

Product competitiveness and beating analyst earnings target

Xueming Luo

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Abstract While Wall Street closely watches financial analysts' earnings forecasts, Main Street often scrutinizes product quality relative to competition. Do firms with superior product competitiveness enjoy greater likelihood of beating analyst earnings target? And if so, is there contingency in this impact? We show that positive changes in product competitiveness contribute to the firm's likelihood of beating analyst earnings target, while negative changes in product competitiveness account for missed earnings target. In addition, this impact of product competitiveness on the likelihood of beating analyst earnings target is more positive in the situations of high firm future growth opportunity and low financial environment uncertainty. These findings innovatively use analyst forecast metrics to reinforce the relationship between product quality, competitive advantage, and financial performance. Our study also cultivates a contingency theory of the marketing-finance interface and allows marketing and finance executives to find common ground in strategic discourse. Overall, this research offers brand new financial analysts-based implications of product competitiveness.

Keywords Product quality · Competition · Financial analysts · Earnings forecast · Stock prices · Marketing strategy

Introduction

What happens when Main Street meets Wall Street? Generally speaking, Wall Street closely watches financial

analysts' earnings forecasts. Because financial analysts (experts) help gauge firm future financial health by providing earnings forecasts, investors depend on such forecasts in forming *earnings target*. Beating or missing this target moves firm share prices upwards or downwards. That is, if firms "beat" this target with positive earnings surprises, investors trade these firms' share prices higher. Otherwise, if firms "miss" this target with negative earnings surprises, they trade such firms' share prices lower. As explicitly noted by Srinivasan and Hanssens (2009, p. 293), "the importance of analyst earning expectation is evident every quarter when companies' earnings announcements are followed by sometimes drastic stock price adjustments when the actual earnings deviate from expectations." As such, analyst earnings target is an important performance metric and plays a critical role in the stock market.

In contrast, Main Street has focused on *product competitiveness*, or superior product quality relative to competition. Because consumers tend to prefer products with better quality all else being equal, marketers often stress the importance of superior quality for achieving competitive advantages in the product market. Prior research has established that quality is among the most important factors that determine product preference, customer loyalty, and brand equity (Gupta and Zeithaml 2006; Jacobson and Aaker 1987; Keller and Lehmann 2006). Echoing this, several studies examined quality's impact on accounting performance (Rust et al. 1995) and share prices (Tellis and Johnson 2007). Yet, extant marketing research, as a whole, has not directly investigated quality's impact on analyst earnings target.

Therefore, our study seeks to fill this gap in the literature. Specifically, we address these questions: Do firms with superior product competitiveness enjoy greater likelihood of beating analyst earnings target? And if so, is there contingency in this impact?

X. Luo (✉)
College of Business Administration,
The University of Texas at Arlington,
Arlington, USA
e-mail: luoxm@uta.edu

Our study contributes to the literature on several fronts. First, theoretically, we add new substance by finding that improvements in product competitiveness explain the firm's likelihood of beating analyst earnings target. In converse, deteriorations in product competitiveness account for missed earnings target. This makes a material contribution, because analyst earnings forecasting is important to the Wall Street community (Sadka and Scherbina 2007; Womack 1996) but has been much under-researched in marketing literature (see a review in Srinivasan and Hanssens 2009). Although prior studies have shown the financial value of quality (see Table 1), they have devoted little attention to the pivotal performance metrics of analysts' earnings forecasts. To our knowledge, this paper is the first, across both marketing and finance disciplines, to explain whether (main effects) and how (moderated effects) changes in product competitiveness explain the firm's likelihood of beating analyst earnings target.

Furthermore, practically, our analyses may help managers to better understand why investments on product competitiveness over time matter to financial analysts and investors. These are important issues because marketing managers are under growing pressure to show the financial accountability of marketing spending (Rust et al. 2004b). Simply put, there are no more blank checks from chief financial executives to product managers. As a result, our findings that improving product competitiveness significantly enhances the firm's likelihood of beating analyst earnings target would help boost the credibility of marketing science in today's financially-oriented corporate world (Stewart 2009).

The balance of this paper presents theoretical framework, method, results, and conclusion.

Theory development

In this section, we present our theoretical framework. In essence, this framework suggests that (1) changes in product competitiveness of a firm affect the firm's

likelihood of beating analyst earnings target and (2) this impact is contingent upon such factors as firm future growth opportunity, industry concentration, and financial environment uncertainty. We begin this section by reviewing the concept of analyst earnings target.

Analyst earnings target

Though less addressed in marketing literature, both popular press and academic research in finance and accounting have suggested that financial analysts play an important role in the stock market by providing earnings forecasts. Popular trade press offers ample anecdotal evidence that beating or missing this earnings target moves firms' share prices upwards or downwards in the stock market (see Fig. 1):

- “Thanks to the increased growth of corn, corporate earnings of CF Industries were up 1000% in 2007 (beat analysts' forecasts by a wide margin), and its stock price quintupled” (*Forbes* 2008).
- “Investors run from Sprint: Sprint Nextel Corp. share price plunged 25% due to worse-than-expected losses in cellular telephone subscribers” (*Wall Street Journal* 2008).
- “Due to the subprime mortgage crisis, big losses in the third-quarter earnings forecast of Merrill Lynch & Co. Inc. sent the value of its stock tumbling” (*American Banker* 2007).
- “Polycom's share prices dropped 20% in September 2007 amid worries that it might miss third quarter 2007 earnings forecasts” (*BusinessWeek* 2007).
- “Because Wal-Mart Stores Inc. posted second-quarter earnings that fell short of the expected outcome, this dismal financial outlook blows Wal-Mart recovery” (*Wall Street Journal* 2007).
- “After the company missed its quarterly earnings forecast, the prices of Best Buy Co.'s stock tumbled \$2.83 per share or 5.9% on June 19, 2007” (*Wall Street Journal* 2007).

Table 1 A comparison of research

Research on valuing product quality	Firm profitability	Stock price	Financial analysts' earnings forecasts	Product quality relative to competition	Time-series cross-sectional data
Phillips et al. (1983)	√	X	X	X	X
Jacobson and Aaker (1987)	√	X	X	X	X
Aaker and Jacobson (1994)	√	√	X	X	√
Rust et al. (1995)	√	X	X	X	√
Hendricks and Singhal (1996)	X	√	X	X	X
Rust et al. (2002)	√	√	X	X	X
Tellis and Johnson (2007)	X	√	X	X	X
The present study	√	√	√	√	√

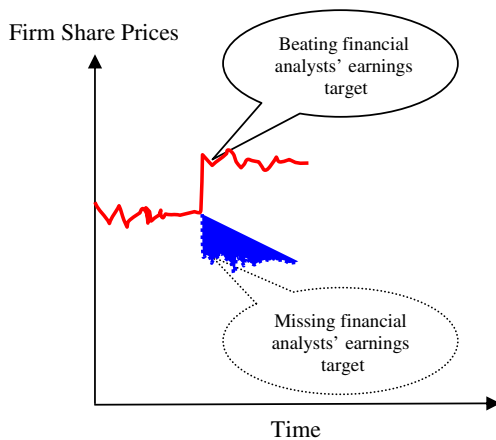


Figure 1 Divergent share price reactions to beating or missing analyst earnings target.

Echoing the popular press, scholarly research in finance and accounting has persuasively shown that firms beating analyst earnings target (positive surprises) are rewarded in financial markets (Cheng and Warfield 2005; Sadka and Scherbina 2007; Womack 1996). For example, Kasznik and McNichols (2002) find compelling empirical evidence that (1) firms beating earnings expectations have significantly higher realized earnings for the current and the three subsequent years, and (2) the stock market rewards a higher value to firms that beat expectations, holding firm fundamentals constant.¹

Perhaps, the negative side is more evident: firms missing the earnings target (negative surprises) are penalized by the stock market. Bartov et al. (2002, p. 186) report that “the average cumulative abnormal returns for stocks with an unfavorable surprise in earnings forecasts can be as dismal as -6.6% over the quarter (-26.4% in a year).” Indeed, a stream of research (Brown et al. 1987; Graham et al. 2005; Lopez and Rees 2002; Matsumoto 2002; McAnally et al. 2008) shows that market reactions to negative earnings surprises are material statistically and economically, suggesting high costs and shareholder value loss in the case of missed analyst earnings target.

Therefore, given that financial analysts’ earnings forecasts play such an important role in determining stock prices and that analyst earnings target is an important performance metric, it would be non-trivial to evaluate whether and in which ways firms with superior product competitiveness affects the firm’s likelihood of beating or missing analyst earnings target.

¹ This line of reasoning is also based on efficient market hypothesis (EMH) theory because this theory suggests that financial markets are at least semi strongly efficient and that investors only react to surprises (i.e., positive/negative earnings surprises or, in our context, beating/missing financial analysts’ earnings forecasts).

Product competitiveness and beating analyst earnings target

Consistent with prior product quality literature (Phillips et al. 1983; Rust et al. 2004a), we define product competitiveness of a firm as the degree to which the firm’s product offerings are perceived to have a superior fitness for use, free of deficiencies, and conformance to requirements relative to its competing firms. In other words, product competitiveness refers to perceived superior product quality relative to competitors in this study. Prior marketing literature has suggested that product quality is critical for a firm’s financial success (Phillips et al. 1983; Rust et al. 2004a). For instance, product quality can affect (1) behavioral outcomes such as repurchase intention, word of mouth, and brand loyalty and (2) financial outcomes such as profits, cost reductions, and stock prices (e.g., Boulding et al. 1999; Keller and Lehmann 2006; Slotegraaf and Inman 2004). Appendix A presents a pictorial classification of the customer-, brand-, market-, and stock price-related outcomes of product quality. Extending past marketing research on the value implications of quality, our focus here is to link product competitiveness to the largely neglected yet important performance metrics of analyst earnings target.

Why would product competitiveness have an impact on the firm’s likelihood of beating analyst earnings target? Theoretically, if the financial markets are efficient or at least semi-efficient (Fama and French 1993), all public information should be considered by financial analysts when they issue earnings forecast quarterly to advice investors. Because product competitiveness changes are widely publicized by popular trade magazine such as *Fortune* or *The Wall Street Journal* (e.g., Tellis and Johnson 2007), there is intuitive support for the notion that product competitiveness changes may impact financial analysts’ earnings forecasts. More formally, there are at least two lines of theory-based reasoning.

First, according to Porter’s (1980) theory, superior product competitiveness can serve as a differentiation strategy which results in competitive advantages over rivals in the industry and earn supranormal earnings above the expected levels. Indeed, Phillips et al. (1983, p. 26) explicitly suggested that “differentiation by quality insulates a business from competitive rivalry by creating customer loyalty, lowering customer sensitivity to price, and protecting the business from other competitive forces that reduce price-cost margins.” If so, then it is possible that by generating differentiation-based competitive advantages, positive changes in product competitiveness boost the odds that firms can exceed industry experts’ expectations and, consequently, beat analyst earnings target, holding other things constant.

Moreover, according to the customer and brand equity theories (Keller and Lehmann 2006; Luo 2007; Rust et al.

2004b), positive changes of product competitiveness over time can drive preferences, satisfaction, and loyalty, all of which subsequently result in above average sales and profits beyond expected levels in the industry. For example, the marketing literature suggests that quality is the most important driver of consumer satisfaction (Fornell et al. 1996, 2006) and that satisfaction directly leads to superior industry competitiveness with higher earnings than the normally expected benchmark (Luo and Homburg 2008). As such, to the extent that product competitiveness affects firms' customer/brand equity impacting firm ability to beat the expected earnings in the industry, it is believed that:

H1 (Main Effects): *increases in product competitiveness have a positive impact on the firm's likelihood of beating analyst earnings target, ceteris paribus.*

However, it would be naïve to assume that the effects of product competitiveness are the same in all situations. Prior research points out that, in general, quality has contingent effects on consumer preferences and stock prices (Mittra and Golder 2006; Tellis and Fornell 1988; Tellis and Johnson 2007). Thus, in line with this literature, we also suggest that the influences of changes in product competitiveness on beating analyst earnings target may be contingent upon such factors as firm-level future growth opportunity, industry-level concentration, and analyst-level financial environment uncertainty.²

The moderating role of more vs. less future growth opportunity

Shares in the stock market are not the same. For example, firms may have shares associated with either more or less growth opportunity as measured by market-to-book ratios. In general, the higher (lower) the market-to-book ratio of a firm, the more (less) growth opportunity for the firm in the future (Mittal et al. 2005; Hendricks and Singhal 1996). Echoing this, prior finance literature suggests that market-to-book ratios (firms' market values over book values) are important indicators of firm intangible assets and investment growth opportunity affecting firms' future stock performance (e.g., Fama and French 1993, 2008).

In light of this literature, product competitiveness changes may have different effects on the likelihood of beating analyst

earnings target for firm stocks with more growth opportunity vs. less growth opportunity. Specifically, in the case of stocks with more future growth opportunity, because of the possible synergistic rents between product quality and intangible assets of the firm (i.e., pricing capability, advertising efficiency, and customer satisfaction, see Mittal et al. 2005; Rust et al. 2002), the same high product competitiveness in the industry may be easier to generate differentiation-based competitive advantages and valuable customer/brand equity (Aaker and Jacobson 1994; Keller and Lehmann 2006), thus more likely beating analyst earnings target. On the contrary, for firms with less growth opportunity and fewer intangible assets, product competitiveness is harder to generate synergy above average earnings or customer/brand equity and thus less likely to beat analyst earnings target. If so, then it follows that product competitiveness's impact on the likelihood of beating analyst earnings target is more evident for stocks with high rather than low future growth opportunity. As such,

H2(Moderating Effects with firm growth opportunity): *for firms with more rather than less growth opportunity, increases in product competitiveness have a more positive impact on the firm's likelihood of beating analyst earnings target.*

The moderating role of high vs. low industry concentration

Industries in the product market are not the same. Firms may operate in either highly or lowly concentrated industries. Formally, industry concentration is the extent to which a small number of companies account for a large proportion of the market output. Prior marketing research suggests that the higher the industry concentration, the lower the competitive intensity in the product market (Anderson et al. 2004; Luo and Homburg 2008).

Changes in product competitiveness may have different effects on the likelihood of beating analyst earnings target across highly concentrated industries vs. lowly concentrated industries. Particularly, in lowly concentrated (more competitive) markets, it is relatively harder to use quality improvements to retain old customers or attract new customers because these customers may be lured to competitive offerings with lower subsequent purchases intentions (Rust et al. 2002; Steenkamp et al. 2005). Further, relative quality changes among firms in fragmented industries may be harder for customers (and analysts) to identify. For these reasons, the same improvement of product competitiveness is less likely to translate into customer/brand equity (Keller and Lehmann 2006) and thus less likely to beat analyst earnings target in lowly concentrated markets. In contrast, in highly concentrated (less competitive) industries, it is easier for the customers to overlook the rival offerings because of a lack of competitive choices and hence exhibit higher repurchasing

² An implicit assumption is that contingency theory motivates our moderating hypotheses, beyond the main effect hypotheses. For contingency variables, we select *firm-level* factor (future growth opportunity) because quality programs may benefit more in firms with more growth opportunity, *industry-level* factor (industry concentration) because of the importance of industry competition for most marketing initiatives, and *analyst-level* factor (forecast dispersion) due to asymmetric information theory and the fact that higher dispersion can infer more noisy and uncertain financial environment on Wall Street.

loyalty (Luo and Homburg 2008; Mitra and Golder 2006). In this case, the same improvement of product competitiveness is more likely to generate valuable customer/brand equity or differentiation-based competitive advantages to beat analyst earnings target. If so, then product competitiveness's impact on beating analyst earnings target is more salient in highly rather than lowly concentrated industries.

H3(Moderating Effects with industry concentration): *for firms operating in highly rather than lowly concentrated industries, increases in product competitiveness have a more positive impact on the firm's likelihood of beating analyst earnings target.*

The moderating role of big vs. small financial environment uncertainty

Analysts in financial markets are not the same in forecasting firm future profitability. Prior finance and accounting literature suggests that the bigger information uncertainty in financial environments, the poorer and more noisy analyst forecasting processes and, thus, the higher analyst forecast dispersion (e.g., Bryan and Tiras 2007; Brown et al. 1987; Thomas 2002). In other words, big financial environment uncertainty may be embodied by high analyst forecast dispersion. In essence, analyst forecast dispersion is the extent to which analysts disagree about the forecasted earnings per share for the same firm from a particular industry.

Changes in product competitiveness may have different effects on the likelihood of beating analyst earnings target across big vs. small financial environment uncertainty. Particularly, when financial environments have less information uncertainty or lagged analyst forecast dispersion is small, analysts tend to rely more on fundamentals such as past earnings performance (which is more credible and certain information) (Bryan and Tiras 2007, p. 655) and less on non-fundamental factors including relative product quality when forming their expectations of firm future earnings targets. If so, then the same improvement of product competitiveness in the industry may be easier to beat analyst earnings target via generating competitive advantages or customer/brand equity which are valuable but largely ignored by financial analysts (Keller and Lehmann 2006; Rust et al. 2004b). In contrast, when financial environments are more uncertain or lagged analyst forecast dispersion is big, analysts tend to rely less on past earnings performance (which is "noisy and uncertain" information) and pay more attention to other value-adding factors such as relative quality to competition in the industry, suggesting that the same product competitiveness is then less likely to account for beating analyst earnings target (Brown et al. 1987; McAnally et al. 2008). For this reason, product competitiveness's impact on beating analyst earnings target is more apparent for small rather than

big financial environment uncertainty. Thus, it is hypothesized that:

H4(Moderating Effects with financial environment uncertainty): *for firms in small rather than big financial environment uncertainty, increases in product competitiveness have a more positive impact on the firm's likelihood of beating analyst earnings target.*

Methodology

Data for product competitiveness

We have data on product competitiveness from *Fortune* data source (2001–2005). This measure is based on the ratings of the quality of goods/services offered by the firm relative to its leading competitors in the industry. Table 2 reports the measures and data sources. Each year, *Fortune* polls more than 10,000 senior executives (e.g., chief executive officers, global sales and marketing vice presidents, chief marketing officers, etc.), financial analysts, and Wall Street investors from over 580 large companies to determine the perceived product competitiveness. Because the respondents rate each firm relative to its major competing firms in the industry, the *Fortune* data assesses perceived product quality relative to competition. The resultant ratings for each company range from 0 to 10 (the highest level). Companies can be rated as the best in product competitiveness in goods (i.e., Nordstrom, Polo Ralph Lauren, Herman Miller) and services (i.e., United Parcel Service, Walt Disney, New York Times). By the same token, companies are rated as the worst in product competitiveness in goods (i.e., Dollar General, Navistar International, Tenet Healthcare) and services (i.e., Qwest Communications, United Airlines). In the sample, companies range from aerospace and defense, airlines, communications, computers, movies and entertainment, oil and gas, semiconductors, trucking, to wireless telecommunications. This measure of product competitiveness has been utilized by prior studies (Cho and Pucik 2005; Luo and Bhattacharya 2006).³

³ Note that our data on product competitiveness is not about other marketing variables such as customers' perceptions/attitudes or brand recognition. But rather, each year, *Fortune* polls more than 10,000 senior executives, financial analysts, and investors to determine the perceived product competitiveness. In this sense, we also feel that product competitiveness information may enter the investment marketplace in such a fashion as to help investors make choices. Further, we check the world top 100 brand value ratings (2001–2005) from *BusinessWeek* and run a correlation between product competitiveness and brand values. We find that the two variables have relatively low but significant correlation ($r=.17$, $p<.05$). Product competitiveness and brand values should be correlated (though not too highly correlated as they are separate constructs), because superior product quality is an antecedent of brand equity. Thus, these steps help establish the validity of the *Fortune* data for product competitiveness.

Table 2 Measures and data sources for key variables

Variables	Measures	Data source
Product competitiveness	Defined as the degree to which the firm's product offerings are perceived to have a superior fitness for use, free of deficiencies, and conformance to requirements relative to its competing firms. In other words, product competitiveness refers to perceived superior product quality relative to competitors; ranging from 0 to 10 (highest level) for each company each year	FORTUNE
Beating or missing analyst earnings target	Measured as a binary variable with 1=beating analyst earning target (observed firm earning per share > the latest analysts' median consensus forecast per share) and 0=missing analyst earning target (observed firm earning per share < the latest analysts' median consensus forecast per share). In order to match the data time frame, we use the first quarterly I/B/E/S earnings report after the FORTUNE data are released.	I/B/E/S COMPUSTAT
Future growth opportunity	Gauged as market-to-book ratio; the higher (lower) the market-to-book ratio of a firm, the more (less) growth opportunity for the firm in the future	CRSP COMPUSTAT
Industry concentration	Assessed as the Herfindahl concentration index; the extent to which a small number of companies account for a large proportion of the market output	COLMPUSTAT
Financial environment uncertainty	Big financial environment uncertainty may be embodied by high analyst forecast dispersion. We measure analyst forecast dispersion as the extent to which analysts disagree about the forecasted earnings per share for the same firm from a particular industry	I/B/E/S

We merged this data on product competitiveness with COMPUSTAT, I/B/E/S, and Center for Research in Security Prices (CRSP) data sources. We have 1,985 (=397 firms x 5 years from 2001 to 2005) data points from FORTUNE. To match the quality data, we have downloaded additional 500,220 (=397 firms x 5 years x 252 trading days of stock prices) data points from CRSP and 694,750 (=397 firms x 5 years x 350 analyst forecasts on average) data points from I/B/E/S. Due to the lagging structure in deriving product competitiveness changes, we lost the first year data and ended up with 1,588 firm-year observations. Tables 3 and 4 present summary statistics of the variables.

Data for analyst earnings target

Data for financial analysts' earnings forecasts are from I/B/E/S. Our key dependent variable here is the likelihood of beating or missing analyst earning target. Following previous studies (McAnally et al. 2008, p. 194; also see Bartov et al. 2002; Kasznik and McNichols 2002), we derive a binary variable with 1=beating analyst earning target (observed firm earning per share > the latest analysts' median consensus forecast per share) and 0=missing analyst earning target (observed firm earning per share < the latest analysts' median consensus forecast per share). We measured observed firm earning per share with COMPUSTAT data #57 and the latest analysts' median consensus forecast per share before the earnings announcements with MEDEST in I/B/E/S.⁴ In our dataset, there are

⁴ Following the accounting literature (Bartov et al. 2002; Lim and Tan 2008), we use the latest (or most recent) analysts' median consensus forecasts that are no earlier than 2 months before the date of earnings announcements. In addition, COMPUSTAT provides more accurate data on firms' reported earnings per share than I/B/E/S does.

1,018 firm-year observations beating analyst earning target and 516 cases missing analyst earning target. In order to match the data time frame, we use the first quarterly I/B/E/S earnings report after the FORTUNE data are released.

Data for control variables

When examining the drivers of the likelihood of beating analysts' earnings forecasts, McAnally et al. (2008, p. 204) control for firm size, leverage, and future growth opportunity. Thus, we not only control for these variables but also add other variables such as R&D, advertising, industry concentration, financial environment uncertainty, and return volatility.

Data for firm size is from COMPUSTAT. It is measured as the (in log) number of shares outstanding (Data #25) multiplied by the share price from CRSP.

Data for leverage is from COMPUSTAT, measured as the ratio of long-term debt (Data #9) to firm total assets (Data #6).

Data for R&D intensity is from COMPUSTAT, measured as the ratio of research and development expenses (Data #46) to total assets (Data #6) (Anderson et al. 2004; Chauvin and Hirschey 1993).

Data for advertising intensity is from COMPUSTAT, assessed as the ratio of advertising expenses (COMPUSTAT Data #45) to total assets (Data #6). We also filled missing values of advertising with the Competitive Media Reporting (CMR) dataset. Following finance literature (Grullon et al. 2004), we entered R&D dummy (=1 when Data #46 is missing) and advertising dummy (=1 when Data #45 is missing in COMPUSTAT).

Data for return volatility is from CRSP, measured as the standard deviation of daily stock returns over the year for each firm based on CRSP (Grullon et al. 2004).

Table 3 Data for the variables

Variables	Mean in whole sample	Mean in sub-sample of firms beating analyst earnings target	Mean in sub-sample of firms missing analyst earnings target
Product competitiveness	6.892	8.152	5.607
Future growth opportunity	2.131	2.877	1.605
Industry concentration	0.082	0.073	0.089
Financial environment uncertainty	0.041	0.029	0.056
Leverage	2.904	2.126	3.857
Size	6.127	7.368	5.052
R&D intensity	0.037	0.056	0.021
Advertising intensity	0.055	0.061	0.018
Return volatility	0.046	0.027	0.063

Table 4 Data for product competitiveness across industries

Industries	SIC	Quality ratings
Aerospace and defense	37xx	7.272
Airlines	45xx	7.996
Apparel and accessories	23xx	6.690
Auto parts and equipment	25xx	5.084
Broadcasting and cable TV	48xx	5.132
Casinos and gaming	79xx	8.893
Communications equipment	36xx	5.712
Computers	57xx	6.997
Data processing and outsourced services	73xx	7.206
Department stores	53xx	9.156
Electric utilities	49xx	4.798
Electronic manufacturing services	36xx	6.739
Food retail	54xx	7.735
Health care services	51xx	6.802
Homebuilding	15xx	8.264
Hotels	70xx	7.054
Household products	28xx	6.966
Industrial machinery	36xx	6.777
Investment banking and brokerage	62xx	7.024
Movies and entertainment	48xx	6.695
Oil & gas refinery	29xx	7.035
Packaged foods	20xx	9.040
Personal products	59xx	5.476
Pharmaceuticals	28xx	6.825
Publishing and printing	27xx	5.809
Real estate investment trusts	67xx	7.593
Regional banks	60xx	6.706
Restaurants	58xx	7.079
Semiconductors	36xx	8.717
Soft drinks	20xx	9.149
Specialty stores	55xx	7.051
Steel	33xx	6.615
Trucking	42xx	7.943
Wireless telecommunications	48xx	5.814

Data for future growth opportunity is from COMPUSTAT and CRSP, gauged as the market-to-book ratio. It is computed as share price (from CRSP) multiplied by number of shares outstanding (Data #25) then divided by book equity (COMPUSTAT item #60).

Data for industry concentration is from COMPUSTAT, measured as the Herfindahl concentration index. It was derived based on the lagged sales for all firms with the four-digit Industry Classification codes (Anderson et al. 2004).

Financial environment uncertainty is gauged with analyst forecast dispersion. The data is from I/B/E/S. It is measured as the standard deviation of analysts' outstanding consensus forecast before the earnings announcement (STDEV in I/B/E/S) (Bryan and Tiras 2007; Thomas 2002).

Finally, in accounting for unobserved heterogeneity, we entered industry dummies and year dummies so as to accommodate fixed effects in modeling analyses.

Robust logistic regression model

We employ logistic regression models to test the developed hypotheses and determine the firm's likelihood of beating or missing analyst earnings target. The logistic regression is specified with Huber/White Robust covariance matrix in order to account for possible heteroskedasticity and autocorrelation biases in data analyses. Specifically, the probabilities of beating analyst earnings target can be obtained from the robust logistic regression model below:

$$P_{(beat=1)} = \frac{1}{1 + e^{(-\lambda - \gamma'X)}}$$

Where:

- $P_{(beat)}$ the probability of beating analyst earnings target
- λ the intercept term

γ the vector of parameters, and
 X the vector of predictors (including main effects of product competitiveness, moderated effects with future growth opportunity, industry concentration, and financial environment uncertainty, as well as control variables of firm size, leverage, R&D, advertising, and return volatility).⁵

Hypothesis testing results

We present the hypothesis testing results in Table 5. The overall fit of the robust logistic regression model is significant ($p < .01$). The model prediction is good, as 98.52% of cases are correctly classified into either beating analyst earnings target or missing analyst earnings target.

In H1, we predict that increases in product competitiveness have a positive impact on the firm's likelihood of beating analyst earnings target. The results in Table 5 suggest that product competitiveness changes have positive and statistically significant effects (i.e., $\gamma = 0.291$, $p < .01$), as expected. This means that improvements in product competitiveness enhance the firm's probability of beating analyst earnings target. In converse, deteriorations in product competitiveness enhance the firm's chance of missing analyst earnings target. Thus, H1 is supported by the data.

In H2, we predict that for firms with more rather than less growth opportunity, increases in product competitiveness have a more positive impact on the firm's likelihood of beating analyst earnings target. The results in Table 5 suggest that the interaction term between product competitiveness changes and *future growth opportunity* has a positive and statistically significant effect (i.e., $\gamma = 0.083$, $p < .05$), as expected. This means that future growth opportunity augments the positive impact of product competitiveness changes on the likelihood of beating analyst earnings target. Therefore, for firms with more future growth opportunity, product competitiveness increases indeed have a more positive influence on the firm's likelihood of beating analyst earnings target. As such, H2 is supported as well.

However, we do not have significant support for H3, which suggests that for firms operating in highly rather than lowly concentrated industries, increases in product competitiveness have a more positive impact on the firm's likelihood of beating analyst earnings target. As reported in Table 5, the results did not suggest a significant moderating

Table 5 Robust logistic regression results of predicting the likelihood of beating analyst earnings target

	Coefficient	Error	p-value
Intercept	-6.078	1.522	0.000
Leverage	-2.093	0.718	0.027
Size	0.217	0.093	0.031
R&D Intensity	0.026	0.019	0.061
Advertising Intensity	0.035	0.013	0.025
Return Volatility	-0.461	0.128	0.000
Product Competitiveness Change	0.291	0.042	0.000
Future Growth Opportunity	0.016	0.001	0.000
Industry Concentration	-0.009	0.006	0.215
Analyst Forecast Dispersion	-0.014	0.008	0.028
Product Competitiveness Change x Future Growth Opportunity	0.083	0.029	0.017
Product Competitiveness Change x Industry Concentration	-0.019	0.031	0.521
Product Competitiveness Change x Analyst Forecast Dispersion	-0.131	0.065	0.042
Firm Fixed Effects	YES		
Time Fixed Effects	YES		
Robust Covariance Matrix	YES		
-2 Log likelihood	457.968		
Percentage correct	98.52%		
p-value of the model	0.000		

Note: Dependent Variable: Beating Analyst Earnings Target = 1 ($n = 1,018$) and Missing Analyst Earnings Target = 0 ($n = 516$).

role of *industry concentration*. That is, the estimated parameter (γ) is statistically insignificant ($p > .05$) for the interaction term between product competitiveness changes and industry concentration.

H4 expects that for firms in small rather than big financial environment uncertainty, increases in product competitiveness have a more positive impact on the firm's likelihood of beating analyst earnings target. The results in Table 5 suggest that the interaction term between product competitiveness changes and financial environment uncertainty has a negative and statistically significant effect (i.e., $\gamma = -0.131$, $p < .05$), as expected. This means that financial environment uncertainty weakens the positive impact of product competitiveness changes on the likelihood of beating analyst earnings target. Therefore, when financial environment uncertainty is small, product competitiveness increases have a more positive influence on the firm's likelihood of beating analyst earnings target. Therefore, H4 is supported.

Additional analyses results

Although a recent study has supported product quality's impact on share prices (Tellis and Johnson 2007), it would

⁵ The robust covariance matrix is: $\hat{\Sigma}HW = \frac{T}{T-k}(X'X)^{-1}\Omega(X'X)^{-1}$, $\Omega = \frac{T}{T-k}[\sum_{t=1}^T u_t^2 x_t x_t' + \sum_{v=1}^q ((1 - \frac{v}{q+1}) \sum_{t=v+1}^T (x_t u_t u_{t-v} x_{t-v}' + x_{t-v} u_{t-v} u_t x_t'))]$, and q (the truncation lag) = $\text{floor}(4(T/100)^{2/9})$ (Maddala 1983).

be interesting to test product competitiveness’s impact on stock returns. As such, we employ a widely-accepted stock return response modeling technique, i.e., the Fama-French four-factor approach (Fama and French 1993; Carhart 1997):

$$(2) \quad SR_{i,d} = \alpha_i + \beta_i^{MKT} r_d^{MKT} + \beta_i^{SMB} r_d^{SMB} + \beta_i^{HML} r_d^{HML} + \beta_i^{UMD} r_d^{UMD} + u_{i,d},$$

Where:

- SR stock return for firm *i* on day *d*
- α the intercept term
- r_d^{MKT} stock market return excessive to the risk-free Treasury-bill rate
- r_d^{SMB} the difference of returns between small and big stocks
- r_d^{HML} the difference of returns between high and low book-to-market stocks
- r_d^{UMD} stock market return momentum, and
- β the vector of parameters.

The residual ($u_{i,d}$), or the difference between observed stock returns and the predicted stock returns from the model above, is a measure of firm-idiosyncratic abnormal stock return (Ang et al. 2006; Luo 2007). After obtaining abnormal return, we regress it on product competitiveness changes. The results supported the impact of product competitiveness changes on abnormal return (coefficient=0.035, $p < .01$), as expected. Thus, we also make incremental contribution beyond Tellis and Johnson (2007) by employing the large scale *Fortune* data on product quality relative to competition. We will return to these findings when discussing the implications.

Further, to rule out alternative explanations, we entered additional interaction term between firm size and changes in product competitiveness and found our hypothesis testing results are robust. Moreover, because we market-to-book ratio is one proxy of future growth opportunities (Luo and Bhattacharya 2006), we also conducted further analyses with other proxies such as average sales over the last 5 years (COMPUSTAT) and earnings-to-price ratio (I/B/E/S and CRSP). Again, our additional analyses suggest that the key results still hold and are robust to multiple measures of future growth opportunities.

Conclusion and implications

Across Wall Street blows the winds of financial analysts’ earnings forecasts which may drift share prices north or south. The core message of our study is that product competitiveness does count in the context of beating analyst earnings forecasts. The secondary message is that

the degree to which it counts is contingent. More specifically, our research shows that positive changes in product competitiveness contribute to the firm’s likelihood of beating analyst earnings target, while negative changes in product competitiveness account for missed earnings target. In addition, this impact of product competitiveness on the likelihood of beating analyst earnings target is more positive in the situations of high firm future growth opportunity and low financial environment uncertainty. Our study offers several important implications for researchers and managers.

Implications for research

First, to marketing research, our study is the first to advance the product quality literature by demonstrating that improvements (deteriorations) in product competitiveness determine the firm’s odds of beating (missing) analyst earnings target. Our work is a further reinforcement of the relationship between product quality, competitive advantage, and performance metrics. By examining financial analysts-based outcomes metrics, we help justify and extend prior studies on the value of quality and return on quality (Rust et al. 1995, 2004b; Tellis and Johnson 2007). Such important metrics as beating/missing analyst earnings target have direct implications for financial markets and thus can provide new insights and directions for future marketing research. We call for more research to utilize the under-addressed yet powerful analyst earnings expectations/targets to benchmark the performance implications of other relevant marketing variables in the marketing productivity chain (Rust et al. 2004b). In doing so, marketing research can paint a more complete portrait of financial outcomes of product competitiveness over time.

In addition, we extend Tellis and Johnson’s (2007) study on the value of quality in three aspects. First, while their study focuses on the main effects, our work develops and tests a framework which includes not only main effects but also the multi-level contingency in terms of moderated effects. Second, they rely on event study methodology, whereas we apply stock return response modeling to support the value relevance of quality with a different research methodology. Third, while they use data from a *Wall Street Journal* reporter’s product reviews, we employ the *Fortune* data on product quality relative to competition that may provide a broader and perhaps stronger test of quality’s impact on abnormal stock returns.⁶

⁶ We acknowledge one anonymous reviewer for bringing this implication to our attention.

Furthermore, under the broad umbrella of scholarship, our study makes a novel attempt to advance the burgeoning research in the marketing-finance interface (Gupta and Zeithaml 2006; Luo 2008, 2009; Srinivasan and Hanssens 2009). Specifically, we not only directly link a core marketing variable (product competitiveness) to important financial outcomes (beating/missing analyst earnings target), but also uncover multi-dimensional (firm-, industry-, and analyst-level) moderated effects. Our study cultivates a contingency theory of the marketing-finance interface and shores up more empirical evidence for the financial credibility of marketing. From a marketing perspective, one interesting issue is that financial analysts should weigh product quality relative to competition when issuing earnings forecasts and advising investors. Yet, the challenge is whether financial analysts have the ability to account for product competitiveness accurately. To the extent that analysts are more and more paying attention to non-financial intangible information (Fornell et al. 2006; Luo and Homburg 2008), marketing academics should more enthusiastically advocate the direct relevance of product competitiveness to the Wall Street community and financial scholars. Though not an easy task, a failure to do so would leave financial analysts (especially those lacking marketing expertise) to be too risk adverse to consider the non-financial information of product competitiveness (Stewart 2009).

Implications for managers

To managers, product quality relative to competition is primarily a strategic factor over which they can have considerable control on Main Street. Because decreases in product competitiveness over time can contribute to missed analyst earnings target, both managers and investors may agree that relentlessly cutting or even terminating organizational investments in product quality should be exercised with great caution. The firm should always improve product competitiveness since there is a penalty if the firm decreases it. In fact, managers should invest more than their competitors do in product competitiveness programs (i.e., product quality controls, R&D spending, employee training, new product developments, etc.) so as to achieve greater differentiation-based competitive advantages.

In addition, managers should think like financial investors, acknowledging that firms beating analyst earnings target are rewarded, while firms missing the earnings target are penalized by the stock market (e.g., eBay once lost 20% when it missed its earnings target by only 1 penny). With this common understanding, it should not be the case that managers and marketers are from Mars, while financial

analysts and investors are from Venus speaking different languages. Thus, by reinforcing the relationship between product quality, competitive advantage, and performance metrics, our study allows marketing and finance executives to find common ground in strategic discourse, i.e., regarding the importance of product competitiveness management.

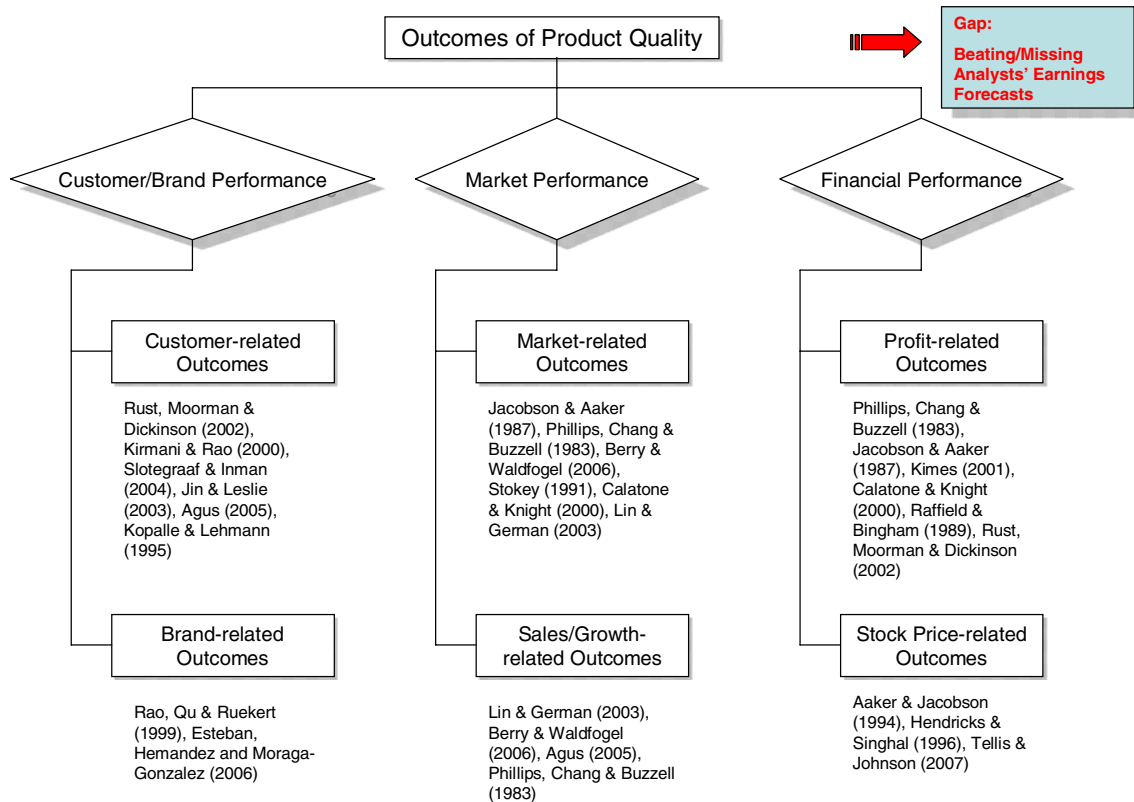
Moreover, prudent managers should ponder and exploit the moderated impact of product competitiveness. Understanding moderated effects can be material because doing so helps managers to adapt their strategic actions of improving product competitiveness to firm-, industry-, and analyst-level situations.⁷ Firms that mesh well product quality programs with various conditions of firm future growth opportunity and financial environment uncertainty can more effectively leverage the performance potential of product competitiveness. Even though managers may not directly control financial environment uncertainty, they should adapt the firm's actions and practices. For example, they may engage in more proactive information disclosing of product competitiveness improvements in uncertain financial environments. Just like the moderating role of environment turbulence in the market orientation literature, although managers cannot directly control environment turbulence, they should adapt the firm's customer-oriented practices in high vs. low degrees of environment turbulence (Kohli and Jaworski 1990). In this sense, our findings of the moderating role of financial environment uncertainty are also relevant for managerial actions.

In conclusion, this study examines (1) the impact of product competitiveness changes on the firm's likelihood of beating analyst earnings target and (2) the multi-level moderated effects of this impact. We hope these financial analysts-based performance implications of product competitiveness may help to motivate future research in marketing science.

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⁷ We focus here on healthy practices (i.e., quality improvement) of earnings surprises management rather than misguided earnings management (under- or over-accounting reporting) which may be unhealthy for firm shareholder value.

Appendix A: Pictorial presentation of classifying the customer-, brand-, market-, and value-related outcomes of product quality



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