THE MULTIFACETED INTERPLAY BETWEEN FIRMS AND THE FINANCIAL COMMUNITY: A MARKETING PERSPECTIVE

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A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

Business Administration-Marketing-Doctor of Philosophy

2018

ABSTRACT

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This dissertation, using a two-essay format, focuses on broadening the targets of strategic marketing communication to reach major participants in financial markets, which are necessary for accessing cash and strategic assets needed by modern, agile corporations. Research in marketing so far has been reluctant to address the prospect of marketing strategy in targeting the financial community. This dissertation tries to close this gap. In the first essay, we employ a scenario-based behavioral experiment to test the impact of disclosure of customer-based brand equity and customer satisfaction as strong indicators of marketing productivity on the sell-side financial analyst's stock price forecast. We find that they favorably factor the increase in the value of customer-based brand equity but not customer satisfaction into their stock price forecasts. Moreover, we observe a synergistic (positive/non-linear) interaction effect of customer satisfaction and customer-based brand equity information on analyst's stock price forecast. This means analysts pay attention to customer satisfaction information when brand equity information also is revealed, and both indicate a positive uptake in value. We also empirically test the effect of brand equity on the analyst's (i.e., a projected security price level over a 12-month horizon) and their forecast accuracy using an analyst-level large longitudinal data set over from 2007 to 2015. We show that customer-based brand equity increases forecast accuracy and is positively associated with the target price. Analyst's experience, as a proxy for skill, moderates the relationship between customer-based brand equity and analyst's target price and forecast accuracy. Interestingly, the positive effect of customer-based brand equity on target price

weakens as analyst's experience increases. We do not find support for the moderating role of analyst's experience in the relationship between customer-based brand equity and forecast accuracy. Overall, our results suggest that firms can benefit from voluntary disclosure of brand equity, beyond their traditional financial reporting. In the second essay, we focus on the important and relevant role of institutional investors in financing innovation. Institutional investors are increasingly powerful market participants. They owned 63 percent of the outstanding public corporate equity in 2016 (Board of Governors of the Federal Reserve System 2016, p. 130). Drawing on Merton's (1987) model of capital market equilibrium with incomplete information and limited attention framework (Peng and Xiong 2006), we show that the relationship between innovation performance measured by stock returns to a new product preannouncement and institutional investor ownership is contingent upon the intensity of investor relations. We analyze a large longitudinal data set on new product preannouncements issued by firms from 2007 to 2015 in the biopharmaceutical industry to test our hypothesized relationships. Our findings suggest that investor relations intensity improves a firm's institutional investor following in response to a new product preannouncement. However, stock returns to a new product preannouncement did not directly influence institutional investor ownership. We also did not find support for the effects of brand sentiment surrounding a new product preannouncement and announcement specificity on the institutional investor ownership.

This dissertation is dedicated to my mom, my dad, and the loving memory of my grandmothers.

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude and appreciation to the department of marketing at Eli Broad College of Business, members of my dissertation committee, and especially to my dissertation chair and mentor, Dr. Roger J. Calantone for supporting me during my doctoral studies. I am also grateful to BAV Consulting, a Y&R Brands company, for providing me the brand data for essay 1.

I am forever thankful to my mother Razieh Ashoori and my father Hadi Sardashti for unconditionally loving and supporting me throughout my life. Moreover, I would like to give a shout-out to my dear friends, Angela Jones and Joyce Wang, for their kindness and support that made my PhD journey one to remember and cherish for the rest of my life. Lastly, I dedicate this dissertation to the loving memory of my grandparents, specially, my beloved grandmothers Fatemeh Khosravi and Saltanat Fahimi.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

GENERAL INTRODUCTION

This dissertation, using a two-essay format, focuses on broadening the targets of strategic marketing communication to reach major participants in financial markets, which are necessary for accessing cash and strategic assets needed by modern, agile corporations. Additionally, it expands the scope of inquiry into the financial community's information needs and its uses of that information that can be sourced from modern marketing research techniques. Research in marketing so far has been reluctant to address the prospect of marketing strategy in targeting the financial community. This dissertation, therefore, tries to contribute to closing this gap.

In the first essay, we employ a scenario-based behavioral experiment to test the impact of customer-based brand equity disclosure and customer satisfaction on an analyst's stock price forecast. The results suggest that the financial analyst favorably factors the increase in value of customer-based brand equity information into their stock price forecasts. However, we do not find support for the effect of customer satisfaction on the stock price forecast. This may be because financial analysts in general assume that brand equity is more significantly associated with future financial performance than customer satisfaction. Our results suggest that financial analysts consider brand equity as more of a leading indicator of financial performance than customer satisfaction, possibly because customer satisfaction captures customers' prior experiences with a brand. The effect of this prior experience is already reflected in the current term financial performance and therefore not necessarily the future performance (e.g., Luo, Homburg and Wieseke 2010). Prior research also shows that customer-based brand equity has a significant and much larger impact on the firm's future financial performance (Mizik 2014). Moreover, we observe a synergistic interaction (positive/non-linear) effect of customer

satisfaction and customer-based brand equity information on stock price forecast. These results indicate that analysts pay attention to customer satisfaction information when customer-based brand equity information is also revealed, and that both indicate a positive uptake in value.

This essay also includes an empirical test on the effect of customer-based brand equity on the analyst's target price (i.e., a projected security price level over a 12-month horizon) and their forecast accuracy, namely absolute value of the forecast earnings error. This test uses analyst-level archival data, which tracks sell-side U. S.-based financial analysts who follow 147 mono-brand firms (i.e., firms in which a single brand embodies most of the firm's businesses) in 19 industries from 2007-2015. We find that customer-based brand equity reduces earnings forecast errors and is positively associated with target price. Analyst's experience, as a proxy for skill, moderates the relationship between customer-based brand equity and analyst's target price and forecast accuracy. Interestingly, the positive effect of brand equity on target price is weaker for more experienced analysts. We do not find support for the moderating role of the analyst's experience in the relationship between customer-based brand equity and forecast accuracy. In summary, our findings suggest that firms can benefit from voluntary disclosure of customer-based brand equity beyond their traditional financial reporting. Increasing the quality of marketing information disclosure by including brand equity can redirect investors' attention to the firm, justify marketing costs, and improve the firm's valuation.

In the second essay, we study the impact of new product preannouncements on institutional investors' holdings. Institutional investors are increasingly powerful market participants. The role and influence of institutional investors has grown over time. They owned 63 percent of outstanding public corporate equity in 2016 (Board of Governors of the Federal Reserve System 2016, p. 130). Firms use new product preannouncements as a strategic

marketing communication tool to distribute new information among influential stakeholders. In this study, I focus on the important and relevant role of institutional investors in financing innovation. Particularly, we examine the effects of communication with institutional investors in the form of investor relations. Further, we introduce this theoretically and managerially relevant topic to new product preannouncement literature in marketing. Drawing on Merton's (1987) model of capital market equilibrium with incomplete information and limited attention framework (Peng and Xiong 2006), we show that the relationship between innovation performance measured by stock returns to a new product announcement and institutional investor ownership is contingent upon the intensity of investor relations. Using data on new product preannouncements issued by firms from 2007 to 2015 in the biopharmaceutical industry, my findings suggest that investor relations intensity improves a firm's institutional investor following, which is necessary for financing innovation and access to cash. However, stock returns to a new product preannouncement did not directly influence institutional investor ownership. We also did not find support for the effects of brand sentiment surrounding a new product preannouncement and announcement specificity on institutional investor ownership.

ESSAY 1

Brand Equity, Customer Satisfaction and Analyst's Stock Price Forecast

Almost all positive cash flows can ultimately be traced to customers (Srivastava, Shervani, and Fahey 1998). A large proportion of the marketing–finance literature focuses on investigating the impact of customer-based assets on firm performance and ultimately on shareholder value (e.g., Ailawadi, Lehmann, and Neslin 2003; Mizik and Jacobson 2008; Rego, Billett, and Morgan 2009; Rego, Morgan, and Fornell 2013). However, a review of relevant literature in marketing and finance reveals that the relationship status of customer-based assets and shareholder value is more complicated than what previously thought, for several reasons. First, the middleman effect is extremely important in understanding whether customer-based assets information is deemed relevant in a firm valuation and, if so, how it is interpreted and consumed by various middlemen or information intermediaries, such as agents, brokers, dealers, market makers, and financial analysts. Particularly, information intermediaries such as sell-side financial analysts function as a critical source of information for institutional investors and individual investors who eventually will drive the demand for a firm's securities (Chang, Dasgupta, and Hilary 2006). Financial analysts are responsible for examining a firm's financial and non-financial information, both public and private, compiling that information, and anticipating its prospects in terms of future earnings and investment potential. They are of substantial interest to researchers because of their critical role in analyzing, interpreting, and disseminating information to capital market participants (Brown et al. 2015). Researchers in finance and accounting have long been interested in how the characteristics of analysts' forecasts affect price formation due to the large demand for earnings forecasts (Hilary and Hsu 2013). Hence, marketing research studying financial analysts can shed light on how they account for

customer-based assets or other relevant marketing information. This knowledge not only provides strategies for marketing managers regarding asset allocation but also can guide them through more effective communication with investors and top management. Second, finance researchers often have limited access to non-financial data, such as customer-based assets. Ultimately, finance and accounting scholars are responsible for much of what we know about how financial analysts do their job. In addition, a large proportion of the information excluded from financial reports relates to customer-based assets, such as brands. In fact, prior research has suggested that financial analysts are expected to make up for the shortcomings of financial reporting and factor information excluded from financial reports into their forecasts and investment recommendations. For example, literature on financial analysts and their processes has almost exclusively focused on examining the efficiency of the analysts' stock price forecasts and recommendations in respect to the accounting and financial metrics that are disclosed in annual and quarterly reports. Several studies have tried to close this gap by examining the relationship between customer-based assets and financial analysts' stock price forecasts in the marketing literature (e.g., Luo, Homburg and Wieseke 2010; Ngobo, Casta, and Ramond 2012). These studies have revealed that financial analysts include customer satisfaction in their stock forecasts and recommendations. However, to our knowledge, there is no research investigating the specific impact of customer-based brand equity on analysts' stock price forecasts. This phenomenon is important to understand, as brand equity is chief among all other customer-based assets. Its favorable impact on financial performance is well-documented in the literature, which has consistently shown that brand equity evokes positive financial consequences for firms as a key determinant of their marketing productivity and long-term value. Notably, brands account for nearly one-third of the $12 trillion in market capitalization of the S&P 500 (BAV Consulting

2017). In addition, brands are also a topic of interest among members of the financial community. We notice that firms increasingly include brand information in their communications (e.g., press releases), as revealed in Figure 1. Reputable financial news outlets, such as the Wall Street Journal, have also called for the inclusion of brand equity information in annual reports or even on balance sheets (Gregory 2011). A review of the Wall Street Journal articles since 1981 indicates an upward trend in publishing articles discussing brand equity and its importance to the firm (see Figure 2).[1] Thus, it is highly relevant to the marketing field to know if financial analysts factor customer-based assets information into their forecasts. Furthermore, both research and anecdotal evidence suggest that top managers communicate with investors and financial analysts informally and formally in their effort to market their firms, increase their visibility and coverage, and enhance firm perceptions among these information intermediaries (Bushee and Miller 2012). Therefore, the need for effective communication with information intermediaries is paramount for firms and is directly relevant to their corporate strategies.

Thus, our research examines the need for effective communication through the disclosure of customer-based assets information to sell-side financial analysts. We consider information disclosure regarding two critical customer-based assets, brand equity and customer satisfaction; these assets are intimately connected with the firm's marketing activities and considered as measures of marketing productivity and performance. By leveraging rich, existing marketing

[1] We ran a text-based analysis through articles published in the Wall Street Journal and firms' press releases to obtain data on number of times brand equity, brands, brand investment, branding had been mentioned and discussed since 1981. Then, we aggregated these frequencies annually. This approach has been used in strategy literature which assumes frequency of specific words connotes meaning and importance. Figure 1 and Figure 2 displays our results.

literature, we address three main research questions that have theoretical and managerial relevance:

1. Do customer-based brand equity and customer satisfaction information influence financial analysts' stock price forecasts?

2. If so, do customer-based brand equity and customer satisfaction information positively influence financial analysts' stock price forecasts?

3. Does analyst's experience, a proxy for skills, influence the impact of customer-based brand equity and customer satisfaction information on the stock price forecast?

We research these questions by executing a 2×2 (increase in brand equity vs. decrease in brand equity × increase in customer satisfaction vs. decrease in customer satisfaction) experiment (study 1). Afterwards, using a longitudinal dataset (study 2) that tracked analysts from 2007 to 2015, we reexamine the value relevancy of customer-based brand equity information to the analyst target price and the moderating impact of the analyst's experience on the relationship between brand equity and target price. This secondary dataset provides the necessary variance and statistical power to strengthen our conclusions. Our findings from study 1 show that analysts use information on customer-based brand equity more than they do customer satisfaction. Moreover, we observed a synergistic (positive/non-linear) interaction between customer-based brand equity and customer satisfaction information in our first study. Our longitudinal analysis (study 2) further revealed that customer-based brand equity provides incremental information to analysts' target price. Lastly, our results suggest that the impact of customer-based brand equity information on target price is stronger for less experienced analysts than more experienced ones. In summary, our findings from these two studies suggest that customer-based brand equity

information is relevant to analysts' stock price forecasts, and there is both interest in and an unmet need for marketing-related information among sell-side financial analysts.

Currently, to our knowledge, no firms disclose brand equity information to the public. Hence, to investigate our research questions, we needed an experimental setting to provide a ground for causality before we could delve deeper into an empirical analysis. We included customer satisfaction in our study for two reasons. First, while studies by Luo, Homburg, and Wieseke (2010) and Ngobo, Casta, and Ramond (2012) offer interesting insights into the relationship between customer satisfaction and analysts' forecasts, these studies only rely on survey results to establish grounds for whether analysts consider customer satisfaction information. Hence, we believe our study, using an experimental design, can generate important insight regarding not only if analysts consider customer satisfaction information but how they incorporate that data into their forecasts. Second, while brand equity captures the emotional capital of a brand and more of a hedonistic customer experience, customer satisfaction reflects a more heuristic aspect of customer experience. This presents an interesting dynamic to study how the release of information regarding these two assets interact and affect analysts' stock price forecasts.

Furthermore, it is worthwhile to mention that much of the discussion in the popular press centers on assigning a dollar value to brand equity (e.g., Interbrand brand equity data, Forbes's The World's Most Valuable Brands) rather than a customer-based metric. However, we rely on using a customer-based measure (also called the mind-set metric) of brand equity in studies 1 and 2 for several reasons. First, given the well-documented shortcomings of financial reporting particularly with respect to internally generated assets such as brands, we believe that a direct financial measure of brand equity would be subjected to the same inefficiencies shared by all

other accounting measures (see Mizik 2011). Second, prior research has already established a strong link between customer-based brand equity and favorable financial outcomes (Mizik and Jacobson 2008). Last, Srinivasan et al. (2010) showed that customer-based metrics improve sales response models and are leading indicators of future sales results. These reasons lead us to believe that a customer-based measure of brand equity is more appropriate than a financial metric for our study, as it has empirically more predictive power to explain future financial performance and more completely reflects the dynamics of a firm's marketing performance.

Conceptual Framework and Literature Review

We carefully reviewed the pertinent literature to create a body of research that illustrates a supportive argument for the importance of customer-based assets to firm value and, hence, to sell-side financial analysts (see Table 1.1). We provide a detailed review of studies that focus on the relationship between analysts' forecasts and customer-based assets and/or marketing capability and long-term and/or short-term firm value. In the following sections, we present an overview of literature regarding brand equity, customer satisfaction, and sell-side financial analysts.

Brand Equity and Customer Satisfaction

Brand equity refers to the tangible and intangible value associated with the brand name (Aaker 2004; Keller 1993). Brand equity entails value, as it embodies the fulfillment of a firm's promises about customers' consumption experience. It is one of the most important customer-based performance metrics and market-based assets and can capture the dynamic nature of customers' mindsets in terms of cognitive and emotional capital and strength of a brand. Simply

put, brand equity is the ultimate measure of a firm's marketing productivity (Keller 1993). As a deeply influential customer-based asset, brand equity can be leveraged to enhance firm performance and create shareholder value (e.g., Mizik and Jacobson 2008; Rego, Billett, and Morgan 2009; Stahl et al. 2012). Building strong brands has long been considered the strategic goal of many organizations due to their strong influence on competitive marketing actions, margins, channel cooperation, and innovation (e.g., Delgado-Ballester and Munuera-Aleman 2005). Both anecdotal and empirical evidence indicate that managers recognize the value of strong brands and dedicate significant resources to building brand equity (Keller 2012). Investments in brand equity are designed to acquire and retain customers and ultimately foster business growth and create shareholder value (Grewal et al. 2010). A large body of marketing literature thus focuses on the consequences of brand equity for firm performance.

Another critical customer-based asset, customer satisfaction, also constitutes an important part of corporate strategy (Fornell et al. 2006) and is a key driver of long-term profitability and market value (Gruca and Rego 2005). Widely used as a key marketing performance indicator in practice (Luo and Homburg 2007) customer satisfaction reflects an overall evaluation of a firm's offerings, according to the customer's total purchase and consumption experience over time (Anderson, Fornell, and Mazvancheryl 2004; Fornell 1992). Theoretically, satisfaction can lead to brand loyalty and ultimately brand equity (Aaker 1996). Yet, we argue that customer satisfaction compared with brand equity is a fundamentally different dimension of the customer experience, as it only relates to direct consumption. In contrast, the multi-dimensional view of a brand provides a platform to measure customers' opinions formed from consumption experience, exposure to firm's marketing communications, brand's social status, and many other influences unrelated to consumption. Moreover, all these influences generate emotions and feelings, which

can be strong predictors of behavioral outcomes, such as loyalty and price insensitivity (e.g., Chaudhuri and Holbrook 2001). In summary, customer satisfaction is strictly based on customers' consumption experiences, while brand equity can be based on many experiences besides consumption.

What Sell-Side Financial Analysts Do and What Goes into Their Models

Sell-side financial analysts, also called equity research analysts, work for brokerage houses and assess firms' future earnings growth and other investment criteria. They also issue recommendations on stocks or other securities, typically phrased as "buy", "sell", or "hold." Sell-side financial analysts use primary research, recent earnings performance, recent 10-K and 10-Q reports, and private communication with management to issue forecasts (Brown et al. 2015). A firm often is followed by multiple sell-side financial analysts (Roulstone 2003) associated with different brokerage houses (Irvine 2004) or institutional investors (Barron 1995) that issue forecasts for each stock and revise their forecasts in response to new information. Analyst forecasts also provide the basis for specific stock recommendations issued to investors. To assist analysts, firm managers disclose information and provide guidelines through direct interviews, 10-Q reports, stockholder reports, and formal presentations (Lang and Lundholm 1996). Analysts have reported that they typically have direct contact with CEOs or CFOs of firms they follow five or more times annually (Soltes 2014). Such communications with C-level management suggest that analysts also combine pieces of nonpublic information from management to increase the accuracy of their forecasts (Brown et al. 2015). This suggests that analysts not only evaluate the value relevancy of public information, but they also collect information that is not readily available to investors (Ivkovic and Jegadeesh 2004). Analysts

assist investors in their interpretation of intangible investments (Kimbrough 2009), and the extent to which market values reflect the fair value of R&D capital, especially the unrecognized portion of it, is a function of analysts' coverage (Kimbrough 2007). Furthermore, Luo and Jong (2012) demonstrated that analyst activities partially mediate the impact of advertising on firm return and risk. These findings suggest that analysts are very skilled at gathering and analyzing information that can significantly influence investors. While a large body of research in accounting and finance has focused on what goes inside the "black box" of sell-side financial analysts, our knowledge regarding the precise nature of information used by analysts in their forecast models remains limited. For instance, we don't know what portion of communications between managers and analysts relate to marketing information or more specifically customer-based assets. Traditional financial reporting does not account for customer/market-based assets directly. Like accounting and finance, the majority of works in marketing literature rely on accounting data such as advertising, research and development expenses, and intangible assets as proxies of firms' marketing spending in their study of analysts' forecasts.

Having large analysts' following matters to firms, as it increases their visibility, particularly in the eyes of institutional investors. However, many firms encounter significant challenges in improving their visibility and attracting analysts to their stock (Bushee and Miller 2012). To increase analysts' following and ultimately, to reduce the cost of capital, prior research has suggested that firms should adopt a policy of voluntary disclosure (Botosan 1997). Thus, given the support in the literature for the importance of analysts on price formation of a security, it is beneficial for firms to understand the consequence of releasing customer-based assets information to financial analysts. Admittedly, this also makes financial analysts a relevant research topic in the marketing literature.

Hypotheses Development

Srivastava, Shervani, and Fahey (1998) show that the value of a firm depends on its future cash flows, and, indeed, for years research in marketing-finance has provided consistent evidence to support their findings. In addition, sell-side financial analysts issue stock recommendations to investors mainly according to the prospects of future cash flows (Chen and Matsumoto 2006). Therefore, the better these prospects, the greater the probability that analysts will issue favorable stock recommendations (Jegadeesh et al. 2004).

The value relevancy of non-financial information as an indicator of corporate management quality and future cash flow prospects has been noted in accounting and finance literature (e.g., Dhaliwal et al. 2012). Prior research in accounting, finance, and marketing suggests that sell-side financial analysts pay attention to non-financial information. Breton and Taffler (2001) found that after accounting for fundamentals (e.g., earnings per share, management effectiveness) non-financial information related to customers and product strategies significantly influence analyst recommendations. Moreover, Amir, Lev, and Sougiannis (2003) revealed that not only do analysts recognize the importance of intangibles, but they also compensate for intangible-related information shortcomings in financial reports. Whitwell, Lukas, and Hill (2007) also demonstrated that analysts pay attention to firm intangibles to enhance the quality of their assessments. These findings suggest that sell-side financial analysts are aware of the importance of non-financial information related to customers and intangible assets as drivers of firm performance and ultimately firm value.

Luo, Homburg, and Wieseke's (2010) study provides the logical ground for our argument that not only will sell-side financial analysts pay attention to brand equity and customer satisfaction information, but it may also positively affect their forecasts. They also suggested that

analysts consider intangibles, such as customer satisfaction, in their forecasts and recommendations. More elaborately, in a related study, Ngobo, Casta, and Ramond (2012) showed that customer satisfaction reduces analysts' forecasts errors and analysts respond to changes in customer satisfaction. Moreover, prior research in marketing-finance has consistently connected brand equity and customer satisfaction to firms' cash flow prospects. For example, Srivastava, Shervani, and Fahey (1998;1999) hypothesized a powerful relationship among customer-based assets (e.g., brand equity), market performance, and shareholder value, arguing that customer-based assets create shareholder value by accelerating cash flows, reducing the risk associated with cash flows, and increasing the firm's long-term value. In a related study, Gruca and Rego (2005) linked cash flow variability to customer satisfaction as a market-based relational asset, and Madden, Fehle, and Fournier (2006) found that a portfolio of stocks comprising firms with high-value brands has lower systematic risk. Likewise, Rego, Billett, and Morgan (2009) showed that strong brand equity reduces equity and debt-holder risk significantly, which lowers the cost of capital for firms. Satisfaction generates positive customer outcomes, including 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 (Aksoy et al. 2008; Anderson, Fornell, and Mazvancheryl 2004). On the other hand, negative customer outcomes and their resulting negative cash flow developments also are less possible when customer satisfaction is high (Luo and Homburg 2008, p. 32). Therefore, information about customer satisfaction and brand equity should serve as an indicator of a promising future. Lastly, a study by Bayer, Tuli and Skiera (2017) made the case for potential benefits of disclosing customer metrics. These authors debunked the myth that disclosing critical customer metrics would have a negative effect on firms' future cash flows. They found that the

disclosure of forward-looking customer metrics is negatively associated with investors' uncertainty in the airlines and telecommunications industries and analysts' uncertainty in the telecommunications industry. Thus, given the similarities between customer satisfaction and brand equity and increasing interest in the financial press, it seems plausible that analysts would pay attention to brand equity and customer satisfaction information if available to them.

We expect that increases in customer satisfaction and brand equity provide analysts with confidence in firms' future performance, which should positively influence stock price forecasts. Naturally, decreases in customer satisfaction and brand equity occur for a variety of reasons, including lack of effective marketing strategy, product defects, negative events, etc., thus putting the prospects of firm performance in jeopardy. Hence, we expect that decreases in these assets will negatively affect stock price forecasts by analysts. Therefore, we propose the following hypotheses:

H_1: Increases (decreases) in brand equity are positively (negatively) associated with stock price forecasts.

H_2: Increases (decreases) in customer satisfaction are positively (negatively) associated with stock price forecasts.

As discussed above, customer satisfaction and brand equity positively affect firms' future cash flows. This means it is likely that analysts will find increases or decreases in both assets to be related signals of a major shift in the customer base opinion regarding the firm and its offerings, which can significantly affect future firm performance. Thus, given that both customer satisfaction and brand equity are leading indicators of firm performance, we hypothesize a positive synergistic effect of brand equity and customer satisfaction information on stock price forecast. We propose the following hypothesis:

H_3: Customer satisfaction and customer-based brand equity have a positive interaction effect on stock price forecasts.

Moderating Role of Analyst Experience

As we investigate whether analysts pay attention to customer-based assets information and how they incorporate this information, it is important to consider their characteristics, which can potentially influence their forecast models. Prior research has presented a plethora of factors affecting analysts' ability related to earnings forecasts and stock picking, such as aptitude, experience, and various environmental factors like brokerage house characteristics (Jacob, Lys, and Neale 1999). Within the context of analysts' forecasting, experience is the key to more accurate forecasting (Mikhail, Walther, and Willis 1997; Clement 1999; Clement and Tse 2005). More experienced analysts are less likely to herd (Hong, Kubik, and Solomon 2000). Thus, we focus on the analyst's experience as a critical factor that can affect his or her forecasting model, choice of inputs that go into the model, and forecast accuracy.

"Learning by doing" proposes a positive relationship between experience and task performance (Jacob, Lys, and Neale 1999). According to the learning-by-doing theory (Newell and Rosenblum 1981; Argote and Epple 1990), analysts' forecasting is likely to improve as they obtain deeper industry- and company-specific knowledge and develop working relationships with corporate management. These findings suggest that more experienced analysts are likely to incorporate more firm-specific information into their forecasting models than market-level information. This is because more experienced analysts having a deeper knowledge about drivers of firm value and more experience in general working with firm-level information. Thus, it is likely that they will pay more attention to brand equity and customer satisfaction information

than their less experienced peers who may be motivated to use market-level information or who don't know how to account for brand equity and customer satisfaction information. Therefore, we are proposing following hypotheses:

H_4: The positive incremental effect of information content of brand equity on the stock price forecast strengthens as the analyst's experience increases.

H_5: The positive incremental effect of informational content of customer satisfaction on the stock price forecast strengthens as the analyst's experience increases.

Study 1: An Experimental Study

We tested our hypotheses via a scenario-based behavioral experiment. We investigated whether financial analysts pay attention to disclosures of customer-based brand equity and customer satisfaction information by a firm.

Sample, Data Collection, and Procedure

Study 1 included sell-side financial analysts (n = 203) currently employed in the United States who had a minimum of 6 months of experience at the time the study was conducted. A research firm assisted us in recruiting these analysts. More than 20 percent of our sample had a certificate of financial analysis (CFA) and more than 40 percent had MBA degrees. Also, half of our sample had less than 12 years of experience and covered less than five firms. Prior to starting the study, we tested our experiment with a panel of experts and revised the survey to maximize its fluency and clarity. We also pretested the experiment on 60 respondents, recruited through a marketing research firm. The pretest results confirmed that the experimental content is relevant and indicated how long people would need to answer the questions on average. We included

three manipulation checks and one attention check in the final survey. Our final survey included 35 questions ranging from demographic questions and open-ended questions related to our research questions (see Appendix C.1 and D.1). We rejected incomplete or partial answers as well as answers provided after spending less than 10 minutes on the survey. We collected the responses over two days, during which time no significant macroeconomic events occurred that might affect survey respondents' view of the market.

Applying a randomized block design, we assigned each analyst to one of the four between-subjects treatment conditions, a 2×2 experimental design (increase in brand equity vs. decrease in brand equity × increase in customer satisfaction vs. decrease in customer satisfaction). They read a short scenario (see appendices) about a recent memo from the CEO to the board of a hypothetical company called Tuft Technology Corporation. This company manufactures consumer electronics and creates computer software. In this memo, the CEO discusses his suggestions for reporting non-financial information, specifically brand equity and customer satisfaction, for public consumption. He also quantifies the amount of increase and decrease in brand equity and customer satisfaction in his memo. A short description of the methodology to measure customer-based brand equity was presented as part of the memo. Respondents were provided with several necessary financial documents, including a 10-K report, key financial statistics for the firm and its direct competitors, and an industry report. In the control condition, the randomly assigned participants only received basic financial data, without any information about brand equity or customer satisfaction. The results of the manipulation checks confirmed that the conditions demonstrated significant mean differences (*p-value* < .05) in the expected directions.

Covariates

There is substantial evidence in the psychology of individual differences that people indicate varying levels of cognitive ability for complex tasks. In this research design, we provided analysts with extra information about brand equity and customer satisfaction but without any instructions about how they should use this information to make investment decisions or forecast stock price. The two new pieces of information that we introduced may make the information processing task more difficult or unpleasant, which could heighten the analyst's concern about cognitive closure (Webster and Kruglanski 1994).

Therefore, we considered the need for cognition closure as a covariate.[2] This trait varies across people and may influence analysts' judgment. As the need for cognitive closure increases, people consider less evidence; reach impulsive conclusions that have immediate implications; and disregard complex, ambiguous, or belief-inconsistent information (Kardes et al. 2004). An analyst with a high need for cognitive closure may suffer diminished judgmental accuracy, as they are more likely to neglect information about the two new pieces of information. We adapted an original measure from Christie and Geis (1970) to measure the need for cognitive closure, reducing the original 18 items to 8 items after removing some redundant measures. A confirmatory factor analysis on the 8 items (confirmatory fit index = 99.4, Tucker-Lewis index = 99.2, root mean square error of approximation = .02) indicated that they are acceptable. We used a factor score for the 8 items as a covariate in the analysis.

[2] Need for cognition closure differs from involvement and the need for cognition (see Cacioppo et al. 1996).

We also used MBA degree as an additional control variable to confirm our results. We believe that MBAs have more marketing knowledge and familiarity with customer-based assets such as brand equity than non-MBAs, which may influence their forecasts.

Analysis and Results

For the stock price forecast (target price), we coded predictions as follows: 1 = stock price will go down, 2 = no change, and 3 = stock price will go up. The 2 × 2 between-subject design includes brand equity (increase vs. decrease) and customer satisfaction (increase vs. decrease). We analyzed the effects of the experimental treatment with an analysis of variance (ANCOVA), with the need for cognitive closure as the covariate, to assess the extent to which a person expressed a need for definite answers rather than ambiguity. Stock price forecasts varied significantly across the control and treatment groups ($F(1, 1, 202) = 4.083$, *p-value* < .05), such that they were significantly higher (more optimistic) in the treatment group ($M_{treatment} = 2.55$, $M_{control} = 2.15$; *p-value* < .05). In testing H_1, we found that an increase in brand equity results in more optimistic stock price forecasts ($M_{Increase} = 2.72$, $M_{Decrease} = 2.26$; $F(1, 202) = 5.87$, *p-value* < .05), in support of H_1. However, we did not observe any significant positive effect of an increase in customer satisfaction on the stock price forecast ($M_{Increase} = 2.35$, $M_{Decrease} = 2.63$; $F(1, 202) = 1.99$, *p-value* > .05), so we cannot confirm H_2. The interaction between brand equity and customer satisfaction had a statistically significant and positive effect on the analyst's stock price forecast ($F(1, 202) = 4.23$, $p < .05$), in support of H_3 (see Figure 3.C). However, the positive synergistic effect of brand equity and customer satisfaction is only significant when both are increasing. These results also are robust when we include MBA as a control variable and when we do not include any covariates. Our results do not support H_4 and H_5, as we find no evidence

that the effect of increases (decreases) in brand equity ($M_{Increase} = 2.63$, $M_{Decrease} = 2.38$; $F(1, 202) = .83$, $p > .05$) or customer satisfaction $M_{Increase} = 2.27$, $M_{Decrease} = 2.56$; $F(1, 202) = 1.13$, $p > .05$) on stock price forecast were stronger for more experienced analysts.

Study 2: A Deeper Examination of Study 1 Results

In study 2, we tested the impact of customer-based brand equity on analysts' stock price forecasts using a secondary data set. This mixed methodology using a secondary data analysis allows us to consider both the broader nomological net and the experimentally manipulated effects, and the experimental setting provides the necessary control to establish internal validity.

We decided to exclude customer satisfaction in our final model specification in study 2 for four reasons. First, study 1 did not support H_2, which stated that changes in customer satisfaction influence stock price forecasts. Second, theoretical measures of customer satisfaction and customer-based brand equity overlap. One can argue that customer satisfaction predicts brand equity. However, empirically, the correlation between the American Customer Satisfaction Index (ACSI) measure and our measure of brand equity, the brand asset value of BAV consulting, in our sample was .12. Third, we used quarterly brand equity data. We only had access to the annual ACSI, which would significantly reduce the variance within firms. Fourth and last, it is important to note that BAV consulting survey and ACSI customer satisfaction survey do not include the same firms, although, they overlap by 60 percent in our study. For instance, Ngobo, Casta, and Ramond (2012) use a sample of 111 companies included in the ACSI survey from 1995 to 2004. Luo, Homburg, and Wieseke (2010) use ACSI data from 1995 to 2006 which includes 1125 pooled firm-year observations to examine the mediating role of analyst stock recommendation which refers to analyst's tiered stock recommendation.

Forecasting target price is very different from forecasting earnings, and the quantification of a target price presents a more precise statement than a tiered stock recommendation (Bradshaw, Brown, and Huang 2013). We recommend that our readers, for detailed explanations of the impact of customer satisfaction on analyst stock recommendation and forecast accuracy, see Luo, Homburg, and Wieseke (2010) and Ngobo, Casta, and Ramond (2012).

Sample, Data, and Measures

We obtained brand equity data from the U.S. BAV metrics survey. Since 2000, Y&R's BAV initiative has begun regular surveys of consumers' brand perceptions (Mizik 2014). Every quarter, samples of 1,200 or more consumers are carefully chosen from a panel of 15,000 people. Those selected answer multiple-item scales that generate measures of brand equity during a 45-minute survey (Tavassolie, Sorescu, and Chandy 2014). The BAV model is the most comprehensive study of consumer attitudes, beliefs, familiarity, and evaluation of different brands. This model relies on the premise that each brand is a multidimensional construct that can be assessed through customer perceptions. In addition, it remains to be one of the few sources of brand equity data that is available for more than 10 years. Finally, the BAV database has been used by other marketing researchers. BAV metrics relate positively to customer lifetime value metrics (Stahl et al. 2012), the cost of debt (Larkin 2013), and firm value (Mizik and Jacobson 2008 2009; Mizik 2014). Table 2.1 presents a complete list of the variables and data sources.

Main Dependent Variable: Target Price

We used target price as reported in the I/B/E/S details file for the analyst level. Target price represents the projected price level forecasted by the analyst within a 12-month horizon.

The literature has shown that analysts' earnings forecasts and target price forecasts significantly affect stock prices, and that analysts exhibit differential abilities to predict earnings and make profitable recommendations (Bradshaw, Brown, and Huang 2013). Target prices reflect analysts' most succinct and clear statements on the magnitude of the firm's expected value.

Prior studies in marketing-finance literature use stock recommendation and earnings forecast to evaluate analyst's performance (e.g., Luo, Homburg, and Wieseke 2010; Luo and Jong 2012). However, analysts also include target prices in addition to recommendation and earnings forecasts in their equity reports. These target prices offer analysts' expectations of the magnitude of the firm's value to market participants (Brav and Lehavy 2003). Analysts' forecasts affect stock prices, and target prices are forecasts of future stock prices, all of which investors consider being relevant and informative (Bradshaw, Brown, and Huang 2013). We therefore used analysts' target price as our main dependent variable, which represents the projected price level forecasted by the analyst within a 12-month horizon. Forecasting price movement remains fundamentally different from forecasting earnings, and the quantification of a target price introduces a more accurate statement than a standard tiered stock recommendation (Bradshaw, Brown, and Huang 2013). Furthermore, Bradshaw (2002) revealed that analysts issue target prices to support their stock recommendations. Huang, Mian, and Sankaraguruswamy (2009) demonstrated that analysts' target prices conveys investment values incremental to their stock recommendations, and that the market reacts to changes in target prices. Finally, analysts' target price, due to its 12-month horizon, is possibly a better representation of a sell-side financial analyst's ability to process brand equity information, as it is a key driver of long-term firm value.

Alternative Dependent Variable: Forecast Accuracy

We define forecast accuracy as the absolute value of the difference between an analyst's earnings per share forecast and reported actual earnings per share of the firm scaled by the closing price at the end of corresponding quarter. Using the analyst-level forecast accuracy allows us to examine a larger sample size. The most widely used accounting performance measure is earnings per share (EPS). Considering that the target price represents a 12-month projection, EPS forecasts are more frequently issued and reflect short-term prospects of a firm. We did not use the raw forecast error because forecast accuracy is more commonly used in the literature, and it provides more information at the analyst level relative to a firm's actual performance. We obtained analysts' EPS forecasts data from the Thomson Financial l/B/E/S database.

Independent Variables

Brand equity. We use brand asset value from the BAV model as our main measure of brand equity. The BAV model includes data on four brand pillars: brand knowledge (familiarity), esteem (e.g., quality, value), energized differentiation (the extent to which the brand is distinctive, unique, and dynamic), and relevance (the extent to which consumers can relate to the brand). In addition, these pillars are combined into brand stature (esteem and knowledge), brand strength (relevance and energized differentiation), and a single brand asset measure in the BAV data base. They are also highly correlated (e.g., Stahl et al. 2012). Table 3.1 summarizes the BAV model and its measures in detail.

It is worth noting that Mizik (2014) used an aggregated measure of five BAV pillars, including energy, differentiation, esteem, relevance, and knowledge (the updated BAV database

combines energy and differentiation into one single dimension of energized differentiation). On the other hand, Stahl et al. (2012) directly employed the four pillars, including differentiation, esteem, relevance, and knowledge. Finally, Tavassolie, Sorescu, and Chandy (2014) and Larkin (2013) used brand strength, reasoning that only this dimension has economic value relevance. We observed in our tests that brand stature alone didn't have any explanatory value in our model. However, our main measure of brand equity assumed the value of both stature and strength. We believe that the stature dimension has important theoretical value, as it relates to customer loyalty and brand awareness, two equally important constructs with rich theoretical support in the marketing literature. Thus, we consider brand asset metrics as our main independent variable in this paper.

Analyst's experience. We obtained analyst's experience from the I/B/E/S database. We define analyst's experience as the number of years that an analyst has issued stock price forecasts prior to issuing forecasts for firm i in our sample. I/B/E/S assigns a unique code to each analyst. We calculated the difference in years between the first time an analyst showed in I/B/E/S and the corresponding quarter in our sample. Prior research has found that forecast accuracy is related to several analysts' and forecast characteristics (past accuracy, brokerage house size, experience, and the number of companies and industries the analyst follows) (Mikhail, Walther, and Willis 1997; Clement 1999; Jacob, Lys, and Neale 1999). Particularly, analyst's experience is extremely relevant to the analyst's ability to understand and interpret brand-related information. Since non-financial information regarding brand assets are not readily available in public records, analysts must have access to management or possess strong market acumen to incorporate the impact of any changes in customer attitudes and perceptions into their final evaluation.

Control Variables

We control for firm size, its dividend yield, financial leverage, and intangible asset intensity. These control variables all influence firm value and, hence, stock price forecast, as documented by previous research (Carter, Lynch, and Tuna 2007; Luo, Homburg, and Wieseke 2010; Luo, Wieseke, and Homburg 2012; Bradshaw, Brown, and Huang 2013).

Firm valuation models used by analysts and investors control for dividend yield, as demands for such stocks differ from non-dividend paying stocks (Luo, Homburg, and Wieseke 2010). Intangible asset intensity also is likely to affect firm valuation. Prior research has documented that firms vary in their disclosure of intangible assets, and analysts spend greater effort to follow firms with intangible assets (Barth, Kasznik, and McNichols 2001). Perhaps, would analysts pay more or less attention to brand equity information if a firm already has significant investments in intangible assets that are also publicly disclosed? As such, we also use financial leverage, as it signals a firm's financial strength, and the natural log transform of total assets to account for firm size.

Further, we use several analyst-level control variables, including the number of firms covered by an analyst per quarter (analyst's portfolio complexity), analysts' firm-specific experience, and brokerage house size (employer size). These analyst-level control variables appear in the literature due to their potential influence on analysts' forecast ability and the resources available to the analyst (Clement 1999; Yu 2008; Hillary and Hsu 2013). Analyst portfolio complexity pertains to the analyst's attention. The numbers of firms and industries followed are employed as proxies for portfolio complexity, assuming that it requires more effort to follow a larger set of firms and industries. Thus, an analyst may allocate less attention to individual firms (Clement 1999). Firm-specific experience is a significant factor in analyst

accuracy. Analysts improve their forecast accuracy with firm-specific experience, and the market recognizes this improvement (Mikhail, Walther, and Willis 1997); thus, failure to control for its effects may confound our results. Moreover, brokerage house size is an environmental factor that provides analysts with necessary resources, such as access to corporate management.

To control for differences between industries, we computed industry concentration (Herfindahl–Hirschman index [HHI]) using COMPUSTAT data. HHI is the sum of squares of all suppliers' market shares in an industry. This is the most widely used indicator of market structure (Curry and George 1983), and it relates significantly to firm performance (Montgomery and Wernerfelt 1991).

We also included year-quarter dummies to capture the effect of inflation or any other macro-economic events exogenous to firms. Using time dummies can greatly reduce, if not fully eliminate, cross-sectional (spatial) correlation (Wooldridge 2015).

We winsorize the continuous variables at 1 and 99 percentiles over the full sample to mitigate the effect of outliers (Bradshaw, Tan, and Huang 2012). We report the details of the databases and variable construction in Table 3.1 and the correlation matrix and descriptive statistics in Table 4.1.

Merging BAV, COMPUSTAT, and I/B/E/S Data

We carefully merged the BAV data with analyst-level data from I/B/E/S and the accounting data obtained from the COMPUSTAT database. The final sample includes 147 public mono-brand firms in 21 sectors, with data from 2007 to 2015, such that we obtained 28,081 analyst-firm-quarter observations. We followed prior studies (e.g., Mizik and Jacobson 2009) and restricted our sample to only mono brands (i.e., firms in which a single brand embodies most

of the firm's business). Additionally, to increase our sample size, we utilized a conventional approach from the finance literature that uses analyst-level samples. Finally, we included analysts who had appeared at least three or more times in our sample.

Model

We employed fixed-effects with first-order autoregressive correlation structure (FE-AR1) estimation method, which also accommodates for the estimation of moderately unbalanced panels (Wooldridge 2015). This approach allowed us to control for unobserved heterogeneity. Additionally, the autoregressive correlation structure allowed us to address any serial correlation concerns. Regular fixed effects estimation assumes strict exogeneity, which means the covariates at any time s are uncorrelated with the idiosyncratic errors at any time t. Behaviorally, strict exogeneity often fails and can cause serious inconsistencies in estimations (Wooldridge 2015). Furthermore, prior researchers have documented the serial correlation problem, that is, the relationship between past and current random errors of covariates, in modeling analyst stock price forecasts (Ali, Klein, and Rosenfeld 1992, Bradshaw, Brown, and Huang 2013). Thus, it is imperative to choose an econometric model that can accommodate serial correlation. Accordingly, fixed effects estimation with AR (1) disturbances is appropriate for our study. Moreover, we obtain a significant test statistic (*p-value* < .05) for autocorrelation by performing Wooldridge's (2010) test. Variance inflation (VIF) and condition indices statistics remain adequately below standard limits suggesting that multicollinearity is not a concern. We propose the following model specification:

(1) $$\text{Ln(Target price)}_{it+1} = \alpha_1 \text{ Brand equity}_{it} + \alpha_2 \text{ Analyst's experience}_{it} + \alpha_3 \text{ Brand equity} \times \text{Analyst's experience}_{jt} + \alpha_4 \text{ Analyst} - \text{level control variables}_{jt} + \alpha_5 \text{ Firm} - \text{level control variables}_{it} + \alpha_6 \text{Competition}_{it} + \alpha_7 \text{ Time dummies}_{t} + u_{it}$$

Where i indicates the firm, j refers to the analyst, t refers to time (financial quarter), time variable represents a set of mutually exclusive year-quarter dummies to absorb the effect of any relevant macro-economic event, and u_{it} is the random error that represents all unobserved influences on analysts' target price that we don't account for in our model.

Analysis and Results

Table 4.1 presents the summary statistics and correlation matrix for all the variables in equation 1. Our results for equation 1 (model 1b) show that brand equity is positively associated with target price (α_1=.19, *p-value* < .05), in further support of H_1. H_4 is supported opposite of what we originally hypothesized, indicating that as analysts' experience increases, the effect of brand equity on target price weakens (α_3 =-.03, *p-value* < .001). We also tested equation 1 without brand equity to detect potential spurious effects. Analysts' experience and all the control variables remain consistent in the subsequent models. See Table 5.1 for the complete results.

Extended Analysis

We used forecast accuracy as the alternative dependent variable to extend our analysis. Forecast accuracy is an important performance metric for analysts as their compensations and credibility to their investor clients depends on accuracy. Similar to our original analysis, we used fixed effects (within) regression with AR (1) disturbances and a similar set of control variables for consistency. Following is our model specification:

$$(2)\quad \text{Forcast accuracy}_{\text{it+1}} = ß_1\,\text{Brand equity}_{\text{it}} + ß_2\,\text{Analyst's experience}_{\text{it}} + ß_3\,\text{Brand equity} \times \text{Analyst's experience}_{\text{jt}} + ß_4\,\text{Analyst} - \text{level control variables}_{\text{jt}} + ß_5\,\text{Firm} - \text{level control variables}_{\text{it}} + ß_6\text{Competition}_{\text{it}} + ß_7\,\text{Time dummies}_{\text{t}} + ʒ_{\text{it}}$$

Our findings suggest that the informational content of brand equity increases forecast accuracy ($ß_1$ = -.06 *p-value* < .05). However, we did not observe a similar effect for analyst experience with respect to influencing the relationship between brand equity and forecast accuracy (*p-value* > .05). See Table 6.1 for the complete results.

Robustness Checks

Considering the persistent nature of target price as reported in the past literature (e.g., Sinha et al. 1997; Brown et al. 2015), we used dynamic panel difference generalized methods of moments (GMM) with robust standard errors (Arellano and Bond 1991) to test the validity and robustness of our results. The robust option alleviates concerns about heteroscedasticity and serial correlation. In particular, the time variant nature of our variables and our large sample size, available for 36 quarters, makes difference GMM an appropriate estimator. Difference GMM eliminates fixed effects, but unlike the mean-deviations transform in the one-way fixed effects model, deeper lags of the regressors are orthogonal to the error, and available as instruments in difference GMM (Roodman 2009). This approach addresses endogeneity problems.

We included analyst-level, firm-level, and industry-level variables to control for observable heterogeneity. Moreover, we used a forward measure of target price similar to Rego, Morgan, and Fornell's (2013) approach to establish causality. The Wald chi-square statistic, which assesses whether the proposed model specification predicts target price, is statistically significant (see Table 7.1). We also examined the AR (1) and AR (2) statistics to test for serial

correlation. Whereas first-order serial correlation is present in the data, second-order serial correlation is not. The test for the AR (1) process in first differences usually rejects the null hypothesis of no correlation. We thus looked at the test for AR (2) in which the null is rejected. We also reported the Hansen J-statistic, which is a test of model specification and valid instrument overidentification restrictions. Valid instrumentation entails that the J-statistic be consistent in not rejecting the null hypothesis. The number of available moment conditions was large in our sample because of the large number of variables observed over 36 quarters, potentially instigating overfitting bias. Therefore, we tested our models assuming a smaller set of moments conditions, and we obtained similar results. As a robustness check, we also treated the independent variables as endogenous, again finding similar results.

Difference GMM results for equation 1 (model 3c) showed that changes in brand equity is positively associated with changes in target price (γ_1=.01 *p-value* < .01). Also, the effect of changes in brand equity on target price weakened as analyst experience increased (γ_3=-.0003, *p-value* < .05). We also tested our model without brand equity to detect potential spurious effects. Analyst experience and all the control variables remained consistent in the subsequent models. In all three model specifications (Model 3a-3c), analysts' current-period target price was a significant positive predictor of the following quarter's target price, with regression coefficients ranging from .22 to.23 (all *p-values* < .001). We summarize these results in Table 7.1.

Discussion

Our results in study 1 and study 2 confirm the need and an interest in information about customer-based brand equity among financial analysts. We showed that brand equity favorably influenced stock price forecast in both studies. Additionally, in the extended analysis, we

observed that brand equity reduced earnings forecasts error. When we discussed the effect of brand equity information on the target price in study 2, we meant that the incremental informational content of brand equity, which is a proxy for marketing performance, influences the target price.

Our findings bring a new perspective on the contributions of brand-related investments to firm value by specifying their impact on the sell-side financial analysts and, ultimately, institutional clients, who in turn significantly influence the demand for a firm's security. Our results in study 1 did not support H_2, where customer satisfaction positively affects stock price forecast. There are a few possible explanations for this finding. First, prior empirical studies have showed that customer satisfaction effect on firm value is reflected in the current term financial results and not in the future (e.g., Luo, Homburg and Wieseke 2010). Our results seem to be in line with this conclusion. It is possible that the participants in our study assumed that the customer satisfaction effect should be already shown in the current term financial results, and therefore they chose to factor brand equity information into the stock price forecast. Second, it is possible that some analysts have preconceived notions about customer satisfaction and its possible influence on stock price; hence, they chose to overlook it. For instance, customer satisfaction can be perceived to be costly to the firm's bottom line, and analysts may be cautious in monetizing its influence. However, they may find brand equity information more useful when deciding the stock price forecast, as it pertains more directly to profiting from a name brand. It is worthwhile to note that we also tested a separate treatment for customer satisfaction only. Then again, we did not find support for the main effect of customer satisfaction. In general, we noticed in the answers to our open-end questions that financial analysts have a very good understanding of brand equity and how it drives customer equity and customer lifetime value.

We also did not find support for H_4 and H_5 in study 1 related to the moderating effect of the analyst's experience. We believe that the novelty of the topic and lack of precedence for the disclosure of brand equity and customer satisfaction information evoke the same response among all analysts. However, we also put this hypothesis to test using a large longitudinal data set in study 2. Still, our results did not support H_4 in the expected direction. However, we detected a statistically significant effect of the analyst's experience on the relationship between brand equity information and target price in the opposite direction. Prior literature has led us to believe that the effect of brand equity information on the target price should be stronger for more experienced analysts versus less experienced ones, but we observed the opposite in our tests. Prior research has showed that forecasting and stock recommendation activities are influenced by analysts' career concerns and compensation factors (Hong, Kubik, and Solomon 2000). Brokerage houses are less tolerant towards inexperienced low performers. Moreover, less experienced analysts are more concerned about their reputations and, therefore, tend to herd more frequently (Trueman 1994). Therefore, it seems that less experienced analysts' forecasts should be less efficient than those of more experienced ones. Moreover, as we discussed in the hypotheses development section, experienced analysts have more access to firm-specific information and have better industry knowledge. These findings suggest that the effect of firm-specific information such as brand equity on target price should be stronger for experienced analysts. Still, we found that the effect of brand equity information on the target price weakened as the analyst's experience increased. There are a few possible explanations for this unexpected result. First, it is possible that the less experienced analysts are still shaping their forecasting models, so they may be more willing to experiment with various types of firm-specific information; hence, they developed more comprehensive stock forecasting models that factor

more firm-specific information. In contrast, the more experienced analysts, who may have already developed a full-fledged model and may include more industry-level or market-level factors in their models based on their past experience, may incorporate less brand equity information into their forecasts. For instance, in their survey of 365 sell-side financial analysts and conducting 18 follow-up interviews, Brown et al. (2015) found that industry knowledge stands out as the single most valuable input to analysts' earnings forecasts and stock recommendations. In their study, industry knowledge refers to comprehending the industry's important trends and technologies, its supply chains, distribution models, margins, and its customers, labor, and management teams (Brown et al. 2015, p.10).

There are other explanations for stock forecast inefficiency. For instance, selection bias explanation (McNichols and O'Brien 1997) regards analysts as both rational forecasters and truthful reporters, but it predicts that they report their beliefs selectively and only when they hold favorable views. In addition, psychological researchers suggest that learning from experience is difficult (Thompson 1991). Thus, simply having the forecasting experience is not sufficient for learning to occur. Instead, analysts must improve their understanding of the relations between factors (e.g., how does brand equity information translate into an earnings increase? How important is brand equity information for this firm?).

Conclusion

Customer-based assets, such as brand equity, are often left out from traditional financial reporting. There are no guidelines for how firms should communicate such information, nor do we know what impact such disclosures might have on firm performance. Our study provided insights on how the disclosure of brand equity and customer satisfaction information affects sell-

side analysts' stock price forecasts. We also showed that analyst's interpretation of brand equity information varies by their experience. These findings are highly relevant to firms, investors, and governing bodies that wish to better understand the underlying mechanism of the firm–investor relationship.

Our findings further confirm and expand the results of Bayer, Tuli, and Skiera (2017) in their empirical examination of two industries, the telecommunications and airlines industries. Their study revealed that increased disclosure of customer metrics on average is negatively associated with investors' uncertainty in both industries and with analysts' uncertainty in the telecommunications industry. Our study also showed that the disclosure of customer-based brand equity (increase in brand equity) is positively related to analysts' stock price forecasts. More importantly, the incremental informational content of brand equity is positively associated with forecast accuracy. Hence, if firms seek to influence financial analysts and investors, they can benefit from communicating about customer-based assets. Using these results, we argue that the disclosure of more marketing-related information in a firm's communications can address the shortcomings in traditional financial reporting. At the same time, governing bodies and public policy makers should provide clearer guidelines for the inclusion of customer-related information in practice. Companies also must use caution when providing such information, as disclosing material information to the financial community must follow Securities and Exchange Commission (SEC) standards and generally accepted accounting principles (GAAP). Non-compliance with these standards can have serious consequences, including fines or threats of lawsuits from investors who accuse the firm of disclosing misleading information.

Managerial Implications

Our study has several implications for practice. First, our study portraits how sell-side financial analysts consider brand equity in their forecasts. Firms should consider the influence of brand equity on sell-side financial analysts and on the firm's market value when making decisions on building brand equity. Second, inclusion of customer-based assets in firms' public communications can increase power of marketing managers. Moreover, top management can more effectively hold CMOs and marketing managers accountable for marketing expenditures. However, this may be used for better or for worse. On the plus side, firms could better guide investors' valuations and achieve efficient asset allocation during financing. On the negative side, firms may temporarily manipulate their market value by adjusting brand equity to finance at a lower cost or for insiders to trade in their favor.

Limitations and Future Research

Our study has several limitations. First, we only provide a customer-based measure of brand equity to survey respondents. Future studies should study the impacts of both financial and customer-based measures of brand equity to identify any potential differences. Second, many aspects of financial analysts' behavior remain unexplored in the marketing–finance literature. For example, financial analysts experience brands as both customers and as experts. As customers, their prior consumption and brand experiences likely affect their perceptions of the firms in their portfolios. They also are exposed to the same marketing stimuli (e.g., advertising, new product introductions) as any other customers of a firm. However, unlike regular customers, financial analysts also exhibit unique needs and expectations, such as those related to disclosures of asset information. Marketing researchers are particularly well equipped to further investigate

how an analyst's own consumption experiences affect his or her perception of a corporate brand. Third, our study only focused on brand equity and customer satisfaction. Future research should investigate the impact of disclosure of other customer-based assets, such as customer equity on stock price forecast. Lastly, we only focused on sell-side financial analysts because I/B/E/S only tracks sell-side financial analysts. Future research should expand our study to include buy-side analysts.

APPENDICES

APPENDIX A.1: TABLES

Table 1.1: Literature Review

Main Theme	Citation	Key Marketing Construct	Moderator	Data	Key Financial Outcome	Estimation	Findings
Customer-based assets and analyst stock price forecast	Our Study	Customer-based brand equity Customer satisfaction	Analyst's experience	Primary and secondary data	Analyst's target price Forecast accuracy	Fixed effects regression with AR (1) disturbances	
Customer-based assets and firm value	Aaker and Jacobson (1994)	Brand quality Brand salience		Secondary data	Stock return Return on assets	Regression	The authors suggest that the brand quality measure holds information, incremental to that reflected by current-term accounting measures, about future-term firm performance.
Customer-based assets and firm value	Barth et al. (1998)	Interbrand non-financial and brand-related variables		Secondary data	Stock price Stock return	Regression with instrumental variables	The authors show that brand value estimates are significantly positively associated with prices and returns, incremental to accounting variables.

Table 1.1 (cont'd)

Main Theme	Citation	Key Marketing Construct	Moderator	Data	Key Financial Outcome	Estimation	Findings
Customer-based assets and firm performance	Ailawadi, Lehmann and Neslin (2003)	Marketing mix		Secondary data	Sales	Regression	The authors find that the revenue premium a brand produces compared with that of a private label product is a simple, objective, and managerially relevant product-market measure of brand equity.
Customer-based assets and firm value	Mizik and Jacobson (2008)	Customer-based brand equity (BAV consulting) Brand attributes		Secondary data	Abnormal stock return	Regression with dummies	The authors show that perceived brand relevance and energy conveys incremental information to accounting measures in explaining stock returns. But, esteem and knowledge do not.
Customer-based assets and firm value	Rego, Billett, and Morgan (2009)	Customer-based brand equity (Harris Interactive)		Secondary data	Credit rating firm risk	Ordered logit regression	The authors find that a firm's customer-based brand equity is associated with firm risk.

Table 1.1 (cont'd)

Main Theme	Citation	Key Marketing Construct	Moderator	Data	Key Financial Outcome	Estimation	Findings
Customer-based assets and analyst recommendation	Luo, Homburg and Wieseke (2010)	Customer satisfaction	Product market competition Financial market uncertainty	Secondary data	Analyst recommendations Abnormal stock return Firm risk	Regression with GMM estimation	The authors show that positive changes in customer satisfaction improve analyst recommendations and lower dispersion in those recommendations. Also, analyst recommendations partially mediate the effects of changes in satisfaction on firm value.
Customer-based assets and firm value	Bharadwaj, Tuli, and Andre Bonfrer (2011)	Brand Quality	Changes in earnings and industry concentration	Secondary data	Stock return Firm risk	Panel-data estimation, fixed effects	The authors find that brand quality enhances shareholder wealth as unanticipated changes in brand quality are positively associated with stock returns and negatively associated to changes in firm risk.

Table 1.1 (cont'd)

Main Theme	Citation	Key Marketing Construct	Moderator	Data	Key Financial Outcome	Estimation	Findings
Customer-based assets and forecast error	Ngobo, Casta, and Ramond (2012)	Customer satisfaction	Base level of customer satisfaction	Secondary data	Forecast error	Dynamic panel-data estimation, system GMM	The authors indicate that customer satisfaction reduces earnings forecast errors. However, analysts react to changes in customer satisfaction but not to the metric alone.
Advertising and analyst forecast	Luo and Jong (2012)	Research and development expense Advertising expense		Secondary data	Analyst coverage Analyst forecast Stock return Firm risk	Regression with Newly-West robust S.E.	The authors demonstrate that analyst activities partially mediate the effect of advertising on firm return and risk.
Customer-based asset and market share	Rego, Morgan, and Fornell (2013)	Customer satisfaction		Secondary data	Customer satisfaction Market share	Dynamic panel-data estimation, system GMM	The authors show that customer satisfaction can predict future market share when it is benchmarked against firm's nearest competitor and customer switching costs remain low.

Table 1.1 (cont'd)

Main Theme	Citation	Key Marketing Construct	Moderator	Data	Key Financial Outcome	Estimation	Findings
Customer-based asset and stock market return	Mizik (2014)	Brand equity		Secondary data	Stock market return	VAR model	The author finds that brand equity positively influences current financial performance. Moreover, the author shows brand equity's significant and much larger impact on the firm's future financial performance.
Marketing capability and analyst recommendation	Angulo-Ruiz et al. (2014)	Marketing Capability (advertising and promotion)		Secondary data	Tobin's Q Analyst recommendations	Network data envelopment analysis	The authors find that customer-oriented marketing capability positively influences the growth of Tobin's Q and improves the growth of analyst recommendations.

Table 1.1 (cont'd)

Main Theme	Citation	Key Marketing Construct	Moderator	Data	Key Financial Outcome	Estimation	Findings
Marketing spending and analyst forecast	Chakravarty and Rajdeep Grewal (2016)	Research and development expense Advertising expense	CEO's functional experience Ratio of SG&A to total assets	Secondary data	Unanticipated adjustments in advertising and R&D budgets	MCMC estimation	The authors show that both artificially imposed incentives on managers (monitoring costs) and personal career management concerns (bonding costs) moderate the extent to which managers react to analyst forecasts.

Table 2.1: Data Sources and Measures

Variable	Definition	Data Source	Literature Support
Target price	Target price represents the projected price level forecasted by the analyst within a 12-month horizon	I/B/E/S	(Bradshaw, Brown, and Huang 2013)
Forecast accuracy	Absolute value of analyst's earnings per share forecast- firm's actual earnings per share, measured at analyst level scaled by the closing price for firm i in quarter t	CRSP	Butler and Lang (1991)
Brand equity	An overall measure of brand's four pillars called brand asset in BAV data base.	Y&R (BAV Consulting)	
Brand strength	A measure of brand's strength vitality (energized differentiation and relevance)	Y&R (BAV Consulting)	Tavassoli Sorescu, and Chandy (2014)
Brand stature	A measure of brand's emotional capital (esteem and knowledge)	Y&R (BAV Consulting)	
Analyst's experience	The number of years (irrespective of the firm) during which analyst j following firm i supplied at least one forecast during the previous quarters through quarter t	I/B/E/S	Clement (1999)
Analyst's firm - specific experience	Firm-specific experience in following a particular firm, measured in number of times analyst h has covered the specific firm	I/B/E/S	Ertimur, Sunder, and Sunder (2007)
Analyst's portfolio complexity	The number of firms that analyst j follows in quarter t.	I/B/E/S	Clement (1999)
Employer size	The number of analysts employed by the brokerage firm that employs analyst j who follows firm i in quarter t. We calculated a quarterly measure of employer size.	I/B/E/S	Yu (2008)
Firm size	Measured as natural log of firm's total assets	COMPUSTAT	Luo, Wieseke and Homburg (2012)
Dividend yield	Measured as a percentage and can be calculated by dividing the dollar value of dividends paid in a given quarter per share of stock held by the dollar value of one share of stock	COMPUSTAT	Fabrizi (2014); Carter, Lynch, and Tuna (2007)
Intangible asset intensity	(Total Assets—Property, Plant, and Equipment PP&E)/Total Assets	COMPUSTAT	Luo et al. (2014)
Financial Leverage	The ratio of long-term debt to total assets for firm i during quarter t	COMPUSTAT	Tuli and Bharadwaj (2009)
Herfindahl–Hirschman index	The sum of squares of all suppliers' market shares in an industry.	COMPUSTAT	Curry and George (1983)

Table 3.1: Summary of the Four Pillars of the Brand Asset Valuator Model®

BAV Metrics		Pillars	Perceptual Metrics	Survey Scale	Meaning
Brand Asset Value	**Brand Strength**	Energized Differentiation	Differentiation (different, distinctive, and unique)	Yes/no	What is a brand's point of difference and reason for being?
			Energy (innovative and dynamic)	Yes/no	
		Relevance	Relevant to me	1–7 scale	How appropriate is the brand to you?
	Brand Stature	Esteem	Personal regard	1-7 scale	How well regarded is the brand?
			Leader	Yes/no	
			High quality	Yes/no	
			Reliability	Yes/no	
		Knowledge	Familiar with the brand	1–7 scale	How well do you understand the brand?

Note: Information in this table was collected from BAV Consulting's methodological document. The brand asset valuator model® belongs to BAV Consulting, a Y&R Brands company. We are grateful to BAV Consulting for sharing the data with us. We use the latest version of BAV's survey which has merged two dimensions of energy and differentiation together; it is called energized differentiation. See Mizik and Jacobson (2008) and Lovett, Peres, and Shachar (2014) for more details on four pillars.

Table 4.1: Descriptive Statistics and Correlation Matrix

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Analyst's target price	60.91	119.83	1											
2. Forecast accuracy	-.01	.61	-.023	1										
3. Brand equity	5.51	5.34	**.056**	-.002	1									
4. Firm size	54.47	77.25	**.312**	**.094**	**.141**	1								
5. Analyst's experience	13.80	9.34	**.112**	-.009	-.001	**.132**	1							
6. Analyst's firm-specific experience	1.68	.91	**.036**	**.062**	**-.042**	**.131**	**.024**	1						
7. Analyst's portfolio complexity	21.66	11.27	-.022	**.037**	**.072**	.006	**.041**	**.330**	1					
8. Employer size	951.57	620.82	.008	.016	**.039**	**.095**	**.045**	**.115**	**.154**	1				
9. Intangible asset intensity	.18	.19	**.116**	-.002	**.157**	**.515**	**.120**	**-.024**	.012	**.079**	1			
10. Competition	.68	.24	**-.142**	-.013	**-.322**	**.162**	.014	**.054**	**-.173**	-.009	**.053**	1		
11. Dividend yield	.02	.01	.010	.012	-.005	**.086**	.002	-.005	.011	.017	**.143**	**.040**	1	
12. Financial leverage	3.07	15.13	**.065**	.004	**-.085**	**.117**	.005	.015	.012	.002	**.039**	**.028**	.009	1

Bold correlations are significant at the .05 level (2-tailed).

Table 5.1: Results for Brand Equity-Target Price Relationship

	Dependent Variable: Natural Log of Target Price $_{t+1}$			
Independent Variables	Model 1a Fixed-effects with AR (1)		Model 1b Fixed-effects with AR (1)	
Brand equity $_t$	.05(.02)	**	.19(.03)	*
Brand equity $_t$ × Analyst's experience$_t$			-.03(.005)	***
Analyst's general experience $_t$	.24(.01)	***	.27(.01)	***
Analyst's firm-specific experience $_t$	-.02(.01)	*	-.02(.01)	*
Analyst's portfolio complexity $_t$	.005(.004)		.004(.004)	
Employer size $_t$	.002(.0004)	***	.002(.0004)	***
Financial leverage $_t$	.25(.07)	***	.22(.07)	**
Firm size $_t$	.000001(.0000002)	***	.000001(.0000002)	*
Dividend yield $_t$	1.15(.71)		1.05(.71)	
Intangible assets intensity $_t$	.57(.13)	***	.54(.13)	***
Competition $_t$	.43(.09)	***	.44(.09)	***
Time effect	Included		Included	
Firm effect	Included		Included	
Sample size	28801		28801	
R-Square	6.16%		6.20%	

*** p < .001, ** p < .01, * p < .05. Quarter (time effect) and firm (firm effect) fixed-effects are included in the model.

Table 6.1: Results for Brand Equity-Forecast Accuracy Relationship

	Dependent Variable: Forecast Accuracy $_{t+1}$			
Independent Variables	Model 2a Fixed-effects with AR (1)		Model 2b Fixed-effects with AR (1)	
Brand equity $_t$	-.05(.02)	**	-.06(.02)	*
Brand equity $_t$ × Analyst's experience $_t$			.001(.003)	
Analyst's general experience $_t$	-.03(.01)	*	-.03(.01)	**
Analyst's firm-specific experience $_t$	.01(.01)		.03(.03)	
Analyst's portfolio complexity $_t$	-.01(.003)	**	-.01(.002)	***
Employer size $_t$	-.0001(.0005)		-.0002(.0002)	
Financial leverage $_t$	.0002(.0003)		.0002(.0003)	
Firm size $_t$	.02(.01)		.02(.01)	
Dividend yield $_t$	-.21(.09)	*	-0.22(0.08)	*
Intangible assets intensity $_t$	-.40(.13)	**	-0.40(0.09)	***
Competition $_t$	-.26(.08)	**	-0.25(0.06)	***
Time effect	Included		Included	
Firm effect	Included		Included	
Sample size	28801		28801	
R-Square	11.08%		11.22%	

*** p < .001, ** p < .01, * p < .05. Quarter (time effect) and firm (firm effect) fixed-effects are included in the model.

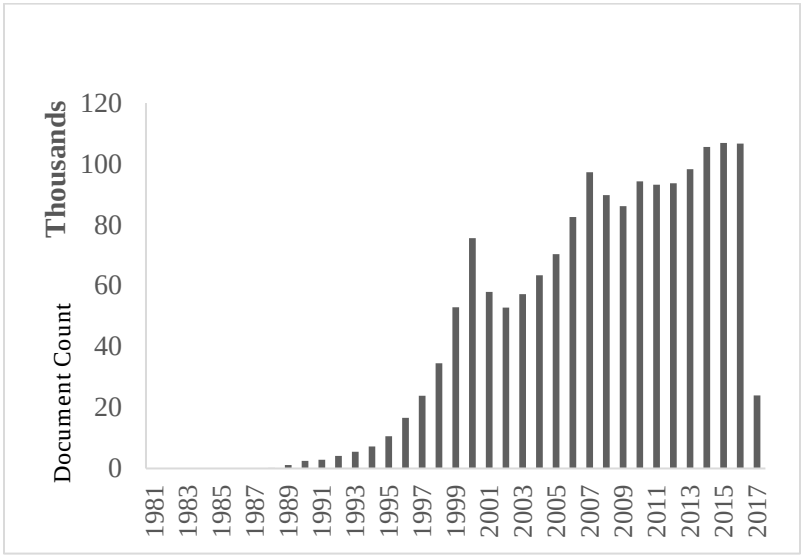
Table 7.1: Difference GMM Results for Brand Equity-Target Price Relationship

	Dependent Variable: Natural Log of Target Price $_{t+1}$					
Independent Variables	Model 3a		Model 3b		Model 3c	
ΔLn (Target price $_t$)	.22(.03)	***	.23(.03)	***	.23(.03)	***
ΔBrand equity $_t$			.002(.001)	*	.01(.002)	**
ΔAnalyst's experience $_t$	-.13(.06)	*	-.13(.06)	*		
ΔBrand equity $_t$ × Analyst's experience$_t$					-.0003(.0001)	*
ΔAnalyst's firm-specific experience $_t$	-.003(.004)		-.003(.004)		-.003(.004)	
ΔAnalyst's portfolio complexity $_t$	.0003(.001)		.0002(.001)		.0002(.001)	
ΔEmployer size $_t$	-.00001(.00002)		-.00001(.00002)		-.00001(.00002)	
ΔFirm size $_t$	.04(.04)		.04(.04)		.04(.04)	
ΔDividend yield $_t$	-1.12(.62)		-1.11(.62)		-1.11(.62)	
ΔIntangible assets intensity $_t$	.02(.20)		.02(.20)		.03(.20)	
ΔCompetition $_t$	.12(.11)		.13(.11)		.11(.11)	
Time dummies	Included		Included		Included	
Observations	28801		28801		28801	
Instruments	77		78		79	
Wald $\chi 2$	2419.01	***	2443.42	***	2465.16	****
AR (1)	-7.98	***	-7.96	***	-7.95	***
AR (2)	-0.55		-.50		-.51	
Hansen J Statistic	630.37		630.22		630.47	

*** p < .001, ** p < .01, * p < .05. Time dummies represent quarter dummies (not shown). Coefficients are calculated based on robust standard errors. We used natural log transformation of target price for this model.

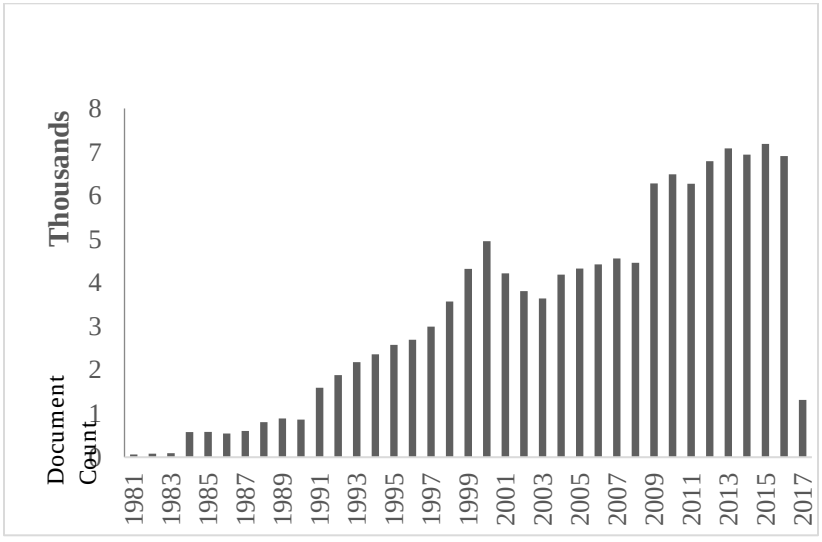
APPENDIX B.1: FIGURES

Figure 1.1: Press Releases Using Brand-Related Information



We ran a text-based search using Factiva to obtain annual number of company press releases citing brand level information and brands in firm communications.

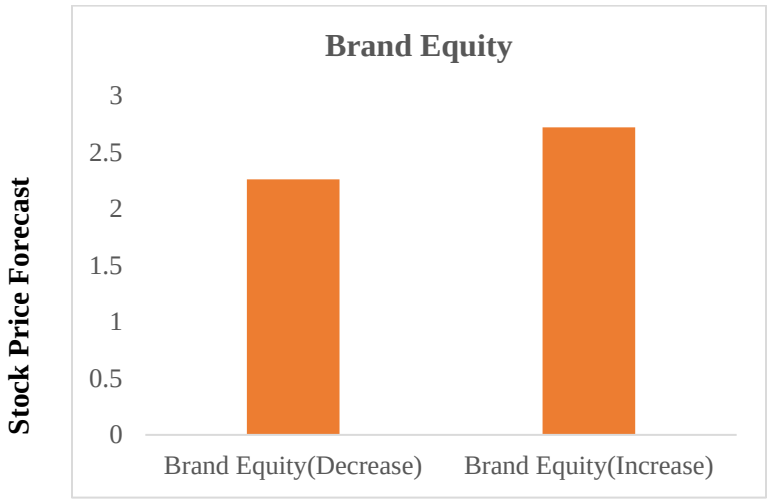
Figure 2.1: Brand Equity in the Financial Press



We ran a text-based search using Factiva to obtain annual number of articles written on the topic of brand equity and importance of brand to firms in The Wall Street Journal, a flagship financial journal.

Figure 3.1: Graphical Interpretation of Study 1's Results

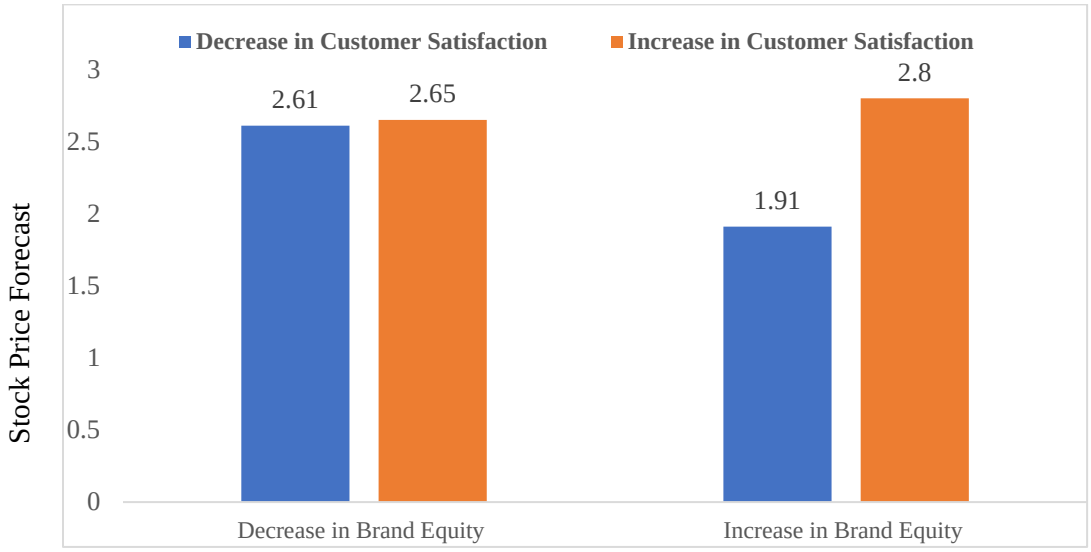
A. The effect of customer-based brand equity on the stock price forecast



B. The effect of customer satisfaction on the stock price forecast

Figure 3.1 (cont'd)

C. The Interaction effect of brand equity and customer satisfaction on the stock price forecast



APPENDIX C.1: SAMPLE SCENARIO FOR STUDY 1

Tuft Technology Corporation
Santa Barbara, California

Date: August 4th, 2015
To: Board Members
By: Tobias M. Bumgarner

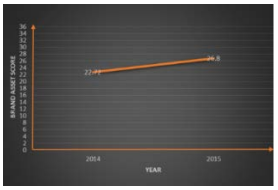
Dear Board members,

As you were informed, last two years, I have assigned a task force to design a non-financial scorecard for our company. Particularly, this non-financial scorecard will include information regarding brand equity or value of our corporate brand. The global business community now widely accepts the importance and value of strong brands—and the significant contribution they make to business value. I believe our dedication to share non-financial information as part of our annual report will guide investors and public to better evaluate us.

The brand asset valuation method (see figure 1) that we have adopted is a customer-based measure of brand attributes. The data collection is performed quarterly. Customers rate brands on four dimensions: differentiation (The brand's point of difference), relevance (how appropriate is the brand to you?), esteem: (how well regarded the brand is to you?), and knowledge (an intimating knowledge of the brand).

Figure 3

Since last year, our brand asset value has increased 18 percent and our current brand asset value stands at 26.80(competitive range =0-36). Customer Satisfaction score was 74, where the top score was 86/100. Our new customer satisfaction score remains at 76.



Tobias M. Bumgarner
Chief Executive Officer

APPENDIX D.1: INSTRUCTIONS AND SURVEY QUESTIONS

Instructions: Tuft Technology Corporation is a company invented for the purpose of this study. Please read the following hypothetical memo issued by CEO addressing board members regarding inclusion of non-financial information in annual and quarterly reports effective immediately. Please carefully review the information and answer the following questions assuming that if you were presented such information in a real-world setting, how your decisions would be influenced by it. Supporting documents include Business Monitor International(BMI)'s industry forecast, annual report and key financial statistics for Tuft Technology Corporation and comparable companies.

Supporting documents:

- Annual Report
- Industry information
- Key financial benchmarks for Tuft Technology Corporation
- Key financial benchmarks for Tuft Technology Corporation's direct competitors

Selected Survey Questions

Do you anticipate stock price for Tuft Technology Corporation to go up, down or not change next quarter?

1. Go up
2. No change
3. Go down

Do you find the non-financial information provided helpful in your analysis?

1. Yes
2. No

If you acquired 500 shares of this stock and it has appreciated to your price target, will you buy, sell or hold the shares of the stock?

Can you briefly explain the reasoning behind your investment decision and recommendation? Why do you think the stock price would change or not change?

What other non-financial information you would consider when evaluating a company to issue forecast? Please explain.

Are you a Chartered Financial Analyst? Please specify your level.

Do you have an MBA? if yes and if applies, what was the concentration area of your MBA?

How many years of experience do you have working in the financial industry?

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ESSAY 2

Reexamining the Relationship between Innovation and Institutional Investor Ownership: The Moderating Role of Investor Relations Intensity

Innovation is the primary driver of growth and the key to the long-term success of a firm. Yet, it represents the most uncertain bet on the future by management in pursuit of prosperity. Correspondingly, the financing of innovation remains the most vulnerable to problems, such as adverse selection and moral hazard, due to its inherent uncertainty (Arrow 1962). More importantly, the uphill battle of innovative firms to access financing begins with their struggle to reach the right investors and effectively communicate with them.

In finance and accounting literature, researchers have introduced the problem of firm visibility in conjunction with the investor relationship paradigm. For instance, Bushee and Miller (2012) suggest that many firms which lack visibility enhancing characteristics, such as large size and high liquidity, encounter significant challenges in improving visibility and attracting investors to their stock. Prior research finds that significant visibility barriers are attributable to advertising (Grullon, Kanatas, and Weston 2004), press coverage (Falkenstein 1996), and presentations to analysts (Francis et al. 1997). Lehavy and Sloan (2008) suggest that firm visibility affects stock price even more than firm fundamentals. There is limited literature on the effect of the press, but what does exist indicates that press coverage is highly correlated with both firm size and analysts' following (Miller 2006).

Innovative firms that are not large and don't have high liquidity often struggle to attract resourceful investors. It's estimated that nine out of 10 high-tech startups fail (Fortune Magazine 2015). Thus, it is of paramount importance to understand how innovative firms can attract resourceful investors to survive and thrive.

Visibility begins with communication. Firms in many industries often preannounce new products to attract investors and signal their innovation capabilities. More specifically, new product preannouncements not only create attention-grabbing events but can also reduce information asymmetry between firms and investors regarding innovation. These public announcements have long been an inexpensive and highly appealing strategic marketing communication tool for firms to communicate with stakeholders and ultimately achieve visibility. Marketing literature has focused extensively on the role of new product preannouncement in driving financial or non-financial values for firms (e.g., Warren and Sorescu 2017; Sorescu, Shankar, and Kushwaha 2007).

Firms using new product preannouncements seek to attain a high-profile industry leadership position and visibility, and they announce future planned actions to reduce uncertainty in their own favor (Calantone and Schatzel 2000). New product preannouncements are highly appealing tools in strategic marketing communications (Sorescu, Shankar, and Kushwaha 2007), offering both risks, such as public and legal scrutiny, and benefits, such as reductions in information uncertainty to the effective management of public opinion, as documented by extensive research in finance and marketing. For example, AVEO Pharmaceuticals Inc. concealed the FDA's level of concern about its new drug, Tivozanib, in public statements to investors. This company omitted the critical fact that the FDA had recommended a second clinical trial to address concerns. When the FDA made public months later that it had recommended an additional clinical trial, the company's stock price declined 31 percent. [3]

The main objective of any strategic communication is to inform or influence the target audience in some way (Calantone and Schatzel 2000). Although prior research has enhanced our

[3] For more details, see https://www.sec.gov/news/pressrelease/2016-59.html.

understanding of stock market responses to firm communications and investor expectations, little is known about how firms' new product preannouncements can increase visibility and coverage by institutional investors. Both research and practice suggest that firms across different industries increasingly fund investor relations to reach investors, particularly institutional investors. A rather practical question arises here regarding whether this engagement in investor relations is effective for highly innovative firms in reaching the right investors, since these firms often have limited human and capital resources to invest in such endeavors. Nevertheless, this is a critical piece of information in understanding the complicated relationship between the financial market and innovation. We are motivated to reexamine this relationship between innovation and institutional investor ownership because of the importance of innovation and the expanding role of institutional investors in the financial markets.

To offer a conceptual framework for our study, we reexamine the long-term consequences of new product preannouncements on firm visibility. We concentrate on institutional investors' responses to new product preannouncements. Because short-term market reaction is a highly imperfect measure of the long-term success of a company (Porter 1989), using institutional investor ownership as a proxy for the long-term success of a company can generate greater insight into the ever-challenging relationship between innovation and institutional investors.

We address the following research questions in this study: 1) What is the long-term impact of new product preannouncements on institutional investor ownership? 2) Can investor relations intensity improve institutional investors' following in highly innovative firms?

This study is different from prior studies in the new product preannouncement literature in several ways. First, we apply Merton's (1987) incomplete information assumptions and

subsequent expanded theoretical framework, limited attention theory, to hypothesize the relationship between a firm's new product preannouncement and institutional investors' responses. Prior studies often use efficient market hypotheses and focus on general investors. Second, we examine three aspects of a new product preannouncement, including: the magnitude of stock returns to a new product preannouncement, brand sentiment surrounding a new product preannouncement, and specificity of the announcement. Third, we introduce investor relations to new product preannouncement literature to improve the general understanding of how firms market innovations and ideas to investors in the context of a highly innovative industry, biopharmaceuticals. Conditioning the relationship between new product preannouncements (a strategic marketing communication tool) and institutional investor ownership and its effect on investor relations intensity lends the traditional innovation-investor relationship a new perspective. Finally, we use a large longitudinal data set, which provides larger statistical power, to better understand the topic of interest.

The context for this study is the biopharmaceutical industry, an archetypical high-technology industry. Biotechnology firms are focused on the development of innovative technologies for future commercialization. Transparency market research predicts that the global market for biotechnology will reach a value of $414.5 billion by the end of 2017.[4] Using data on new product preannouncements issued by firms from 2007 to 2015, we examine how these firms, which are characterized by a few highly innovative drug discovery programs and a few or less commercialized products, communicate with the investor community. We present an illustrative body of prior research pertaining to our research questions in Table 1.2 to clearly delineate the

[4]For more information see http://www.prnewswire.com/news-releases/global-biotechnology-market-to-value-usd-4145-billion-2017-transparency-market-research-276915571.html.

contributions of our study. This table includes two main sections. In the first section, we present a detailed list of relevant new product preannouncement literature. In the second section, we present a body of research related to recent trends in studies related to the impact of online word of mouth on firm value. This stream of research relates to our brand sentiment construct, and in the following sections, we provide more details in this regard.

Hypotheses Development

Institutional investors play an important role in fostering innovation. Essentially, institutional investors hold the requisite abilities and resources to assist highly innovative firms in acquiring necessary cash and improving their competitive position. Kochhar and David (1996) suggest that institutional investors tend to look for long-term benefits from their investments in the equity of a firm. Aghion, Reenen, and Zingales (2013) demonstrate that there is a robust positive association between innovation and institutional ownership. Kochhar and David (1996) find that dedicated institutional investors may even influence firms to increase innovation, also finding that short-term-oriented institutional investors do not impact managerial choices.

Investors regularly follow firms' communications and actions, such as new product preannouncements, to develop expectations about firms' future performance (e.g., Warren and Sorescu 2017). New product preannouncements are attention-grabbing events that often become news headlines and are featured in analyst reports. These announcements are a deliberate form of strategic marketing communication from a firm and are ultimately a form of firm-specific information intended to influence stakeholders (e.g., Rao, Chandy, and Prabhu 2008; Bayus, Erickson, and Jacobson 2003). In addition, new product preannouncements– which represent a firm's deliberate communications regarding its future planned actions – differ from other signal

types (Eliashberg and Robertson 1988). Members of senior management often issue and approve these announcements, which echo the mindset of the firm's leading strategists (Calantone and Schatzel 2000). Consistent with previous literature, a new product preannouncement refers to an announcement that a firm issue about the availability of a new product on the market at a future date (e.g., Eliashberg and Robertson 1988). In addition, our definition of a new product preannouncement is not constrained by the development stage of the product or its anticipated time to launch, providing that it is not immediately available (Sorescu, Shankar, and Kushwaha 2007).

We examine three aspects of new product preannouncements in relation to institutional investor ownership. These three aspects include short-term stock returns to the new product preannouncement, brand sentiment around the announcement in the financial news, and announcement specificity.

Merton (1987) demonstrates that the awareness of a firm is a precondition of any trading in its securities and that there is an investor cost associated with becoming aware of a firm. This means that investors may not initially become aware of all firms due to time and resource limitations. This view is consistent with investor's limited attention theory, which suggests that investors possess limited attention and processing power. Moreover, the limited attention theory is supported by research in psychology indicating that attention is a scarce cognitive resource (Kahneman 1973). Researchers have examined attention constraints in investors to provide better explanations for market imperfections (e.g., Barber and Odean 2008). Attention has been referred to as a critical mechanism that selects information for further processing (Greenwald and Leavitt 1984). Attention assists investors and financial analysts in security selection, and in the selection of information necessary to make the right investment decisions. Notably, Peng and

Xiong (2006) argue that due to attention constrain, investors are more likely to respond to market- and industry-wide information than they are to firm-specific information. This means that important firm-specific news or information is not reflected in prices unless and until investors pay attention to it (Peng and Xiong 2006). Given the vast amount of available firm- and market-specific information, investors must be selective in information-processing activities (Peng and Xiong 2006, p. 564). Barber and Odean (2008) argue that the effects of limited investor attention effectively constrain the set of firms across which investors search when making investment decisions.

Classical asset pricing models assume that the diffusion of every type of publicly available information occurs immediately among all investors and they act on the information as soon as it is received (Merton 1987). However, in this study – unlike previous studies of new product preannouncements based on classical asset pricing models – we postulate that a new product preannouncement may grab institutional investor attention based on the magnitude of the initial stock market reaction to such an event. Even though investors may notice the announcement, they may not immediately act upon such information. It is worth mentioning that imperfections in short-term stock returns in response to marketing actions have been well documented in the marketing literature. For instance, Markovitch and Steckle (2012) find that the stock market more than not reacts incorrectly in response to new product preannouncements. Additionally, Sorescu, Shankar, and Kushwaha (2007) argue that the impact of new product preannouncements on firm value is not fully captured through short-term stock returns. However, despite their limitations, short-term stock returns to a new product preannouncement represent a forward-looking measure of innovation performance that can convey material – if not complete – information, such that their magnitude can reflect the expected impact on future cash flows

attributable to such events (Talay, Akdeniz, and Kirca 2017). Furthermore, Markovitch and Golder (2008) offer empirical evidence that short-term stock returns can predict sales take offs. Therefore, we assume that short-term stock returns can provide an acceptable proxy to understand the initial reaction of the stock market to the release of new product information. To understand their long-term effects, we examine their relationship to institutional investors' holdings.

We know that individual investors trade stocks around attention-grabbing events (Chapman 2015). However, we don't know whether institutional investors do the same. Barber and Odean (2008) attribute positive stock returns surrounding such announcements to increased firm awareness. This is consistent with the limited attention theory explanation, as it implies that upon release of new information, as is the case with new product preannouncements, investors become aware of a firm. Attention-grabbing events do not necessarily cause investors to trade, but they do help to define the search criteria for investors searching for stocks to purchase (Chapman 2015). In addition, although institutional investors have more resources than individual investors, it is possible that they forgo investment opportunities that fall outside the scope of their investment selection criteria. In the context of institutional investors, prior research provides conflicting views on whether these investors are also subject to attention constraints. For instance, one popular view is that these investors have vast resources to achieve consistent and universal awareness of a larger set of firms compared to individual investors. Hence, attention is not as scarce a resource for institutional investors as it is for individual investors (Barber and Odean 2008). On the other hand, prior research has indicated that institutional investors and security analysts disregard firms that lack visibility-enhancing characteristics, such as large size, high liquidity, and prominent exchange listings (Bushee and Miller 2012). Ferreira

and Matos (2008) find that institutional investors have a strong preference for large and liquid stocks with good governance practices. Hence, companies that do not meet these set of visibility-enhancing characteristics need to place more effort on achieving visibility. It is also very important to consider the search costs for institutional investors to seize every investment opportunity. At the end of the day, their resources are also limited. Finally, Kochhar and David (1996) suggest that institutions may not be superior investors, as their investment portfolios do not perform better than market proxies such as the S&P 500. The bottom line is that it is possible for the psychology of attention to be expanded to institutions like those of individuals given the clues and bread crumbs left in prior research.

We hypothesize that the initial market reaction to a new product preannouncement conveys an approximation of the expected impact on future firm cash flows. The magnitude of short-term stock returns is an attention trigger for institutional investors, even if they do not engage in trading activities immediately following the announcement. Investors continuously update their prior beliefs in a Bayesian manner as new information becomes accessible (e.g., Lewellen and Shanken 2002). Thus, it is conceivable to consider that they may react to a new product preannouncement later as they become aware of the focal firm. This means that short-term stock returns to a new product preannouncement are not merely a consequence but may also be a cause for further contemplation by institutional investors. Thus, we propose the following hypothesis:

H_1: There is a positive relationship between short-term stock returns to a new product preannouncement and institutional investors' holdings.

Attention facilitates the analysis of environmental stimuli such as a firm's new product preannouncement, as well as the processing of information and, subsequently, the enablement of

its use (Fiske and Taylor 2013). A new product preannouncement often entails media coverage, particularly in the financial press, which can enhance a firm's visibility. Dong and Ni (2014) find that firms with higher media coverage have more firm-specific information incorporated into their stock price. This is because the financial press has the ability to capture investors' attention. Naturally, researchers have tried to establish a causal link between media coverage and trading activities. For instance, Engelberg and Parsons (2011) find that an earnings announcement made by a given S&P500 firm is strongly associated with local media coverage of such announcements. In a related study, Peress (2008) demonstrates that earnings announcements accompanied by an article in The Wall Street Journal gain quicker and longer positive market reaction. By and large, these studies suggest that media coverage captures investors' attention. Finally, media coverage is also helpful in attracting and retaining buy-side investors and analysts, and often media coverage enhances a firm's credibility (Bushee and Miller 2012). Furthermore, Bushee et al.'s (2010) findings indicate that greater press coverage reduces the degree of information asymmetry and facilitates more of both small and large trades.

Interestingly, in marketing literature, with the advent of the Internet and the rise of user-generated content, several studies have investigated the impact of online word of mouth as a proxy for brand performance effects on stock market reactions (e.g., Dieijen et al. 2016). Luo, Zhang and Duan (2013) find that social media-based metrics (Web blogs and consumer ratings) are significant leading indicators of firm equity value. Tirunillai and Tellis (2012) also demonstrate that the volume of online word of mouth regarding corporate brand significantly leads abnormal returns by a few days. This stream of research investigates the relationship between online word of mouth – generated either by customers or news outlets – and stock price, which is similar to what we observe in other streams of research yet is more nuanced in nature.

This approach breaks down online word of mouth into valence (sentiment) and volume. This is different than the widespread approach of using volume as the de facto measure of press coverage in the finance literature.

Borrowing from marketing literature, we define brand sentiment as the positive sentiment surrounding a new product preannouncement in the financial press. We do not consider user-generated content in this definition, as we seek only to account for brand sentiment in the financial press, which is more relevant in the institutional investor context. As a firm issues a new product preannouncement, to varying degrees it is covered by the financial press and/or receives additional attention in the form of featured articles. This coverage gives another dimension to a new product preannouncement and provides visibility to the focal firm. Therefore, it is natural to assume that investors may become aware of a firm based on media coverage, which can in turn result in further action from institutional investors in investigating the focal firm and ultimately acting on such information. Moreover, investors respond positively in relation to this positive media coverage, as it also signals credibility and reduces investors' uncertainty as more firm-specific information becomes available and is scrutinized by the financial press. Hence:

H_2: There is a positive relationship between brand sentiment surrounding a new product preannouncement in the financial press and institutional investors' holdings.

A new product preannouncement entails important information. Following the work of Sorescu, Shankar, and Kushwaha (2007), we define announcement specificity as the amount of information provided in the announcement intended to reduce investor uncertainty associated with a new product. The specificity of an announcement can act as a credible signal (Sorescu, Shankar, and Kushwaha 2007). This argument assumes that more specificity can enhance

investors' understanding of a new product. Bushee and Noe (2000) find that the higher the quality of corporate disclosures and the communication of material information regarding firm performance and practices, the higher the results in terms of the level of institutional ownership. Chen, Chiang and Yang (2014) find that new product preannouncements can help institutional investors to assess the potential success of impending new products by conveying relevant informational content. Moreover, investor relations professionals encourage firms to enhance the quality of their disclosures and general press releases to attract institutional investors (Bushee and Miller 2012). Thus, it is likely that announcement specificity positively influences institutional investor response, as it provides credible information regarding a firm's new product, which can ultimately affect future performance. Thus:

H_3: There is a positive relationship between the specificity of a new product preannouncement and institutional investors' holdings.

The Moderating Role of Investor Relations Intensity

Less-visible firms often fail to attract the initial attention of institutional investors, even when they increase the quality and quantity of information (Bushee and Miller 2012). To enhance their visibility, these firms participate in investor conferences and road shows and establish direct lines of communication (e.g., conference calls, meetings) with informed market participants, such as analysts and investors. The primary goal in many investor relations strategies is to attract institutional investors (Elgin 1992). We define investor relations intensity as number of times a firm participates in investor conferences as well as initiates analyst/investor conference calls per quarter, which can increase the salience of a new product preannouncement

and inform institutional investors who may not otherwise notice the initial announcement or – perhaps even if noticed –may not otherwise take any action to purchase the stock.

Investor relations strategies often attempt to use information intermediaries, such as analysts and the media, to increase firm visibility and attract investors. Bushee and Miller (2012) find that companies initiating investor relations programs exhibit greater increases in institutional investor ownership and a shift toward investors that normally would not follow the companies. Institutional investor ownership significantly improves firm visibility and stock prices (Chen, Hong, and Stein 2002; Lehavy and Sloan 2008).

Firms use investor relations initiatives to improve their long-term performance and form long-lasting relationships with investors. Investor relations initiatives determine a strategy for management communication, which is often characterized as finding the right way to tell the story to the right investors. This further indicates that investor outreach resembles what we do in marketing to communicate the right message to the right customer at the right time. Buy-side investors need to have faith in management; thus, direct communications are crucial in developing credibility (Bushee and Miller 2012). Hence, we consider that investor relations enhance firm visibility in the market by improving the quality and quantity of firm-specific information. We predict that the relationship between new product preannouncement and institutional investors is moderated by a firm's investor relations intensity. This is due to increased visibility, which provides higher salience for the announcement and grabs the attention of investors. This means that we expect that as a firm's investor relations intensity increases, it further magnifies the positive effect of stock returns to a new product preannouncement, brand sentiment around the announcement, and announcement specificity on the institutional investors' holdings. Therefore, we propose the following hypotheses:

H_4: The positive relationship between short-term stock returns to a new product preannouncement and institutional investors' holdings strengthens as investor relations intensity increases.

H_5: The positive relationship between brand sentiment surrounding a new product preannouncement in the financial press and institutional investors' holdings strengthens as investor relations intensity increases.

H_6: The positive relationship between the announcement specificity of a new product preannouncement and institutional investors' holdings increases in accordance with the intensity of investor relations.

Figure 1 reveals our hypothesized relationships.

Data, Measures, and Method

We used a sample of 211 biopharmaceutical firms over a period spanning from 2007-2015. The median firm age in our sample is 10 years. The median market cap in our sample remains at $329 million. Only 15 percent of firms in our sample have one or more commercialized products on the market. The median institutional investor ownership in our sample is 61 percent. The biopharmaceutical industry is an appropriate sample for our study for several reasons. First, biopharmaceuticals generate global revenues of $163 billion, comprising about 20 percent of the pharma market (Mckinsey & Company 2014). Moreover, biopharmaceutical companies are among the most sophisticated and innovative companies in modern science. Second, this industry is heavily regulated by various governmental agencies, providing a wealth of longitudinal data for research, as these companies are obligated to communicate their new product development results at every step. For instance, the IT industry

is similar in terms of rampant innovation, but companies don't report every step of a new product's development. Third, the timeline for developing a drug and bringing it to market can take as long as 15 years (Nature 2011). Furthermore, the cost of bringing a new drug to market is now estimated to surpass $1 billion (Nature 2011). Considering the timeline and the cost of a new drug's development, relatively speaking, these companies can only attract long-term-oriented investors. Finally, most of companies in this industry do not have a commercialized product or only have a few, which provides a very clean platform to examine the effect of new product signals on investors without fear of overcrowding by a firm's own signals or that of its competitors.

We obtained our financial data from COMPUSTAT and CRSP. Data on institutional ownership was obtained from Thomas Reuters F13 file. We collected the new product preannouncements data from the Lexis/Nexis database. We identified 1,969 new product preannouncements pertaining to 211 firms over the 2007-2015 period. Through a research partnership with a marketing research firm, we obtained the positive brand sentiment (valence) in the financial press surrounding a new product preannouncement. Our final sample includes 6,123 firm-year quarterly observations.

We used percentage ownership of institutional investors relative to total shares outstanding for firm i during quarter t as the main dependent variable.

Our main independent variables are cumulative abnormal returns (CARs) to a new product preannouncement, announcement specificity, and brand sentiment of the announcement in the financial press. We used the event study methodology to estimate cumulative abnormal returns (CARs) and to measure short-term returns to a new product preannouncement. We

employed the traditional market model and the four-factor model, with a value-weighted index[5] that expands the market model through inclusion of several well-documented market abnormalities (Fama and French 1996):

$$R_{id}=\alpha_i + \beta_i R_{dd} + s_i SMB_d + h_i HML_d + u_i UMD_d + \varepsilon_{id}$$

Where

R_{id} The return of stock of firm i on day d
R_{dd} The daily return on the CRSP value-weighted index
$ß_i$ A measure of stock of firm i's sensitivity to market changes
ε_{id} error term
SMB_d Difference between average returns of small- and large-cap portfolios
HML_d Difference between average returns on high and low book-to-market stock portfolios
UMD_d Difference between average returns on high- and low-performing stock portfolios

We estimated cumulative abnormal returns (CARs) using the Fama French Four Factor model:

$$AR_{id}= R_{id} - (\alpha_i + \beta_i R_{dd} + s_i SMB_d + h_i HML_d + u_i UMD_d + \varepsilon_{id})$$

Following McWilliams and Siegel's (1997) recommendation, we considered the shortest possible event window to control for any confounding effects. We found significant results for 1 day before to 1 day after a new product preannouncement (-1, 1), 1 day before and the day of the preannouncement (-1,0), and, finally, the day of the preannouncement (0,0). We chose the (−1, 0) window in our Analysis as the main independent variable, as it has the largest abnormal returns (.53%) among the three. However, we used the other windows for sensitivity analysis

[5] The value-weighted index is a stock market index whose components are weighted in relation to the total market value of their outstanding shares.

purposes. A summary of our results is available at Table 3.2. Additionally, we tested our results by eliminating 10 identified concurrent new product preannouncements for three firms. Our results did not change. We searched Lexis/Nexis to identify any major negative relevant events that may coincide with our event of interest, including litigation, class actions, investigations, and bankruptcy. We used a dummy variable that takes the value of 1, if a major negative event occurs for firm i during quarter t.

We measured brand sentiment in the financial press surrounding a new product preannouncement as the ratio of the number of positive articles published about a firm's corporate brand in the financial press to the number of negative articles surrounding a firm's new product preannouncement. In partnership with a marketing research firm, we obtained this data at the corporate brand level over the 2007-2015 period. Using natural language programming and a proprietary classifying algorithm, this data was obtained by sampling a large text-based database. To minimize the confounding effect, we considered a five-day window before and after the announcement. Due to the nature of the firms that comprise our sample, shorter windows result in many missing values and a significantly smaller sample size. On the other hand, wider windows of one week or longer could potentially bias the results. Our main objective is to measure brand sentiment surrounding a new product preannouncement. In addition, Berger and Milkman (2012) demonstrate that positive content is more viral than negative content – hence the choice for positive brand sentiment. Additionally, our logic for relying on brand sentiment in the financial press beyond relevancy relates to the increasing importance of the financial press in the investor community.

We measured announcement specificity following the research of Sorescu, Shankar, and Kushwaha (2007). We define announcement specificity as the amount of information, as

measured by the number of words related to new product information provided in the announcement.

We controlled for the effects of several relevant variables that could potentially influence the future institutional ownership of the firm. Consistent with prior research, first, we controlled for several accounting measures, including research and development expenditures, firm size, financial leverage, and firm risk. Prior research suggests that institutional investors often invest in large firms. In addition, large firms often have higher research and development expenses. Financial leverage indicates a firm's financial strength. We controlled for firm risk as an important firm performance indicator to investors. We calculated systematic and idiosyncratic risk using CRSP daily data. These firm-level control variables represent differences among firm resources, financial strength, and market performance (McAlister et al. 2007). We also considered the number of new product preannouncements issued by a firm's direct competitors (i.e., firms in the same product category as the focal firm) during the same quarter. Since we focus only on one industry, this variable can control for competitiveness within the product category. We have a total of six major product categories. Finally, we controlled for negative news for firm i during quarter t. This negative news pertains to negative firm-specific events such as litigation, lawsuits, and class actions. New product preannouncements may also negatively influence a firm's stock price if proven misleading in courts (Mishra and Bhabra 2001), or if investors find such announcements deceptive and pursue action through the SEC. The sources and details of our measures are available in Table 3.2.

Analysis

We employed dynamic panel GMM estimation with robust standard errors due to the cross-sectional and temporal variances within our data. The econometric model should thus include a lagged dependent variable to account for the persistence in institutional holdings over time. We use difference GMM, which employs first-differencing to eliminate firm-specific fixed effects. We also use two-period or earlier lagged values of all predictors as instrument variables to reduce simultaneity and dynamic endogeneity concerns. The GMM estimators are part of a broader trend in econometric practice toward estimators that make fewer assumptions regarding the distribution of data and use more sophisticated techniques to obtain information (Roodman 2009). This approach also addresses endogeneity concerns associated with our model (Arellano and Bond 1991). The Arellano-Bond (1991) and Arellano-Bover (1995) dynamic panel estimators are general estimators suitable for circumstances with 1) few time periods and large sample size; 2) a linear functional relationship; 3) a dependent variable that is dynamic and contingent on its previous values; 4) independent variables that are not strictly exogenous, meaning they are correlated with past and probably current realizations of the error; 5) fixed individual effects; and 6) heteroskedasticity and autocorrelation within individuals, but not between them (Roodman 2009). More specifically, the time-variant nature of our variables and our large sample size, available for 36 quarters, render difference GMM an appropriate estimator. We include firm-level and industry-level variables to control for observable heterogeneity. Hence, we propose the following model specifications:

Equation (1)

$$\Delta Institutional\ investors'\ holdings_{\ it}$$
$$= \alpha_1\, \Delta Institutional\ investors'\ holdings_{\ it-1}$$
$$+\ \alpha_2\, \Delta Stock\ returns\ to\ a\ new\ product\ preannoucnement_{it}\ +\ \alpha_3\, \Delta Brand\ sentiment_{it}$$
$$+ \alpha_4\, \Delta Annoucement\ specificity_{it} + \alpha_5\, \Delta Stock\ returns\ to\ new\ product\ preannoucnement_{it}$$
$$\times\ \Delta Investor\ relations\ intensity_{it}\ + \alpha_6\, \Delta Brand\ sentiment_{it}$$
$$\times \Delta\ Investor\ relations\ intensity_{it} + \alpha_7\, \Delta Annoucement\ specificity_{it}$$
$$\times \Delta\ Investor\ relations\ intensity_{it}\ + \alpha_8 \Delta Investor\ relations\ intensity_{it}$$
$$+\ \alpha_9\, \Delta Contorl\ variables_{it} +\ \alpha_{10}\, Time\ variable + \Delta\varepsilon_{it}$$

Where i stands for firm and t for time (quarter), time variable represents financial quarter variable, and ε_{it} is random error, representing all unobserved influences on the dependent variable.

Results

Table 4.2 presents the descriptive statistics of the dependent variable, independent variables, and control variables used in our study. An examination of the magnitude of the correlations between the independent variables reveals that multicollinearity shouldn't be a concern. Moreover, we obtain variance inflation statistics to ensure that multicollinearity does not excessively influence our results. We log-transform firm size due to its skewed distribution. Further, we winsorize data at the 1 percent level to ensure that extreme observations do not influence our findings (e.g., Tuli, Bharadwaj, and Kohli 2010; Rego, Morgan, and Fornell 2013).

We assess the validity of our results via several tests recommended in the literature. The Wald Chi-square statistic is an overall fit test that evaluates whether our specified model predicts institutional investors' holdings. We obtain significant results for this test. Moreover, we observe statistically significant results for AR (1), which indicates that first-order serial correlation is present and finds no significant result for AR (2). Second-order serial correlation is not present in our sample. Many studies in marketing and finance literature report similar first-order serial

correlation (e.g., Rego, Morgan, and Fornell 2013; Talay, Akdeniz, and Kirca 2017). Finally, we also report the Hansen J-statistic, which is a test that jointly examines the correct model specification and valid instrument overidentification. This test also reveals that our model is not overidentified, as we don't reject the null hypotheses stating that the overidentification restrictions are valid.

Examining the full model, we find that the interaction between stock returns to a new product preannouncement and investor relations intensity positively and significantly relates to institutional investors' holdings (α_1 =.91, *p-value* < 0.01). Hence, our results support H_4. However, we did not find support for H_1-H_3, H_5, and H_6. Our results do not support the positive relationships between brand sentiment surrounding a new product preannouncement and institutional investors' holdings, as well as between announcement specificity and institutional investors' holdings. Moreover, investor relations intensity does not influence the relationships between brand sentiment, announcement specificity, and institutional investors' holdings. Control variables demonstrate consistent results in both the main and the full model. Table 5.2 reports the results of our main effect (Model 1a) and the full model (Model 1b).

Extended Analysis

Additionally, we consider analysts' following as an alternative dependent variable. This variable has also been examined in very similar contexts as institutional investors pertaining to a firm's visibility. Analysts have an important role in increasing firm visibility (Irvine 2003; Miller 2006; Bushee et al. 2010).

The Wald-chi square test result is significant, demonstrating a strong overall model fit. The Hansen J-statistic shows that our model is not overidentified. The AR (1) test reveals the

presence of a first-order serial correlation of the error term, but we do not observe a second-order serial correlation for this model. Like equation 1, we use two period or earlier lags as instrumental variables for all predictors.

We use the same set of control variables as equation 1 and estimate the results with dynamic panel GMM using first-differencing.[6] We find that stock returns to a new product preannouncement significantly and negatively relate to analysts' following (ß$_2$=-65.75 *p-value* < .05). This finding is of interest, because the relationship between stock returns to a new product preannouncement and institutional investors' holdings is not statistically significant. This is also the opposite of what we originally hypothesized. Furthermore, we observe that investor relations intensity influences the relationship between stock returns to a new product preannouncement and analysts' following (ß$_5$=22.11 *p-value* < .05). Our findings suggest that as investor relations intensity increases it weakens the negative association between stock returns to a new product preannouncement and analysts' following. We did not find statistically significant results for the relationship between brand sentiment and analysts' following, but announcement specificity is positively and significantly related to analysts' following (ß$_4$=.003 *p-value* < .05). Finally, investor relations intensity did not influence the relationship between brand sentiment and

[6] Below is the model specification:

$$\Delta Analysts' following_{it} = \beta_1 \Delta Analysts' following_{it-1} + ß_2 \Delta Stock\ returns\ to\ a\ new\ product\ preannouncement_{it} + ß_3 \Delta Brand\ sentiment_{it} + ß_4 \Delta Annoucement\ specificity_{it} + ß_5 \Delta Stock\ returns\ to\ a\ new\ product\ preannouncement_{it} \times \Delta Investor\ relations\ intensity_{it} + ß_6 \Delta Brand\ sentiment_{it} \times \Delta\ Investor\ relations\ intensity_{it} + ß_7 \Delta Annoucement\ specificity_{it} \times \Delta\ Investor\ relations\ intensity_{it} + ß_8 \Delta Investor\ relations\ intensity_{it} + ß_9 \Delta Contorl\ variables_{it} + ß_{10}\ Time\ variable + \Delta\xi_{it}$$

Where i stands for firm and t for time (quarter), time variable represents financial quarter variable, and ξ_{it} are random errors representing all unobserved influences on the dependent variable.

analysts' following or announcement specificity and analysts' following. See Table 6.2 for complete results.

Robustness Checks

We ran various checks to ensure the robustness of our results. First, we tested our results using a deeper lag, a three-period lag. We obtained very similar coefficients in terms of magnitude and direction. Second, considering several weaknesses of the dynamic panel GMM (Rego, Morgan, and Fornell 2013, p. 7), such as the decline in statistical power due to first-differencing application (Levine, Loayza, and Beck 2000), the magnification problem associated with gaps in unbalanced panel data sets (Roodman 2009), and instrument validity for the first-differences equations (Arellano and Bover 1995), we employed system GMM estimation. This approach accounts for these inadequacies by jointly estimating levels-levels and changes-changes formulations (Arellano and Bover 1995; Blundell and Bond 1998) and providing supplementary instruments to increase efficiency (e.g., Rego, Morgan, and Fornell 2013; Roodman 2009). We used two-period lags for both levels-levels and changes-changes equations. Our test result for the Wald Chi-square is significant and demonstrates acceptable overall model fit. Both our Hansen J statistic and difference in Hansen test (robustness test for changes-changes equations) indicate acceptable model specification and valid instrumentation. We obtained very similar results. A summary of our results is available at Table 7.2.

Discussion

Our results offer an interesting perspective into the complicated relationship between innovation and institutional investor ownership. While previous research in marketing and

finance has reported that the effect of new product preannouncements on shareholder value is on average positive in the long run (e.g., Rao, Chandy, and Jaideep 2008; Sorescu, Shankar, and Kushwaha 2007), we investigated a different outcome of a firm's new product preannouncement, institutional investors' holdings, which is an increasingly important source of financing for innovation. We did not find support for H_1, which proposed that the magnitude of stock returns to a new product preannouncement positively affects institutional investors' holdings. This means that the sheer size of a new product preannouncement's stock returns does not necessarily translate into an increase in institutional investors' holdings. For instance, Lee (1992) observed that small investors buy stocks around significant news events, regardless of whether it represents positive or negative news. Additionally, Hirshleifer et al. (2008) demonstrate that retail investors are net buyers of both positive and negative extreme earnings stocks surrounding earnings announcements. This can place upward pressure on stock prices, specifically in the short-term, surrounding positive news (Barber and Odean 2008). Hence, the magnitude of stock returns becomes larger. There are two possible scenarios to explain why institutional investors don't react to a new product preannouncement. First, institutional investors may pay more attention to industry- and market-level factors as opposed to firm-specific information, hence willfully ignoring new product preannouncement news. Another reason for the lack of action from institutional investors may be attributable to the attention constraints of such investors, as they may overlook the informational content of a new product preannouncement – which is firm-specific – and instead focus on processing common factors, such as market and sectoral factors. Second, institutional investors may find that the new product preannouncement is not persuasive enough due to the high degree of uncertainty for investment in the firm. Hence, they prefer to wait and not engage. However, we find support for H_4, in which we hypothesize that the positive

effect of stock returns to a new product preannouncement on institutional investors' holdings is moderated by investor relations intensity. As prior research holds, institutional investors may become aware of a firm due to its new product preannouncement, but they may not act upon this information. Hence, it seems that investor relations intensity will be effective not only in terms of increasing the awareness of a firm, but also by convincing institutional investors to follow suit and reduce investors' uncertainty.

We also did not find support for the effects of brand sentiment (H_2) and announcement specificity (H_3) on institutional investors' holdings. Although increases in brand sentiment surrounding a new product preannouncement enhanced a firm's visibility, which is associated with positive financial press coverage for a firm, it did not influence institutional investors' holdings. Prior research suggests that press coverage is associated with larger stock prices and trading volume reactions to the earnings announcement, but we did not observe that brand sentiment to a new product preannouncement positively influences institutional investors' holdings. This again may be because of a lack of attention to firm-specific information, as these investors prefer not to engage due to market factors as they become aware of the focal firm. Because there are many sectors in one market and a large number of firms in one sector, investors often rely on common market factors. We can infer that institutional investors are, as Barber and Odean (2005) explained, less attention-constrained when compared to individual investors, since we did not observe an increase in their holdings. Additionally, the interaction effects between brand sentiment and investor relations intensity, as well as between announcement specificity and investor relations intensity, were not statistically significant. Sorescu, Shankar, and Kushwaha (2007) find support for the effects of specificity on stock returns, but we did not observe any relationship between announcement specificity and

institutional investors' holdings. Even though greater specificity should reduce investors' uncertainty, it seems that this does not affect institutional investors. This may be because a very high degree of uncertainty is associated with innovation, and an even higher degree of uncertainty is associated with radical breakthrough drug discovery programs. Thus, an increased level of product-specific information in a new product preannouncement may not be adequate for institutional investors to take actions to increase their holdings.

In our extended analysis, we examined the effect of stock returns to a new product preannouncement on analysts' following. We found significant and negative effects magnitude of stock returns toward a new product preannouncement on institutional investors' holdings. This result is the opposite of what we expected. However, prior research finds that analysts prefer to follow large firms listed on major exchanges with lower volatility (O'Brien and Bhushan 1990; Lang and Lundholm 1996). This means that higher innovation performance does not lead to analysts' following. This finding may also be attributable to the high degree of uncertainty associated with innovative firms. For instance, analysts do not have the expertise or the resources necessary to accurately evaluate new product information, and as a result, they intentionally do not follow these firms. We observed a positive and significant relationship between announcement specificity and analysts' following. We also noticed that the negative effect of the magnitude of stock returns to a new product preannouncement on institutional investors' holdings weakens as investor relations intensity increases. This is consistent with prior research, which found that analysts' following is related to disclosure quality, suggesting that analysts' following through improvement in disclosure can increase (Lang and Lundholm 1996), since as a component of investor relations, firms regularly hold conference calls with analysts and communicate important and relevant firm-specific information. We did not find support for the

moderating role of investor relations intensity in the relationship between brand sentiment and announcement specificity and analysts' following. In summary, our results confirm the difficulty faced by highly innovative firms in attracting analysts' following.

Conclusion

Much of the prior research in marketing and finance has found that new product preannouncements are usually positively correlated to stock price (Rao, Chandy, and Jaideep 2008). However, we have limited knowledge of the long-term effects of stock returns to new product preannouncements on institutional investor ownership. Most importantly, the role of investor relations has not been studied in the context of innovation performance. Our study is theoretically and managerially relevant. We contribute to new product preannouncement literature by reexamining the firm-investor relationship through a focus on institutional investors. Additionally, we introduce an investor relations construct to the marketing and finance literature.

Unlike previous studies of new product preannouncements in the marketing literature that use classical asset-pricing models based on the efficient market hypothesis (Fama 1980), we propose a framework using Merton's (1987) assumptions and limited attention theory. Merton (1987) established the theoretical link between limited investor attention and stock prices by presenting limited investor attention as a form of imperfect information that influenced firm value and optimal investor behavior decades ago. Researchers have challenged efficient market hypotheses assumptions, reasoning that perfect efficiency requires investors' close attention to the processing of information and the flawless incorporation of this knowledge into their decisions. In summary, prior research suggests that investors' attention constraints will lead to dire economic consequences for a firm, such as a higher equity premium and lower informational

efficiency around analyst recommendations and earnings announcements (Peress 2008; Fang and Peress 2009; Loh 2010).

We investigated new product preannouncements as attention-grabbing events, and our results indicate that stock returns to these announcements do not reflect complete information processing by investors but, rather, reflect the expectation of the market. This expectation can later act as valuable information in influencing institutional investors. This contradicts efficient market hypotheses that assume markets understand and interpret new information fully and efficiently, providing optimal estimates for all asset values. An immediate but far-reaching consequence of limited attention is that informationally equivalent and nonequivalent disclosures can have different effects on investor perceptions, depending on the form of presentation (Hirshleifer and Teoh 2003). In our study, we found that institutional investors overlook information pertaining to new product preannouncements. However, positive short-term stock returns to a new product preannouncement demonstrate high demand by the general market, which pushes the stock price up. This is consistent with prior research that suggests investors sometimes ignore useful information in firm communications (Hirshleifer et al. 2004).

Our study highlights the importance of communication with investors. We demonstrate that the relationship between innovation performance and institutional ownership is contingent upon investor relations intensity. Our findings suggest that investor relations intensity improves firms' institutional investor following, which is necessary for financing innovation.

Limitations and Future Research

Our study has several limitations that need to be addressed by future researchers. We only had access to data in one industry. The biopharmaceutical industry is heavily regulated, and

hence, new product preannouncements conveyed additional information, such as the stage of new product development and trial results compared to typical new product preannouncements. Additionally, innovation in this industry takes on average much longer than other industries, and hence, the industry is associated with a higher degree of uncertainty. Future researchers should examine our findings in the context of various industries.

We also examined investor relations intensity as a potential influencer of the relationship between innovation performance and institutional investor ownership. Future research should investigate the impact of other influencing factors on this relationship. Moreover, firms vary in their degree of information disclosure to investors. Future research should also analyze the content of conference calls with analysts and investors surrounding a new product preannouncement.

APPENDICES

APPENDIX A.2: TABLES

Table 1.2: Literature Review

Focus of Study	Citation	Key Independent Variables	Moderator	Data	Key Dependent Variables	Theoretical Framework	Estimation	Findings
The relationship between a new product preannouncement and institutional investor ownership	Our Study	Stock returns to a new product preannouncement Brand sentiment Announcement specificity	Investor relations intensity	Secondary data	Institutional investors' holdings	Signaling theory Limited attention theory	Dynamic panel GMM estimation	
Firm preannouncing behavior	Eliashberg and Robertson (1988)	Customer switching costs Product trial tendency Consumer learning Attractiveness of competitive environment Likelihood of immediate competitive retaliation		Survey Data	Likelihood of preannouncing behavior	Signaling theory	SEM	The results suggest that constructs such as market dominance, company size, attractiveness of the competitive environment and customer switching costs can provide good explanations for preannouncing behavior.

Table 1.2 (cont'd)

Focus of Study	Citation	Key Independent Variables	Moderator	Data	Key Dependent Variables	Theoretical Framework	Estimation	Findings
The relationship between a new product preannouncement and likelihood of competitive response	Robertson, Eliashberg and Rymon (1995)	Signal hostility Signal credibility		Primary data (survey)	Likelihood of competitive response	Signaling theory	Discriminant and regression Analysis	Investigating incumbent reactions to new product preannouncements, authors provide a characterization of the factors affecting the likelihood of competitive response to new product preannouncements ' signals.
Firm new product preannouncing behavior	Calantone and Schatzel (2000)	First-mover predisposition. Firm information interactivity Competitive equity building.		Primary data (survey)	Firm's propensity to preannounce	Signaling theory	SEM	The authors introduce competitive equity building, a firm's tendency to seek a high-profile leadership position within its industry, as the main driver of a firm's propensity to preannounce.

Table 1.2 (cont'd)

Focus of Study	Citation	Key Independent Variables	Moderator	Data	Key Dependent Variables	Theoretical Framework	Estimation	Findings
Firm new product preannouncing behavior	Schatzel and Calantone (2006)	Market anticipation Competitive equity		Primary data (survey)	New product success	Signaling theory	SEM	Preannouncing behavior produces new product success through its positive effect on market anticipation and emphasizes the use of preannouncements as business-to-business marketing communications to influence current and prospective supply chain partners.
The relationship between a new product preannouncement and stock returns	Sorescu, Shankar, Kushwah (2007)	Announcements specificity Announcements updating	Announcements reliability	Secondary data	Abnormal stock returns (long and short)	Agency and signaling theories	Cross-sectional regression	The authors find that the financial returns from new product preannouncements are significantly positive in the long run. Also, these preannouncements produce positive short-term abnormal returns only for firms that offer specific relevant information.

Table 1.2 (cont'd)

Focus of Study	Citation	Key Independent Variables	Moderator	Data	Key Dependent Variables	Theoretical Framework	Estimation	Findings
The relationship between alliances, new product preannouncements and abnormal stock returns	Rao, Chandy, and Jaideep (2008)	External and internal legitimacy		Secondary data	Abnormal stock market return	Legitimacy and signaling theories	Regression	The authors find that new firms that obtain legitimacy externally through establishing alliances with reputable firms benefit more from their new products than those that do not pursue such alliances.
The relationship between new product preannouncements and new product performance	Markovitch and Steckel (2012)	Abnormal stock returns to a new product preannouncement		Secondary data	New product performance (success or failure)		Regression	The authors find that the stock market reacts incorrectly to new product preannouncements more often than would be expected in a highly efficient market.
The relationship between a new product preannouncement and message clarity	Cheng and Wong (2012)	Brand strength Product newness Message uniformity Amount of message cues		Primary data	Message clarity		SEM	The authors show that the amount of message cues in the preannouncement influences the extent of clarity that determines the consistency in messages.

Table 1.2 (cont'd)

Focus of Study	Citation	Key Independent Variables	Moderator	Data	Key Dependent Variables	Theoretical Framework	Estimation	Findings
The relationship between new product preannouncements and investor response	Chen, Chiang and Yang (2014)	New product preannouncements	Advertising expenditure	Secondary data	Stock returns	Signaling theory	OLS regression	The authors show that there is a significantly positive relationship between information content and institutional investors.
The relationship between new product preannouncements and short-term cumulative abnormal return	Lee, Chen and Hartman (2015)	Technological sophistication New technology New product preannouncement Message length	Information quality	Secondary data	Short-term cumulative abnormal return	Signaling theory	Hierarchical multiple regression analysis	The results suggest that higher information quality intensifies the strength of the positive relationship between innovativeness and stock market return.
The relationship between new product preannouncements and market share	Talay, Akdeniz, and Kirca (2017)	Stock returns to new product preannouncements	Announcement specificity Product innovativeness Reputation Advertising expenditure Competitive Intensity	Secondary data	Market share	Signaling theory	Dynamic panel data GMM estimation	The authors find that stock returns associated with a new product preannouncement are not an appropriate forward-looking measure of future product performance.

Table 1.2 (cont'd)

Focus of Study	Citation	Key Independent Variables	Moderator	Data	Key Dependent Variables	Theoretical Framework	Estimation	Findings
The impact of concurrent new product preannouncements and stock market response	Warren and Sorescu (2017)	News sentiment Stock return volatility	Firms with high values Firms with low investor recognition Firms with high idiosyncratic volatility	Secondary data	The probability of concurrent announcement	Signaling theory	Propensity score matching	The authors show that under specific conditions, the increase in shareholder value associated with concurrent announcements is higher than that associated with issuing separately.
New product preannouncements and investor expectation	Warren and Sorescu (2017)	The new product preannouncement history of the firm The new product preannouncement history of a firm's competitors Average past news sentiment		Secondary data	Tobin's Q Abnormal stock returns		Random-effects regression with robust standard errors	The authors find that the stock market reaction to a new product preannouncement is negatively related to (1) firm's new product preannouncement history, (2) firm's competitors' average number of new product preannouncement and (3) the average firm's past news sentiment

Table 1.2 (cont'd)

Focus of Study	Citation	Key Independent Variables	Moderator	Data	Key Dependent Variables	Theoretical Framework	Estimation	Findings
The Online Word of Mouth Literature								
The relationship between online word of mouth and message virality	Berger and Milkman (2012)	Emotionality Positivity		Secondary data	Content virality		Regression Analysis	The authors examine how emotion forms virality. The results show that positive content is more viral than negative content.
The relationship between online word of mouth and abnormal stock returns	Tirunillai and Tellis (2012)	New product preannouncements User generated Content (volume and valence)		Secondary data	Abnormal stock returns		VAR model	The authors find that volume of word of mouth not valence significantly leads abnormal returns by a few days.
The relationship between online word of mouth and stock returns	Luo and Zhang (2013)	Consumer buzz (reviews, recommendations, and blogs)	Web traffic	Secondary data	Stock returns		Auto regressive regression	The results support the relationships of buzz and traffic with firm equity value, also the related mediation effects of buzz and traffic.

Table 1.2 (cont'd)

Focus of Study	Citation	Key Independent Variables	Moderator	Data	Key Dependent Variables	Theoretical Framework	Estimation	Findings
The relationship between online word of mouth and stock returns and risk	Luo, Zhang and Duan (2013)	Consumer buzz and web traffic on social media		Secondary data	Stock returns and risk		VARX model	The authors find that social media-based metrics (web blogs and consumer ratings) are significant leading indicators of firm equity value.
The relationship between online word of mouth and stock returns	Dieijen et al. (2016)	User-generated content Company-related events		Secondary data	Stock returns Customer social media engagement		VARX model	The results for two studies in different markets show significant volatility spillovers between the growth rates of online word of mouth and stock returns. Moreover, new product introductions significantly increase the volatility in the growth rates of online word of mouth.

Table 2.2: Measures and Data Sources

Variable	Definition	Data source	Literature support
Institutional investors' holdings	Percentage ownership of institutional investors relative to total shares outstanding for firm i during quarter t	Thomas Reuters F13 File	Bushee and Miller (2012)
Analysts' following	Number of analysts who issued quarterly earnings forecasts for firm i during quarter t	I/B/E/S	Luo et al. (2013)
Cumulative abnormal returns (-1, 0)	Cumulative abnormal returns (CARs), Fama French Four Factor model for new product preannouncement of firm i	CRSP and Fama-French Factors	Fama and French (1996)
Announcement specificity	Length of product information disclosure in words for each new product preannouncement	Lexis/Nexis	Sorescu, Shankar, and Kushwaha (2007)
Brand sentiment	Using natural language processing to identify number of positive articles/posts to negative articles/posts published as financial news around the new product preannouncement event period	Content analysis	
Negative news	A dummy variable that would get a value of 1 if a class action law suit, litigation, fraud, bankruptcy, etc. happens for firm I during quarter t	Lexis/Nexis	
Investor relations intensity	Number of major investor conferences attended by firm i during quarter t plus number of analyst and earnings conference calls during the same period	Lexis/Nexis and company website	
Number of competitors' new product preannouncements	Number of new product preannouncements issued by direct competitors of the firm i during quarter t	Lexus/Nexis	
R&D expenditure	Research and development expenses for firm i during quarter t	COMPUSTAT	Luo and Homburg (2007)
Financial leverage	The ratio of long-term debt to total assets for firm i during quarter t	COMPUSTAT	Tuli and Bharadwaj (2009)
Firm size	Natural logarithm of total assets for firm i during quarter t	COMPUSTAT	Mizik and Jacobson (2008)
Systematic risk	Using daily returns data from CRSP, we ran firm-year regressions against market returns and we subtract the squared standard deviation in the errors from the squared standard deviation in returns to get our systematic equity risk metric	CRSP	Rego, Billett and Morgan (2009)
Idiosyncratic risk	Using daily returns data from CRSP, we ran firm-year-quarter regressions against market returns and utilize the standard deviation of the errors as unsystematic equity risk	CRSP	Rego, Billett and Morgan (2009)

Table 3.2: Abnormal Returns and Test Statistics for Event Study

Event Window	Sample Size	Mean CARs	Time-Series Standard Deviation Test	Rank Test Z
(-1, +1)	1969	0.34%	3.178**	2.260*
(-1, 0)	1969	0.53%	5.838***	3.423***
(0, 0)	1969	0.52%	8.756***	3.611***

The symbols *, **, and *** denote statistical significance at .05, .01 and .001 levels, respectively, using a two-tail test.

Table 4.2: Correlations and Descriptive Statistics

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Institutional investors' holdings	0.60	0.31	1											
2. Stock returns to a NPPA	0.001	0.01	**.035**	1										
3. Brand sentiment	0.12	0.32	**.110**	**.132**	1									
4. Announcement specificity	1023.31	436.30	**-.089**	.037	.048	1								
5. Investor relations intensity	1.07	1.51	**.121**	.013	**.093**	.026	1							
6. Systematic risk	1.12	0.56	**.136**	-.011	**-.026**	-.015	**.140**	1						
7. Idiosyncratic risk	0.04	0.02	**-.392**	-.003	-.022	**.066**	**-.092**	**-.072**	1					
8. Negative news	0.03	0.17	**.054**	-.007	**.142**	**-.124**	.007	-.019	**-.036**	1				
9. NPPAs by competitors	4.54	11.48	**.072**	**.103**	**.557**	.009	**.085**	**-.032**	-.013	**.132**	1			
10. Financial leverage	0.16	0.22	**.224**	.008	**-.038**	-.012	.008	**.073**	**-.110**	.023	-.012	1		
11. R&D expenditure	18.29	26.55	**.349**	-.010	**.108**	**-.063**	**.163**	**.054**	**-.383**	**.114**	-.015	**.201**	1	
12. Firm size	5.04	1.71	**.556**	.000	**.079**	**-.063**	**.137**	**.123**	**-.560**	**.112**	-.024	**.216**	**.767**	1

Bold correlations are significant at the.05 level (2-tailed). NPPA stands for new product preannouncement.

Table 5.2: Results for NPPAs-Institutional Investors' Holdings Relationship

Independent Variables	Dependent Variable: Institutional Investors' Holdings $_t$			
	Model 1a Difference GMM		Model 1b Difference GMM	
ΔInstitutional investors' holdings $_{t-1}$	.36(0.07)	**	.36(0.07)	**
ΔBrand sentiment $_t$	.001(0.004)		.002(0.01)	
ΔStock returns to a NPPA $_t$	.41(0.46)		-.95(0.63)	
ΔAnnouncement specificity $_t$	.00004(0.00004)		-.00001(0.00004)	
ΔInvestor relations intensity $_t$	.01(0.01)		-.003(0.01)	
ΔStock returns to a NPPA$_{it}$ $\times$ ΔInvestor relations inte			.91(0.28)	**
ΔBrand sentiment$_{it}$ $\times$ Δ Investor relations inte			-.0001 (0.003)	
ΔAnnoucement specificity$_i$ $\times$ Δ Investor relations inte			.00002(0.00001)	
ΔSystematic risk $_t$	-.02(0.03)		-.03(0.03)	
ΔIdiosyncratic risk $_t$	-.03(0.71)		-.21(0.81)	
ΔFinancial leverage $_t$	-.18(0.07)	*	-.16(0.07)	*
ΔNegative news $_t$	-0.09(0.06)		-.07(0.06)	
ΔNumber of NPPAs by competitors $_t$	.001(0.001)		.001(0.001)	
ΔR&D expenditure $_t$	.0003(0.0003)		.00004(0.0003)	
ΔFirm size $_t$	.06(0.03)	*	.07(0.03)	*
Time variable	-.00003(0.0003)		-.000002(0.0003)	
Observations	6,132		6,132	
Wald $\chi 2$	107.95	***	104.48	***
Instruments	86		86	
AR (1)	-2.26	***	-2.86	***
AR (2)	-0.78		-1.48	
Hansen J Statistic	72.61		78.71	

*** p < .001, ** p < .01, * p < .05. Coefficients are calculated based on robust standard errors. NPPA stands for new product preannouncement.

Table 6.2: Extended Analysis Results for NPPAs-Analysts' Following Relationship

Independent Variables	Dependent Variable: Analysts' Following $_t$			
	Model 2a Difference GMM		Model 2b Difference GMM	
ΔAnalysts' following $_{t-1}$	.48(.06)	**	.41(.06)	***
ΔBrand sentiment $_t$	1.29(.93)		.37(.22)	
ΔStock returns to a NPPA $_t$	-41.36(17.90)	*	-65.75(30.52)	*
ΔAnnouncement specificity $_t$	.71(.25)	**	.003(.001)	*
ΔInvestor relations intensity $_t$	-.24(.18)		-.08(.15)	
ΔStock Returns to a NPPA$_{it}$ × ΔInvestor relations intens			22.11(11.20)	*
ΔBrand sentiment$_{it}$ × Δ Investor relations intens			-.06(.10)	
ΔAnnoucement specificity$_{it}$ × Δ Investor relations intens			-.0002(.001)	
ΔSystematic risk $_t$	.91(.38)	*	.60(.39)	
ΔIdiosyncratic risk $_t$	4.34(25.56)		-10.69(23.44)	
ΔFinancial leverage $_t$	-2.88(2.51)		-5.29(2.48)	*
ΔNegative news $_t$	.23(2.10)		3.13(1.75)	
ΔNumber of NPPAs by competitors $_t$	-.01(.05)		.002(.03)	
ΔR&D expenditure $_t$	.02(.04)		-.01(.01)	
ΔFirm size $_t$	1.89(.75)	*	2.73(.83)	**
Time variable	-.01(.01)		-.01(.01)	
Observations	4,098		4,098	
Wald $\chi 2$	340.15	***	380.68	***
Instruments	77		87	
AR (1)	-6.45	***	-6.30	***
AR (2)	-.80		-1.22	
Hansen J Statistic	64.85		74.34	

*** p < .001, ** p < .01, * p < .05. Coefficients are calculated based on robust standard errors. NPPA stands for new product preannouncement.

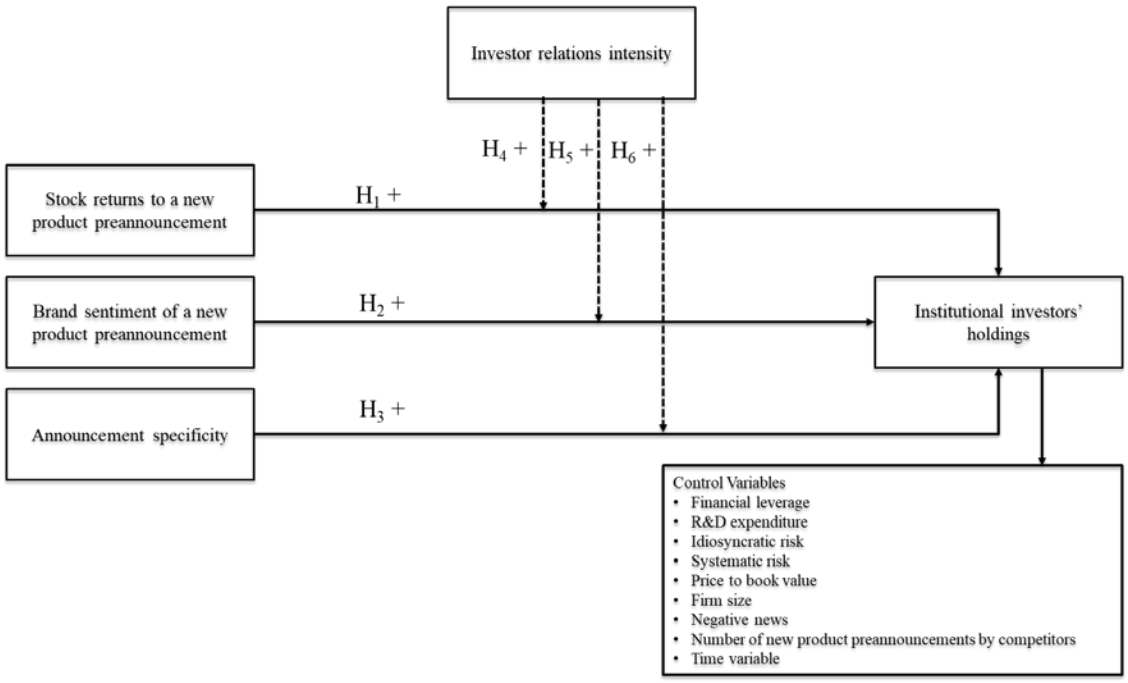
Table 7.2: Estimation Results for Equation 1, Robustness Check

Independent Variables	Dependent Variable: Institutional Investors' Holdings $_t$			
	Model 3a System GMM		Model 3b System GMM	
Institutional investors' holdings $_{t-1}$	.37(.10)	**	.37(.11)	**
Brand sentiment $_t$	-.01(.01)		-0.02(0.02)	
Stock returns to a NPPA $_t$	1.55(1.15)		-1.58(1.73)	
Announcement specificity $_t$	.00004(.0001)		-.0001(.0001)	
Investor relations intensity $_t$	-.01(.01)		-.03(.02)	
ΔStock Returns to a NPPA$_{it}$ $\times$ ΔInvestor relations inter			2.79(.87)	**
ΔBrand sentiment$_{it}$ $\times$ Δ Investor relations inter			.01(.01)	
ΔAnnoucement specificity$_{it}$ $\times$ Δ Investor relations inter			.00003(.00003)	
Systematic risk $_t$			-.02(.03)	
Idiosyncratic risk $_t$			.57(.67)	
Financial leverage $_t$			-.20(.11)	
Negative news $_t$	-.17(.09)		-0.21(0.11)	
Number of NPPAs by competitors $_t$	.01(.002)	*	.01(.003)	*
R&D expenditure $_t$	-.001(.0004)	**	-.001(0.001)	*
Firm size $_t$	.13(.02)	***	.15(.03)	***
Time variable	-.003(.001)	***	-.002(.001)	*
Constant	-.15(.13)		-0.08(0.15)	
Observations	6,132		6,132	
Wald $\chi 2$	314.44	***	183.75	***
Instruments	85		85	
AR (1)	-5.24	***	-4.80	***
AR (2)	-.85		-1.48	
Difference in Hansen Test	23.82		20.64	
Hansen J Statistic	82.23		67.05	

*** p < .001, ** p < .01, * p < .05. Coefficients are calculated based on robust standard errors. NPPA stands for new product preannouncement.

APPENDIX B.2: FIGURES

Figure 1.2: Conceptual Framework



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