΔCustomer satisfaction (ACSI)	1.306***	1.293***	1.286***
ΔProduct market competition (PMC)		–.033*	–.031*
ΔFinancial Market Uncertainty (FMU)		–.875**	–.906**
ΔACSI × ΔPMC			.708**
ΔACSI × ΔFMU			.495*
R^2	.21	.27	.32
Change in R^2		.06***	.05***
F-statistic	10.615	17.556	19.128
Schwarz Bayesian information criterion	2.472	2.207	1.838
N	1032	1032	1032

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

are associated with more positive analyst stock recommendations.

H_2 predicts that positive changes in customer 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 ($\xi = –.713$, $p < .05$). As such, the data support H_2. Thus, we find empirical support that firms with higher levels of customer satisfaction are associated with smaller dispersion (fewer disagreements) among analyst stock recommendations.

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 × product market competition is positive and significant ($\delta = .708$, $p < .05$). 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 × product market competition is negative and significant ($\xi = –.415$, $p < .05$). Therefore, the negative impact of satisfaction on recommendation dispersion is stronger in high product market competition than in low product market competition. Thus, the data support H_3.

H_4 predicts that the impact of changes in satisfaction on analyst recommendations and dispersion is stronger under high financial market uncertainty. As Table 4 shows, the coefficient of customer satisfaction × financial market is positive and marginally significant ($\delta = .495$, $p < .10$). 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 × financial market uncertainty is not significant statistically ($p > .05$). Therefore, H_4 is supported for stock recommendations but not for recommendation dispersion. In addition, including interaction items explains significantly more variance of analyst recommendations and dispersion. As we report in Tables 4 and 5, adding interactions of satisfaction changes × product market competition and satisfaction changes × financial market uncertainty leads to an incremental R-square of .05 ($p < .01$) for changes in recommendations and .04 ($p < .05$) for changes in dispersion.

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 we discussed previously, satisfaction affects recommendations. In addition, the results in Table 6 suggest that recommendations affect firm value (except the dispersion–systematic risk association). As we report in Table 6, because inclusion of recommendations in the model reduces the strength of the effects of satisfaction on abnormal return (from $W = .893$, $p < .05$, to $W = .712$, $p < .10$, only marginally significant), the data support a partial mediating role of recommendations.

Inclusion of recommendations makes the impact of satisfaction on systematic risk no longer significant (from $p < .05$ to $p > .10$), in support of full mediation. In addition, inclusion of recommendations reduces the effects of satis-

Table 5
RESULTS FOR THE IMPACT OF CUSTOMER SATISFACTION CHANGES ON DISPERSION IN 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	.781	.802	.775
ΔAnalyst earnings forecast errors	1.202**	1.241**	1.226**
ΔAnalyst expertise	–.195	–.181	–.193
ΔTotal asset	.211**	.232**	.225**
ΔROA	–1.055*	–1.131*	–1.128**
ΔROA variability	.087	.076	.082
ΔAdvertising investment	2.182**	2.035**	2.066**
ΔR&D investment	1.893*	1.866*	1.859*
ΔFinancial leverage	.072	.063	.069
ΔDividend	–.926**	–.918**	–.907**
ΔLiquidity	.027	.053	.036
ΔCustomer satisfaction (ACSI)	–.713**	–.692**	–.685**
ΔProduct market competition (PMC)		–.052	–.057
ΔFinancial market uncertainty (FMU)		.458*	.446*
ΔACSI × ΔPMC			–.415**
ΔACSI × FMU			–.071
R^2	.16	.24	.28
Change in R^2		.08***	.04**
F-statistic	9.138	13.226	18.037
Schwarz Bayesian information criterion	2.605	2.535	2.006
N	1032	1032	1032

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

faction on idiosyncratic risk (from W = –3.452, $p < .01$, to W = –2.618, $p < .05$), again in support of a partial mediation role of recommendations. Therefore, the data support H_4. In addition, the inclusion of mediating effects of recommendations significantly improves the fit of the full models, as Table 6 shows. Specifically, adding changes in recommendations leads to an incremental R-square 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 because the largest variance inflation factor is 2.76 in the full models.

These mediation results are noteworthy 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). Our calculations show that satisfaction's direct effects on abnormal return are .712, while its indirect effects through recommendations are .348 = [1.306 × .217 + (–.713) × (–.091)] (for the corresponding coefficients, see Tables 4, 5, and 6). While satisfaction's direct effects on systematic risk are insignificant, its indirect effects through analyst recommendations are –.677 = 1.306 × (–.518). In addition, satisfaction's direct effects on idiosyncratic risk are –2.618, and its indirect effects through recommendations are –1.327 = [1.306 ↔ (–.865) + (–.713) × .277], thus expanding satisfaction's risk-reduction benefits by 34% [1.327/(1.327 + 2.618)]. In addition, we conducted Sobel's (1982) test for mediation to assess whether the indirect mediation effects are statistically significant. 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, respectively, for the impact of the independent variable on the mediator and b and s_b are coefficient and standard error, respectively, for the impact of the mediator on the dependent variable. We find that the 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's indirect effects through the mediating role of recommendations are mostly 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 (through recommendations) in boosting abnormal return and reducing systematic and idiosyncratic risks, thus uncovering a more complete impact of customer satisfaction.

Customer Satisfaction and Accurate Analyst Forecasts

A major topic in finance and accounting literature is how to understand 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, a further test would examine whether changes in customer satisfaction lead 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, disregarding R&D spending can lead to severe forecast errors, whereas attention to such spending leads to more accurate analyst forecasts (Lev 2001). Con-

Table 6
RESULTS FOR THE MEDIATING ROLE OF ANALYST STOCK RECOMMENDATIONS IN THE IMPACT OF CUSTOMER SATISFACTION CHANGES ON FIRM VALUE

	Firm Value: Abnormal Return		*Firm Value: Systematic Risk*		*Firm Value: Idiosyncratic Risk*	
Mediation Effects						
Changes in analyst stock recommendations		.217***		–.518**		–.865***
Changes in dispersion in analyst stock recommendations		–.091**		.062		.277**
ΔCustomer satisfaction (ACSI)	.893**	.712*	–1.896**	–.526	–3.452***	–2.618**
ΔACSI × PMC	.429**	.415**	–1.084**	–.895*	–1.426***	–1.107**
ΔACSI × FMU	.067*	.021	.046	.031	–.210**	–.163*
ΔProduct market competition (PMC)	–.047	–.032	1.277***	1.281**	–1.815**	–1.823**
ΔFinancial market uncertainty (FMU)	–.327**	–.336**	1.215**	1.237**	.064	.032
ΔAnalyst coverage	.026	.017	–.021*	–.026*	.008	.002
ΔAnalyst earnings forecast errors	.063	.051	.137	.115	.106	.085
ΔAnalyst expertise .167* .169* –.576 –.502 –.869* –.871*						
ΔTotal asset	.386***	.355***	.163*	.166*	.121	.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	.055**	.042*	–4.927***	–4.233**	–3.637***	–3.145**
ΔR&D investment	.046**	.037*	–3.116**	–3.107**	–2.557**	–2.036*
ΔFinancial leverage	.138	.120	.758**	.762**	4.562***	4.027**
ΔDividend	1.071	1.063	–1.358	–1.316	.517	.505
ΔLiquidity	.156	.142	.107	.082	.186	.163
R^2	.26	.35	.43	.48	.45	.59
Change in R^2		.09***		.05**		.14***
F-statistic	8.576	9.208	7.553	8.829	8.638	9.716
N	1032	1032	1032	1032	1032	1032

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

sistent with this literature, picking up customer satisfaction information, another element of firm intangible assets, may 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 = –.028, $p < .05$) or more accurate earnings forecasts, even after accounting for ROA, analyst coverage, analyst expertise, and other covariates. We also conduct additional data analyses surrounding alternative measures of customer satisfaction relative to competition, other analyst-based metrics (e.g., analyst coverage), different modeling techniques, and unit-root and structural break tests. We provide these results in Appendix B.

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 data set, we find that after we account 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, Wall Street investors should have good reason to listen and follow. The design and findings of our study have several research and practical implications.

Research Implications

This 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, earnings forecast accuracy, and downgrades in recommendations and earnings 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; Luo 2009). Our work brings together two streams of research to examine how customer satisfaction in the marketing domain can influence analyst recommendations in the finance domain. For marketing researchers, it is crucial to understand the reactions of analysts to customer satisfaction information because analysts provide investors with expert guidance. Similarly, for finance and accounting researchers, our study raises awareness of nonfinancial assets, which help analysts provide more precise earnings forecasts and stock recommendations to investors.

Second, with respect to the customer satisfaction literature in particular, our study contributes to previous knowledge by uncovering additional roles of satisfaction. Thus far, the extant literature has rarely linked satisfaction to outcomes on the analyst side. In this sense, we provide a vital stock analyst–based perspective for understanding how and

why customer satisfaction should ultimately affect firm stock prices (i.e., through 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.

Third, 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, such negligence will contribute to undependable stock recommendations and assessment of true firm value and thus will likely lead to insignificant associations between satisfaction and firm value. Conversely, if analysts can effectively account for firm-specific information such as satisfaction and issue recommendations reflecting the true value of the firm, the information content of satisfaction is more likely to be reflected in changes in stock return and risk. In this sense, our results with analyst recommendations help extend Jacobson and Mizik's (2009), Ittner, Larcker, and Taylor's (2009), and Fornell, Mithas, and Morgeson's (2009a) studies. That is, we provide 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 markets with high levels of competition, analysts release even more favorable stock recommendations when they account for 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 might employ these metrics to test whether the information content of customers and brands is reflected in analyst recommendations and, if so, to examine the underlying reasons and analyst-based evidence for the financial impact of marketing actions, consumer mind-sets, brand equity, and customer lifetime value (Gupta 2009; Kumar 2008; Srinivasan, Vanhuele, and Pauwels 2010). As market-based intangible assets become more relevant than balance sheet assets in firm value creation (Lehmann 2004; Lehmann and Reibstein 2006), the marketing profession can improve managerial activities by examining marketing's direct impact on firm value and its indirect impact through information intermediaries (i.e., financial analysts) and their recommendations.

A related implication is that financial market volatility sheds more light on the implications 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 volatility, stock analysts should attend to the nonfinancial metric of customer satisfaction because doing so can help them 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, Kasznik, and McNichols 2001; Fornell, Rust, and Dekimpe 2010). 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 FASB guidelines. 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." We also add that the FASB might further guide the accounting profession in improving financial reporting and stock forecasting by leveraging the nonfinancial 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.

Managerial Implications

This study offers several implications for managers, analysts, and investors. First, marketing managers are under mounting pressure to show the financial accountability of marketing strategies (Ambler 2003; Lehmann 2004; Rust et al. 2004). Customer satisfaction's significant effect on stock recommendations and its direct and indirect effects on firm value hold implications for firm communication. Chief marketing officers should more effectively communicate the positive effects of intangibles such as customer satisfaction on recommendations and firm stock return/risk to make a stronger case for marketing accountability among top executives in the boardroom (Luo 2008).

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 Securities and Exchange Commission 10-K/10-Q filings. Such corporate announcements may help the firms conform to FASB guidelines and signal to the financial community their superior future cash flows (stronger growth and lower volatility) relative to product market rivals.

Second, 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 (1) more strongly emphasize the information content of customer satisfaction as a key market-based intangible asset and (2) 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

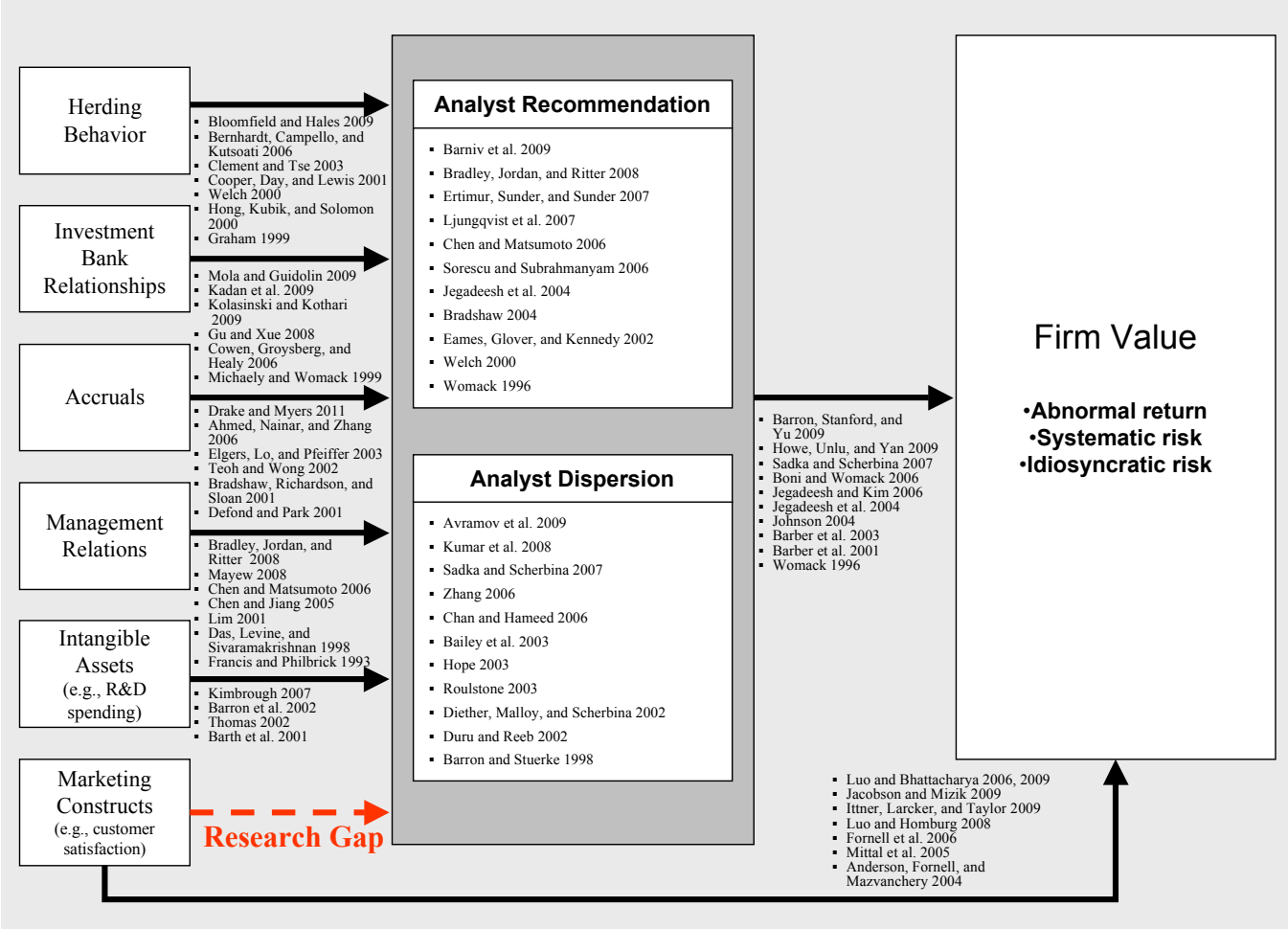
analysts' stock recommendations more accurately gauge firm long-term cash flow prospects for investors.

Third, for investors on Wall Street, our results imply that, all else being equal, if they rationally follow analysts' advice, they should (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 in accordance with the interplay between customer satisfaction changes over time and the settings of both product market competition and financial market volatility.

In conclusion, this research investigates the links among 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 that 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.

Appendix A

AN OVERVIEW OF ANALYST RECOMMENDATIONS LITERATURE



Notes: Analyst recommendations have been studied for their role in connecting firms' intangible assets, accruals, and management relationships to firm value in the accounting and finance literature.

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 = –.593, $p < .05$), adding more evidence for the relationships 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, Kasznik, and McNichols (2001), we find that customer satisfaction changes are positively related to analyst coverage (b = 1.608, $p < .01$), in support of 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 a lower likelihood of downgrades in stock rec-

ommendation revisions (b = –.461, $p < .01$) and a lower likelihood of downgrades in analyst earnings forecast revisions (b = –.339, $p < .05$), as we expected.

We also test the robustness of our results with different modeling approaches. Because analyst stock recommendations are measured with a five-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 = .728, $p < .1$). Furthermore, because our panel data are in a multilevel structure (i.e., firms nested within industries), we run 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: the augmented Dickey–Fuller test (ADF) and the Kwiatkowski–Phillips–Schmidt–Shin test (KPSS). The general model of ADF test is $\Delta y_t = \alpha y_{t-1} + \Sigma_{t=1}^{k} \beta_t \Delta y_{t-1} + \gamma x_t + \varepsilon_t$, and the ADF test statistic is $t_\alpha = \hat{\alpha}/[se(\hat{\alpha})]$. The 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 .136 to .296) are significant ($p < .05$), as we 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, cumulative sum of squared recursive residuals, and bounds tests, we fail to find evidence of structural breaks in the first differences data (Pauwels and Hanssens 2007; Pesaran, Smith, and Yeo 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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