

MARKETING AND FIRM VALUE

Metrics, Methods, Findings, and Future Directions

Shuba Srinivasan¹

Dominique M. Hanssens²

June 25, 2008

Forthcoming, *Journal of Marketing Research*

1 Associate Professor of Marketing, The A. Gary Anderson School of Management, University of California, Riverside. Phone: +1 951 827 6447, e-mail: shuba.srinivasan@ucr.edu.

2 Bud Knapp Professor of Marketing, UCLA Anderson School of Management. Phone: +1 310 825 4497, e-mail: dominique.hanssens@anderson.ucla.edu.

The authors acknowledge the helpful comments of the editorial team, and Donald Lehmann, Canlin Li, David Mayers, Natalie Mizik and Hyun Shin on earlier versions of this article. Shuba Srinivasan acknowledges the financial support of the University Scholar Award from the University of California, Riverside. Dominique Hanssens acknowledges the role of the Marketing Science Institute in encouraging and funding research on marketing and firm value.

ABSTRACT

The marketing profession is being challenged to assess and communicate the value created by its actions on shareholder value. These demands create a need to translate marketing resource allocations and their performance consequences into financial and firm value effects. The objective of this paper is to integrate the existing knowledge on the impact of marketing on firm value. The authors first frame the important research questions on marketing and firm value and review the important investor response metrics and relevant analytical models, as they relate to marketing. The authors next summarize the empirical findings to date on how marketing creates shareholder value, including the impact of brand equity, customer equity, customer satisfaction, R&D, product quality and specific marketing-mix actions. In addition the authors review emerging findings on biases in investor response to marketing actions. The paper concludes by formulating an agenda for future research challenges in this emerging area.

INTRODUCTION

Investors trade companies' shares because their expectations of these companies' future earnings differ. This trading activity results in a share *price* that represents the valuation, or *consensus forecast* of the financial health, of these companies. To aid in this process, industry experts ("analysts") publish their own earnings expectations, based in part on meetings with senior company executives that focus on their strategies and business plans for the foreseeable future. The importance of this expectation setting is evident every quarter when companies' earnings announcements are followed by sometimes drastic stock price adjustments when the actual earnings deviate from expectations (i.e., when there is an earnings surprise).

This continuous firm value adjustment process is of major importance to senior executives, and in particular to the stewards of demand generation for the firm, i.e. the marketing and sales managers. Individual executive compensation packages are often tied to stock price, and more importantly, when stock prices don't trend upward, that is perceived as a failure of management strategy. Consequently, managerial actions may be influenced by past movements in share price; in other words, there is a feedback loop of investor sentiment into managerial resource allocation. Thus, it is of the utmost importance to understand how managerial actions *translate* into the consensus forecast of financial health (i.e., stock price), and in particular what influences the consensus formation.

In recent years, researchers in marketing have begun to examine the *demand creation* aspect of firm valuation. While demand creation is but one aspect of management strategy, it is arguably the most important and the most challenging. Its critical importance stems from the fact that customers have become the ultimate *scarce resource* (e.g., Peppers and Rogers 2005). Its challenge is demonstrated by the fact that the tenure of Chief Marketing Officers (CMOs) is comparatively short (Nath and Mahajan 2008), which is another way of saying that chief executives and boards of directors are more often disappointed in the performance of their CMOs than in that of the other senior executives in the firm.

If marketing's contributions were readily visible in quarterly changes in sales and earnings, the task would be simple, because investors are known to react quickly and fully to earnings surprises. However, much of good marketing is building *intangible assets of the firm*, in particular brand equity, customer loyalty and market-sensing capability. Progress in these areas is not readily visible from quarterly earnings, not only because different non-financial

“intermediate” performance metrics are used (e.g., customer satisfaction measures), but also because the financial outcomes can be substantially delayed. Like R&D, marketing is requesting the investor community to adopt an investment perspective on its spending.

The following recent quotations from the business press serve as illustrative examples of investor response to specific marketing actions and non-financial performance movements in different areas:

Pricing. In September 2007, when Apple announced a \$200 price cut on the new cell phone, iPhone, investor reaction to this presumed “bad news” led to a stock price drop of Apple by 5 percent to \$136.36 (*Information Week* 2007).

Channels of distribution. In July 2006, when Wal-Mart closed its operations in Germany, its share price increased by 1 percent to \$43.91 (Reuters 2006).

New-product introductions. In April 2006, the introduction of Boot Camp software by Apple, allowing users to operate Windows XP on Mac computers, led to an increase of \$6.04 in Apple's share price (*Wall Street Journal* April 2006).

Perceived quality. In September 2006, GM announced that it would extend warranties to 100,000 miles on 2007 cars and trucks as part of a plan to tout quality and win back buyers lost to Toyota Motor Corp. and other rivals. Investor reaction led to a 2.4 percent increase in GM stock price (*Wall Street Journal* September 2006).

Customer satisfaction. In August 2005, when Dell's customer satisfaction rating dropped a steep 6.3 percent to 74 out of a possible 100, the biggest drop among major PC makers, its shares closed down from \$41.79 to \$36.58 (*Forbes* 2005).

These examples suggest investors react quickly, rewarding firms with a higher stock price as information perceived as “good news” becomes available, and vice versa. But are these *financial-market* reactions in sync with *product-market* reactions which, de facto, are the revenue sources for the firm? According to the well-known Efficient Markets Hypothesis (EMH) in finance, these investor reactions fully and accurately incorporate any new information that has value relevance.¹ Thus insofar as marketing drives product-market performance, new marketing developments could be value relevant.

Finance theory supports the value relevance of marketing via its effect on the firm's cash needs (Rao and Bharadwaj 2008). Provided marketing impacts the shape of the probability distribution of future sales revenues, it helps determine the firm's working capital requirements (see Rao and Bharadwaj o.c. for an elaboration). Thus the study of marketing's impact on valuation proceeds via its impact on cash flows, in particular their magnitude, speed, and

volatility (Srivastava, Shervani and Fahey 1998). Both tangible and intangible impact routes need to be considered. However, it is not clear a priori that the investor reaction mechanism will always be complete and accurate, as predicted by the EMH. In the iPhone example, did the investors accurately infer the price elasticity for this new cell phone? Indeed, there are two reasons why accurate investor response to marketing developments is inherently difficult to assess. First, because investors are not necessarily marketing experts, they may wrongly evaluate the impact of a marketing driver on future cash flows. For instance, it has been reported that the shares of “intangible-intensive” firms are systematically undervalued (Lev 2004). This results in adverse consequences, including excessively high costs of capital for such firms, leading them to under-invest in intangibles such as brand building, which could limit the future earnings growth that investors seek. Second, investors may be influenced by persuasive communication by company executives or stock analysts (e.g., Sirri and Tufano 1998; Gallaher, Kaniel and Starks 2005), and by a host of other mediating factors.

This paper *examines the methods* for determining the impact of marketing on investor valuation and *summarizes the existing findings* in this area. We first frame the important research questions on marketing and firm value and review the key investor response metrics and relevant analytical models, as they relate to marketing. We then summarize the empirical findings to date on how marketing creates shareholder value, including the impact of brand equity, customer equity, customer satisfaction, R&D and product quality, and specific marketing-mix actions on firm value. Finally, we conclude the paper with several directions for future research.

MARKETING AND FIRM VALUE — METHODS AND METRICS

Summary steps in Market Valuation Modeling

The starting point for tackling the marketing-valuation question is the Fama-French factor model developed in the finance literature (e.g., Fama and French 1992; 1996) (see Table 1, row 1). This model recognizes the random-walk nature of stock prices and is therefore expressed as stock returns, which are stationary.

--- Insert Table 1 about here ---

The Fama-French model also recognizes three systematic factors that explain cross-sectional differences among stock returns. It states that the additional returns investors can expect to receive by investing in stocks of companies are explained by three factors: the excess return on a

broad market portfolio (market risk factor), the difference in return between a large-cap and a small-cap portfolio (size risk factor), and the difference in return between high versus low book-to-market stocks (value risk factor). These three factors are augmented with a fourth factor, *momentum*, to obtain the Carhart four-factor financial model (Carhart 1997). Marketing-valuation models then act on the unanticipated component of stock returns. From a finance perspective, such efforts complement the Carhart four-factor financial model because they demonstrate how *firm-specific managerial actions* can either add or subtract shareholder value. The impact of these exogenous variables provides the ultimate evidence of marketing's contribution to shareholder value.

Metrics. Stock returns have unexpected components due to financial and non-financial results and actions/signals. On the results side, the most straightforward are top-line (revenue) and bottom-line (earnings) surprises. These are typically modeled via time-series extrapolations.ⁱⁱ In addition, earnings surprises may be modeled as the difference between analysts' consensus forecasts and the realized value of earnings. Unexpected stock-return components that are the result of actions or signals include changes in marketing strategy, such as price hikes or price cuts, partnership announcements, top-management changes, advertising campaigns, new-product introductions, and the like. In this way, virtually all aspects of marketing strategy can be examined on the extent to which they are recognized by investors. In addition one can incorporate surprises in non-financial metrics that are generally believed to have a long-term impact on business performance, including customer satisfaction, customer attrition, brand equity, and customer equity. If desired, competitive results and competitive signals may be modeled in the same way as own results and signals.

Methods. The Carhart four-factor financial model is based on cross-sectional inferences. While simple to estimate, and under the null of the factor model, firm-specific attributes should not matter. In practice, however, the model may be subject to omitted variables as well as the temporal chain leading to stock returns. Depending on the research hypotheses and the data at hand, different methods are used to complement the four-factor financial model. For example, when firm actions take on the form of discrete interventions with information release at known time stamps, an *event study* (Table 1, row 2) is called for (e.g., Ball and Brown 1968; Chaney, Devinney and Winer 1991). Such events may be recurring throughout the year (e.g., earnings announcements) or may be intermittent (e.g., new-product introductions). When the actions are

continuous rather than discrete, *stock-return models* (Table 1, row 4) may be used (e.g., Lev 1989; Aaker and Jacobson 1994). Such stock-return models are single-equation models, and as such, they are limited in their ability to represent the temporal chain leading to stock returns. Persistence modeling (e.g., Vector Autoregressive Models) involving a system of equations, (Table 1, row 5), may be used for that purpose (e.g., Eun and Shim 1989; Pauwels et al. 2004). Such models generate impulse-response functions that can be used to assess the speed with which stock returns react to new information.

Capturing the long-term impact of marketing on valuation is more difficult because investors react to “news” quickly, and thus, any extended horizon is subject to a number of intermediate events that cloud the relationship the researcher is looking for. The abnormal returns can be summed across the horizon to obtain models of cumulative abnormal return (CAR) or buy-and-hold returns (BHAR). CAR measures abnormal returns relative to a model such as CAPM (Fama 1998) or the Carhart four-factor financial model and is preferred for short horizons (e.g. several days). BHAR reflects the abnormal return an investor would earn from holding the stock for an extended time period, using compounded interest, and is therefore preferred for longer horizons (e.g. several months or more) (e.g., Barber and Lyon 1997). Using either metric, the preferred solution is to build a *test vs. control portfolio*—where “test” refers to a marketing condition that did not exist in “control”—and track its performance over extended periods of time. Two such approaches are the calendar portfolio method (e.g., Fama 1998; Sorescu, Shankar and Kushwaha 2007) and the matched-pair return model (Barber and Lyon 1997). A calendar-time portfolio includes all stocks of firms with the event as the unit of analysis --for example, a new-product announcement--and then measures the long-term abnormal returns of that portfolio (see Table 1, row 3). In contrast, a matched-pair return model includes only the stocks of the focal firm and a matched firm.

Figure 1 is a schematic representation of these metrics, modeling steps, and choices. Table 1 summarizes the characteristics and limitations of each method, as well as the nature of the samples used in the study--i.e., a firm over time only, firms within an industry, and firms across industries. We now discuss the metrics and the modeling approaches in more detail.

--- Insert Figure 1 about here ---

Metrics on Marketing and Firm Value

Market Capitalization and Stock Returns. The ultimate metric of shareholder value is firm value or market capitalization, the share price multiplied by the number of outstanding shares. In order to operationalize firm value for empirical work, two factors need to be taken into account:

- Isolating the book value of the firm, typically not related to marketing activity.ⁱⁱⁱ This is achieved by Tobin's q, the ratio of market value to the replacement cost of the firm's assets, or by the market-to-book ratio (MBR), the ratio of market value to book value. Of these two, Tobin's q is a preferred metric since the use of replacement costs of assets avoids accounting complications associated with book value, which rarely reflects the actual value of assets (McFarland 1988). However, replacement costs of intangible assets are not easy to discern in most cases (ibid). Further, Tobin's q data are typically available only on a quarterly or annual basis.
- Incorporating the random-walk behavior in stock prices (Fama 1965). Unlike the typical time series behavior of consumer sales or product prices, the permanent component in stock-price fluctuations dominates; i.e., the series are in a constant state of evolution. Taking logarithms of stock prices, followed by first-differences to account for the random-walk behavior, will result in stationary (mean-reverting) time series of stock returns as a dependent variable.

As shown in Figure 1 (first row), the total stock returns of a firm have two parts: expected returns and abnormal returns. Fama and French (1992; 1996) proposed a three-factor explanatory model for *expected* stock returns, including the size risk factor, the value risk factor, and the market risk factor (i.e., beta). In particular, investors can be expected to receive additional returns by investing in stocks of companies with smaller market capitalization and with lower market-to-book ratios. Both of these effects imply that riskier stocks are characterized by higher returns. Carhart (1997) extended this model to a four-factor model by including a momentum factor. Specifically, the extended Carhart four-factor explanatory financial model for stock returns is estimated as follows:

$$R_{it} - R_{rf,t} = \alpha_i + \beta_i(R_{mt} - R_{rf,t}) + s_iSMB_t + h_iHML_t + u_iUMD_t + \varepsilon_{it} \quad (1)$$

where R_{it} is the stock return for firm i at time t , $R_{rf,t}$ is the risk-free rate of return in period t , R_{mt} is the average market rate of return in period t , SMB_t is the return on a value-weighted portfolio of small stocks minus the return of big stocks, HML_t is the return on a value-weighted portfolio of high book-to-market stocks minus the return on a value-weighted portfolio of low book-to-

market stocks, and UMD_t is the average return on two high prior-return portfolios minus the average return on two low prior-return portfolios.^{iv} These are referred to as the market factor, size factor, value factor and momentum factor, respectively. The data source for the four-factor financial model is Kenneth French's web site at Dartmouth, which provides details on all factors at the daily and weekly levels.^v ε_{it} is the error term; α_i is the model intercept; and β_i , s_i , h_i and u_i are parameter estimates of the factors used in the model. If the stock's performance is "normal", the four-factor model captures the variation in R_{it} , and α_i is zero.^{vi} Therefore, α_i is the *abnormal* return associated with firm i , and ε_{it} captures additional abnormal (excess) returns associated with time period t .

The empirical evidence around the three Fama-French factors is typically positive while the evidence on the Carhart fourth factor (momentum) is ambiguous.^{vii} Momentum captures the notion that a stock that has performed well in the recent past continues to do so, and vice versa (Jegadeesh and Titman 1993). Among others, Fama and French (1996) question whether the momentum effect is real and call for more empirical verification of momentum. As such, we recommend that marketing researchers tackling the investor valuation question use the Carhart four-factor model as the starting point, but be prepared for ambiguous results on the momentum factor.

Systematic Risk and Idiosyncratic Risk. A second fundamental metric in finance is firm stock risk (Hamilton 1994). Greater risk, as reflected in higher stock-price volatility, may suggest vulnerable and uncertain cash flows in the future, which induces higher costs of capital financing, thus damaging firm valuation in the long run. Total risk has two components: systematic risk (related to variability via the four factors) and idiosyncratic (firm-specific) risk, as shown in Figure 1 (second row). Risk stems from several factors, including market volatility (via beta in equation 1) at macroeconomic levels (e.g., exchange rate and interest risk) or at the sector level (some industries by their very nature are more or less stable), product-market competition (competition may be stronger or weaker than anticipated), and project-level outcomes (projects such as new-product launches may fare better or worse than expected).

Systematic *market* risk is the part of the total risk that is explained by changes in overall market portfolio returns due to inflation, interest rate changes, etc., that are common to all stocks and is measured by the β_i in equation (1). By construction, the stock market as a whole has a β of 1.0. A stock whose return falls more than a drop in market return has a $\beta > 1.0$, and vice versa.

Thus, β , a measure of the stock's sensitivity to market changes, is an important metric for publicly listed firms.

Unsystematic or idiosyncratic risk is that part of the risk which cannot be explained by changes in average market portfolio returns and is measured by the variance of the residuals in equation (1). Idiosyncratic risk constitutes about 80% of total risk on average (Goyal and Santa-Clara 2003). Recent finance literature has shown its relevance in firm-value determination for several reasons (Brown and Kapadia 2007). First, all else equal, investors favor stable earnings over volatile earnings (e.g., Graham, Harvey and Rajgopal 2005; Goyal and Santa-Clara 2003; Ang, Chen and Xing 2006). Insofar as marketing contributes to the stability or volatility of earnings, this becomes an important area for marketing researchers to address, in particular the impact of marketing on the firm's required level of working capital (Rao and Bharadwaj 2008). Indeed, the higher the volatility, the more working capital is required to prevent insolvency. Second, high levels of idiosyncratic risk increase the number of securities required to generate a well-diversified portfolio (see Campbell et al. 2001). Similarly, some investors cannot diversify (e.g., participants in employee stock option plans) and must bear idiosyncratic risk. Third, stock option prices depend on the total volatility of the underlying stock, of which idiosyncratic volatility is the largest component. In sum, an emerging literature is incorporating market realities that firm value depends on both systematic and idiosyncratic risk, with each component impacting value negatively. Table 2 provides an overview of different investor response metrics, each with its own characteristics and limitations.^{viii}

--- Insert Table 2 about here ---

Marketing Asset and Marketing Action Metrics. On the independent variable side, marketing is represented by one or more asset metrics or by direct marketing actions (investments) as shown in Figure 1 (third row). The asset metrics shown in Table 3 are intermediate performance metrics such as brand equity, and customer metrics such as customer satisfaction, customer equity and perceived product quality. Table 4 provides an overview of the marketing action metrics, such as new products, advertising, promotions, channels of distribution, etc., with some illustrative papers that have used these different marketing metrics. Several empirical generalizations about the customer response effects of these actions have been derived (see e.g. Hanssens, Parsons, and Schultz 2001).

Of recent interest to marketing researchers is the question if investors react differently to movements in asset metrics (e.g., movements in customer satisfaction) versus directly observable marketing investments (e.g., marketing spending movements). In answering this question, several empirical issues arise.

--- Insert Tables 3 - 4 about here ---

First, there is the issue of temporal aggregation of the data, which may be different among the dependent variable (e.g., daily price changes) and the independent variables (e.g., monthly changes in marketing actions). While marketing actions can theoretically be traced back to daily or even 5-minutely intervals (e.g., a firm's announcement of an innovation launch), they are typically examined at weekly or longer intervals (e.g., weekly in Pauwels et al. 2004; annually in McAlister, Srinivasan and Kim 2007). New econometric methods are available to deal with such differences in temporal aggregation (e.g., Ghysels, Santa-Clara and Valkanov 2006).

Second, cross-sectional studies have sometimes linked stock prices directly to levels of marketing (e.g., Rao, Agarwal and Dahlhoff 2004). Models based on the efficient market hypothesis must, however, recognize that investors react only to new information, which is operationalized as the difference between the actual and the expected level of the independent variable. As such, models based solely on these levels ignore the distinction between unexpected changes versus expected levels of marketing actions and hence have limited value, both from a theoretical and a methodological perspective.

Lastly, stock return is typically measured at the firm or corporate level while marketing actions often take place at the brand or product level. As such, the level of aggregation differs between the dependent variable (firm stock returns), and independent variables such as brand metrics, brand extension announcements, etc. (e.g., Barth et al. 1998; Pauwels et al. 2004; Lane and Jacobson 1995; Geyskens, Gielens and Dekimpe 2002). One modeling solution is to aggregate the brand-level marketing variables. However, such aggregation would involve a substantial loss of information and, thus, managerial insight. For one, managers would no longer be able to pinpoint which brands (e.g., those with more versus less advertising support, innovation level, quality, etc.) and/or targeted categories contribute more or less to the firm's stock returns. For another, the estimated aggregate effects may be fully driven by one or two brands.^{ix} Stock return impact assessment typically works well for major events associated with

large brands (i.e. with a high signal-to-noise ratio). It also works well for smaller brands focused on one or a few lines of business, or on tracking stocks created by large parent companies to value the financial results of specific subsidiaries. For example, Gupta, Lehmann & Stuart (2004) studied the relationship between customer equity and stock price for some internet firms. Whether such assessment pertains to large or to small brands, we believe that it is preferable to link stock returns to brand-level variables, even though that augments the size of the data matrix.

In summary, we offer three specific recommendations to marketing researchers tackling the investor valuation question: (1) start with the Carhart four-factor model, (2) assess the impact of unanticipated changes, recognizing that investors react only to new information, and (3) preferably use Tobin's q as the metric of firm valuation.

Measuring Investor Response to Marketing Using Four-Factor Finance Models

Several recent studies have examined the relationship between marketing and firm value starting with the four-factor financial or CAPM models (see Figure 1, first item in last row). Such studies assume that financial markets are efficient and have focused either on (i) the levels of financial performance (e.g., Barth et al. 1998; Madden, Fehle and Fournier 2006) or on (ii) the variability in financial performance (e.g., Gruca and Rego 2005; McAlister, Srinivasan and Kim 2007).

One approach is to start with the four-factor model in equation (1) to compare the performance of firms that have a proven emphasis on a particular marketing characteristic (e.g., branding) with a relevant benchmark set of firms. The null hypotheses are that, in equation (1), $\alpha_i = 0$ and the β_i coefficients of the two portfolios are equal; i.e., there is neither a significant abnormal return for the portfolio of focal firms nor a significant difference in the variability (beta) for the portfolio of focal firms versus the benchmark portfolio of firms. The alternate hypotheses are that the $\alpha_i > 0$ and the β_i coefficients of the two portfolios are not equal. Positive α_i relative to the benchmark indicates superior performance in returns, and $\beta_i < 1$ suggests below-average market risk, and vice versa.

Studies of marketing's impact on returns include Madden, Fahle and Fournier (2006), who compare an ex-ante portfolio of 111 companies' brands that appeared on the Interbrand list of World's Most Value Brands (WMVB) at least once between 1994 and 2001, to a benchmark.^x Along comparable lines, Rao, Agarwal and Dahlhoff (2004) estimate the relationship between brand strategy and firm value (as measured by Tobin's q) using a cross-sectional/time-series

panel model that controls for firm-specific variables reflecting either previous operations or future growth opportunities.

Studies of marketing's impact on volatility include McAlister, Srinivasan and Kim (2007), who examine the relationship among firms' advertising and R&D expenditures and their systematic market risk. First, they estimate a firm's systematic market risk, β , starting with the capital asset pricing model (CAPM), using both the equal-weighted and value-weighted portfolios. In a second step, the authors assess the effect of advertising/sales and R&D/sales on systematic market risk, incorporating unobserved firm heterogeneity and serial correlation in the errors by estimating a model with the systematic market risk, β_{it} , as the dependent variable.

The four-factor financial model is relatively straightforward to estimate and is quite useful in assessing cross-sectional variation in investor response. On the other hand, existing applications rarely control for all the four factors. For example, the branding study of Rao, Agarwal and Dahlhoff (2004) account for two factors (the size factor and the relative importance of intangibles) whereas the systematic-risk study of McAlister, Srinivasan and Kim (2007) control for three of the four factors (excluding the momentum factor). Second, the inferences from the portfolio approach are sensitive to the choice of the benchmark portfolio (Barber and Lyon 1997). For example, a benchmark portfolio based on strong brands runs the risk of omitted-variable bias because brand strength may be associated with other characteristics that are not represented in the portfolio. As such, the selection of the benchmark is important, and it is advised to conduct robustness checks using samples matched on several characteristics (e.g., industry, market share, etc.). Finally, the four-factor model assumes that markets are efficient. The persistence model discussed below allows the researcher to test for deviations from market efficiency.

Measuring Investor Response Using Event Studies

When firm actions take on the form of interventions with known time stamps, an event study is called for. Event studies eliminate the dependence on accounting information—assuming again that markets are efficient—and allow for an inference of cause and effect in a quasi-experimental setting (see Figure 1, second item in last row). Indeed, all event studies are joint tests of the hypothesis under consideration as well as the efficiency of capital markets (Fama et al. 1969). The intuition behind the event-study methodology is that, given market efficiency, perfect

information, and rationality of investors (Fama 1991), the effect of a relevant event should be immediately reflected in stock prices. Event studies require that the share-price reaction to the event of interest can be clearly isolated while controlling for other relevant information, and that an appropriate benchmark be used to compute normal and abnormal returns. Event studies have been used to measure investor impact of new-product announcements (Chaney, Devinney and Winer 1991), corporate name changes (Horsky and Swyngedouw 1987), brand extensions (Lane and Jacobson 1995), celebrity endorsements (Agarwal and Kamakura 1995), joint ventures (Johnson and Houston 2000), internet channel additions (Geyskens, Gielens and Dekimpe 2002), new-product quality reports (Tellis and Johnson 2007), market entry of a retailer (Gielens et al. 2008) and motion-picture advertising (Joshi and Hanssens 2008a).

The abnormal return for a stock is the ex-post return of the stock during the course of the event window minus the normal expected return, assuming that the event had not taken place (Srinivasan and Bharadwaj 2004). Starting with the Carhart four-factor financial model, the abnormal return for a stock is calculated as:

$$\varepsilon_{it} = (R_{it} - R_{rf,t}) - \alpha_i - \beta_i(R_{mt} - R_{rf,t}) - s_iSMB_t - h_iHML_t - u_iUMD \quad (2)$$

In equation (2) ε_{it} , the measure of abnormal return (risk-adjusted) for firm i in period t , provides an unbiased estimate of the future earnings generated by the event (Fama 1970). This abnormal return is then aggregated over the length of the window after the event of interest, to arrive at the cumulative abnormal return (CAR).^{xi} The statistical significance of the abnormal return is calculated by dividing the CAR by its standard error. When the test period is short, for example a day or a week, the CAR measures are not too sensitive to the financial model used to adjust for risk. For longer test periods, event studies are sensitive to the return metrics used (Fama 1998). Consequently, it is advisable for researchers to use multiple measures of abnormal returns, such as continuously compounded abnormal return (CCAR) or buy-and-hold returns (BHAR), and to assess the sensitivity of findings to these alternative return metrics (Lyon, Barber and Tsai 1999; Jacobson and Mizik 2008). Note also that, for applications outside the U.S., data on some of the four factors are available at Kenneth French's web site for a set of 20 major countries, including the UK, Germany and Japan. For international applications beyond this set of countries, equation (2) may not include SMB, HML and UMD (e.g., Gielens et al. 2008). These authors find that their substantive results are insensitive to such omissions in their empirical setting. Overall, we

recommend that investor valuation applications in markets with incomplete factor data conduct robustness checks for such omissions.

Measuring Investor Response Using Calendar Portfolio Theory

The event-study methodology has a limitation which makes it inappropriate for measuring long-term abnormal returns to events that are clustered in time: it cannot properly account for cross-sectional dependency (or overlap) among events, which could lead to misleading statistical inferences (Barber and Lyon 1997; Kothari and Warner 2006; Mitchell and Stafford 2000). One way to account for such cross-sectional dependency is to compute “one-to-one matched-pair returns” by matching firms that are closest in size and market-to-book ratio to the target firm (Barber and Lyon 1997; Joshi and Hanssens 2008b).

Another approach is the calendar-time portfolio method (Fama 1998; Mitchell and Stafford 2000), which has recently been applied in marketing (Sorescu, Shankar and Kushwaha 2007) and is shown in Figure 1 (as the third item in last row). This method begins with the construction of a single portfolio (called a calendar-time portfolio) to include all stocks of firms with the event as the unit of analysis --for example, a new-product announcement--and then measure the long-term abnormal returns to that portfolio using the four-factor model in equation (1). Unlike the matched-pair approach, the calendar portfolio method is based on a large comparison sample, so the potential omitted-variable bias resulting from industry characteristics variables is smaller (Barber and Lyon 1997).

The calendar-time method automatically accounts for cross-sectional correlation of returns (Lyon, Barber and Tsai 1999; Mitchell and Stafford 2000). This is because the standard error of the abnormal return estimates of the portfolio, α_p , is not computed from the cross-sectional variance (as is the case with the event-study method), but rather from the *inter-temporal* variation of portfolio returns. Given rational investors, monthly stock returns are serially uncorrelated (Kothari and Warner 2006), so the methodology is well-specified, and statistical inferences are likely to be more accurate than those obtained with event studies in which the standard error is computed within the cross-section. However, the calendar-time portfolio approach has lower power to detect abnormal performance because it averages over months of “hot” and “cold” event activity (Loughran and Ritter 2000). For example, the calendar-time portfolio approach may fail to identify significant abnormal returns if abnormal

performance primarily exists in months of heavy event activity. Since stocks are grouped into a portfolio and a single measure of returns is obtained for the entire group, it is not possible to use a cross-section regression model to analyze the relationship between financial performance and marketing drivers (e.g., marketing actions). When the actions are continuous or repetitive rather than discrete, stock-return models are better suited for that purpose.

Measuring Investor Response Using Stock-Return Response Models

Stock-return response models (e.g., Lev 1989; Brennan 1991) are similar to event studies, except the inputs are continuous rather than discrete in nature (see Figure 1, fourth item in last row). Marketing examples include price movements, advertising spending and distribution outlets. Both approaches build upon the efficient-markets hypothesis, and both assess the stock-return reaction to unanticipated events, i.e., the effect of new information on investors' expectations of discounted future cash flows. Stock-return models may be specified on whatever data interval is appropriate for the marketing resources being deployed, such as weekly data for advertising or monthly data for major new-product innovations.

Stock-return response models establish whether or not investors perceive information on change in marketing activity such as advertising spending as contributing to a change in the projection of future cash flows (Mizik and Jacobson 2004). The causal inference in stock-return models is not as straightforward as in event studies. Indeed, event studies are designed as controlled quasi-experiments, where the post-event behavior of the stock price is tested relative to the expected pre-event behavior, so the causal inference is direct. In contrast, stock-return models may lead to *signaling* interpretations as well. For instance, suppose an automobile manufacturer announces a significant increase in its promotional incentives, and its stock price goes down. One interpretation is that investors anticipate that these promotions would reduce the firm's future profit margins and therefore cash flows, indicative of a causal linkage from promotions to cash flows and hence to firm valuation. An alternative interpretation is that the market views the increase in promotional spending as a signal of weakening consumer demand for the firm's products and adjusts its valuation of the firm accordingly, indicative of a signaling linkage from promotional spending to firm valuation.

More broadly, both event studies and stock-return response models may be subject to omitted variable bias. For example, forecasts of downturns in demand or increases in commodity

prices may lead to a) more aggressive firm innovation spending and b) decreased sales of existing products. If b) is greater than a) then a study of innovation spending could show a negative rather than a positive effect on stock returns.

In a stock-return response model, the four-factor financial model (Equation 1) is augmented with firm results and actions in order to test hypotheses on their impact on future cash flows. These are expressed in unanticipated changes, i.e., deviations from past behaviors that are already incorporated in investor expectations. The stock-return response model is defined as

$$R_{it} = ER_{it} + \beta_1 U\Delta REV_{it} + \beta_2 U\Delta INC_{it} + \beta_3 U\Delta CUST_{it} + \beta_4 U\Delta OMKT_{it} + \beta_5 U\Delta COMP_{it} + \varepsilon_{i2t} \quad (3)$$

where R_{it} is the stock return for firm i at time t , ER_{it} is the expected return from the FF model in equation (1). A test of “value relevance” of unexpected changes to firm and competitive results and actions is a test for significance of the β coefficients in equation (3); significant values imply that these variables provide incremental information in explaining stock returns.

The components of stock returns that are, to some extent, under managerial control are of three kinds: financial results, customer asset metrics (non-financial results), and marketing actions. Financial results include unanticipated revenues ($U\Delta REV$) and earnings ($U\Delta INC$) while non-financial results include metrics such as customer satisfaction and brand equity ($U\Delta CUST$). Specific marketing actions are the unanticipated changes to marketing variables or strategies ($U\Delta OMKT$). In addition, competitive actions or signals in the model reflect the unanticipated changes to competitive results, marketing actions, strategy and intermediate metrics ($U\Delta COMP$), and ε_{i2t} is the error term. As an illustrative example, Srinivasan et al. (2009) investigate the impact of product innovations, advertising, promotions, customer quality perceptions and competitive actions on stock returns for automobile manufacturers.

The unanticipated components may be modeled as the difference between analysts’ consensus forecasts and the realized value (in the case of earnings), or via time-series extrapolations using the residuals from a time-series model (e.g., Lev 1989). A few studies argue that analysts’ forecasts could be more accurate predictors of earnings expectations than time-series models since analysts have access to broader and more current information sets (e.g., advance knowledge of firm actions) leading to improved quantitative models (Brown and Rozeff 1978; Brown et al. 1987).

Recent research in finance has relaxed the EMH assumption of investors’ structural knowledge while maintaining the rationality assumption in decision making (e.g., Brav and

Heaton 2002; Brennan and Xia 2001). This literature suggests that, with rational learning, stock prices move not only when new information becomes available, but also when investors improve their understanding of the various economic relationships that shape the market equilibrium. Hence, the short-term investor reaction to marketing “news” may be adjusted over time until it stabilizes in the long run and loses its ability to further adjust stock prices. Under the EMH hypothesis, there would not be any time-adjusted effects since the impact of marketing actions would be fully contained in the next period’s stock price. This perspective motivates the use of persistence models instead of event windows to study marketing’s impact on firm value, which we turn to next.

Measuring Investor Response Using Persistence Modeling

Persistence models (shown in Figure 1, fifth item in last row) use a system’s representation (e.g., Dekimpe and Hanssens 1995; Pauwels et al. 2002), in which each equation tracks the behavior of an important agent; for example, the consumer (demand equation), the manager (decision rule equations), competition (competitive reaction equation), and finally, the investor (stock price equation).^{xii} As an example, a persistence model estimated as a vector autoregressive model (VAR) can be specified for each brand (two in the illustration) of firm i , as follows:

$$\begin{bmatrix} \Delta MBR_{it} \\ \Delta INC_{it} \\ \Delta REV_{it} \\ MKT1_{it} \\ MKT2_{it} \end{bmatrix} = C + \sum_{n=1}^N B_n \times \begin{bmatrix} \Delta MBR_{it-n} \\ \Delta INC_{it-n} \\ \Delta REV_{it-n} \\ MKT1_{it-n} \\ MKT2_{it-n} \end{bmatrix} + \Gamma \times \begin{bmatrix} X_{1t} \\ X_{2t} \\ X_{3t} \end{bmatrix} + \begin{bmatrix} u_{MBR_{it}} \\ u_{INC_{it}} \\ u_{REV_{it}} \\ u_{MKT1_{it}} \\ u_{MKT2_{it}} \end{bmatrix} \quad [4]$$

with B_n , Γ vectors of coefficients, $[u_{MBR_{it}}, u_{INC_{it}}, u_{REV_{it}}, u_{MKT1_{it}}, u_{MKT2_{it}}]' \sim N(0, \Sigma_u)$, N the order of the system based on Schwartz’ Bayes Information Criterion (SBIC), and all variables expressed in logarithms or their changes (Δ). In this system, the first equation is an expanded version of the stock-return response model (3). The second and third equations explain the changes in, respectively, bottom-line (INC) and top-line financial performance (REV) of firm i . The fourth and fifth equations represent firm i ’s marketing actions (e.g., for each brand), i.e., ($MKT1_{it}$) and ($MKT2_{it}$). For example, Pauwels et al. (2004) considered a brand’s new-product introductions and sales promotions. The exogenous variables in this dynamic system (X_{1t} , X_{2t} , X_{3t} ...) could include controls such as the Carhart four factors and the impact of stock-market analyst earnings

expectations (Ittner and Larcker 1998). The impact of contemporaneous shocks is incorporated through the elements of Σ_{it} . Such models provide baseline forecasts of each endogenous variable, along with estimates of the shock or surprise component in each variable. If the EMH holds and all relevant new information is incorporated immediately in stock returns, then the lagged terms in the investor equation of (4) will be zero. By contrast, lagged effects indicate that information is incorporated gradually. For instance, Pauwels et al. (2004) show that investors in the automotive industry need about six weeks to fully incorporate the impact of a new-product introduction on stock returns.

While the system's representation makes these models more comprehensive than the single-equation approaches in (2.3-2.6), VARX models have some limitations. First, persistence models are inherently reduced-form models, unless structural restrictions are imposed on the contemporaneous causal ordering. Second, the data requirements are substantial, and the data-generating process is assumed constant over time. To alleviate this concern, the stability of results over time needs to be tested, which may lead to moving-window estimation to capture response shifts (e.g., Pauwels and Hanssens 2007). Finally, VAR models can result in over-parameterization, which may affect the quality of individual parameter estimates.

MARKETING AND FIRM VALUE — FINDINGS

The models reviewed above have been used in a number of studies on the marketing-finance interface that allow us to formulate some empirical patterns, summarized in the last column of Tables 3 and 4. We present these as propositions rather than empirical generalizations at this juncture, as the studies are recent and, in many cases, still need replication across industries. We discuss, in turn, propositions on brand equity, customer equity, customer satisfaction, R&D and product quality, and specific marketing-mix actions. We conclude this section with a discussion of the emerging evidence on biases in investor response.

Marketing Assets and Investor Response

Brand Equity Effects. Over the past decade, there has been significant interest among academics and practitioners in understanding the importance of brand equity (Keller and Lehmann 2006). Brands are viewed as assets that generate future cash flows (Aaker and Jacobson 1994; Rao, Agarwal and Dahlhoff 2004), and investors appear to consider brand value in their stock

evaluation (Barth et al. 1998; Simon and Sullivan 1993). Marketing papers on the link between brand-related intangible assets and firm value have assessed stock-market reaction to the changing of a company's name (Horsky and Swyngedouw 1987), new-product announcements (Chaney, Devinney and Winer 1991), perceived quality (Aaker and Jacobson 1994), brand extensions (Lane and Jacobson 1995), brand attitude (Aaker and Jacobson 2001) and customer mind-set brand metrics (Mizik and Jacobson 2008).

Research using a commercial brand equity metric, Interbrand, has indicated that strong brands not only deliver greater stock returns than a relevant benchmark portfolio, but also do so with lower risk (Madden, Fehle and Fournier 2006). Additionally, research has suggested that the impact of marketing variables on Tobin's q may be moderated by the type of branding strategy adopted by a firm (Rao, Agarwal and Dahlhoff 2004; Joshi and Hanssens 2008b). A corporate branding strategy was found to offer higher returns than either a house-of-brands strategy or a mixed-branding strategy. Although there is intense discussion about the admission of brands into financial accounts in the accounting community (Barth et al. 1998; Lev and Sougiannis 1996), there is little disagreement that brands are intangible assets of a firm. *In summary, improvements in brand equity have a significant and positive impact on firm valuation.*

Customer Satisfaction Effects. Several recent studies have shown a strong link between customer satisfaction and firm profitability and market value (see Gupta and Zeithaml 2006 for a review). Changes in customer satisfaction are associated with increases in abnormal returns (Ittner and Larcker 1998), increases in Tobin's q (Anderson, Fornell and Mazvancheryl 2004), increases in cash flows and decreases in cash-flow variability (Gruca and Rego 2005). Based on comprehensive historical data, Luo and Bhattacharya (2006) show that customer satisfaction partially mediates the relationship between corporate social responsibility and firm market value. Furthermore, higher levels of customer dissatisfaction harm a firm's future idiosyncratic stock returns (Luo 2007). Since cash-flow volatility impacts the firm's cost of capital, this effect provides yet another source for stock-price appreciation.

In cross-sectional analyses, Fornell et al. (2006) and Mittal et al. (2005) report that firms with highly satisfied customers usually generate positive returns. In addition, Fornell et al. (2006) report that changes in the ACSI are not immediately or fully incorporated in stock returns. This situation creates an arbitrage opportunity for alert investors, which the authors find to be quite sizeable over a five-year horizon. On the other hand, Anderson, Fornell, and Mazvancheryl

(2004) report that satisfaction growth is positively related to Tobin's q growth. A possible explanation for these different findings may stem from the different time periods used (1994 to 1997, versus 1994 to 2002). The difference may also stem from a failure to include an appropriate measure of unanticipated customer satisfaction in the stock-return model (see Jacobson and Mizik 2008 for a discussion). A third possible explanation is that some studies do not control for financial and accounting information that is likely to affect investor expectations (i.e., an omitted variables problem). For example, Fornell et al. (2006) do not consider two of the four factors, namely the size and the value risk factors. *In summary, levels of customer satisfaction are significantly related to firm value, while news about changes in customer satisfaction may not result in an immediate change in firm valuation.*

Customer Equity Effects. CE and market valuation are intrinsically related, as they are two versions of the principle of the present value of a stream of expected future cash flows. This connection helps to make marketing more financially relevant and accountable. As an illustration, in a small-sample study of five companies, Gupta, Lehmann and Stuart (2004) demonstrate how valuing customers makes it feasible to value firms, since customer equity moves in parallel with market value for three of the five companies. Interestingly, they find that the remaining two companies are potentially mispriced. Their key findings are in column 5 of Table 3. However, CE maximization can imply a narrowing the customer base, as the firm concentrates its efforts on the most profitable customers. This practice, however, may increase the firm's risk in the long run, an area in need of further research. *In summary, improvements in customer equity are significantly related to firm value.*

R&D and Product Quality Effects. Several papers have linked firm value to R&D expenditures (Doukas and Switzer 1992; Chan, Lakonishok and Sougiannis 2001), discretionary expenditures such as R&D and advertising (Erickson and Jacobson 1992; Griliches 1981; Pakes 1985; Jaffe 1986), and innovation (Bayus, Erickson and Jacobson 2003; Pauwels et al. 2004). Most notably, value creation (e.g., through investments in R&D), in combination with value appropriation (e.g., through investments in advertising), has been found to enhance firm value (Mizik and Jacobson 2003). As for product quality, its relationship with market valuation is a relatively new research area. The research is sparse because there are varying definitions for quality, and there are significant differences between objective quality and perceived quality (Mittra and Golder 2006). Changes in perceived quality are associated with changes in stock

returns, and hence, investors view the quality signal as providing useful information about the future-term prospects of the firm (Aaker and Jacobson 1994; Mizik and Jacobson 2004). Moreover, two recent studies suggest that it takes innovation *and* quality assessment to improve stock performance. Srinivasan et al. (2009) assess the impact of unanticipated consumer quality scores in product innovations, while Tellis and Johnson (2007) focus on the impact of expert ratings of quality; their key findings are summarized in Table 3. *In summary, it takes more than merely introducing new products to improve stock performance. Improvements in consumer appraisal in terms of perceived quality, particularly for new products, are significantly related to firm value.*

Overall, research supports that brand equity, customer satisfaction, customer equity, R&D, and product quality are all linked to firm value. These are slow-moving performance metrics that are not immediately visible. In contrast, marketing initiatives are typically immediately observable, but because they are not outcome variables, their impact on firm value is more ambiguous.

Marketing Mix and Investor Response

Advertising Effects. Several recent studies suggest that a firm's advertising (Frieder and Subrahmanyam 2005; Grullon, Kanatas and Weston 2004; Joshi and Hanssens 2008b) directly affects stock returns, over and above the indirect effect of advertising through lifting sales revenues and profits. The intangible equity that advertising seeks to create, ostensibly for customer marketing purposes, can spill over onto investors and increase the firm's salience with individual investors who typically prefer holding stocks that are well known or familiar to them (Grullon, Kanatas and Weston 2004; Frieder and Subrahmanyam 2005). Recently, Luo and Donthu (2006) report a positive influence of marketing communication productivity on shareholder value. These findings help explain why several firms advertise at levels beyond those justified by sales response alone. Indeed, recent studies have confirmed that advertising expenditures create an intangible asset (Barth et al. 1998; Rao, Agarwal and Dahlhoff 2004). Grullon, Kanatas and Kumar (2006) find that, after controlling for other factors, firms that decrease their leverage through increased *equity* financing advertise more aggressively than firms whose *debt* financing has increased. The authors' rationale for this increased advertising spending is that it creates more assets that are intangible and nontransferable. In

addition, McAlister, Srinivasan and Kim (2007) report that a firm's advertising lowers its systematic market risk. Srinivasan et al. (2009) find that communicating the added value created by product innovation to consumers yields higher firm-value effects of these innovations, especially for pioneering innovations. *Our conclusion is that advertising affects intangible firm value and lowers systematic market risk. Moreover, product innovation affects firm value more when it is accompanied by higher advertising support.*

New-Product Introduction Effects. It has been reported that new-product announcements generate small excess stock-market returns for a few days (Eddy and Saunders 1980; Chaney, Devinney and Winer 1991; Kelm, Narayanan and Pinches 1995). While these studies have focused on the short-term effect, recent evidence indicates that the financial returns from pre-announcements are significantly positive in the long term as well, with annual abnormal returns of about 13 percent (Sorescu, Shankar and Kushwaha 2007). Similarly, Pauwels et al. (2004) find that new-product introductions increase long-term financial performance and firm value, but promotions do not. Moreover, investor reaction to new-product introduction occurs over time, indicating that financially useful information unfolds in the first two months after product launch. Finally, the stock performance impact shows a U-shaped relation with innovation level, which is predominantly in the positive zone, but with a preference for new-market entries over minor innovations (Pauwels et al. 2004). However, this positive impact of innovation is not without error, as recent empirical evidence suggests that investor reaction is a poor predictor of the eventual commercial success of new-product introductions (Markovitch and Steckel 2006). *Our conclusion is that firm innovativeness is predominantly positively related to firm value and potentially unfolds over time.*

Price Promotion Effects. While many studies have examined the impact of price promotions on revenues and firms, their impact on firm valuation is relatively under-researched. An exception is Pauwels et al. (2004), who find that investor reaction mirrors consumer reaction to incentive programs, which is strong, immediate, and positive (Blattberg, Briesch and Fox 1995; Srinivasan et al. 2004). However, these beneficial effects are short-lived for all but firm top-line performance, as both long-term bottom-line and firm-value elasticities are negative. Price promotions may also signal desperation, foretelling decreased earnings. Another plausible explanation for these sign switches is price inertia or habit formation in sales promotions: the short-run success of promotions makes it attractive for managers to continue using them (Nijs,

Srinivasan and Pauwels 2007). However, this practice eventually erodes profit margins, and bottom-line performance and firm value suffer in the long run. *In summary, price promotions are negatively related to firm value in the long run.*

Channels of Distribution Effects. The relationship between channel strategy and market valuation is also under-researched. In a study of the net impact of an additional internet channel on a firm's stock return, Geyskens, Gielens and Dekimpe (2002) show that, on average, investors perceive that the expected gains of the added channel will outweigh its costs. However, negative stock returns are observed for established firms that may be hurt by internet channel cannibalization. More recently, Gielens et al. (2008) assess the effect of Wal-Mart's entry in the United Kingdom on the stock prices of European retailers. They find that the shareholder value of incumbent retailers is negatively affected by the degree of overlap with Wal-Mart in assortment, positioning, and country of entry. On the other hand, the shift in retail power can also lead to positive effects in the form of channel-wide productivity increases for all retailers. While these studies examine the market valuation impact of channel additions, research is needed on channel deletions as well. *Our conclusion is that the opening of new distribution channels is, on average, positively related to firm value.*

How does Stock Price Influence Marketing Actions?

The previously stated propositions establish that investors interpret many marketing initiatives, and therefore, marketers may want to incorporate investor behavior in their actions. For example, Rappaport (1987) notes that "sophisticated managers have found that they can learn a lot if they analyze what the stock price tells about the market's expectations about their company's performance.... managers who ignore important signals from stock price do so at their peril." The central premise in this research is that managers look to stock returns for information, actively respond to that information, and do so differently depending on whether the information is "good news" or "bad news." Specifically, managers of firms with under-performing stocks react more aggressively with changes to their product portfolio and distribution than managers of firms with high-performing stocks (Markovitch, Steckel and Yeung 2005).

Recent evidence also suggests that, in a myopic effort to inflate current-term earnings to give the appearance of improved long-term business prospects (and thereby enhance stock price), managers tend to reduce marketing expenditures at the time of seasoned equity offerings (Mizik

and Jacobson 2007). Furthermore, an unexpected decline in a firm's stock price has been shown to lower managers' subsequent marketing and R&D spending (Shin, Sakakibara and Hanssens 2008). *In summary, preliminary evidence supports reverse causality, i.e., changes in firm value may drive some marketing actions.*

Biases in Investor Response to Marketing Actions

Given stock-market reaction to marketing changes, there are several reasons why investors may find it difficult to evaluate the impact of marketing actions, leading to deviations from the standard EMH model (e.g., Thaler 2005). First, investor overconfidence bias is well-documented (e.g., Daniel and Titman 1999), and is hypothesized to stem from illusions of control and knowledge. Second, investor familiarity bias occurs because investors are cognitively unable to apply the same level of expertise across an entire universe of stocks (Freider and Subrahmanyam 2005; Shiller 2002). In this context, advertising can help attract a disproportionate number of investors who, at least in part, make their investments based on familiarity rather than fundamental information (Grullon, Kanatas and Weston 2004). Third, investors are subject to loss-aversion bias (Benartzi and Thaler 1995). Even those with long-term investment horizons are tempted to change course at the prospect of short-term losses.

Finally, investors may be influenced by persuasive communication, either by companies themselves or by stock analysts. Companies spend substantial resources in dealing with capital markets through press releases, corporate advertising, CEO appearances, and the like. Stock analysts specialize in certain sectors and compete with each other for influence over investors when they make stock recommendations. Recent work shows that investor portfolio choices for mutual funds are affected by fund advertising (Sirri and Tufano 1998; Gallaher, Kaniel and Starks 2005; Cronqvist 2006), even though such advertising provides little direct informational content (e.g., Nelson 1974). In other words, investors are biased toward investing more in mutual funds with higher levels of advertising, despite the fact that these funds are not associated with higher post-advertising excess returns (Jain and Wu 2000; Mullainathan and Shleifer 2005). Similarly, analysts may have a biasing influence on investors as well. Specifically, analyst forecasts could be positively biased due to client relationships (e.g., Kothari 2001) or herding behavior (e.g., Trueman 1994). *In summary, preliminary evidence indicates that there are biases in investor response to marketing actions.*

FUTURE RESEARCH DIRECTIONS

Our review has emphasized the importance of the investor community in the design and execution of marketing plans. Investors do react to changes in important marketing *assets* and *actions* that are perceived to change the outlook on the firms' cash flows. Several econometric models have been developed to parameterize these relationships, and several empirical propositions have been generated to date. These lead to the formulation of an important agenda for future research in the following areas:

1. Comparing the different measures of brand equity. We know that investors react to movements in brand value, but are these brand metrics reliable and consistent with each other? In general, what is the best approach to quantifying the value of intangibles such as brands and intellectual property, and assessing their impact on cash flows, growth, and risk?
2. Understanding the stock-market impact of various metrics of return on marketing investment (ROMI). Given that the benefits of sound marketing and branding strategy are typically materialized over multiple periods, are these ROMI measures shortsighted?
3. Understanding the stock-market impact of known marketing phenomena such as diffusion of innovation, which can generate momentum in sales and stock returns. More generally, assessing how marketing may create the momentum factor in the Carhart four-factor financial model.
4. Understanding the stock-market impact of corporate social responsibility (CSR) initiatives such as environmental sustainability. In particular, do higher levels of social responsibility investments hurt or benefit firms, from a firm valuation perspective?
5. Assessing the influence of public relations efforts on the investor community.
6. Prescribing the critical marketing information elements that should be made available to investors. As an example, should firm revenue be broken down between existing and new customers? Additionally, how should the value of market-based assets (such as customer lifetime value, brand equity and channel equity) and firms' marketing strategies be communicated? What is the role of intermediate performance metrics, such as customer satisfaction, and how do they impact valuation? Why are movements in customer satisfaction not immediately reflected in stock returns, even though a long-run relationship between customer satisfaction and investor valuation exists?

7. Understanding the volatility component of firm value. In particular, do higher levels of brand equity, customer equity and product variety reduce the vulnerability of companies to competitive inroads, thereby reducing risk and volatility of cash flows? Does this result in favorable risk profiles (lower betas)? Further, what is the relationship between volatility in cash flows (or volatility in earnings) and the firm's systematic market risk (i.e., beta)?
8. Dealing with short-term revenue pressures. The empirical evidence to date supports the notion that the stock market is not myopic. Thus, companies that engage in effective strategic marketing spending should feel justified in their actions. However, many corporate executives are concerned about their quarterly performance metrics, which motivates some of their actions. How can these two seemingly contradictory behaviors be reconciled?
9. Identifying the conditions under which investor reaction is accurate and how long it takes for such investor reaction to materialize. Given the mixed evidence on the quality of investor reaction, we need to understand when biases occur and how they may be corrected.
10. Understanding the potential biases introduced by persuasive communication of analysts and company representatives. How do analysts' interpretations of marketing activities such as product-price changes impact stock returns? Can corporate lobbying efforts influence analyst reports? In turn, how do these reports influence subsequent movements in firm value? Is there a difference in the behavior of stock returns of firms that are tracked by analysts versus those that are not? And, how long does it take for investors to take such biases into account?

Overall, given the increasing pressures on marketing executives to demonstrate the financial accountability of their firms' marketing initiatives, the studies we have reviewed clearly point to the link between marketing actions and investor response. Lev (2004) noted that marketing managers need to generate better information about their intangibles (e.g., investments in brand building, product and service innovations, R&D) and the benefits that flow from them, and then disclose that information to the capital markets to give investors a sharper picture of the company's performance outlook. As a step in that direction, we hope that the collective findings in this paper will generate a much-needed discussion among senior management, finance and marketing executives, and academics on the important role played by marketing actions in determining firm valuation.

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Table 1: Overview of Research Approaches

Approach	Characteristics of Approach	Limitations of Approach	Representative Studies /Sample from Approach	Dependent/Predictor Variable used in Study
1. Four-Factor Model	<p>Recognizes systematic sources of cross-sectional differences among firms: the size factor, the market-to-book value factor, the market risk factor and the momentum factor.</p> <p>Relies on efficient market hypothesis.</p> <p>Straightforward to estimate.</p> <p>Can assess cross-sectional variation in investor response.</p>	<p>Inferences from the portfolio approach are sensitive to the choice of the benchmark portfolio.</p> <p>Is correlational in nature.</p> <p>Is subject to omitted variable bias.</p> <p>For application outside the U.S., three of the four factors are not readily available.</p>	<p>Rao, Agarwal and Dahlhoff (2004) (across industries)</p> <p>Barth et al. (1998) (across industries)</p> <p>Madden, Fehle and Fournier (2006)</p>	<p>Tobin's q/Branding strategy</p> <p>Firm valuation/ Brand value estimates</p> <p>Stock returns/Brand valuation</p>
2. Event-Study	<p>Assesses the abnormal return for a stock as the ex-post return of the stock during the course of the event window minus the normal expected return, assuming that the event had not taken place.</p> <p>Relies on efficient market hypothesis.</p> <p>Easy to implement since key data are event dates and stock prices around the events.</p> <p>Analysis is causal in nature.</p>	<p>Inappropriate for measuring long-term abnormal returns to events that are clustered in time.</p>	<p>Horsky and Swyngedouw (1987) (across industries)</p> <p>Chaney, Devinney and Winer (1991) (across industries)</p> <p>Lane and Jacobson (1995) (within industry)</p> <p>Geyskens, Gielens and Dekimpe (2002) (within industry)</p>	<p>Stock returns/Name change events</p> <p>Stock returns/ New product announcements</p> <p>Stock returns/Brand extension announcements</p> <p>Stock returns/Internet channel investments</p>
3. Calendar Portfolio	<p>Constructs a single portfolio including stocks of firms with the event to measure the long-term abnormal returns to that portfolio</p> <p>Accounts for cross-sectional correlation of returns.</p> <p>Statistical inferences are likely more accurate than those obtained with event studies.</p>	<p>Does not produce separate measures of abnormal returns for each event.</p> <p>Inferences from the portfolio approach are sensitive to the choice of the benchmark portfolio.</p>	<p>Sorescu, Shankar and Kushwaha (2007) (within industry)</p>	<p>Stock returns/New product announcements</p>

Approach	Characteristics of Approach	Limitations of Approach	Representative Studies /Sample	Dependent/Predictor Variable
4. Stock-Return Response Model	<p>Establishes whether or not investors perceive information on marketing activity such as advertising spending as contributing to the projection of future cash flows.</p> <p>Based on the Carhart four-factor (1997) model</p> <p>Relies on efficient market hypothesis.</p> <p>Provides insights into the market's expectations of the <i>long-term</i> value prospects associated with changes in marketing strategy.</p> <p>Takes into account the dynamic properties of stock returns.</p>	<p>Requires detailed marketing data at the brand or SBU level.</p> <p>Marketing measures have to reflect information that is available to market participants since the stock market reacts to public information.</p> <p>Single-equation models and hence no temporal chain leading to stock returns</p>	<p>Aaker and Jacobson (1994) (across industries)</p> <p>Aaker and Jacobson (2001) (within industry)</p> <p>Mizik and Jacobson (2003) (across industries)</p> <p>Srinivasan et al. (2009) (within industry)</p>	<p>Stock returns/ Perceived quality</p> <p>Stock returns/Brand attitude</p> <p>Stock returns/Shifts in strategic emphasis</p> <p>Stock returns/Marketing actions</p>
5. Persistence Modeling	<p>These models use a system's representation in which each equation tracks the behavior of an important agent: the consumer (demand equation), the manager (decision rule equation), competition (competitive reaction equation), and the investor (stock price equation)</p> <p>VAR provides a flexible treatment of both short-term and long-term effects.</p> <p>Robust to deviations from stationarity.</p> <p>Provides a forecasted, expected baseline for each performance variable.</p> <p>Allows for various dynamic feedback loops among marketing and stock performance variables.</p>	<p>Requires detailed marketing data at the brand or SBU level.</p> <p>Requires time-series over a long horizon.</p> <p>Inherently reduced-form models</p>	<p>Pauwels et al. (2004) (within industry)</p> <p>Joshi and Hanssens (2008b) (within two sets of industries)</p>	<p>Firm valuation/New product introductions, sales promotions</p> <p>Stock returns/Advertising</p>

Table 2: Dependent Financial Metrics for Assessing Investor Response

Dependent Financial Metric	Characteristics	Limitations	Illustrative Papers (Data Interval used)
A. Returns/Levels Metrics			
1. Firm valuation (stock price x number of shares outstanding)	a) Forward-looking measure, providing market-based views of investor expectations of the firm's future profit potential.	a) Need to incorporate the random-walk behavior in stock prices. b) Estimated model should be robust to deviations from stationarity, in particular the presence of random walks in stock prices, which can lead to spurious regression problems (Granger and Newbold 1986).	Fornell et al. (2006) (annual)
2. Relative Importance of Tangibles to Intangibles			
2a. Tobin's q (ratio of market value of the firm to the replacement cost of the firm's assets)	Characteristic a) applies here b) Values greater than unity signal a contribution of intangible assets on valuation. c) Accepted paradigms of research (e.g., event study, VAR modeling, stock-return response models) can be used to assess firm-value effects. d) Directly comparable across industries, whereas accounting measures may not be easily compared Mittal et al. (2005). e) Monte Carlo experiments show that Tobin's q estimates have smaller average errors and greater correlation with true measures (McFarland 1988) as compared to accounting rates of return.	Limitations a) and b) apply here c) Replacement cost of tangible assets is difficult to compute and that of intangible assets is usually ignored (Mittal et al. 2005).	Simon and Sullivan (1993) (annual) Rao, Agarwal and Dahlhoff (2004) (annual)
2b. Market-to-Book ratio (ratio of market value to book value of common equity)	Characteristics a), b), c) and d) apply here	Limitations a) and b) apply here	Pauwels et al. (2004) (weekly)
3. Stock returns (change in the total value of an investment in a common stock over some period of time per dollar of initial investment and defined as $(Price_t + Dividend_t - Price_{t-1}) / (Price_{t-1})$)	A stationary time series of stock returns is obtained as a dependent variable	No obvious limitations	Srinivasan et al. (2009) (weekly)

Table 2: Dependent Financial Metrics for Assessing Investor Response (continued)

Dependent Financial Metric	Characteristics	Limitations	Illustrative Papers (Data Interval used)
B. Risk/Volatility Metrics			
1. Cash Flow Volatility (firm's cash flow coefficient of variation divided by the market's cash flow coefficient of variation)	Coefficient of variability equal to one indicates that the firm's cash flows are as volatile as those of the overall market. A coefficient of variability greater than one indicates higher volatility than the market, and vice versa. Cash flow volatility can explain as much as 80 percent of the variation in systematic market risk.	It is not based on a financial model such as CAPM. Brand-level data are needed for all or most of the firm's divisions.	Gruca and Rego (2005) (annual) Fischer et al. (2007) (quarterly)
2. Systematic Market Volatility (the part of stock volatility that is explained by changes in average market portfolio returns)	It is the market risk common to all firms and is easily compared across industries. Based on the CAPM and dependent on the market portfolio returns; a stock whose return falls (or rises) more than the fall (or rise) in market return has a $\beta > 1.0$, and vice versa. Has received considerable attention in the literature. Can be extended with finer-grain analyses for upside and downside betas (Ang, Chen and Xing 2006).	Accounts for only about 20 percent of the total risk. Can be measured but cannot be eliminated. Inferences are sensitive to the choice/definition of the market portfolio.	McAlister, Srinivasan and Kim (2007) (monthly) Fornell et al. (2006) (daily)
3. Idiosyncratic Volatility (the variability that is not explained by changes in average market portfolio return but instead by firm-specific events)	It is independent of the economy but is firm-idiosyncratic. Assumption is that unsystematic risk could be eliminated in a well-diversified portfolio since unique risks could cancel each other out. Accounts for 80 percent of the total risk.	Theoretically, it is not related to a firm's long-run stock price but increasing empirical support on the role of idiosyncratic volatility (e.g., Brown and Kapadia 2007).	Luo (2007) (daily aggregated to monthly) Osinga et al. (2008) (monthly)

Table 3: Marketing Assets (as Predictors) and Investor Response –Metrics and Findings

Marketing Metric	Illustrative Metrics	Characteristics	Illustrative Papers	Empirical Findings
1. Brand Equity	Financial World's measure of brand equity Young and Rubicam Brand Asset Valuator	Brand's strength is determined by five components Based on consumer self-reports on five brand asset pillars— relevance, vitality, esteem, knowledge, and differentiation. Available only for large firms. Not always publicly available to investors (e.g., Y&R)	Barth et al. (1998) Simon and Sullivan (1993) Madden, Fehle and Fournier (2006) Rao, Agarwal and Dahlhoff (2004); Joshi and Hanssens (2008b) Mizik and Jacobson (2007)	Stock returns are positively related to brand valuation. A substantial fraction of the valuation of consumer good companies and even some high-technology firms is based on brand equity. Strong brands deliver greater stock returns and do so with lower risk. Impact of branding on firm valuation is moderated by type of branding strategy: corporate branding, house-of-brands, or mixed branding. Changes in a firm's brand assets are associated with changes in financial market valuation.
2. Customer Satisfaction	American Customer Satisfaction Index	Publicly available ACSI data but not at the firm level ACSI scores are updated only annually. Disaggregate firm/product data available for certain industries (e.g., auto from JDPA)	Ittner and Larcker (1998) Anderson, Fornell and Mazvancheryl (2004) Gruca and Rego (2005) Fornell et al. (2006); Mittal et al. (2005) Gupta and Zeithaml (2006) Luo and Bhattacharya (2006)	A 5-unit increase on a 0-100 scale (roughly one standard deviation from its mean) in the American Customer Satisfaction Index (ACSI) was associated with a 1 percent increase in cumulative abnormal returns. A 1 percent change in ACSI is associated with a 1.016 percent change in Tobin's q. A 1-point increase in the ACSI generates an additional growth in cash flows as well as a decrease in cash flow variability. Highly satisfied customers generate positive returns. There is a strong link between customer satisfaction, firm profitability and market value. Customer satisfaction partially mediates the relationship between CSR and firm market value.
3. Customer Metrics	Customer Lifetime Value (CLV) Customer Equity (CE)	Customer metrics data tend to be proprietary	Gupta, Lehmann and Stuart (2004)	Valuing customers makes it feasible to value firms since customer equity moves in parallel with market value for three of the five companies. Retention is more important than margin or acquisition cost since a 1 percent improvement in retention can improve profitability by about 5 percent while a similar improvement in margin and acquisition cost improves profits by 1.1 percent and .1 percent, respectively.

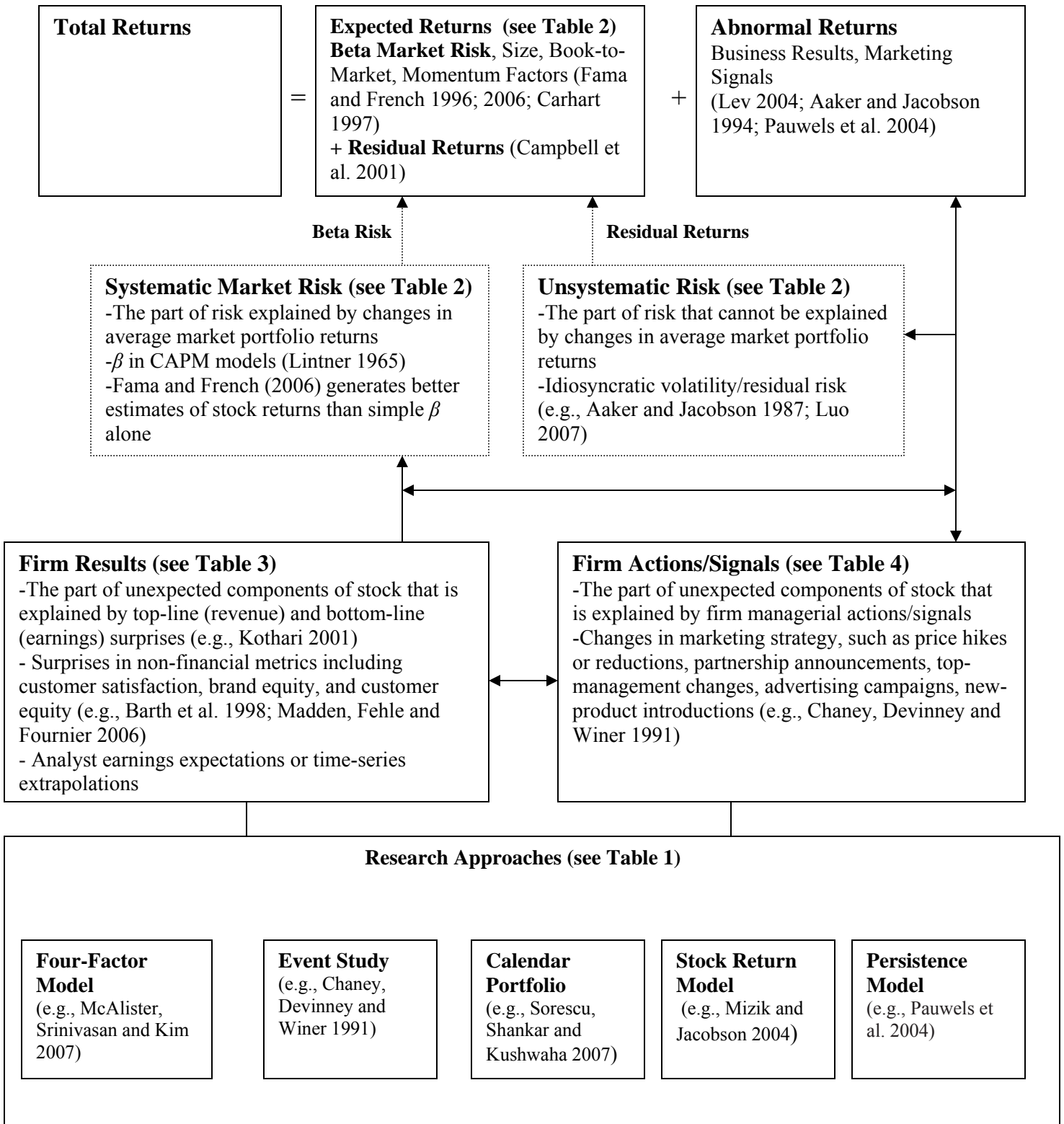
Marketing Metric	Illustrative Metrics	Characteristics	Illustrative Papers	Empirical Findings
4. Product Quality	<p>Equitrend Perceived Quality</p> <p>JDPA Perceived Appeal and Quality</p> <p>Product Review (e.g., Lexis-Nexis)</p>	<p>Customer-driven measures.</p> <p>Amenable to event-study analysis.</p> <p>Time-intensive data collection (e.g., product review data)</p>	<p>Aaker and Jacobson (1994) and Mizik and Jacobson (2003)</p> <p>Srinivasan et al. (2009)</p> <p>Tellis and Johnson (2007)</p>	<p>Perceived quality is associated with changes in stock returns, and hence, investors view quality signals as providing useful information about future prospects of the firm.</p> <p>New product introductions that enjoy more positive consumer perceptions of quality and product appeal lead to systematically higher returns.</p> <p>Ratings of quality in published reviews influence investors' evaluation of the quality of the firm's products. Firms with good-quality reviews enjoy a gain of 10 percent in stock returns over the same period, while firms with poor-quality reviews suffer a drop of returns of about 5 percent.</p>

Table 4: Marketing Actions (as Predictors) and Investor Response – Metrics and Findings

Marketing Metric	Illustrative Metrics	Characteristics	Illustrative Papers	Empirical Findings
1. Advertising	Advertising dollars (e.g., COMPUSTAT) Advertising dollars (e.g., TNS Media)	COMPUSTAT aggregate firm-level quarterly data but widely available. TNS Media is disaggregate at the brand/category level, and data interval is monthly. Data are expensive.	Frieder and Subrahmanyam (2005); Grullon, Kanatas and Weston (2004); Joshi and Hanssens (2008b) Barth et al. (1998); Rao, Agarwal and Dahlhoff (2004) Mathur and Mathur (2000); Mathur, Mathur and Rangan (1997); Gifford (1997); Grullon, Kanatas, and Weston (2006) McAlister et al. (2007) Srinivasan et al. (2009)	Advertising directly affects stock returns over and above the indirect effect of advertising through lifting sales revenues and profits. Advertising will have a direct effect on firm value through two mechanisms: spillover and signaling. Investors, cognizant of the benefits of increased advertising through enhanced brand equity, may look beyond a firm's current cash flows and translate the long-term effects of advertising into firm valuation. Advertising may act as a signal of the firm's financial well-being or competitive viability. Firms that raise significant amounts of equity capital increase their advertising significantly more than firms with higher financial leverage (i.e., higher levels of debt relative to equity capital). Advertising lowers its systematic market risk. Communicating the differentiated added value created by product innovation yields higher firm-value effects of these innovations, especially for pioneering innovations.
2. Price Promotions	Promotional expenditures (e.g., J.D. Power and Associates)	Disaggregate, weekly brand/category level but tend to be proprietary	Pauwels et al. (2004)	Price promotions diminish long-term firm value, even though they have positive effects on revenues and, in the short run, on profits. A policy of aggressive new-product introductions acts as an antidote for excessive reliance on consumer incentives.
3. Distribution Channels	Channel additions (e.g., newspaper search of Internet channel additions)	Amenable to event-study analysis. Internet data collection is time-intensive.	Geyskens, Gielens and Dekimpe (2002) Gielens et al. (2008)	Investors perceive that the expected gains of the added channel will outweigh its costs. However, the negative stock returns are observed for established firms that may be hurt by Internet channel cannibalization. Entry of large retailers can have negative and positive effects on firm value of other retailers.
4. New Products	Product pre-announcements (e.g., Lexis-Nexis) New product introductions (e.g., J.D. Power and Associates)	Amenable to event-study analysis. Researcher needs to control for considerable delay in pre-announcement date and introduction.	Chaney, Devinney and Winer (1991) Sorescu, Shankar and Kushwaha (2007) Kelm, Narayanan and Pinches (1995) Pauwels et al. (2004) Srinivasan et al. (2009)	New-product announcements generate small excess stock-market returns for a few days. Financial returns from pre-announcements are significantly positive in the long run. Additional excess returns can be created when the new product is subsequently launched. New-product introductions increase long-term financial performance and firm value, but promotions do not. Moreover, investor reaction to new-product introduction occurs over time, indicating that useful information unfolds in the first two months after product launch. Pioneering (new-to-the-world) innovations have a higher stock-return impact than non-pioneering innovations.

Figure 1

Flow Chart of Return and Risk



ENDNOTES

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- ⁱ The finance literature makes the distinction between weak, semi-strong, and strong efficiency (Fama 1991). In a marketing context, the semi-strong definition is the most appropriate as marketing actions are publicly observable, by definition.
- ⁱⁱ Typically this involves estimating an autoregressive model of the variable (e.g. earnings) on its past lags and using the residuals as the unanticipated component of the variable.
- ⁱⁱⁱ Exceptions include investments in retail warehouses, retail outlets, etc., that are marketing investments accounted for (in part) in the book value of the firm.
- ^{iv} To construct momentum, six value-weighted portfolios including NYSE, AMEX, and NASDAQ stocks, formed on size and monthly prior (2-12) returns are used. The monthly portfolios are the intersections of two portfolios formed on size and three portfolios formed on prior (2-12) return. The monthly size breakpoint is the median NYSE market equity and the monthly prior (2-12) return breakpoints are the 30th and 70th NYSE percentiles. For further details, we refer the interested reader to http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_mom_factor.html.
- ^v http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html
- ^{vi} Related finance literature (e.g. Daniel and Titman 1997) has proposed characteristics-based models which argue that firm characteristics, rather than the sensitivity to the four risk factors, drive stock returns. As an example, it is firm size and not the sensitivity to the size factor (SMB) that drives stock returns. However, Davis, Fama and French (2000) subsequently argued that such characteristics-based effects are confined to the shorter sample used in the former study.
- ^{vii} Empirical evidence suggests that under certain sampling conditions such as using samples with only large firms versus small caps (Loughran 1997) or samples trimmed for extreme observations (Knez and Ready 1997), the size factor and the value factor become insignificant. Bollerslev and Zhang (2003) use high-frequency data (e.g., 5-minute intervals) to find a sign-reversal in these two factors. As for momentum, its effect sign depends on the time period considered as follows (see, e.g., Subrahmanyam 2005): it is negative for one week up to one month, positive for three- to twelve-month periods (Jegadeesh and Titman 1993), and negative for long horizons such as three to five years (DeBondt and Thaler 1985). Robustness checks of these factor effects are an area of ongoing research in empirical finance.
- ^{viii} While our focus here is on outcomes in the *real* stock market, the application of Internet-based *virtual* stock markets (VSM) is an emerging empirical approach that can be used to predict market valuation. Its basic idea is to bring a group of participants together via the Internet to trade shares of virtual stocks. These stocks represent a bet on the outcome of future market situations, and their value depends on the realization of these market situations (e.g., Elberse 2007).
- ^{ix} Ideally, one would want to run the regression $RET^{BRAND} = bX + \mu$ where RET^{BRAND} is the return associated exclusively with the particular brand information X . However, given the corporate nature of stock returns, the estimated regression is $RET = \beta X + \varepsilon$ where RET is the total corporate stock return, which is composed of RET^{BRAND} and $RET^{NOT-BRAND}$, i.e., the stock return that is not associated with the brand. Because $RET = (RET^{BRAND} + RET^{NOT-BRAND})$, it can be shown that the least-squares estimate of $E[\beta] = E[(XX)^{-1}X'(RET^{BRAND} + RET^{NOT-BRAND})] = b$ (see Lane and Jacobson 1995 and Geyskens, Gielens and Dekimpe 2002), leading to an unbiased estimate, under the reasonable assumption that $RET^{NOT-BRAND}$ and X are uncorrelated.
- ^x The substantive findings of this and other marketing studies are summarized in Table 4.
- ^{xi} Event leakage can be investigated by including pre-event periods in the event window (e.g. Chaney, Devinney and Winer 1991).

^{xii} The long-run behavior of each endogenous variable is obtained from a shock-initiated chain reaction across the equations. For instance, a successful new-product introduction will generate higher revenue, which may prompt the manufacturer to reduce sales promotions in subsequent periods. The combination of increased sales and higher margins may improve earnings and ultimately stock price. Because of such chains of events, the full performance implications of the initial product introduction may extend well beyond its immediate effects.