

Does customer satisfaction matter to managers' earnings forecasts and stock returns?

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Abstract

Purpose – The purpose of this study is to examine the relevance of American Customer Satisfaction Index (ACSI) to management voluntary forecasts of earnings. The authors further investigate whether the market reacts to such forecasts in respect of satisfaction.

Design/methodology/approach – The authors' econometric models are constructed from previous work in accounting to specify the effect of ACSI on the issuance and optimism of management forecasts. Our model also specifies the impact of management optimism with respect to ACSI on stock returns. The data consisting of US firms in the 2001-2010 is collated from several databases and analyzed using multiple regression procedures.

Findings – Results indicate that ACSI is positively associated with the likelihood of issuing management forecasts and boosts management optimism. It is also found that investors react negatively to management optimism that is inherent in forecasts and results from satisfaction.

Research limitations/implications – The authors' research findings not only complement prior work on the linkage between customer satisfaction and firm value by incorporating a managerial perspective but also respond to the recent call for further work on how relevant marketing metrics drive organizational decisions and firms' financial performance. It should be noted that findings are limited to firms that release both a voluntary issuance of management forecasts and ACSI.

Practical implications – The study results shed light on the justification of marketing expenditures and provide a response to the call for marketing accountability. The study results also enable managers to make better decisions about whether and when to issue a forecast. The authors' research further calls stakeholders' attention to the presence of management forecast optimism with respect to satisfaction.

Originality/value – Despite the importance of managers as primary information generators and disseminators in the capital markets, there appears to be little discussion on the satisfaction's relevance to market participants, particularly in relation to the role of managers. Therefore, this investigation is the first to empirically show the relevance of ACSI to management earnings forecasts that have been ignored in the marketing literature.

Keywords Customer satisfaction, Management earnings forecasts, Stock returns, Management forecast optimism

Paper type Research paper



Introduction

The importance of nonfinancial information as a valuable intangible asset has been noted in the literature. Such information as brand equity and customer relationships enables

investors not only to determine the long-term financial sustainability of firms (Mizik and Jacobson, 2007) but also to capture their true financial value (Srinivasan and Hanssens, 2009). It therefore complements traditional accounting information by capturing off-balance-sheet values (Arvidsson, 2011; Gupta *et al.*, 2004). From the firm's perspective, customer satisfaction is an implicit market-based economic asset that has a positive association with future cash flows (Gruca and Rego, 2005). From the managers' perspective, satisfaction is an important performance metric because it is tied to their annual bonus awards and promotions (Hauser *et al.*, 1994; O'Connell and O'Sullivan, 2011).

Scholars across disciplines have suggested that customer satisfaction information is relevant to capital market participants such as financial analysts and investors. Marketing researchers have examined the linkage between satisfaction and shareholder/firm value (Aksoy *et al.*, 2008; Anderson *et al.*, 2004; Fornell *et al.*, 2006, 2016; Ittner *et al.*, 2009; Ivanov *et al.*, 2013; Jacobson and Mizik, 2009; O'Sullivan *et al.*, 2009; O'Sullivan and McCallig, 2012; Peng *et al.*, 2015; Tuli and Bharadwaj, 2009). Recent marketing-accounting/finance interdisciplinary studies have spotlighted financial analysts' use of customer satisfaction in making forecasts and recommendations (Luo *et al.*, 2010; Ngobo *et al.*, 2012) that influence the eventual firm value (Luo *et al.*, 2010). Nevertheless, little is known about whether satisfaction information is pertinent to managers' forecasts of earnings that significantly impact these participants.

Referred to as a management earnings forecast (King *et al.*, 1990), managers make forecasts of the expected profitability of investments and voluntarily release their estimated earnings to market participants (Eccles, 1991; Heflin *et al.*, 2003; Hirst *et al.*, 2008; Pownall *et al.*, 1993). Just as analysts' forecasts and recommendations impact stock prices, an earnings forecast by managers influences investors' assessment of the return potential of investment opportunities and decisions to trade shares of the firm (Beyer *et al.*, 2010; Sirri and Tufano, 1998). Such a forecast affects analyst behavior (Baginski and Hassell, 1997; Feng and McVay, 2010) and stock prices (Patell, 1976; Penman, 1980; Pownall *et al.*, 1993). This implies that management earnings forecasts have considerable importance for other participants in capital markets.

Anecdotal evidence indicates a possible linkage between customer satisfaction and management earnings forecasts. For example, CyberSource Corporation, a provider of electronic payment and risk management solutions, disclosed optimistic guidance on earnings for the second quarter of 2005 after a high satisfaction level (98 per cent) was reported by an independent research firm during the first quarter of 2005 (PR Newswire, 2005). Another example can be found in an earnings forecast of National Medical Health Card Systems (NMHCS), a national independent pharmacy benefit manager. NMHCS's chief executive officer, Jim Smith, provided reassurance on the company's optimistic forecasts for the year of 2006 considering its excellent customer satisfaction ratings (Business Wire, 2006). Consumers Energy Company also raised earnings per share guidance in 2016 as a result of its significant improvements in customer satisfaction in the previous year (News Bites US, 2016).

Despite some anecdotes hinting at a possible association of customer satisfaction with managers' earnings forecasts, this relationship has not been empirically tested. Therefore, we examine the impact of satisfaction on management earnings forecasts and resultant market reactions. This investigation addresses the following specific research questions:

RQ1. Does customer satisfaction influence the likelihood of issuance of management earnings forecasts?

RQ2. If the association exists, how does this information affect managerial forecasts?

RQ3. In other words, do higher satisfaction ratings lead to management forecast optimism?

RQ4. If so, how do investors respond to management forecast optimism in respect of satisfaction?

Using a sample of US firms that release both a voluntary management earnings forecast and the American Customer Satisfaction Index (ACSI) ratings in between 2001 and 2010, we find that satisfaction is positively associated with the likelihood of management forecast issuance and their forecast optimism. We also find that investors react negatively to managerial optimism that is inherent in management forecasts and resultant from customer satisfaction.

The findings of this study contribute to building knowledge and improving practice. This investigation, suggesting the pertinence of satisfaction information in driving organizational decisions and firms' financial performance, is timely and important for two reasons. First, this investigation is the first to examine whether customer satisfaction is related to the issuance and optimism of managers' earnings forecasts. This metric is typically used as a management control system for monitoring future performance, implementing marketing strategies and allocating resources toward improving customer services (Morgan *et al.*, 2005). Going beyond its use in customer service decision-making, our research provides novel insights into the utility of customer satisfaction for management earnings forecasts.

Second, our study complements the existing marketing-accounting/finance interface literature by incorporating a managerial perspective into the relationship between customer satisfaction and firm value. Much effort has been expended in examining the relevance of satisfaction either to financial analysts (Ngobo *et al.*, 2012), to investors (Aksoy *et al.*, 2008; Anderson *et al.*, 2004; Fornell *et al.*, 2006, 2016; Gruca and Rego, 2005; Ittner *et al.*, 2009; O'Sullivan and McCallig, 2012; Peng *et al.*, 2015; Tuli and Bharadwaj, 2009) or to both (Luo *et al.*, 2010). There appears to have been little discussion on how satisfaction information leads to managers' forecasts of future earnings and the resultant business performance in the literature. Therefore, the study results highlight the role of managers in the relationship between customer satisfaction and firm value.

Our work offers practical insights for managers and investors. As marketing budgets continue to increase, demands are being imposed on managers to reassess the impact of marketing-related metrics so as to justify the spending (Moorman, 2016). The study results indicating the relevance of customer satisfaction to management earnings forecasts not only shed light on the justification of marketing expenditures but also provide a response to the call for marketing accountability. The study results also enable managers to make better decisions about whether and when to issue a forecast, which has been lacking in the management earnings forecast literature (Hirst *et al.*, 2008). Our research further calls stakeholders' attention to the presence of management forecast optimism with respect to satisfaction.

This paper proceeds as follows: we first provide a review of the literature on customer satisfaction and management earnings forecasts and construct hypotheses based on theoretical and empirical evidence. We then discuss our sample and data set along with a research design. Following this, we present the results of our analyses and additional sensitivity test. Finally, we draw conclusions and discuss theoretical and practical implications.

Literature review

Use of customer satisfaction by capital market participants

Customer satisfaction is viewed as an intangible asset of a firm that influences consumer behavior and consequently drives favorable business performance (Anderson *et al.*, 2004;

Gruca and Rego, 2005; Luo and Homburg, 2007). It signifies the strength of the firm's relationships with customers and establishes a stable customer base that ensures future cash flows (Anderson *et al.*, 2004) as satisfied customers tend to repurchase and be more receptive to cross-selling efforts (Reichheld and Teal, 1996), less sensitive to price (Stock, 2005) and willing to pay a premium price (Homburg *et al.*, 2005). Satisfaction also allows the firm to reduce acquisition and transaction costs of obtaining and maintaining customers (Reichheld and Teal, 1996) and justify its marketing investments and lessen unfavorable customer outcomes (Luo and Homburg, 2007).

In this regard, scholars have devoted much attention to investigating the effect of satisfaction on firm value (Aksoy *et al.*, 2008; Anderson *et al.*, 2004; Fornell *et al.*, 2006, 2016; Ittner *et al.*, 2009; Ivanov *et al.*, 2013; Jacobson and Mizik, 2009; O'Sullivan *et al.*, 2009; O'Sullivan and McCallig, 2012; Peng *et al.*, 2015; Tuli and Bharadwaj, 2009). Furthermore, recent research provides findings on the mechanism through which satisfaction impacts firm value. Luo *et al.* (2010) demonstrate that the satisfaction–firm value relationship is partially mediated by financial analyst recommendations. Specifically, they find that positive changes in customer satisfaction enhance firm value by increasing cash flows and reducing risks through analyst recommendations. In line with Luo *et al.*'s work, Ngobo *et al.* (2012) confirm the relevance of satisfaction information to financial analysts in making forecasts. They observe that customer satisfaction reduces analysts' forecast errors, and this effect is greater when there is an increase in satisfaction levels rather than a decrease.

Figure 1 provides an overview of previous empirical work on the use of customer satisfaction by key market participants. Apparently, prior research has, by and large, ignored the extent to which customer satisfaction is relevant for managers in making earnings-related decisions.

Linking customer satisfaction to management earnings forecasts

Managers disclose information about the expected profitability of firms' current and future investments prior to a release of the actual earnings (King *et al.*, 1990). Such forecasts containing firm-specific financial information have considerable implications for other participants in capital markets (Beyer *et al.*, 2010). For example, management earnings forecasts have a direct influence on financial analysts' forecasts and recommendations (Baginski and Hassell, 1997; Feng and McVay, 2010; Heflin *et al.*, 2003; Jennings, 1987; Sirri and Tufano, 1998; Waymire, 1986) and the stock market (Patell, 1976; Penman, 1980; Pownall *et al.*, 1993). Management earnings forecasts also enable firms to mitigate litigation risks (Skinner, 1994) by reducing information asymmetry among market participants and

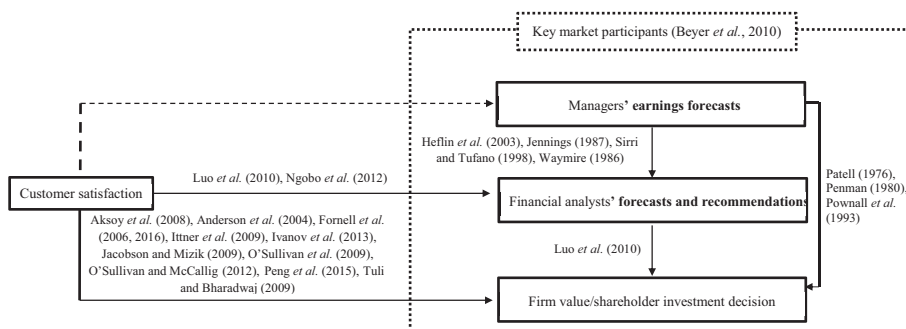


Figure 1. Empirical studies on the relevance of customer satisfaction to key market participants

setting market earnings expectations (Eccles, 1991; Hirst *et al.*, 2008). In this context, what then motivates managers to voluntarily issue a forecast of their firm's earnings?

Past research has suggested that the voluntary issuance of earnings guidance is driven by external forces (regulatory changes and demands of market participants) and firm- or manager-specific motives (Arvidsson, 2011; Hirst *et al.*, 2008). As the passage of the Securities and Exchange Commission's (SEC) Regulation Fair Disclosure (RegFD) in 2000, firms have been required to release earnings information simultaneously to analysts and the public to prevent superior trading opportunities arising for selected analysts (Heflin *et al.*, 2003). Because managers as insiders have more information than others about their firm's return on investments (Beyer *et al.*, 2010; Eccles, 1991), analysts and investors demand that firms issue forward-looking information (i.e. earnings forecasts) to obtain a more accurate picture of financial performance. Indeed, these participants prefer investing in firms with voluntary disclosure policies (Ajinkya *et al.*, 2005).

In addition to external pressures, managers' self-interest is the salient motivation to voluntarily release their firm's earnings forecasts (Hirst *et al.*, 2008). Nagar *et al.* (2003) find that managers whose compensation is based on their firm's equity value are highly motivated to issue their forecasts frequently, thereby minimizing equity mispricing that could negatively impact their own wealth. However, it is clear that no prior work has examined management decisions to issue an earnings forecast with reference to customer satisfaction.

We maintain that a body of literature on organizational learning and market information can be used for providing a theoretical foundation by linking customer satisfaction to management earnings-related decision-making. Organization learning theory offers insights into how firms create and use knowledge to adapt effectively to a changing business environment (Morgan *et al.*, 2005). The theory underlines the feedback processes that individuals within the organization learn, share information and take actions based on their accumulated knowledge (Cyert and March, 1963). In a similar vein, market information is processed sequentially in firms, such that organizational knowledge is acquired, distributed, interpreted and stored for decision-making (Sinkula, 1994).

The customer satisfaction index (i.e. ACSI) is a well-refined market-based information that signifies consumer trends and the firm's future earnings (Anderson *et al.*, 2004). The ACSI in conjunction with the firm's internal customer monitoring system is the valuable customer knowledge that managers acquire through market research, share within and/or across business units and interpret as the fundamental base of competitive advantage (Morgan *et al.*, 2005). Such information, referred to as "procedural knowledge," allows managers to scan the environment and make organizational decisions (Sinkula, 1994).

In particular, chief marketing officers (CMOs), who are responsible for conducting market research and generating future revenues for internal planning and budgeting (Fernandez, 2012; Miller, 2010; White, 2015), can gather and feed on the customer satisfaction information to other executives as organizational knowledge for their firm's strategic decision-making. CMOs often engage in strategic discussions with other senior executives by providing their knowledge accumulated from market research (Boyd *et al.*, 2010). For CMOs, the industry-comparable customer satisfaction index (e.g. ACSI) can be a reliable source that enhances the quality of internal information and revenue predictions, thereby reducing top management's uncertainty about future profits and investments. Prior studies have shown that the quality of managers' internal information is related to management forecasts (Dye, 1985; Verrecchia, 1982, 1990). Therefore, it is reasonable to presume that the ACSI motivates managers to issue earnings forecasts.

The association of customer satisfaction with management earnings forecasts can be also inferred from empirical evidence in the literature. Managers whose firms have positive satisfaction ratings are likely to anticipate increased future cash flows (Gruca and Rego, 2005). As managers disclose earnings forecasts based on the expected return on their current and future investments (Beyer *et al.*, 2010; Miller, 2002), they consider issuing forecasts as a result of their optimistic financial outlook. In fact, Miller (2002) finds a substantially increased disclosure of managerial forecasts during the period of increased earnings and a decrease from the prior level once earnings declines are announced. Firms with strong current performance are found to provide similar levels of total forecasts regardless of future performance.

Moreover, customer satisfaction is conducive to the creation of equity holder value (Fornell *et al.*, 2006, 2016; Gupta and Zeithaml, 2006; Ittner and Larcker, 1998; Mittal *et al.*, 2005), which determines manager incentivization (Hauser *et al.*, 1994; O'Connell and O'Sullivan, 2011). These managers with equity-based compensation are highly motivated to release their forecasts of earnings (Hirst *et al.*, 2008; Nagar *et al.*, 2003). Hence, it is conceivable that customer satisfaction is related to the managers' decision on voluntary forecast issuance.

Taken together, we posit that the managers of firms with high satisfaction scores tend to decide to issue management earnings forecasts. The more promising the future cash flows of a firm and personal incentives resulting from high satisfaction ratings, the greater the likelihood that the firm's managers will issue forecasts. Therefore, the following hypothesis is constructed:

- H1. Customer satisfaction is positively associated with the likelihood of the firm's managers issuing a management earnings forecast.

Customer satisfaction and optimistic management forecasts

Once managers decide to issue a forecast, they make efforts to achieve accurate forecasts or strategically forecast to obtain a desired result (Hirst *et al.*, 2008). Researchers underscore the importance of the accuracy of management earnings forecasts as forecast errors damage credibility (Kasznik, 1999) and increase litigation risks (Skinner, 1994)[1]. In a survey of 405 senior managers on corporate financial reporting, Graham *et al.* (2005) find that a majority (92 per cent) are motivated to issue earnings voluntarily to develop a reputation for transparent reporting.

Nonetheless, managers, who typically have more information on the profitability of their firms' investments than outsiders, tend to exaggerate their projected performance for their own financial gains (Beyer *et al.*, 2010). In addition to personal incentives, management forecast inaccuracy occurs when managers intentionally guide analysts' forecasts pessimistically or optimistically to adjust market participants' expectations (Eccles, 1991; Hirst *et al.*, 2008).

The accounting and corporate finance literature implicitly suggests that such biases appear to be related to the time horizon of a forecast (i.e. quarterly versus annual) and personality traits. According to Hirst *et al.* (2008), quarterly forecasts representing usually a short-horizon outlook are pessimistically biased whereas annual earnings forecasts reflecting usually a long-horizon outlook are optimistically biased. Likewise, Bergman and Roychowdhury (2008) report that managers are likely to "walk down" analysts' optimistic short-horizon forecasts, while they are disinclined to walk down analysts' optimistic long-horizon earnings estimates. Chen (2004) further finds a prevalence of negative forecast errors, indicating that quarterly management earnings forecasts from 1994 to 2003 were

pessimistically biased (i.e. actual earnings exceeded forecasts 44 per cent of the time). The trend of forecast pessimism results from managers' inclination to use earnings forecasts as a means to avoid negative earnings surprises (Bergman and Roychowdhury, 2008; Matsumoto, 2002). Pessimistic forecasts also allow managers to create easier benchmarks to meet or exceed when releasing actual earnings (Hirst *et al.*, 2008).

On the other hand, managerial forecast optimism – defined as management systematic overestimation of the possible good financial performance of a firm and underestimation of the possible bad performance – results from managers' assumptions that successful business outcomes can be achieved through their commitment (Heaton, 2002). Managerial optimism is manifested in confidence that affects corporate decisions. Specifically, Hilary and Hsu (2011) report that managers with past earnings forecast accuracy attribute their current successes to their superior ability and their failures to external events. The resulting confidence in their forecasting abilities leads to an overreliance on their own beliefs, thus increasing current forecast errors. Libby and Rennekamp (2012) also demonstrate that overoptimism and miscalibration – the manifestation of (over)confidence – is conducive to managerial forecasting optimism. Because confident managers tend to discount uncertain events (i.e. make forecasts which are subject to miscalibration) and overestimate future performance (i.e. make forecasts which are subject to overoptimism), they commit to issuing voluntary earnings forecasts and make upwardly biased cash flow forecasts (Heaton, 2002). This optimism leads to financial misreporting (Schrand and Zechman, 2012). As overconfident senior managers perceive investment projects as less risky, they pursue more acquisitions and overinvestments (Heaton, 2002; Malmendier and Tate, 2008) and achieve more innovative success (Hirshleifer *et al.*, 2012).

Accordingly, we assume that confidence is the underlying psychological mechanism that links customer satisfaction to management forecast optimism. High ratings of satisfaction are achievable through management commitment to the delivery of superior quality products and services. Firms with business strategies emphasizing revenue expansion through improved satisfaction are financially viable in the long run (Rust *et al.*, 2002). Thus, managers may attribute their firms' high satisfaction scores to their superior ability to control the manufacturing processes and service provision, thereby boosting their self-confidence (Heaton, 2002; Hilary and Hsu, 2011). Confident managers are more optimistic about the firm's future profits and discount the probability of unexpected events such as fluctuations in the business cycle (Libby and Rennekamp, 2012) given their belief that positive satisfaction ratings lead to future cash flows (Gruca and Rego, 2005). These managers then tend to issue optimistic forecasts. Hence, it is conceivable that:

- H2. Customer satisfaction is positively associated with management forecasting optimism.

Market reactions to management optimism with respect to customer satisfaction

Marketing researchers have examined the impact of satisfaction on firms' financial performance using capital market measures (Aksoy *et al.*, 2008; Anderson *et al.*, 2004; Fornell *et al.*, 2006, 2016; Gruca and Rego, 2005; Tuli and Bharadwaj, 2009; O'Sullivan and McCallig, 2012; Peng *et al.*, 2015). The evidence from these studies is mixed and inconclusive. Some find the positive association of changes in customer satisfaction not only with an increase in the level of cash flows (Gruca and Rego, 2005), shareholder value (Anderson *et al.*, 2004; O'Sullivan and McCallig, 2012) and market value of equity (Fornell *et al.*, 2006) but also with a decrease in cash flow variability (Gruca and Rego, 2005). Higher levels of customer dissatisfaction harm the firm's future idiosyncratic stock returns (Luo and Homburg, 2007). Tuli and Bharadwaj

(2009) also confirm that an improvement in satisfaction leads to reduction in the risk of stock returns. Recent studies suggest that investors can outperform the market by investing in firms which have high ACSI ratings (Fornell *et al.*, 2016; Peng *et al.*, 2015).

By contrast, other studies show no linkage between satisfaction and stock returns (Aksoy *et al.*, 2008; Fornell *et al.*, 2006; O'Sullivan *et al.*, 2009). This insignificant relationship is attributed to the lagged satisfaction effect that creates an arbitrage opportunity for alert investors for about five years (Fornell *et al.*, 2006). Abnormal stock returns are evident only in a small group of satisfaction leaders in the computer and internet sectors (Jacobson and Mizik, 2009) and when the improved satisfaction level is announced (Ivanov *et al.*, 2013).

In terms of the relationship between management forecasts and firm value, accounting researchers generally agree that management earnings forecasts with pertinent information content and value influence stock returns (Patell, 1976; Penman, 1980; Pownall *et al.*, 1993). As there is no empirical study examining the influence of management forecasts with respect to satisfaction of investors, we infer this association from the work on manager confidence by Malmendier and Tate (2008) and Libby and Rennekamp (2012). In an analysis of the merger decisions of (over)confident senior executives of Forbes 500 companies from 1980 to 1994, the former study reveals that the market reacts negatively to value-destroying corporate takeover bids carried out by these managers. The findings of the latter study imply that the market is aware of (over)confident managers' predisposition to make irrational decisions based on their overestimated ability and overly optimistic outlook on returns and responds accordingly. Similarly, Rogers and Stocken (2005) report that market participants can assess and react to the potential optimism of management forecasts.

Based on this logic, we expect that capital markets react negatively to managerial optimism associated with customer satisfaction. Investors may discount the optimism of earnings forecasts issued by managers who are confident and optimistic of their ability to generate future cash flows upon learning of the firm's high satisfaction ratings. Our hypothesis thus is as follows:

- H3.* On the condition that satisfaction drives managerial optimism of earnings forecasts, the market negatively responds to the optimistic forecast related to satisfaction.

Methods

Data

We collate data on customer satisfaction, management earnings forecasts, stock returns and controlling variables from various databases. These are the ACSI, the First Call Historical Database, the Center for Research in Security Price (CRSP) data, the Institutional Brokers Estimate System (I/B/E/S) data and COMPUSTAT.

Customer satisfaction is related to an overall evaluation of the consumer's purchase and consumption experience of a firm's market offerings (Anderson *et al.*, 2004). To assess overall satisfaction levels of US firms, we use ACSI data between 2001 and 2010 for which data on management earnings forecasts are also available. Developed by the National Quality Research Center at the University of Michigan in 1994, the ACSI measure is a firm-level, objective indicator of customer evaluations of product and service quality across industries (Fornell *et al.*, 2006). Firms in the ACSI are selected on the basis of total sales, thereby representing a significant proportion of the overall market share of the industry. The resulting satisfaction scores are reported on a scale of 0 to 100.

The data on annual management earnings forecasts of companies are collected using the First Call Historical Database. Our sampling begins in 2001 when RegFD took effect and

ends in 2010 when the database was discontinued. It should be noted that this database is incomplete and unavailable for the pre-RegFD period (Chuk *et al.*, 2013).

We gather data on stock prices from CRSP and the analyst forecast data from I/B/E/S. The firm-level accounting variables are extracted from the COMPUSTAT data set. Both management and analyst forecasts are derived from earnings per share.

Figure 2 illustrates the timeline of events. We systematically merge the ACSI data with the First Call Historical Database, I/B/E/S, CRSP and COMPUSTAT data. Following Tuli and Bharadwaj (2009), we record ACSI scores in the most recent quarter of year $t-1$ for year t . We use the satisfaction information from the prior year because:

- the annual ACSI data are collected and released throughout the year in different quarters for firms in different industries (Tuli and Bharadwaj, 2009); and
- the satisfaction effect on the financial market is lagged (Srinivasan and Hanssens, 2009).

As prior studies indicate that analyst forecasts are related to the satisfaction index (Luo *et al.*, 2010; Ngobo *et al.*, 2012; Tuli and Bharadwaj, 2009), we include analyst forecasts and management forecasts. To ensure that both types of forecast reflect the satisfaction index of the prior year, we use the most recent analyst forecasts from the I/B/E/S database after the ACSI release for year $t-1$. Similar to the approach in Rogers and Stocken (2005) and Hribar and Yang (2015), we then use the first management forecast after the analyst forecast and before the fiscal year t 's ending date. The first management forecast is examined in this study because such forecasts tend to be more affected by satisfaction ratings than other forecasts made during the year t . We treat this variable as an indicator variable equal to 1 if a firm issues at least one voluntary management forecast for year t after the release of satisfaction scores in year $t-1$, 0 otherwise. As mentioned previously, the main event of this study is the issuance by managers of an earnings forecast.

Sample

Panel A of Table I shows our sample selection procedures. The total observations from ACSI releases between 2001 and 2010 are 1,027. We find Committee on Uniform Security Identification Procedures (CUSIP) numbers for ACSI firms based on their name. Then, the ACSI is matched with COMPUSTAT based on CUSIP. After excluding observations without relevant data from COMPUSTAT, CRSP and I/B/E/S, we obtain a total of 515 firm-year observations with an ACSI score during a 10-year period. *Ind_ACSI* has only 448 observations as the industry of investor-owned utilities did not release ACSI scores until 2010. Of these

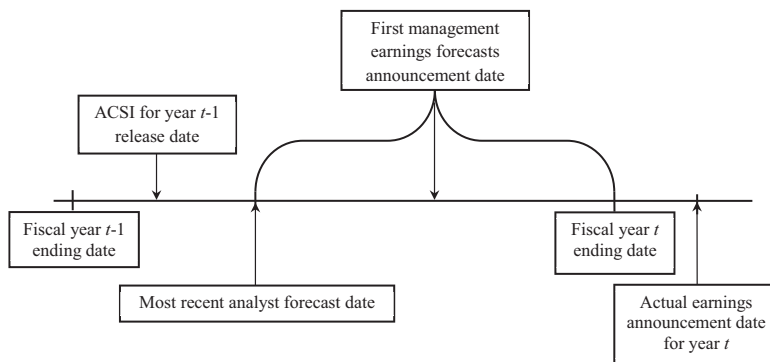


Figure 2.
Timeline of events

Variable	Description and measures	Source
<i>ACSI</i>	Firm-level ACSI	Fornell <i>et al.</i> (2006)
<i>Issue_MF</i>	Likelihood of a management forecast (equals 1 if firm issued at least one management forecast in year t , 0 otherwise)	Feng <i>et al.</i> (2009), Lang and Lundholm (1996)
<i>MF_Opt</i>	Management optimistic earnings forecasts (difference between management forecast earnings and actual earnings divided by beginning stock price)	Rogers and Stocken (2005)
<i>Analystcoverage</i>	Natural log of number of analysts following in year t	Feng <i>et al.</i> (2009), Hribar and Yang (2015)
<i>STD_AF</i>	Standard deviation of analyst forecasts outstanding when the management forecast is released	Rogers and Stocken (2005)
<i>Size</i>	Natural log of firm's market capitalization in year t	Lang and Lundholm (1996)
<i>Lit_Ind</i>	High litigation risk industry (equal to 1 if SIC codes are 2833-836, 8731-8734, 3570-3577, 7370-7374, 3600-3674, and 5200-5961, 0 otherwise)	Skinner (1994)
<i>MTB</i>	Market-to-book ratio	Bamber and Cheon (1998)
<i>ShrOwn</i>	Percentage of outstanding shares owned by the CEO in year t	Malmendier and Tate (2005)
<i>ROA</i>	Return on assets in year t	Miller (2002)
<i>Lag_Loss</i>	Equal to 1 if a firm reported negative earnings per share in year $t - 1$, 0 otherwise	Hribar and Yang (2015)
<i>DACC</i>	Discretionary accruals in year t estimated from modified Jones model	Kasznik (1999)
<i>Horizon</i>	Number of days between forecast issuance and fiscal year	Ajinkya <i>et al.</i> (2005), Baginski and Hassell (1997)
<i>InvMills</i>	Inverse Mills ratio estimated from the first stage probit regression model	Heckman (1979)
<i>Pre_Issue_MF</i>	Equal to 1 if firms issue management forecasts in the prior period, 0 otherwise	
<i>Ind_ACSI</i>	Industry-level ACSI	
<i>FF4F_{MF(-1, +1)}</i>	Cumulative abnormal returns using the Carhart four-factor model on one day before, on the day of, and one day after management forecast date. If a management forecast is made on a non-trading date, the next trading date is considered as a forecast date	Ahern (2009), Brown and Warner (1985)
<i>FF4F_{MF(0, +1)}</i>	Cumulative abnormal returns using the Carhart four-factor model on the day and one day after management forecast date. If a management forecast is made on a non-trading date, the next trading date is considered as a forecast date	Ahern (2009), Brown and Warner (1985)

Table II.
Variable definitions

used in the evaluation of the effect of satisfaction (Fornell *et al.*, 2016; Himme and Fischer, 2014; Ivanov *et al.*, 2013; Ngobo *et al.*, 2012).

We also control for information asymmetry measured by standard deviation of analyst forecasts (*STD_AF*) to capture a lack of consensus among analysts (Rogers and Stocken, 2005). We include firm size (*Size*) as a control variable because of a positive association between disclosure and size (Lang and Lundholm, 1996). Market-to-book (*MTB*) is controlled to rule out growth and proprietary costs (Bamber and Cheon, 1998). We also control for return on assets (*ROA*) because firms with poor performance are less likely to provide disclosures (Miller, 2002). Additionally, other variables such as negative earnings per share (*Lag_Loss*), percentage of outstanding shares owned by senior managers (*ShrOwn*) and the issuance of a management forecast in the prior period (*Pre_Issue_MF*) are

controlled, as they potentially affect management forecasts (Hribar and Yang, 2015). Finally, industry ACSI score (*Ind_ACSI*) is accounted for in the model estimation to rule out unobserved heterogeneity across firms (Hsiao, 2003; O'Connell and O'Sullivan, 2011).

Following on from this specification of the forecast decision, our second hypothesis involves testing the impact of customer satisfaction on management optimistic earnings forecasts. In accordance with Rogers and Stocken (2005), we define management forecast optimism as the difference between a manager's earnings forecast and actual earnings divided by stock prices in the prior year. This definition can be formally expressed as:

$$\text{Management optimistic forecast (MF_Opt}_{jt}) = \frac{MF_{jt} - AE_{jt}}{\text{price}_{jt-1}}$$

where MF_{jt} is firm j 's management earning forecast for year t ; AE_{jt} is firm j 's actual earnings date for year t ; and price_{jt-1} is stock price for firm j at the end of year $t-1$ which is unaffected by any information available in year t .

We subsequently construct the model for management optimism with other related variables being controlled (Hribar and Yang, 2015). The regression model is as follows (firm subscripts are suppressed):

$$\begin{aligned} MF_Opt_t = & \alpha_0 + \alpha_1 ACSI_{t-1} + \alpha_2 Horizon_t + \alpha_3 STD_AF_t + \alpha_4 Size_t + \alpha_5 Lit_Ind_t \\ & + \alpha_6 MTB_t + \alpha_7 ShrOwn_t + \alpha_8 Lag_Loss_t + \alpha_9 DACC_t + \alpha_{10} InvMills_t \\ & + \alpha_{11} Ind_ACSI_t + Year\ fixed\ effects + v \end{aligned} \quad (2)$$

Table II presents the definition of variables used in this estimation. Importantly, we choose the firms that issue management forecasts, as the forecast optimism is observed only in firms whose management issues a forecast of earnings. In addition to all controlling variables included in the previous model [equation (1)], we control for forecast horizon (*Horizon*) because managers have less information about realized earnings in the earlier issuance of forecasts (Baginski and Hassell, 1997). We also include *Lit_Ind* to control for litigation risk to affect management earnings forecasts (Skinner, 1994) and a firm's discretionary accruals (*DACC*) estimated from the modified Jones model, as firms tend to manage earnings to avoid missing their own forecast (Kasznik, 1999). Moreover, industry ACSI score (*Ind_ACSI*) is included to rule out unobserved heterogeneity across firms (Hsiao, 2003; O'Connell and O'Sullivan, 2011). We calculate t -statistics using corrected standard errors robust to heteroskedasticity and clustered at the firm level (Rogers, 1993).

Finally, we propose the following model to test the short-term market reaction to management forecast optimism with respect to customer satisfaction[2]:

$$\begin{aligned} FF4F_{MFt} = & \alpha_0 + \alpha_1 ACSI_{t-1} + \alpha_2 MF_Opt_t + \alpha_3 ACSI_{t-1} \times MF_Opt_t + \alpha_4 Horizon_t \\ & + \alpha_5 STD_AF_t + \alpha_6 Size_t + \alpha_7 Lit_Ind_t + \alpha_8 MTB_t + \alpha_9 ShrOwn_t \\ & + \alpha_{10} Lag_Loss_t + \alpha_{11} DACC_t + \alpha_{12} InvMills_t + \alpha_{13} Ind_ACSI_t \\ & + Year\ fixed\ effects + v \end{aligned} \quad (3)$$

In line with the research studies of Ahern (2009) and Brown and Warner (1985), we specify the dependent variable as cumulative abnormal returns using the Carhart four-factor model

(β , size, market-to-book and momentum effects are being controlled for) for two different event periods: three days ($FF4F_{MF(-1,+1)}$; i.e. one day before, the day of and one day after the management forecast date) and two days ($FF4F_{MF(0,+1)}$; i.e. the day of and one day after the management forecast date). Note that the event in this study refers to the voluntary disclosure by management of earnings for a firm. If a management forecast is released on a non-trading date, the next trading date is considered as the forecast date. A short event specification allows more accurate estimation by reducing the possible effect of other intervening factors and increasing the power of statistical tests (Fornell *et al.*, 2006).

In estimating this model, we include the effects of customer satisfaction, managerial optimism and their interaction term along with all controlling variables from equation (2) (firm subscripts are suppressed). As main-effect terms and product terms tend to be highly correlated, we center the independent measures around their mean scores and then compute their interaction terms to alleviate multicollinearity (Aiken and West, 1991). We exclude corporate events – annual earnings announcement and inside trading around the management forecast issue date – that may have confounding effects. We also cluster standard errors at the firm level to account for heteroskedasticity and serial correlation in the error terms (Han *et al.*, 2017). The definition of each measure for equation (3) can also be found in Table II.

Addressing endogeneity

The models specified in equations (2) and (3) are susceptible to endogeneity from sample selection bias and omitted variable bias. We control for the potential sample-induced endogeneity as samples of management optimism are based on the firms' decision to release earnings forecasts voluntarily (Certo *et al.*, 2016). Our models containing forecast optimism are estimated on subsample of companies that issue management earnings forecasts rather than the full sample. For those firms not disclosing their forecasts, there are no stock market reactions to such optimism in respect of customer satisfaction. Following the Heckman's (1979) two-stage procedure to account for the possible sample selection bias (Certo *et al.*, 2016), we first calculate the inverse Mills' ratio (*InvMills*) in the first-stage selection equation without and with *Ind_ACSI* in equation (1). Referred to as the ratio of the standard normal probability density function to the standard normal cumulative density function (Heckman, 1979), the inverse Mills' ratio enables researchers to effectively obtain unbiased estimates by ruling out sample-induced endogeneity of the model estimation (Certo *et al.*, 2016). In the second-stage estimation [equations (2) and (3)], we incorporate this ratio into any specification where the sample includes only firms with forecast issuance.

Furthermore, we perform the instrumental variable estimation that effectively corrects for a potential endogeneity from omitted variable bias of the satisfaction impact (Germann *et al.*, 2015). According to Little (1985), Larcker and Rusticus (2007) and Lennox *et al.* (2012), the instrumental variable has correlation with the dependent variable in the first-stage probit model [equation (1)] but not with the dependent variable in the second-stage model [equations (2) or (3)]. Accordingly, we identify *Analystcoverage* (measured by the natural log of the number of analysts following the firm) from the accounting literature, suggesting that the analyst following of a firm is positively related to management voluntary disclosure frequency (Feng *et al.*, 2009; Lang and Lundholm, 1996) and guidance likelihood (Ajinkya *et al.*, 2005) but has no association with management forecast optimism (Ajinkya *et al.*, 2005; Feng *et al.*, 2009). We then include this variable in equation (1) but not in the subsequent selection models.

Results

Panels A and B of Table III summarize descriptive statistics of variables used in our analyses. These variables are winsorized at 1 per cent to reduce outlier issues. The average

Variable	N	Mean	SD	Q1	Median	Q3		
<i>Panel A: descriptive statistics for the full sample</i>								
ACSI	515	76.550	6.275	72.000	77.000	81.000		
Analystcoverage	515	2.529	0.650	2.303	2.708	2.944		
STD_AF	515	0.120	0.230	0.020	0.050	0.110		
Size	515	9.376	1.493	8.516	9.495	10.361		
MTB	515	-0.421	22.533	1.388	2.452	4.928		
ROA	515	0.036	0.112	0.016	0.048	0.094		
Lag_Loss	515	0.134	0.341	0.000	0.000	0.000		
ShrOwn	515	1.448	6.492	0.000	0.000	0.000		
Pre_Issue_MF	515	0.285	0.452	0.000	0.000	1.000		
Ind_ACSI	448	77.067	6.137	74.000	78.000	81.000		
InvMills	448	1.278	0.838	0.404	1.421	1.828		
MF_Opt	210	-0.009	0.106	-0.004	0.000	0.005		
Horizon	210	251.405	75.241	202.000	280.000	294.000		
Lit_Ind	210	0.229	0.421	0.000	0.000	1.000		
DACC	210	-0.015	0.121	-0.042	0.000	0.041		
FF4F _{MF(-1,+1)}	210	0.022	0.112	-0.022	0.015	0.059		
FF4F _{MF(0,+1)}	210	0.014	0.074	-0.015	0.009	0.039		
<i>Panel B: descriptive statistics for the subsamples partitioned by management forecast^a</i>								
Variable	Firms with management forecast (A)			Firms without management forecast (B)			t-stat [(B) - (A)]	
	N	Mean	Median	N	Mean	Median	Mean	Median
ACSI	210	77.824	78.500	305	75.672	76.000	2.15***	2.50***
Analystcoverage	210	2.592	2.674	305	2.486	2.708	0.11*	-0.03
STD_AF	210	0.074	0.040	305	0.152	0.060	-0.08***	-0.02***
Size	210	9.544	9.415	305	9.260	9.562	0.28**	-0.15
MTB	210	3.437	2.441	305	-3.078	2.452	6.51***	-0.01*
ROA	210	0.059	0.051	305	0.019	0.047	0.04***	0.00**
Lag_Loss	210	0.043	0.000	305	0.197	0.000	-0.15	0.00***
ShrOwn	210	0.947	0.000	305	1.792	0.000	-0.85	0.00*
Pre_Issue_MF	210	0.643	1.000	305	0.039	0.000	19.72***	1.00***
Ind_ACSI	165	78.896	80.000	283	76.000	76.000	2.89***	4.00***
InvMills	165	0.538	0.287	283	1.709	1.668	-1.17***	-1.422***

Note^a: *, **, and *** indicate significance at the 10, 5 and 1% levels, respectively, for two-tailed *t*-test (Wilcoxon tests) of differences in mean and median

Table III.
Descriptive statistics

ACSI score of all firms ($N = 515$) is 76.550, and the standard deviation is 6.275 (Panel A of Table III). As displayed in Panel B of Table III, we find a significant difference ($t = 2.15$, $p < 0.01$) in the average ACSI scores between firms with management forecasts ($M = 77.824$) and those without forecasts ($M = 75.672$), which provides preliminary support for *H1*. We also find most of the other variables to be significantly different between firms with and without management forecasts. We further report a correlation matrix for variables used in the analysis ($N = 210$; Table IV).

The effect of customer satisfaction on managers' issuance of earnings forecasts

Our *H1* predicts that customer satisfaction is positively linked to the likelihood of issuing management forecasts. As indicated in Table V, the results of population averaged probit regression analyses show a positive and significant coefficient of the ACSI score after

Table IV.
Pearson correlations
for variables
specified in
models^{a,b,c}

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	1.000											
(2)	-0.250	1.000										
(3)	-0.247	0.118	1.000									
(4)	-0.130	0.176	0.113	1.000								
(5)	0.038	0.034	-0.030	0.038	1.000							
(6)	-0.045	0.047	-0.013	0.062	0.038	1.000						
(7)	0.044	0.021	-0.120	0.171	0.012	0.102	1.000					
(8)	0.870	-0.299	-0.173	-0.153	0.002	-0.218	-0.034	1.000				
(9)	-0.532	0.153	0.333	0.071	-0.037	0.128	-0.171	-0.272	1.000			
(10)	0.190	-0.014	-0.315	0.054	0.022	0.030	0.291	0.121	-0.139	1.000		
(11)	-0.127	0.085	0.131	0.047	-0.020	-0.037	-0.110	-0.030	0.172	-0.137	1.000	
(12)	-0.136	0.087	0.152	0.050	-0.026	-0.036	-0.126	-0.049	0.186	-0.152	0.991	1.000

Notes: ^a(1) ACSI, (2) Horizon, (3) STD_AF, (4) Lit_Ind, (5) MTB, (6) ShrOwn, (7) DACC, (8) Ind_ACSI, (9) ImvMills, (10) MF_Opt, (11) FF4F_{MF,t-1,t} and (12) FF4F_{MF(t,t-1)}; ^bthe upper diagonal contains Pearson correlations and the lower diagonal includes Spearman correlations; and ^citalic numbers represent the statistical significance at least 10% levels (two-sided)

Table V.

Results of population averaged probit modeling: ACSI and management forecast issuance^{a,b}

Variables	Predicted sign	<i>Issue_MF</i>		Coefficient	z-stat
		Coefficient	z-stat		
Intercept		-2.242**	-1.87	-5.651***	-3.41
<i>ACSI</i>	+	0.035***	2.60	0.034*	1.90
<i>Analystcoverage</i>	+	0.243**	2.43	0.344***	2.99
<i>STD_AF</i>	-	-0.875	-1.48	-0.635	-1.01
<i>Size</i>	+	-0.162**	-2.49	-0.161**	-2.37
<i>MTB</i>	+	0.003	0.64	0.001	0.16
<i>ROA</i>	+	0.278	0.22	1.076	0.77
<i>Lag_Loss</i>	-	-0.758*	-1.92	-0.435	-1.03
<i>ShrOwn</i>	-	-0.019**	-2.26	-0.013	-1.51
<i>Pre_Issue_MF</i>	+	2.323***	12.67	2.284***	11.46
<i>Ind_ACSI</i>				0.042	1.56
Year fixed effect		Yes		Yes	
<i>N</i>		515		448	
Wald χ^2		204.18***		169.67***	

Notes: a: *, **, and *** indicate significance at the 10, 5 and 1%, respectively; ^bz-statistics in parentheses are calculated using corrected standard errors robust to heteroskedasticity and clustered at the firm level

controlling for factors that may have confounding effects on management forecast issuance (0.035, $p < 0.01$)[3]. We find that this relationship remains unchanged after controlling for the industry-level *ACSI* (0.034, $p < 0.10$)[4]. This finding thus provides empirical evidence in support of *H1*. That is, all things equal, managers are more likely to make a voluntary management forecast when they observe high levels of customer satisfaction.

Consistent with the literature (Feng *et al.*, 2009), the coefficient on *Analystcoverage* (our exogenous measure) is found to be positive and significant (0.243, $p < 0.05$)[3] which supports its use as an instrumental variable. We also observe that control variables, including *Size* (-0.162, $p < 0.05$)[3], *Lag_Loss* (-0.758, $p < 0.10$)[3], *ShrOwn* (-0.019, $p < 0.05$)[3] and *Pre_Issue_MF* (2.323, $p < 0.01$)[3] are statistically significant. The positive and significant coefficient on *Pre_Issue_MF* suggests that issuing a forecast or not may be a practice which some companies regularly follow. The directions of these relationships are congruous with those reported in previous studies (Ajinkya *et al.*, 2005; Ajinkya and Gift, 1984; Hribar and Yang, 2015; Malmendier and Tate, 2008).

The effect of customer satisfaction on management forecast optimism

We subsequently test *H2* positing that managers issue optimistic forecasts after observing a significant satisfaction impact effect on the likelihood of management forecast issuance. As shown in Table VI, we find the coefficient of *ACSI* to be statistically significant and positive (0.003, $p < 0.05$)[3] with control variables. This means that a one standard deviation increase in *ACSI* leads to an increase of 1.88 per cent (0.003 multiplied by 6.275 of *ACSI* standard deviation in Panel A of Table I) in the *MF_Opt*, which, in economic terms, is equivalent to two times the mean value of *MF_Opt* (0.90 per cent) in our sample. This positive coefficient remains significant even after *Ind_ACSI* is controlled for (0.006, $p < 0.05$)[4], indicating the robustness of our findings. These results support *H2* suggesting that customer satisfaction positively affects managers' optimistic earnings forecasts. Managers whose firms achieved higher satisfaction ratings may become confident in their managerial ability and, at the

Table VI.
ACSI and
management
optimism^{1,2}

Variable	<i>MF_Opt</i>			
	Coefficient	<i>t</i> -stat	Coefficient	<i>t</i> -stat
Intercept	-0.259*	-1.85	-0.352*	-1.73
<i>ACSI</i>	0.003**	2.11	0.006**	2.00
<i>Horizon</i>	0.000	0.99	0.000	0.71
<i>STD_AF</i>	-0.296***	-3.83	-0.279***	-3.06
<i>Size</i>	0.006	0.86	0.008	1.04
<i>Lit_Ind</i>	0.011	0.62	0.027	1.27
<i>MTB</i>	0.000	0.25	0.000	0.30
<i>ShrOwn</i>	0.000	-0.18	-0.000	-0.18
<i>Lag_Loss</i>	0.023	0.41	0.089	1.35
<i>DACC</i>	0.242**	4.01	0.226***	3.08
<i>InvMills</i>	0.018	0.48	0.018	0.40
<i>Ind_ACSI</i>			-0.002	-0.57
Year fixed effect	Yes		Yes	
<i>N</i>	210		165	
<i>F</i> -statistics	2.83***		2.39***	
Adjusted <i>R</i> ²	0.15		0.15	

Notes: ^a: *, **, and *** indicate significance at the 10, 5 and 1%, respectively; ^bthe *t*-statistics are calculated using corrected standard errors robust to heteroskedasticity and clustered at the firm level

same time, optimistic about their earnings because of anticipation of increased future cash flows.

Investor reactions to customer satisfaction and management forecast optimism

We test our final hypothesis suggesting that investors negatively react to managerial optimism resulting from positive satisfaction ratings. Table VII shows the regression results of stock market responses to management forecast optimism with respect to customer satisfaction.

To deal with potential confounding effects of other-related events, we exclude corporate announcements such as the annual earnings announcement and insider trading around the first management forecast date. Consequently, we deduce nine observations in $FF4F_{MF(-1, +1)}$ and seven observations in $FF4F_{MF(0, +1)}$. Regardless of the presence of control variables, we find an insignificant association between ACSI scores and stock returns during an event window of three days. We also observe a significant negative effect of management optimism ($-0.882, p < 0.05$)[3] and its interaction with customer satisfaction ($-0.111, p < 0.05$)[3] with confounding variables in the three-day event duration (first column of Table VII), which supports *H3*. These results are also found to be unchanged even when *Ind_ACSI* is included as a control variable in the regression model (-0.833 and -0.109 , both at $p < 0.05$; second column of Table VII)[4]. This implies that the stock market negatively responds to optimistic management earnings forecasts, both in the case where such bias is inherent to the forecast and where it relates to customer satisfaction.

We further check the robustness of these findings during a two-day event period. Consistent with the preceding results, we find an insignificant main effect of customer satisfaction. To a lesser extent, there are significant negative main effects of management optimism (-0.570 [3], $p < 0.05$ and -0.541 [4], both at $p < 0.05$) and negative interacting effects on stock returns (-0.070 [3] and -0.069 [4], both $p < 0.05$; third and fourth columns of Table VII). This suggests that, all other are held equal, our findings are robust in the

Variable	$FF4F_{MF(-1,+1)}$				$FF4F_{MF(0,+1)}$			
	Coefficient	<i>t</i> -stat	Coefficient	<i>t</i> -stat	Coefficient	<i>t</i> -stat	Coefficient	<i>t</i> -stat
Intercept	0.126	0.61	-0.042	-0.16	0.104	0.78	0.002	0.01
ACSI	-0.002	-0.98	-0.003	-0.95	-0.002	-1.14	-0.002	-1.06
MF_Opt	-0.882**	-2.22	-0.833**	-2.18	-0.570**	-2.20	-0.541**	-2.11
ACSI × MF_Opt	-0.111**	-2.18	-0.109**	-2.21	-0.070**	-2.13	-0.069**	-2.10
Horizon	0.000	0.51	0.000	1.52	0.000	0.57	0.000	1.45
STD_AF	0.169*	1.93	0.152*	1.65	0.126**	2.22	0.115*	1.88
Size	0.004	0.49	-0.002	-0.16	0.003	0.66	0.000	0.04
Lit_Ind	0.015	0.79	0.006	0.25	0.011	0.86	0.005	0.3
MTB	0.000	0.56	0.000	0.46	0.000	0.41	0.000	0.35
ShrOwn	0.000	0.06	0.000	0.02	0.000	0.20	0.000	0.13
Lag_Loss	0.140*	1.67	0.126	1.34	0.106*	1.93	0.095	1.52
DACC	-0.041	-0.45	-0.041	-0.39	-0.036	-0.62	-0.033	-0.5
InvMills	-0.083	-1.12	-0.069	-0.81	-0.065	-1.31	-0.054	-0.93
Ind_ACSI			0.003	0.80			0.002	0.75
Year fixed effects	Yes		Yes		Yes		Yes	
N	201		160		203		161	
F-statistics	1.86***		1.62**		1.95***		1.63**	
Adjusted R ²	0.09		0.07		0.10		0.08	

Notes: *, **, and *** indicate significance at the 10, 5 and 1%, respectively; ^b*t*-statistics are calculated using corrected standard errors robust to heteroskedasticity and clustered at the firm level

Table VII.
ACSI, management optimism and market reactions^{a,b}

shorter period that could forestall the confounding impact of other possible events on returns (Fornell *et al.*, 2006).

Additional analyses

Control function approach. We use the control function approach to further address the endogeneity issue resulting from possible omitted variables (Han *et al.*, 2017; Wooldridge, 2010). In the first stage of the control function approach, we estimate an auxiliary regression of the endogenous variable on the instrumental and the exogenous variables. In the second stage, we test the model [i.e. equation (2)] with the estimated residuals from the first stage, which controls for the endogenous variable. The control function approach requires additional instrumental variables that satisfy the following two conditions: that instrumental variables should be correlated with the endogenous variable (i.e. ACSI) but uncorrelated with the error term (Wooldridge, 2010). One variable that may satisfy these conditions is the industry-level ACSI. Arguably, resource allocation decisions of competitors in the same industry may reflect industry norms. Firm managers may make their decisions on the basis of industry norms to use the knowledge among industry competitors (Cohen and Levinthal, 1989). In this sense we assume that the industry ACSI is positively associated with the firm ACSI as the industry ACSI satisfies the first condition as an instrumental variable. At the same time, it is highly unlikely that the industry ACSI will correlate with the error term, as it does not significantly affect management earnings forecasts beyond the effects of the firm's ACSI and other control variables in our study.

We estimate the following auxiliary model [equation (4)] by regressing the firm's ACSI on the industry's ACSI and the exogenous variables. We use the predicted residuals from this equation as a control function in equation (2):

$$ACSI_t = \alpha_0 + \alpha_1 Horizon_t + \alpha_2 STD_AF_t + \alpha_3 Size_t + \alpha_4 Lit_Ind_t + \alpha_5 MTB_t + \alpha_6 ShrOwn_t + \alpha_7 Lag_Loss_t + \alpha_8 DACC_t + \alpha_9 InvMills_t + \alpha_{10} Ind_ACSI_t + Year\ fixed\ effects + v \tag{4}$$

The main effects in the model are consistent with previous findings for *H2*. As indicated in column 2 of Table VIII, the coefficient for ACSI is found to be statistically significant and positive ($0.006, p < 0.05$) after controlling for other factors.

Alternative American Customer Satisfaction Index measure. We use the natural log of customer satisfaction for each firm as its alternative measure to further assess the robustness of our results. According to Tuli and Bharadwaj (2009), this procedure is beneficial to lessen the influence of outliers. When the log-transformed ACSI is used instead in the model estimation, we find that the main results provide evidence supporting all hypotheses: *H1* (2.566, $p < 0.05$ and 0.598, $p < 0.10$, both for *ACSI*)[5][6], *H2* (0.199[5] and 0.401[6], both for *ACSI* at $p < 0.05$) and *H3* (-0.867[5] and -0.835[6] for *MF_Opt* and -0.110[5] and -0.109[6] for *ACSI x MF_Opt*, all at $p < 0.05$).

Alternative measure of abnormal returns. Following Rogers and Stocken (2005), we also specify the dependent variable as the size-adjusted cumulative abnormal returns (CAR_{MF}) for three days ($CAR_{MF(-1,+1)}$; i.e. one day before, the day of and one day after the management forecast date). We also find that the results for *H3* are robust (-0.368[3], $p < 0.05$ and -0.236[4], $p < 0.10$ for *MF_Opt*; -0.044[3], $p < 0.10$ and -0.028[4], $p < 0.10$ for *ACSI x MF_Opt*).

Variable	Control function (DV = ACSI)		MF_Opt	
	Coefficient	t-stat	Coefficient	t-stat
Intercept	8.881*	1.75	-0.294*	-1.80
ACSI			0.006**	2.43
Horizon	-0.004	-1.19	0.000	0.75
STD_AF	-1.185	-0.53	-0.237***	-3.34
Size	-0.198	-0.97	0.006	1.00
Lit_Ind	-1.632***	-3.10	0.024	1.43
MTB	0.004	0.26	0.000	0.29
ShrOwn	0.112**	2.25	-0.001	-0.33
Lag_loss	5.498	1.42	0.089	1.35
DACC	3.055*	1.67	0.157***	2.66
InvMills	-4.553***	-4.28	0.029	0.82
Ind_ACSI	0.977***	16.01	-0.003	-0.91
Control function			-0.052***	-2.66
Year fixed effect	Yes		Yes	
N	165		165	
F-statistics	49.70***		2.62***	
Adjusted R ²	0.73		0.15	

Table VIII.
Control function approach^{a,b}

Notes: ^a*, **, and *** indicate significance at the 10, 5 and 1%, respectively; ^bt-statistics are calculated using corrected standard errors robust to heteroskedasticity and clustered at the firm level

Bootstrapping. As the covariance matrix generated by ordinary least squares regression estimates of equations (2) and (3) in the second stage is inconsistent, we calculate corrected standard errors in this stage from an asymptotic approximation or by a bootstrap (McArdle and Ritschard, 2014; Petrin and Train, 2010). Therefore, we bootstrap (replications = 100) the sample to obtain corrected standard errors in the second stage and re-estimate equations (2) and (3). Our main findings are found to remain unchanged in both models: $H2$ (0.003[3] and 0.006[4], both for $ACSI$ at $p < 0.05$) and $H3$ (-0.882 [3], $p < 0.05$ and $(-0.833$ [4], $p < 0.10$ for MF_Opt ; -0.111 [3], $p < 0.05$ and -0.109 [4], $p < 0.10$ for $ACSI \times MF_Opt$).

Discussion

This research sets out to examine the influence of customer satisfaction on managers' decisions to issue voluntary earnings disclosure and on forecast optimism. We further investigate whether satisfaction information, managerial optimism and their interaction influence short-term stock returns.

We draw three meaningful conclusions from our analyses. First, positive satisfaction news increases the likelihood of issuance of management earnings forecasts. Managers of a firm with reported high satisfaction scores are more likely to release their forward-looking, earnings-related information voluntarily. Second, there is a positive and significant association between satisfaction and optimistic management forecasts. Third, customer satisfaction has no direct impact on stock returns; instead, the negative impact of management optimism on abnormal returns is stronger for firms with high customer satisfaction scores than for those with low scores.

Our research findings have considerable implications for researchers and practitioners. This investigation enriches the marketing-accounting/finance interface research stream. We demonstrate that customer satisfaction can be a source of the management forecast optimism that significantly impacts market participants by integrating a key marketing metric of satisfaction and a set of accounting/finance metrics (i.e. the issuance and optimism of management earnings forecasts and size-adjusted cumulative abnormal stock returns) into the models. Incorporation of such metrics may broaden the research scope in the domains of marketing and accounting/finance because they enhance our understanding as to how a nonfinancial, market-based asset (i.e. the publicly released customer satisfaction index) affects financial decision-making by managers and investors individually and collectively.

Our study further contributes to the literature on customer satisfaction and management earnings forecasts. The marketing literature, by and large, has overlooked the linkage between satisfaction and the key participant of capital markets, particularly in relation to the role of managers. We extend the existing literature by incorporating a managerial perspective into the understanding of how customer satisfaction influences analyst behavior and market reaction (Luo *et al.*, 2010; Ngobo *et al.*, 2012). Little is also known in the accounting/finance discipline about whether satisfaction information motivates managers to issue a forecast. In this study, we identify satisfaction as a driver of voluntary issuance of earnings guidance in addition to environmental forces and firm- or manager-specific motivations. In sum, this research is invaluable and timely because there is scant evidence as to whether managers are influenced by satisfaction news and whether their decisions ultimately affect investors.

The practical insights presented in this study revolve around the relevance of a specific marketing metric, customer satisfaction, in driving management decisions and firm financial performance. Given the considerable effect of customer satisfaction on management forecast issuance, we conclude that this information is relevant to

managers. The study results thus can improve managers' ability to make decisions about whether and when to issue a forecast. For investors, this research draws attention to customer satisfaction because not all nonfinancial information that managers choose to use in issuing earnings forecasts is equally pertinent to these participants (Hirst *et al.*, 2008). Furthermore, our research benefits investors and regulators who are concerned about the quality and effectiveness of management earnings forecasts by highlighting the optimism embedded in managers' decisions to issue forecasts in relation to satisfaction.

This investigation is not without its limitations. Researchers in future studies can incorporate other marketing-related nonfinancial metrics such as brand value and corporate reputation into the model. Satisfaction focuses on the customer, whereas brand value focuses on the product and corporate reputation on the firm; therefore, each metric provides a different outlook on the firm's financial health to investors and creditors (Himme and Fischer, 2014).

Although this study does not examine the psychological process behind the forecast optimism, it would be interesting to examine the possible role of (over)confidence in the association between customer satisfaction and managerial forecast optimism and the reaction of capital markets. The absence of empirical evidence on the satisfaction–management forecasts relationship leaves much for researchers to explore in the future.

Notes

1. Please note that the terms forecast error and forecast bias are used interchangeably (Rogers and Stocken, 2005).
2. The management forecast optimism is the difference between management forecast of earnings and actual earnings. Even though the actual earnings are unavailable at the time of management forecast, prior studies find that stock returns react to information beyond that reflected in management forecasts such as management forecast optimism (McNichols, 1989).
3. Coefficient without *Ind_ACSI* in the model estimation.
4. Coefficient with *Ind_ACSI* in the model estimation.
5. Coefficient without $\ln(\text{Ind_ACSI})$ in the model estimation.
6. Coefficient with $\ln(\text{Ind_ACSI})$ in the model estimation.

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Further reading

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