Capital Market Impact of Product Marketing Strategy: Evidence From the Relationship Between Advertising Expenses and Cost of Capital

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To analyze the prospect of a firm's advertising decision affecting shareholder wealth, this article investigates the relationship between a firm's advertising expenditure and the market-imposed weighted average cost of capital. For a sample of U.S. firms, the results show that advertising expenditure is negatively related to the cost of equity and positively related to debt utilization, resulting in a lower weighted average cost of capital. A higher debt level, however, associates with a lower level of financial strength. In addition, and plausibly by lowering the cost of capital through product market advertising, firms with higher advertising expenditure experience higher performance in terms of market value added.

Keywords: *advertising; cost of capital; capital and product markets; capital structure; performance*

Paul Anderson's (1979) observation that "too often marketing tends to focus on sales growth . . . it fails to recognize the impact of marketing decisions on . . . financing cost, debt-to-equity ratios, and stock prices" holds true in that the marketing discipline research has traditionally focused on identifying drivers of success in the product market, defined in terms of sales revenue, profit margins, and market share. The more recent trend, however, indicates a shift in evaluating the impact of marketing strategies on improving market value and stock price (Joshi and Hanssens 2004; Srivastava, Shervani, and Fahey 1998).

It is largely accepted that advertising is a means of creating market-based assets, which contributes positively to shareholder wealth. Advertising promotes brand equity, which in turn generates financial value through enhanced cash flows attributable to customer loyalty, increased marketing efficiency, brand extensions, and higher margins (Keller 2002). The sources of such advertising-related cash flow augmentations are traced to price premiums (Farquhar 1989) and capturing greater market share (Boulding, Lee, and Staelin 1994). In addition, corporate branding strategy, in contrast to a mixed branding strategy, is positively related to corporate value in terms of Tobin's *q* (Rao, Agarwal, and Dahlhoff 2004). Previous empirical studies within the marketing literature suggest that changes in marketing expenditures are related to changes in stock prices (Cheng and Chen 1997) in particular, and there is a relationship between marketing strategies and financial value (Chauvin and Hirschey 1993). More recently, Joshi and Hanssens (2004) suggested that advertising has a positive, long-run impact on a firm's market value.

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Surprisingly, it seems that the research to date has looked at advertising's positive value contribution to shareholder wealth through cash flow enhancements only, and "there has been little effort to study the direct impact of advertising on stock price" (Joshi and Hanssens 2004). Brand familiarity and perceived brand quality in product markets might spill over to the capital markets where investors may elevate demand for the stock of firms with established brands. In fact, recent evidence suggests that investors favor stocks with higher product market exposure, and higher advertising expenditure leads to increases in trading volume and number of shareholders (Frieder and Subrahmanyam 2001; Grullon, Kanatas, and Weston 2004). Thus, from the market microstructure perspective, higher advertising expenditure is expected to increase the breadth of ownership and improve liquidity, thereby lowering the cost of equity and improving firm value. This line of research, however, is still in its infancy. More important, the impact on debt holders has not been explored. Except for few recent works such as Day and Fahey (1988), linking advertising expenditure to corporate cost of capital and its determinants remains largely unexplored territory. Furthermore, the existing literature has not considered corporate value as a function of two distinct variables conditioned by advertising expenditure: cash flow augmentation and a firm's weighted average cost of capital (WACC).

The aim of this article is to fill this gap in research by using a unique database to analyze the impact of advertising promotion strategies on a firm's overall cost of capital. In addition, we explore the impact of advertising strategy on the drivers of a firm's cost of capital, namely, corporate capital structure (debt-to-asset ratio), equity risk (market beta), and firm financial strength (Altman's *Z*-score).[2]

Our findings suggest that higher advertising outlays associate with a lower WACC. In addition, advertising seems to be related to higher debt capacity and utilization. In terms of the drivers of the cost of capital, as influenced by advertising expenditure, the results indicate that for firms with greater advertising expense, the cost of equity is lower (in terms of beta) and that Altman's *Z*-score is adversely influenced. Finally, the results suggest that higher advertising contributes significantly to market-based performance in terms of the market value added (MVA).

The remainder of this article is organized as follows. The following section provides a theoretical and empirical framework within which the issue is considered, along with information on hypothesis development and the description of models relating advertising expenditure to a firm's cost of capital and the other test variables. The subsequent section describes the data collection and methodology and presents a description of the sample. Finally, we present the results and offer conclusions of the study.

LITERATURE REVIEW

Advertising, Cash Flow Augmentation, and Acceleration

Marketing expenses are aimed at creating customer loyalty, high margins, brand extension, licensing opportunities, and increasing revenue generation efficiency. In addition, advertising expenditures are justified in terms of their contribution to creating brand equity (Aaker 1991). Greater advertising intensity, by creating brand loyalty and brand association, has been argued to generate future cash flow and hence shareholder value (Aaker and Jacobson 1994). Within this perspective, Rao et al. (2004) suggested that corporate branding strategy associates positively with Tobin's q. Their results are consistent with other research in the brand assets literature (Barth et al. 1998; Kallapur and Kwan 2004). Mizik and Jacobson (2003) reported that the stock market positively rewards firms when they increase their emphasis on value appropriation through advertising strategies designed to create competitive barriers, establish customer loyalty, improve margins, and enhance brand equity.

According to Srivastava et al. (1998), advertising can create market-based assets that may accelerate the timeliness of cash flow occurrence, thereby improving overall shareholder value. The authors provide a summary of channels through which advertising can add to shareholder value by creating market-based assets: lower costs of sales and services to customers, secure price premiums through creation of perceived value identified with brand equity, and create competitive barriers, thereby enhancing and stabilizing cash flows and generating synergies among assets within a firm to improve productivity that may provide further competitive advantages.

The debate, however, is far from being conclusive. For example, Pauwels, Silva-Risso, Srinivasan, and Hanssens (2004) analyzed the differential impact on a firm's value for two distinct marketing strategies: advertising expenditure and new product introductions. Their findings suggest that although both strategies positively affect sales revenue in the short and long run, only the strategy of new product introductions has a significant and positive long-term impact on shareholders' wealth. In fact, according to the authors, marketing promotions have a long-term market performance impact that is not only negative but also more than offsets its short-term benefit. Similarly, Kopalle, Mela, and Marsh (1999) argued that advertising promotions' impact on stimulating long-term growth and profitability may be doubtful. Thus, a pure advertising-intensive marketing approach may not always contribute to corporate value; however, in contrast to new product introductions, advertising promotions may effectively

augment product demand without incurring the risks associated with new products (Blattberg and Neslin 1990).

Advertising, Cash Flow Stability, and Cost of Capital

In the finance literature, the value of a corporation is defined as the sum of the present value of all the cash flows to the firm, which is equivalent to discounting future cash flows based on their level of risk. Although research in marketing has explored the link between advertising expenditure and a firm's cash flow, it has not analyzed the impact of advertising on the riskiness of the cash flows that directly determines corporate cost of capital (WACC).

Advertising may have a dual impact on a firm's cost of capital. In its first manifestation, advertising may assist in reducing a firm's cost of financing by reducing cash flow variability as suppliers of the capital identify reduced cash flow variability with lower risk. In addition, advertising may influence investor behavior in terms of the perceived riskiness of a firm's stocks and bonds. Specifically, product market advertising may have a positive spillover effect on investors in financial markets. Corporate advertising increases visibility and familiarity among investors, creating a "home-bias" scenario, in that, other factors being the same, investors are more willing to lend and/or invest in the equity of firms that they are familiar with.

Advertising and Fundamental Risk Reduction

According to Anderson, Fornell, and Mazvancheryl (2004), customer satisfaction not only helps to grow the customer base and enhance future cash flows through customer retention; it also reduces the cash flow variability and, hence, associates with lower corporate risk. The combined impact of greater customer satisfaction is greater corporate value. Similarly, by helping firms increase their sales revenue and market share and facilitating introduction of new products, advertising may augment their cash flows. In addition, advertising may create and sustain product demand, thereby reducing the sensitivity of a firm's sales to external shocks. The resulting revenue stability may be seen as risk reduction in terms of reduced cash flow variability. Strong brands can also reduce a firm's vulnerability to competition, thereby reducing the risk of the future cash flows (Rao et al. 2004).

Within this framework of advertising improving the firm's fundamentals and consequent risk reduction, Srivastava et al. (1998) argued that advertising generates shareholder wealth by enhancing and stabilizing a firm's future cash flows. According to the authors, higher degrees of customer satisfaction, loyalty, and retention help reduce the variability of a firm's cash flows as its susceptibility to competitive or other market-based external shocks declines. In addition to the direct contribution to sales revenue stability, advertising can actually promote stability in a firm's operations by strengthening customer and partnership channels. The authors stress that "it is important to recognize that sustained, long term customer loyalty results in more stable business and therefore a lower cost of capital."

Impact of Advertising on Investor Perception and Behavior

Huberman (2001) suggested that investors' familiarity with a company positively influences their decisions to buy stock in that company. In this framework, if advertising creates product market visibility, then we should expect that, other factors being the same, investors are more likely to buy stock of companies with higher intensity of advertising activity. According to Grullon et al. (2004), the advertising exposure consequent increased breadth of ownership and liquidity may help reduce a firm's cost of equity capital. In addition, companies that have higher visibility in the product market have greater stock market liquidity in terms of a lower bid-ask spread, greater depth, and smaller price impacts. One can argue that higher breadth of equity ownership and greater liquidity would manifest itself in lower overall cost of equity capital.

Several studies in finance suggest the existence of investor bias, where investors buy stock that they are familiar with. For example, international cross listing by foreign firms on the New York Stock Exchange increases visibility to U.S. investors and is associated with a reduced bid-ask spread and higher liquidity (Kadlec and McConnell 1994). Similarly, according to French and Poterba's (1991) results, investors seem to favor domestic company stocks over similarly placed foreign stocks. There have also been studies (Amihud, Mendelsson, and Lauterbach 1997; Brennan, Chordia, and Subrahmanyam 1998) that suggest stock market liquidity is associated with a lower cost of equity.

Finally, Frieder and Subrahmanyam (2001) proposed a theoretical model and concluded that "investors prefer holding stocks with high recognition and consequently, greater information precision and smaller parameter estimation risk." In the same fashion, Merton (1987) and Klein and Bawa (1976, 1977) suggested that investors prefer to buy securities that have higher recognition and lower information asymmetries. Thus, it can be argued that increased advertising by a firm causes increased familiarity and, hence, investor preference to hold that firm's stock.

HYPOTHESES DEVELOPMENT

Although research in the marketing area has a tradition of linking advertising intensity to corporate value through

an increase in sales revenue growth and market share growth, the link between advertising-related visibility and cost of capital has not been explored. This article constitutes the first-known attempt at relating a firm's overall cost of capital to product market visibility and degree of investor familiarity with that firm, proxied by advertising expenditure. We state our formal hypotheses as follows.

Testable Hypotheses

Cost of Equity

(a.) Building on research initiated by Huberman (2001) and results provided by Frieder and Subrahmanyam (2001) and Grullon et al. (2004), we hypothesize that product market advertising will result in increased visibility among customers and prospective investors who will be attracted to the stocks of firms with established brand names. The resulting increase in liquidity, breadth, and depth of the market for those firms' stock is expected to reduce the cost of equity.

(b.) Based on the frameworks provided by Srivastava et al. (1998) and Rao et al. (2004), we hypothesize that advertising may reduce the variability of company cash flows through more predictable consumer behavior, stable partner channels, and reduced operations variability, thereby lowering cost of equity. Therefore, our first hypothesis is as follows:

Hypothesis 1: Firms with higher levels of product market advertising will have lower cost of equity (beta).

Financial Leverage and Cost of Debt

(a.) As suggested by the revenue augmentation and cash flow stability argument by Srivastava et al. (1998), one may expect that firms with higher advertising expenditures will have a lower default risk and a greater capacity to service debt, and hence experience a lower cost of debt.

(b.) A higher debt level, however, may be associated with a higher probability of default (lower Z-score) and, hence, a higher cost of debt capital. In addition, higher advertising expenses may take away resources from building tangible assets as well as reducing the availability of cash flows to service debt.[3]

Given the two contrasting tendencies, the relationship between advertising expense and the cost of debt seems to be unpredictable and should be treated as an empirical issue.

We frame our second hypothesis as follows:

Hypothesis 2: A greater degree of product market advertising will associate positively with debt levels and will have a negative impact on Z-scores.

Weighted Average Cost of Capital

Given that advertising consequent cash flow augmentation and stability, along with positive investor perception, may make firms less risky and attract more investors, we hypothesize that firms with higher product market advertising will have a lower WACC. This leads to our final hypothesis:

Hypothesis 3: Higher product market advertising expenditure will be associated with a lower WACC.

Measurement and Description of Variables

Independent test variable. Our independent test variable is product market advertising. Following Grullon et al. (2004), we use the log of COMPUSTAT's (Item 45) advertising expenditure (Log ADVEXP) as a measure of product market advertising. As computed by COMPUSTAT, this variable represents the cost of advertising media (radio, television, newspapers, and periodicals) and promotional expenses. Given that our focus is on advertising consequent exposure and increased visibility among investors, we feel this measure is the most appropriate.

Dependent test variables. For our first hypothesis, following the convention of previous empirical studies (Jin, Merton, and Bodie 2004; Mishra, O'Brien, and Bodie 2003), we use equity beta (BETA) as the dependent variable to proxy for cost of equity. We note that in the Sharpe-Lintner-Mossin capital asset pricing model (Lintner 1965; Mossin 1966; Sharpe 1964), the equity beta is the direct measure of equity's nondiversifiable risk. Because in equilibrium, only this risk is priced, there is a direct relation between this measure and the cost of equity capital.

In testing our second hypothesis, following the convention of the literature on capital structure (see Harris and Raviv [1991] for an extensive review of the literature), we choose the ratio of total debt to total assets (DTA) as a measure of the degree of leverage in a firm's capital structure. We also use Altman's (1968) Z-score (ZSCORE), as reported by COMPUSTAT, as a measure of default risk and hence a proxy for the cost of debt. We note that a firm's cost of debt is a function of the risk-free rate and firm-specific credit spread. Elton, Gruber, Agrawal, and Mann (2001) pointed out that a major component of a firm's credit spread is expected default risk. Altman's (1968) Z-score has long been used as a valid predictor of bankruptcy (Frank and Goyal 2003). Lastly, in testing our main and third hypothesis, we use WACC as reported by Stern-Stewart.

Control variables. In all of our multivariate regressions, as is the convention, we use the log of the market value of common equity (Log MV) as the control for a firm's size. In testing our first and third hypotheses, to control for the impact of market liquidity on the cost of equity, as in Grullon et al. (2004), we use the log of the 3-year average trailing stock volume (log of VOL3Y). In testing our second hypothesis regarding the link between advertising

and cost of debt, we use both DTA (see Tables 4 and 5) and the ratio of total short-term debt to total debt (STDTD) (see Table 6) to control for the impact of leverage on bankruptcy costs. Note that to control for confounding effects, we also use equity beta (BETA), DTA, and the square of the debt ratio (DTA^2) in our regression analysis for estimating the impact of advertising on WACC.

In our analysis of the impact of advertising on leverage, we additionally use Altman's (1968) *Z*-score (ZSCORE), return on assets (ROA), and the ratio of income tax to pretax income (TAXR) to control for the impacts of distress costs, profitability, and corporate taxation on a firm's leverage (see Harris and Raviv [1991] for a detailed discussion). We also use the ratio of income tax to pretax income (TAXR) in our analysis of the impact of advertising on WACC to control for differential tax treatment of debt and equity.

In all of the multiple regressions, we use one-digit Standard Industrial Classification (SIC) code industry dummies to control for industry effects. We denote each of these dummies as IND_i; the industry associated with the *i*th one-digit SIC code industry. Table 1 provides description and sample statistics of the aforementioned variables. Panel B of Table 1 reports variations in the variables of interest across seven industries. The following regression models are estimated to test our hypotheses:

Hypothesis 1: The estimated model is as follows:

$$\text{BETA} = \alpha + \beta_1 \text{Log (ADVEXP)} + \beta_2 \text{Log (MV)} + \beta_3 \text{Log (VOL3Y)} + \beta_{4\text{-}10} \text{IND}_{1\text{-}7} + \varepsilon$$

Hypothesis 2: The estimated models are as follows:

$$\text{DTA} = \alpha + \beta_1 \text{Log (ADVEXP)} + \beta_2 \text{ROA} + \beta_3 \text{ZSCORE} + \beta_4 \text{Log (MV)} + \beta_5 \text{TAXR} + \beta_{6\text{-}12} \text{IND}_{1\text{-}7} + \varepsilon$$

$$\text{ZSCORE} = \alpha + \beta_1 \text{Log (ADVEXP)} + \beta_2 \text{Log (MV)} + \beta_3 \text{DTA} + \beta_4 \text{STDTD} + \beta_{5\text{-}11} \text{IND}_{1\text{-}7} + \varepsilon$$

Hypothesis 3: The estimated model is as follows:

$$\text{WACC} = \alpha + \beta_1 \text{Log (ADVEXP)} + \beta_2 \text{Log (MV)} + \beta_3 \text{BETA} + \beta_4 \text{Log (VOL3Y)} + \beta_5 \text{DTA} + \beta_6 \text{DTA}^2 + \beta_7 \text{TAXR} + \beta_{8\text{-}14} \text{IND}_{1\text{-}7} + \varepsilon$$

SAMPLE AND METHOD

Sample Selection

Our original source of the set of U.S. firms in this article is the country-wise annual list of the best performing companies compiled by Stern Stewart. For the U.S. firms, the Stern Stewart data include information on the cost of capital and return on capital for the 1,000 best performing—in terms of MVA—companies. We start with the 1,000 firms on the 2001 best performing firms list and trace these firms back for 4 years, to 1998. Then, we retrieve the annual balance sheet and income statement data for these companies from the COMPUSTAT database. The final sample consists of 967 firms that consistently appear in the Stern Stewart best performing list for the 4 years from 1998 to 2001 and also have information available in the COMPUSTAT database. At the next stage, we eliminate financial firms with SIC codes falling in the range of 6000-6999. This yields an average of 772 firms per year. At the next step, we source our advertising expenditure and accounting data from COMPUSTAT. For the period between 1998 and 2001, on average, we find 253 firms that have valid advertising, accounting, and cost of capital information. The following is a brief summary of the sample selection process:

Criterion	*Average Number of Firms per Year*
Step 1: All Stern-Stewart firms	967
Step 2: After elimination of all financial firms	772
Step 3: After eliminating firms with nonavailability of advertising data	253
Step 4: Maximum balanced panel for time-series cross section regression	199
Minimum balanced panel for time-series cross section regression	162

To maximize the power of univariate tests, we use all valid observations for the descriptive and correlation analyses reported in Tables 1, 2, and 3. For univariate tests, it is not necessary to match the number of available observations for all variables. When we conduct the multiple regression analyses, however, all variables that are included in the models must have the same number of observations. The full sample, then, is reduced to a minimum of 162 and a maximum of 199 observations per year for which we have information on all variables for all 4 years. Table 1 provides basic descriptive statistics of the sample.

Data Analysis

We use a multivariate regression analysis to investigate the nature and the degree of influence that advertising has on the WACC and its drivers. Because our data are a cross-sectional time-series combination, we use two different methods to estimate the models. First, we employ yearly regressions to investigate the relationships for each year. This approach ensures that autocorrelation is not influencing the results and that the results are not conditional on observations being from a particular sample year. Also, this constitutes the first step of the Fama and MacBeth (1973) method of handling cross-sectional regressions.

TABLE 1
Descriptive Statistics

Panel A. Mean, median, and standard deviations (in parentheses) for the entire sample

Variable	Description	Number of Firm Years	Mean	Median	Standard Deviation
WACC	Weighted average cost of capital (%)	3,765	9.200	8.617	5.657
ADVEXP	Advertising expense (M$)	1,057	267.533	65.315	556.627
BETA	Equity beta	3,539	1.088	0.956	0.666
ZSCORE	Altman's (1968) Z-score	3,057	7.540	3.644	14.472
DTA	Total debt to total assets (%)	3,845	27.693	25.601	20.191
MV	Market value of equity (M$)	3,845	11,607.570	2,864.120	32,849.770
TA	Total assets (M$)	3,767	7,451.770	2,237.750	23,719.430
NI	Net income (M$)	3,863	279.684	87.185	1,217.690
RET1	1-year stock return (%)	3,860	24.959	12.954	51.445
RET3	3-year stock return (%)	3,701	16.436	11.463	26.342
VOL3Y	3-year trailing volume (million shares)	3,439	40,975.990	11,791.910	123,315.990
ROA	Return on assets (%)	3,644	3.018	4.507	13.579
ROE	Return on equity (%)	3,860	7.108	11.838	162.568

Panel B. Means and standard deviations (in parentheses) for 1-digit SIC code industries

Variable	SIC = 1 (179)	SIC = 2 (739)	SIC = 3 (853)	SIC = 4 (284)	SIC = 5 (448)	SIC = 7 (447)	SIC = 8 (95)	SIC = 9 (720)
WACC	7.980	7.583	10.500	9.085	8.571	10.855	8.239	7.857
	(1.35)	(10.42)	(3.31)	(1.31)	(1.34)	(2.79)	(0.92)	(1.40)
ADVEXP	39.606	436.139	283.024	256.902	197.821	179.594	24.699	68.389
	(38.80)	(693.51)	(658.97)	(432.59)	(286.87)	(591.85)	(36.41)	(93.53)
BETA	0.939	0.835	1.274	1.090	0.928	1.415	1.020	0.713
	(0.39)	(0.36)	(0.73)	(0.57)	(0.46)	(0.94)	(0.82)	(0.31)
ZSCORE	2.486	6.397	9.856	2.265	6.164	12.412	5.847	2.972
	(1.96)	(8.30)	(16.42)	(2.07)	(4.96)	(27.26)	(4.64)	(1.01)
DTA	34.806	29.833	23.995	40.710	25.147	22.144	24.389	36.723
	(15.18)	(18.59)	(17.27)	(24.01)	(20.49)	(22.14)	(19.46)	(15.84)

NOTE: This table reports the mean, median, and standard deviation for variables of interest for the entire sample as well as mean and standard deviations (in parentheses) for one-digit Standard Industrial Classification (SIC) industries. The variable description is also provided. The sample includes all nonfinancial firms in the Stern-Stewart database for which valid accounting data can be found in COMPUSTAT. WACC = weighted average cost of capital as reported by Stern-Stewart; ADVEXP = advertising expenses; BETA = equity beta; ZSCORE = Altman's (1968) Z-score; DTA = ratio of total debt to total assets; MV = total market value of common equity; TA = total assets; NI = net income; RET1 = 1-year stock return; RET3 = 3-year average stock return; VOL3Y = 3-year average trailing stock volume; ROA = return on assets or the ratio of net income to total assets; ROE = return on equity or the ratio of net income to equity.

Fama and MacBeth (1973) proceeded to report weighted average coefficients and corresponding *t* statistics. To confirm our findings, the natural next step would be to run pooled regressions. The mere pooling of the data, however, would cause econometric problems such as serial and cross-sectional correlations in estimating the models. To solve these problems, we follow a simple method discussed by Johnson (2003) whereby we first take the time-series average of our variables (i.e., average during the period of 1998-2001) and then run a cross-sectional regression. This method avoids the serial correlation problem. To avoid the heteroscedasticity inherent in cross-sectional regressions, we use White's variance correction method.[4] As for the specification, in addition to our test variables, we include a number of control variables in the regression models to account for the previously shown determinants of the cost of capital and its drivers. In addition, to control for possible industry effects, we include seven one-digit SIC industry dummies in the regressions.

RESULTS AND DISCUSSION

Sample Description

Table 1 provides the descriptive statistics for the pooled sample. The pooled mean (median) WACC is 9.20 percent (8.62%). The absolute dollar amount of average expenditure on advertising is $267.5 million. The median is much smaller at $65.3 million. The firm size distribution of our sample seems to be skewed as evidenced by the large difference between the mean and median market value and total assets. The average debt ratio of the sample firms is about 28 percent. The sample firms seem to be of average

TABLE 2
Correlation Analysis for the Relationship Among the Test Variables

	Log ADVEXP		*WACC*		*ZSCORE*		*BETA*	
WACC	−.2540***	(.000)						
ZSCORE	−.1573***	(.000)	.2283***	(.000)				
BETA	−.1409***	(.000)	.5172***	(.000)	.2335***	(.000)		
DTA	.0933***	(.003)	−.4187***	(.000)	−.2093***	(.000)	−.1663***	(.000)

NOTE: This table reports the correlation among a set of variables of interest. WACC = weighted average cost of capital as reported by Stern-Stewart; ADVEXP = advertising expenses; BETA = equity beta; ZSCORE = Altman's (1968) *Z*-score; DTA = ratio of total debt to total assets. *p*-values are in parentheses. Coefficients that are statistically different from zero are marked at the 10%, 5%, and 1% levels with *, **, ***, respectively.

TABLE 3
Correlation Between Contemporaneous and Lagged Advertising Expense and (1) Weighted Average Cost of Capital and (2) Debt Ratio

Panel A

	$WACC_{98}$		$WACC_{99}$		$WACC_{00}$		$WACC_{01}$	
Log $ADVEXP_{98}$	−.2535***	(.000)	−.2915***	(.000)	−.3202***	(.000)	−.3199***	(.000)
Log $ADVEXP_{99}$	−.2351***	(.000)	−.2669***	(.000)	−.2990***	(.000)	−.3014***	(.000)
Log $ADVEXP_{00}$	−.1654***	(.009)	−.2168***	(.000)	−.2392***	(.000)	−.2449***	(.000)
Log $ADVEXP_{01}$	−.0107	(.858)	−.1854***	(.001)	−.2548***	(.000)	−.2640***	(.000)

Panel B

	DTA_{98}		DTA_{99}		DTA_{00}		DTA_{01}	
Log $ADVEXP_{98}$	.0646	(.324)	.0067	(.919)	.1345**	(.040)	.1410**	(.031)
Log $ADVEXP_{99}$	.0723	(.261)	.0286	(.655)	.1594**	(.013)	.1577**	(.014)
Log $ADVEXP_{00}$	.0621	(.312)	−.0043	(.945)	.0907	(.139)	.1146*	(.062)
Log $ADVEXP_{01}$	.0702	(.226)	.0091	(.875)	.0928	(.108)	.1054*	(.068)

NOTE: This table reports (1) the correlation between contemporaneous and lagged weighted average cost of capital (WACC) and log of advertising expense (ADVEXP), (2) the correlation between contemporaneous and lagged total debt ratio (DTA) and log of advertising expense (ADVEXP). Subscript with the variables indicates the year to which the variable pertains. *p*-values are in parentheses. Coefficients that are statistically different from zero are marked at the 10%, 5% and 1% levels with *, **, ***, respectively.

market risk having a beta of 1.09 (mean) and 0.96 (median). Finally, the firms have on average ROA of 3.02 percent and ROE of 7.11 percent.

Univariate Correlation Analysis

In terms of preliminary evidence, the foremost observation of the correlation matrix in Table 2 is the significant negative correlation between advertising expenditure and a firm's WACC. The evidence lends support to our fundamental hypothesis that product market advertising may have a favorable capital market impact in terms of reducing the corporate cost of capital. In addition, the results show that advertising is negatively related to financial strength in terms of the *Z*-score. Also, advertising seems to reduce a firm's beta and hence its cost of equity capital. The results with respect to firm leverage, given a positive correlation coefficient, imply that advertising helps increase debt capacity and debt utilization. Thus, overall, our univariate correlation analysis indicates that advertising favorably affects a firm's capital structure and helps reduce the cost of equity as well as the overall cost of capital.

Pauwels et al. (2004) argued that advertising may convey additional information about a firm's value that cannot be captured in the short run alone. Thus, it is conceivable that the relationship between the test variables is not contemporaneous. To analyze the lagged impact of the advertising expenditure on the cost of capital and the capital structure of sample firms, we conduct lagged correlation analysis. In Table 3, Panel A results suggest that advertising expenditure, although related contemporaneously to the cost of the capital, is more strongly related to the lagged cost of capital. In fact, the contemporaneous correlation coefficient at −.25 is the lowest with a monotonic increase in the coefficient with greater lag. The reverse relationship, in terms of current WACC affecting lagged advertising, does not hold so strongly.

In Panel B, we relate advertising expenditure to the lagged debt-to-asset ratio. The results indicate that whereas advertising does not affect capital structure contemporaneously, it does so with the lag. Given the significant positive correlation, it appears that advertising expenditure leads to a future increase in debt capacity and debt utilization. Furthermore, because previous debt level does not relate

TABLE 4
Regression for Weighted Average Cost of Capital as Determined by Advertising Expenditure

	White's Variance Corrected 1998	*White's Variance Corrected 1999*	*White's Variance Corrected 2000*	*White's Variance Corrected 2001*	*Time Series Adjusted for Cross Section*
Panel A. Results without industry dummies					
Intercept	7.3477***	5.1763***	7.9697***	7.2151***	8.3871***
	(6.50)	(4.58)	(6.68)	(6.76)	(7.25)
Log ADVEXP	*-0.3129****	*-0.5654****	*-0.4371****	*-0.3244****	*-0.3849****
	(-2.81)	*(-5.05)*	*(-4.05)*	*(-3.27)*	*(-3.70)*
Log MV	-0.0023	0.3666**	0.3261**	0.2560	0.2776*
	(-0.01)	(2.19)	(2.12)	(1.54)	(1.69)
BETA	1.3596***	1.3093***	1.2381***	1.2829***	1.4788***
	(3.79)	(3.61)	(3.53)	(4.56)	(4.16)
Log VOL3Y	0.3784**	0.3028*	0.1760	0.2169	0.1970
	(2.39)	(1.68)	(0.97)	(1.21)	(1.11)
DTA	-0.0589***	0.0003	-0.0696***	-0.0462***	-0.0661***
	(-3.83)	(0.95)	(-4.74)	(-3.76)	(-4.25)
DTA^2	0.0003**	-0.0006*	0.0004***	0.0001	0.0003**
	(1.82)	(-1.64)	(2.57)	(1.38)	(2.03)
TAXR	-1.4010	-0.3112	-2.7479***	-4.0357***	-5.4708***
	(-1.09)	(-0.24)	(-2.69)	(-4.55)	(-3.54)
Panel B. Results with Industry Dummies (only coefficients on test variable and industry dummies are reported)					
Log ADVEXP	*-0.2506***	*-0.3375****	*-0.3295****	*-0.2822****	*-0.3233****
	(-2.28)	*(-3.01)*	*(-2.97)*	*(-2.79)*	*(-2.98)*
Mean industry dummy coefficient[a]	0.5833	1.1638	0.6615	0.7165	0.7363
	(0.68)	(1.21)	(0.73)	(0.84)	(0.83)
F-statistic	17.96	13.37	20.67	24.92	23.00
p value	.0001	.0001	.0001	.0001	.0001
N	178	178	178	178	178
Adjusted R^2	.4001	.3273	.4362	.4848	.4639

NOTE: This table reports the results of the following regression:

$$WACC = \alpha + \beta_1 \text{ Log (ADVEXP)} + \beta_2 \text{ Log (MV)} + \beta_3 \text{ BETA} + \beta_4 \text{ Log (VOL3Y)} + \beta_5 \text{ DTA} + \beta_6 \text{ DTA}^2 + \beta_7 \text{ TAXR} + \beta_{8\text{-}14} \text{ IND}_{1\text{-}7} + \varepsilon$$

where the dependent variable, WACC, is the weighted average cost of capital as reported by Stern-Stewart. The test variable is log of ADVEXP, the advertising expenses. Control variables are log of MV, the total market value of common equity; BETA, the equity beta; log of VOL3Y, the 3-year average trailing stock volume; DTA, the ratio of total debt to total assets; and TAXR, the ratio of income tax to pretax income. *t*-statistics are in parentheses. The reported coefficients are White's heteroscedasticity (variance) adjusted. Coefficients that are statistically different from zero are marked at the 10%, 5% and 1% levels with *, **, ***, respectively.

a. Average coefficient and *t*-statistics for seven industry dummies are also reported.

significantly to future advertising expenditures, we can conclude that advertising strategy adds to debt capacity.

Multivariate Analysis

At the next stage of our analysis, we analyze the relationship between WACC and advertising expenditure in a multivariate framework. In Table 4, we report the regression results for year-by-year as well as multi-year averaged cross sections. The results indicate a strong negative relationship between advertising expenditure and WACC. All five coefficients of the advertising variable are negative and significant at the 1 percent level. The implication is that firms having greater advertising outlays experience a significantly lower WACC. In terms of control variables, we find that larger firms may have a higher cost of capital, although the relationship does not seem to be strong. As expected, equity beta positively relates to WACC, indicating that firms with risky equity will experience higher overall cost of capital. In terms of market microstructure factors, it appears that higher trading volume actually relates positively to the WACC. The evidence, however, is not very conclusive as the relationship holds only for two of the five models.

Given that the overall cost of capital is a function of the individual component capital costs, as well as the capital structure, we control for the debt ratio in the multiple regression analysis. Furthermore, although higher levels of leverage may reduce the cost of capital due to debt tax shields, it is possible that higher leverage may increase the

TABLE 5
Regression for Capital Structure as Determined by Advertising Expenditure

	DTA_{98}		DTA_{99}		DTA_{00}		DTA_{01}	
Panel A. Results without industry dummies								
Intercept	41.537***	(4.57)	40.07***	(4.60)	34.66***	(4.00)	31.37***	(3.50)
Log ADVEXP$_{98}$	0.1510*	*(1.72)*	0.1430	(1.58)	0.2020**	(2.22)	0.1990**	(2.20)
ROA_{98}	–0.2830***	(–4.10)	–0.1930***	(–2.71)	–0.1480**	(–2.06)	–0.2030***	(–2.85)
$ZSCORE_{98}$	–0.1410**	(–2.07)	–0.1410**	(–2.00)	–0.1270*	(–1.80)	–0.1300*	(–1.85)
Log MV_{98}	–0.1440*	(–1.60)	–0.1380	(–1.49)	–0.1240	(–1.34)	–0.0820	(–0.89)
$TAXR_{98}$	–0.0850	(–1.28)	–0.0640	(–0.93)	–0.0710	(–1.02)	–0.0160	(–0.23)
Panel B. Results with industry dummies (only coefficients on test variable and industry dummies are reported)								
Log ADVEXP$_{98}$	0.1337	*(1.41)*	0.1495	(1.54)	0.2218**	(2.25)	0.2084*	(2.13)*
Mean industry dummy coefficient[a]	–0.1663	(–1.10)	–0.1463	(–0.86)	–0.1326	(–0.75)	–0.0860	(–0.46)
F-statistic	6.86		4.11		3.61		4.08	
p value	.0000		.0010		.0040		.0020	
N	199		199		199		199	
Adjusted R^2	.1280		.0720		.0610		.0720	

NOTE: This table reports the results of the following regression:

$$DTA = \alpha + \beta_1 \text{ Log (ADVEXP)} + \beta_2 \text{ ROA} + \beta_3 \text{ ZSCORE} + \beta_4 \text{ Log (MV)} + \beta_5 \text{ TAXR} + \beta_{6\text{-}12} IND_{1\text{-}7} + \varepsilon$$

where the dependent variable, DTA, is the ratio of total debt to total assets. The test variable is log of ADVEXP, the advertising expenses. Control variables are ROA, the return on assets; ZSCORE, Altman's (1968) *Z*-score; log of MV, the total market value of common equity; TAXR, the income tax to pretax income ratio; and NI, the net income. *t*-statistics are in parentheses. The reported coefficients are White's heteroscedasticity (variance) adjusted. Coefficients that are statistically different from zero are marked at the 10%, 5%, and 1% levels with *, **, ***, respectively. Subscript with the variables indicates the year to which the variable pertains.

a. Average coefficient and *t*-statistics for seven industry dummies are also reported.

cost of capital due to an increase in the probability of bankruptcy. Our results indicate that at lower levels of debt, the weighted average cost of capital is negatively related to leverage, thereby pointing toward tax shield benefits. At higher levels of debt, however, WACC relates positively to the degree of financial leverage, suggesting bankruptcy considerations. We, therefore, observe a nonlinear, U-shaped, relationship between financial leverage and the overall WACC. These results are consistent with the theoretically predicted relationship between leverage and cost of capital in the presence of bankruptcy costs (Copeland and Weston 1992; Krause and Litzenberger 1973; Modigliani and Miller 1958). Finally, firms with a higher average tax rate have a lower cost of capital. In Panel B, where we adjust for industry-specific effects, the results pertaining to the test variable are identical to those reported in Panel A.

Overall, the results in Table 4 suggest that a higher degree of advertising facilitates a lower cost of capital. The findings may be driven by either of two factors: it may be that advertising helps cash flow enhancement and stability and thereby reduces cost of capital or that product market visibility, through advertising, may result in a spillover effect on the capital market as it may attract a larger investor base, enhance liquidity, and provide depth with consequent reduction in the cost of capital.

Impact of Advertising on Drivers of the Cost of Capital

Capital Structure

To identify the source of favorable impact of advertising on cost of capital, at the first stage of the analysis, we look at the capital structure as influenced by the firm's advertising expenditures. Given the univariate correlation results (where advertising seems to affect leverage with a lag) in Table 5, column 1, the dependent variable is the contemporaneous 1998 debt ratio, whereas subsequent columns have 1-, 2-, and 3-year lagged debt ratios. The results indicate that although advertising does not relate to the contemporaneous debt ratio significantly, it positively contributes to increasing debt capacity and utilization in the subsequent years. It is plausible to argue that firms in a particular tax bracket may increase leverage to capture tax shield benefits, thereby reducing the after-tax cost of debt. It is also possible that a higher debt level may lower a firm's *Z*-score and consequently generate negative impact on pretax cost of debt. As long as the tax benefits of increasing leverage outweigh the cost in terms of higher pretax cost of debt, it is rational to increase leverage to reduce overall cost of capital. In terms of control variables, consistent with previous research, we find that a firm's

TABLE 6
Regression for *Z*-score as Determined by Advertising Expenditure

	White's Variance Corrected 1998	*White's Variance Corrected 1999*	*White's Variance Corrected 2000*	*White's Variance Corrected 2001*	*Time Series Adjusted for Cross Section*
Panel A. Results without industry dummies					
Intercept	6.0308	−0.9778	3.5441*	3.9067***	7.3646**
	(0.87)	(−0.16)	(1.81)	(2.36)	(2.12)
Log ADVEXP	*−3.0416****	*−3.5002****	*−0.3110*	*−0.5602*	*−1.3300****
	(−3.58)	*(−4.55)*	*(−1.23)*	*(−2.86)*	*(−3.17)*
Log MV	1.9256**	2.5637***	0.6623***	0.5639***	0.6786
	(1.93)	(2.97)	(2.52)	(2.51)	(1.43)
DTA	−0.1283***	−0.0003	−0.0943***	−0.0725***	−0.1018***
	(−2.46)	(−0.59)	(−5.51)	(−5.62)	(−3.45)
STDTD	0.1047**	0.1304***	0.0132	0.0385***	0.0953***
	(2.09)	(2.65)	(0.96)	(3.42)	(3.12)
Panel B. Results with industry dummies (only coefficients on test variable and industry dummies are reported)					
Log ADVEXP	*−2.6917****	*−3.3493****	*−0.3208***	*−0.7481****	*−1.3023****
	(−2.92)	*(−4.01)*	*(−2.21)*	*(−3.84)*	*(−2.86)*
Mean industry dummy coefficient[a]	−0.5947	1.9473	−5.1031	−1.4673	−1.0826
	(0.02)	(0.27)	(−1.53)	(−0.52)	(−0.12)
F-statistic	7.18	7.33	13.74	18.67	10.30
p value	.0001	.0001	.0001	.0001	.0001
N	162	162	162	162	162
Adjusted R^2	.1325	.1352	.2394	.3038	.1868

NOTE: This table reports the results of the following regression:

$$ZSCORE = \alpha + \beta_1 \text{Log (ADVEXP)} + \beta_2 \text{Log (MV)} + \beta_3 \text{DTA} + \beta_4 \text{STDTD} + \beta_{5..11} \text{IND}_{1..7} + \varepsilon$$

where the dependent variable, ZSCORE, is Altman's (1968) *Z*-score. The test variable is log of ADVEXP, the advertising expenses. Control variables are log of MV, the total market value of common equity; DTA, the ratio of total debt to total assets; and STDTD, the ratio of total short-term debt to total debt. *t*-statistics are in parentheses. The reported coefficients are White's heteroscedasticity (variance) adjusted. Coefficients that are statistically different from zero are marked at the 10%, 5%, and 1% levels with *, **, ***, respectively.
a. Average coefficient and *t*-statistics for seven industry dummies are also reported.

performance and *Z*-score negatively relate to the debt ratio. Firm size and average tax liabilities, however, do not seem to consistently relate to the capital mix.

Overall, the results in Table 5 suggest that advertising may help create additional debt capacity, which, if used optimally, may result in reduced after-tax cost of debt as well as reduced WACC. It is plausible to relate higher debt capacity to greater volume and stability of future cash flows that advertising may yield.

Financial Strength (*Z*-score)

We argue that higher advertising expenditures may result in a reduction in cash flows available for servicing debt, thereby adversely affecting the financial strength of a firm. In addition, higher advertising, by allowing greater leverage, may relate to a lower *Z*-score, as a proxy for a firm's financial strength. We test the direct impact of advertising on a firm's *Z*-score. We report the regression results for year-by-year as well as multi-year averaged cross sections in Table 6. The results consistently show the significant negative impact of advertising expense on a firm's *Z*-score. The implication of the negative relationship is that advertising may adversely affect a firm's ability to service its debt obligations; this may be due to higher level debt and/or usage of company finances for creation of intangible market-based assets through advertising.

As expected, the control variables indicate that large firms have higher *Z*-scores and that firms with higher debt levels have lower *Z*-scores. Also, it appears that firms with higher relative short-term debt have a higher *Z*-score. Overall, it appears that even after controlling for capital structure, firm size, and debt composition, advertising negatively affects a firm's *Z*-score.

Cost of Equity Capital

If advertising helps enhance and stabilize cash flows and helps create a broader investor base and increased liquidity for its stock, we expect to find a negative relationship between equity beta and advertising expense. We test these predictions in a multiple regression framework and

TABLE 7
Regression for Equity Beta as Determined by Advertising Expenditure

	White's Variance Corrected 1998	*White's Variance Corrected 1999*	*White's Variance Corrected 2000*	*White's Variance Corrected 2001*	*Time Series Adjusted for Cross Section*
Panel A. Results without industry dummies					
Intercept	0.1038	−0.3153	−0.4083	−0.2619	−0.2224
	(0.51)	(−1.50)	(−1.93)	(−1.05)	(−1.12)
Log ADVEXP	*−0.0348*	*−0.0608****	*−0.0582****	*−0.0762****	*−0.0597****
	(−1.55)	*(−2.78)*	*(−2.61)*	*(−2.97)*	*(−2.79)*
Log MV	−0.1395***	−0.0856***	−0.1699***	−0.2749***	−0.1656***
	(−4.16)	(−2.58)	(−5.45)	(−6.74)	(−4.94)
Log VOL3Y	0.2381***	0.2445***	0.3198***	0.4047***	0.3020***
	(8.43)	(7.58)	(10.12)	(10.73)	(9.86)
Panel B. Results with industry dummies (only coefficients on test variable and industry dummies are reported)					
Log ADVEXP	*−0.0110*	*−0.0380**	*−0.0467***	*−0.0593***	*−0.0406***
	(−0.48)	*(−1.65)*	*(−2.00)*	*(−2.23)*	*(−1.87)*
Mean industry dummy coefficient[a]	0.1003	0.0455	0.3088	0.2573	0.1888
	(0.51)	(0.24)	(1.33)	(0.98)	(0.92)
F-statistic	24.91	23.06	35.00	40.98	35.31
p value	.0001	.0001	.0001	.0001	.0001
N	179	179	179	179	179
Adjusted R^2	.2861	.2699	.3630	.4012	.3651

NOTE: This table reports the results of the following regression:

$$\text{BETA} = \alpha + \beta_1 \text{Log (ADVEXP)} + \beta_2 \text{Log (MV)} + \beta_3 \text{Log (VOL3Y)} + \beta_{4\text{-}10} \text{IND}_{i,7} + \varepsilon$$

where the dependent variable, BETA, is the equity beta. The test variable is log of ADVEXP, the advertising expenses. Control variables are log of MV, the total market value of common equity; and log of VOL3Y, the 3-year average trailing stock volume. *t*-statistics are in parentheses. The reported coefficients are White's heteroscedasticity (variance) adjusted. Coefficients that are statistically different from zero are marked at the 10%, 5%, and 1% levels with *, **, ***, respectively.

a. Average coefficient and *t*-statistics for seven industry dummies are also reported.

TABLE 8
Correlation Between Advertising Expenditure and Measures of Value Added

	$ADVEXP_{98}$		$ADVEXP_{99}$		$ADVEXP_{00}$		$ADVEXP_{01}$	
MVA_{98}	.569**	(.000)						
MVA_{99}	.398**	(.000)	.406**	(.000)				
MVA_{00}	.367**	(.000)	.373**	(.000)	.408**	(.000)		
MVA_{01}	.396**	(.000)	.396**	(.000)	.406**	(.000)	.377**	(.000)

NOTE: This table reports the correlation between contemporaneous and lagged advertising expense (ADVEXP) and the market value added (MVA). *p*-values are in parentheses. Coefficients that are statistically different from zero are marked at the 10%, 5%, and 1% levels with *, **, ***, respectively. Subscript with the variables indicates the year to which the variable pertains.

present the results for year-by-year as well as pooled-multi-year average cross sections in Table 7.

As expected, advertising expenditure relates significantly and negatively to the market beta of sample firms. This indicates that through product market advertising, firms are able to create capital market visibility and reduce variability of their earnings with respect to market variations. They are thus able to reduce their equity risk and consequently the cost of equity. This lower cost of equity may directly result in the reduction of a firm's WACC. The control variables' coefficients are as expected. Overall, the results in Table 7 suggest that greater advertising expenditure is related to lower cost of equity capital, which in turn reduces WACC.

Impact of Advertising on MVA

The fundamental question that arises pertains to the impact of advertising expenses on corporate value. Although this is not our focus, we present in Table 8 evidence pertaining to positive correlation between a firm's advertising expenditure and the MVA—a measure of corporate performance proposed by Stern Stewart. The results suggest a significant positive relationship between

advertising expenditures and MVA, implying that firms with higher product market advertising also experience greater performance in terms of MVA.

CONCLUSION

In this article, we address the issue of spillover effects of product market advertising into the capital market. Specifically, we investigate three questions: What is the impact of a firm's product market advertising on its overall cost of capital? How does advertising affect the mix of debt and equity? And, what is advertising's impact on a firm's beta and Altman's *Z*-score? Using a sample of U.S. best performing firms from the Stern Stewart database, we conclude that product market advertising expenditures have a positive spillover impact on capital markets in terms of reducing a firm's overall cost of capital. The impact seems to be significant even after controlling for other determinants of cost of capital. In addition, we find that greater advertising associates with lower cost of equity, higher debt utilization, and lower Altman's *Z*-score. Finally, in analyzing corporate value contributions of advertising, we find that firms with higher advertising outlays are also the ones that experience higher performance in terms of MVA.

NOTES

1. We use the term *product market* advertising to connote advertising to promote product/services output to ultimate (final consumers) or intermediate (businesses) actual or potential customers. The term *product market* is used interchangeably with *goods market* in the field of economics to differentiate goods (consumable goods and services as outputs—final or intermediate) market from capital (labor and financial capital) market.

2. The *Z*-score represents the likelihood of insolvency and is generated through multiple discriminant analysis (Altman, 1968).

3. Whereas point a suggests an increase in debt capacity and usage, point b indicates restricted debt usage.

4. In White's adjustment, the variance-covariance matrix is corrected for cross-sectional correlations. Note that without heteroscedasticity, the off-diagonal elements of the variance-covariance matrix (i.e., cross-sectional correlations) are zero. White's method forces these elements to be zero, whereas the "true" variance measures are estimated.

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