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Should Firms Increase Advertising Expenditures during Recessions?

Kristina D. Frankenberger and Roger C. Graham

For consumer and industrial products firms, a recession may be an opportune time to boost ad spending. This study finds that increased ad spending offers financial benefits that extend for at least two years and, just as important, sends a "confidence" signal to firm customers and investors.

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Report Summary
Some advertisers believe that boosting advertising during recessions provides an added benefit in increased sales and profitability. However, evidence for this argument has been weak, first, because it fails to address firm-based (earnings and market value) outcomes, and second, because it has been studied primarily in non-consumer goods industries.

In this report, Frankenberger and Graham extend the investigation of recessionary advertising spending increases and decreases to include financial measures of performance, and compare performance across consumer products, industrial products, and services industries. They conduct an econometric analysis employing cross-sectional time series regression on a sample of 2,662 firms over 16,147 firm-years. They analyze the economy-wide and industry-specific effects that average advertising spending has on earnings and market value, and compare those effects with the effects of increased and decreased advertising spending during recessionary periods.

Their results indicate that advertising creates a firm asset by contributing to financial performance for up to three years in the future. Further, increasing spending on advertising during a recession leads to benefits that exceed the benefits of increasing advertising during nonrecessionary times. However, the effect varies by industry: A performance boost is observed during the recession year and one year following for consumer and industrial products firms, but not for services firms. When firms decrease their advertising during recession, financial performance is eroded only for industrial products firms, and only during the year of the recession.

Frankenberger and Graham conclude that firms should support advertising budgets whenever possible, as advertising in general translates to an asset that is valued by stock market participants. For firms experiencing soft economies in the consumer and industrial products industries, it makes sense to increase budgets during a recession to realize an incremental gain in financial performance. Firms that decide to cut advertising spending during a recession may do so with little cost beyond the recessionary year. ■

Introduction

In a recession, the most productive route for most companies is to increase rather than decrease advertising spending.
—John O'Toole, president of the American Association of Advertising Agencies, 1991

For years, conventional wisdom in the advertising industry has suggested that it is better to increase than decrease advertising expenditures during economic recessions. The assumption is that firms can take advantage of a soft advertising market to increase their advertising relative to the competition. The increased share of industry ad spending and resulting gains in media impact are expected to reduce a recession's effect on the firm's current and future financial performance (American Business Press [ABP] 1993; Biel 1998; Dhalla 1980; O'Toole 1991).

Despite the importance of its strategic implications, the argument for advertising in recession remains largely untested outside the realm of business-to-business advertising. Additionally, its focus has been on indirect measures of success, such as share of market or level of sales, rather than on profitability and return on investment. Although share of market and sales level can reflect a firm's relative competitive position, they may not always be an appropriate indicator of financial success (Day and Fahey 1988). For example, market share does not explicitly consider future cash flows, adjustments for risk, or irregularities due to current U.S. accounting rules and practices (Srivastava, Shervani, and Fahey 1998). Granted that advertising makes a financial contribution to the firm, it must still be shown that investors regard present-day advertising as a firm resource that enhances the firm's value.

This study rethinks the question of advertising during recessions and investigates what financial earnings outcomes are likely to occur when firms increase or decrease advertising spending during recessions. It draws three main conclusions: (1) on average, increases in advertising spending increase a firm's long-term financial performance; (2) increases in advertising during recessions provide a bigger boost to performance than increases in nonrecessionary periods, while decreases in advertising during recessions have little effect on performance beyond the year of the decrease, and (3) industry type plays a role, with advertising spending having a bigger effect in the consumer products and industrial products industries than in the services industry.

The argument for increased advertising during recessions is grounded in a series of studies summarized in the report *Making a Recession Work for You* (ABP 1993). Cumulatively, the studies indicate that firms that do not cut advertising during a recession report higher sales and earnings relative to competitors after a recession. (See Table 1.) The studies are frequently used by others (e.g., Biel 1998; Dhalla 1980; O'Toole 1991) to support arguments to increase advertising spending during recessions, but additional research examining advertising expenditures during recessions is surprisingly absent. Although undeniably important as nearly the only source of research on the topic, the ABP studies are limited in key ways: Data are limited to business-to-business firms, samples include only a few years of data, designs are cross-sectional and restricted to after-only comparisons, and analyses fail to consider variables other than advertising changes that could just as well explain a given outcome. Overall, the ABP report excludes comparisons that would address the more pertinent question of whether the effects of increases or decreases in advertising investments during recessions are any different than the effects of increases or decreases during nonrecessionary periods. In addition, none of the studies explores the effects of advertising changes on financial performance. Because there is increasing recognition that marketing decisions can augment future cash flows and enhance the value of the firm to shareholders (Day and Fahey 1988; Srivastava, Shervani, and Fahey 1999), research needs to investigate the financial repercussions of any given marketing decision.

Table 1
Summary of Studies Reported by the American Business Press

Recessionary Periods Studied	Author or Sponsor	Conclusion
1920s recession	Vaile, *Harvard Business Review*	Biggest sales increases come from companies that increase advertising.
1949, 1954, 1958, 1961 recessions	Buchen Advertising	Companies that cut advertising during recession experience dropped sales and profits.
1970 recession	ABP and Meldrum & Fewsmith	Increased advertising during recession leads to sales or profit advantages (or both) in years following recession.
1974–75 recession	ABP and Meldrum & Fewsmith	Companies that maintain advertising during recession experience higher sales and net income during and after the recession.
1974–75 recession	McGraw-Hill	Advertising during recession creates 132% subsequent 5-year sales growth.
1981–82 recession	McGraw-Hill	Advertising during 1981–82 recession creates 275% sales growth by 1985.
Undisclosed recessionary periods	Cahners Publishing Co. and Strategic Planning Institute	Profit Impact of Marketing Strategies (PIMS) database; advertising during recession creates greater market share gains than decreases do, but there is "no statistically significant difference in the level of profitability [ROI]" (as quoted in American Business press, 1993, p.5).

Source: All studies are as summarized, quoted and/or cited in American Business Press (ABP, 1993). ABP changed its name to American Business Media in June 2000.

Advertising Accountability

A number of studies document the short-term or long-term effects of advertising on current and future sales (Abraham and Lodish 1990; Assmus, Farley, and Lehmann 1984; Clarke 1976; Erickson 1995; Simon and Arndt 1980; Thomas 1989; Tull et al. 1986; Vakratsas and Ambler 1999), but none of these considers recession, and none directly considers advertising's asset influence on earnings and market value. All firm activities are accountable for improving the firm's financial standing in the eyes of its investors, and marketing managers increasingly hold advertising accountable for improving the firm's financial performance. The current trend is to treat advertising like an investment, with payoffs in the form of increased earnings and market value. A growing body of literature supports this position (Srivastava, Shervani, and Fahey 1998, 1999), and empirical studies demonstrate that marketing variables such as perceived product quality (Aaker and Jacobson 1994), brand attitude (Aaker and Jacobson 2001), and Internet and channel additions (Geyskens, Gielens, and Dekimpe 2002) have measurable effects on future earnings.

Investors assess a firm's potential by evaluating its assets, the investments employed by the firm to build its future. Like other investments, assets exhibit growth potential, but not without risk. Investors subjectively weigh growth and risk to derive an expectation about an asset's future contribution to the financial position of the firm. Asset valuations can be relatively straightforward for tangible assets (such as plant and equipment), as they are reported by a firm's accounting system. Valuation of intangible assets (such as advertising or research and development), however, can be problematic because in the United States such expenditures

are expensed as incurred, a practice that is clearly at odds with managers' expectations for their contribution to future sales. One accountant we know equates it to "taking the money invested in advertising and throwing it in a burning barrel." Although expensing remains the accepted accounting procedure for advertising, it is increasingly evident that such intangibles contribute significantly to the financial performance of the firm (Blair and Wallman 2001).

Advertising creates an asset by positively influencing the firm's future cash flows through its contribution to future sales. Future earnings, which capture future cash flows, thereby represent future benefits derived from advertising expenditures. A reasonable estimate of the asset value of advertising expenditures is therefore provided by measuring the influence of the current year's advertising expenditures on future earnings. Furthermore, because the relation between expected future earnings and current market value is firmly established (Ball and Brown 1968), any item contributing to future earnings—in our case advertising expenditures—should also enhance market value. This is not a new notion, and indeed these relations are verified in empirical studies affirming that advertising expenditures represent a firm asset that is interpreted by investors as an indicator of market value (Chauvin and Hirschey 1993; Connolly and Hirschey 1984; Graham and Frankenberger 2000; Hirschey and Weygandt 1985; Peles 1970).

Expectations for increases/decreases in advertising

Advertising is used to gain market share by influencing awareness of a firm and its products. Because advertising increases are expected to boost the number of potential customers that know about a product, such increases are expected to create additional sales. It is difficult, in fact, to argue against the expectation that advertising leads to sales. In a competitive market, non-value-added expenditures are uncompetitive; if there were no value-added benefit to advertising, the practice would have ended long ago, as firms that did not advertise would have outperformed the firms that did. In fact, empirical research does document positive relations between advertising increases and current and future sales (Abraham and Lodish 1990; Assmus, Farley, and Lehmann 1984; Clarke 1976; Erickson 1995; Graham and Frankenberger 2000; Vakratsas and Ambler 1999).

Intuition suggests that increased advertising produces positive results for firm performance, while decreased advertising produces negative effects, but these expectations apply only if advertising strategies are effectively implemented. Holding other factors constant, poor executional elements such as unproductive messages, faulty media choices, or poor message timing may work against the value-adding potential of increases in advertising expenditures. On the other hand, advertising expenditures may already be at optimal levels, such that sales or profits (or both) have already peaked. If so, additional spending will be unlikely to produce incremental gains (Aaker and Carman 1982). Research indicates that managers can be motivated to overadvertise under certain agency and free cash flow conditions (Joseph and Richardson 2002; Aaker and Carman 1982). Overspending on advertising is unlikely to have a positive effect on financial performance.

Alternatively, because primary demand for goods and services is in part a function of general product category awareness, any advertising effort that results in increased category awareness can benefit other firms in the category. Hence, particularly effective media weights and message executions by one or several firms may create advertising spillover that benefits firms who maintain or reduce their budgets. Conceivably, overspending would create a similar effect. Advertising expenditures that are unsuccessful in producing selective (brand or firm) demand may still stimulate primary demand. A famous example of this phenomenon was reported for the Alka-Seltzer brand in the 1970s when advertising for Alka-

Seltzer increased sales for the competing Pepto-Bismol brand. Thus, when category-level advertising spillover or overspending is in place, one or several firms' short-run reductions in advertising may have little long-term effect on their future performance.

Consequences of increases/decreases during recessions

Firms face quite different decision environments during recessionary periods, depending on their relative financial positions before the recession. Firms in weaker pre-recession positions may be forced to cut advertising during the recession. For these firms, advertising is one of several investment opportunities constrained by scarce resources. Advising cash-poor firms to increase recessionary advertising budgets may be unrealistic, especially when a cut to advertising could save jobs or preserve other assets. But what is the cost? If future benefits are a function of current-year expenditures, as research has shown, it is logical to expect that firms who reduce advertising during a recession adversely affect their future earnings. However, because the recession eventually ends with an expanding economy, sales may grow regardless of advertising policy during the recession. It is therefore possible for a decrease in ad spending to be followed by an increase in sales and earnings after the recession. The practical implication of economic recovery is that reduced advertising may bear firms that survive little opportunity cost.

Firms in stronger pre-recession financial positions seemingly have a unique opportunity to increase their future benefits. As other firms succumb to recessionary pressure by reducing promotional spending, stronger firms that can maintain advertising levels could effectively increase the company's share of voice (SOV), the ratio of the company's ad spending relative to total industry spending. This is the foundation upon which the argument for increasing advertising during recession is based (ABP 1993). If budget maintenance during a recession leads to a virtual gain in advertising through increased SOV, it seems logical to expect additional benefits to the firm if advertising spending is increased.

This expected result, however, depends not just on the initial position of the firm, but on the nature of the industry as well. Balasubramanian and Kumar (1990), Farris and Buzzell (1979), and Zinkhan and Cheng (1992) show that advertising levels vary by industry. Also, Graham and Frankenberger (2000) find that the size and duration of advertising assets are a function of industry type. It is therefore prudent to examine industry effects in addition to economy-wide effects when assessing the average contribution of advertising to earnings and market value.

Summary

All things being equal, managers expect advertising increases to enhance firm performance and decreases to dilute it. As we have argued, however, certain conditions provide exceptions to this rule. Advertising increase effects, for example, may be offset by poor strategic execution of advertising plans. Alternatively, if a maximum level of advertising effectiveness has been achieved, advertising increases lead to overspending, leaving no room for cash flow improvements. By the same logic, historic overspending by a firm may cause short-term reductions in advertising to remain unfelt until the budget drops below the optimal level. Additionally, a competitor's overspending may benefit a firm by producing advertising spillover that reduces the performance effects of the firm's own decreases in advertising.

Other factors intervene when we look at advertising increases and decreases during recessions. If the most popular categorywide response during recession is to reduce advertising budgets, it is possible for firms who maintain or increase their advertising to make gains in financial performance through increased SOV. However, if firms have been overspending up until the recession, there may be no marginal increase in financial performance for maintenance of or increases in advertising during the

Table 2
Sample Selection

A: Sample Criteria, Sample Period, and Number of Sample Firms and Firm-Years

	Total calendar years	Calendar years	Total firms	Total firm-year observations
Firms and observations with financial statement data on the 1991-2001 COMPUSTAT tapes	30	1971–2000	6,490	44,515
Sample firms with complete financial data and four years' consecutive data to calculate changes in advertising expenditures	29	1972–2000	2,662	16,147

B: Number of Sample Firms and Firm-Years Categorized by Industry

	All companies	Consumer	Industrial	Services
Number of firms	2,662	994	1,334	334
Number of firm-years	16,147	7,628	6,700	1,819

C: Recession Periods during the Sample Period with Number of Firms and Firm-Years

Recession periods: November 1973–March 1975, January 1980–July 1980, July 1981–November 1982, July 1990–March 1991	Total firms	Total firm-year observations
Sample firms and observations during recession years	1,564	3,334
Sample firms and observations the first year following a recession	1,422	2,114
Sample firms and observations the second year following a recession	1,507	2,283

Note: Recession years are based on changes in inflation-adjusted economy-wide advertising spending.

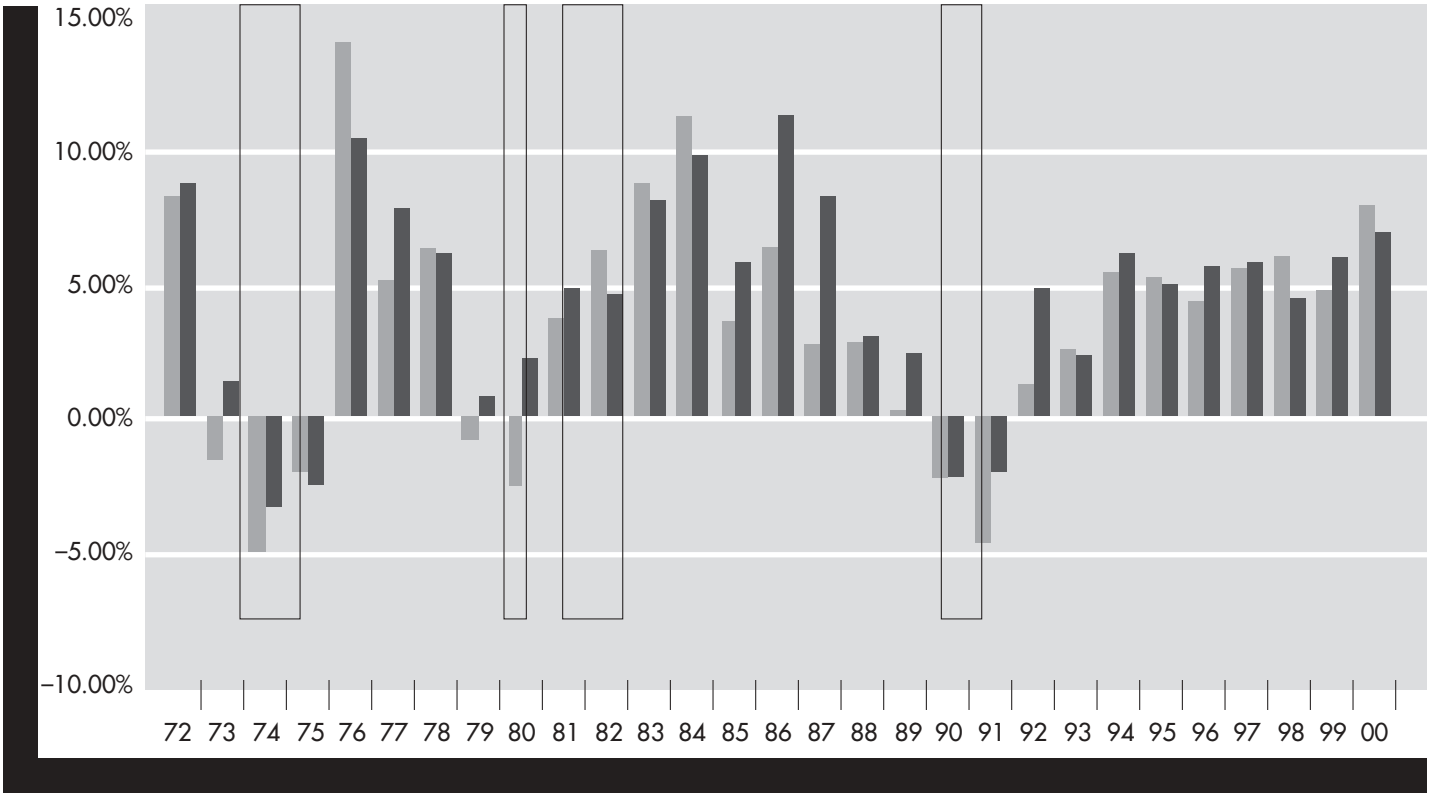
recession. Additionally, there may be no penalty for firms that decrease their budgets. Finally, given the inevitability of economic expansion, there is even less room for recessionary advertising increases to provide a marginal benefit over nonrecessionary increases.

From the preceding discussion we formulate the following expectations:

1. As past research suggests, advertising should provide a benefit beyond current sales and share; that is, advertising should contribute to firm earnings and market value.
2. Contrary to the advertising-in-recession argument, firm performance does not necessarily increase and may actually decrease if firms increase advertising during a recession. Similarly, recessionary advertising decreases may not adversely influence firm performance.
3. Because past research verifies an industry effect on financial performance measures, an industry effect should be observable for increases and decreases in advertising for both the base case of firms not in a recession and in the test case of firms in a recession.

Figure 1

Percentage Changes in Yearly Inflation-Adjusted Advertising Expenditures, 1972–99



Notes: Yearly inflation-adjusted advertising expenditures for the U.S. economy and for the firms represented in the COMPUSTAT data base. The U.S. data is from McCann-Erickson, Inc. The two series have a .89 correlation. Boxed areas represent recessions identified by the National Bureau of Economic Research (NBER).

Sample

COMPUSTAT tapes provided annual accounting and stock market data for approximately 10,000 companies listed on the public stock exchanges. We omitted years missing key variables and eliminated any series of annual data that had less than four consecutive years of advertising expenditures on the basis of research that shows a four-year advertising contribution to earnings (Graham and Frankenberger 2000). The final sample includes 2,662 firms with 16,147 firm-years of usable data, covering 1972–2000 (see Table 2).

We divided the sample into three categories of firms: those selling consumer products (that is, selling manufactured products to final consumers), those selling industrial products (selling manufactured products to other firms), and service firms (those selling intangible products to other firms or final consumers). Precedent for these classifications comes from past research examining the influence of industry classifications on marketing performance (Graham and Frankenberger 2000; Zinkhan and Cheng 1992). Firms were categorized based on the business and largest market descriptions provided in each company's schedule 10-K.

Table 3

Mean (Median) Financial Values of Firms Reporting Four Consecutive Years of Advertising Expenditures, 1971–2000

	Industry			
	All	**Consumer**	**Industrial**	**Services**
Number of firms	2,662	994	1,334	334
Number of firm-years	16,147	7,628	6,700	1,819
Market value	$3,059	$3,464	$2,708	$2,554
	($232)	($432)	($112)	($340)
Assets	$1,896	$2,405	$1,261	$2,096
	($140)	($237)	($69)	($182)
Shareholders' equity	$616	$737	$494	$560
	($62)	($102)	($36)	($54)
Sales	$1,934	$2,747	$1,144	$1,432
	($187)	($400)	($82)	($138)
Operating earnings	$396	$513	$277	$340
	($31)	($55)	($15)	($34)
Advertising expenditures	$63	$101	$29	$30
	($5)	($13)	($1)	($4)
R&D expenditures	$119	$200	$79	$235
	($6)	(12)	($4)	($1)
Firms reporting R&D	46%	30%	74%	5%

Notes: Market value equals end-of-year share price multiplied by number of common shares outstanding. Earnings equals earnings before depreciation and research and development and advertising expenditures. All dollar values are in millions.

Recessionary periods are available from the National Bureau of Economic Research (NBER), accessible online at http://www.nber.org/cycles.html. The recessionary periods roughly cover fourth-quarter 1973 through first-quarter 1975, first- through second-quarter 1980, third-quarter 1981 through fourth-quarter 1982, and third-quarter 1990 through first-quarter 1991. We classify a firm-year as occurring during a recession if the majority of its fiscal year occurred during a recessionary period. Approximately 21% of the firm-year observations are for recession years, 13% are for the first year after a recession period and 14% are for the second year after a recession period. The remaining 52% represent other nonrecessionary years.

To validate the recession year classifications, we compared them to periods of economy-wide declines in advertising expenditures reported by the McCann-Erickson WorldGroup (http://www.mccann.com/insight/bobcoen.html). After inflation adjustments, total advertising spending declined during the years 1973–75, 1979–80, and 1990–91. Although advertising recessions began and ended a bit earlier in the 1980s and 1990s, regression results using these years are effectively the same as those using the NBER periods. Figure 1 charts the percentage changes in yearly inflation-adjusted U.S. advertising expenditures along with the percentage changes in mean yearly inflation-

adjusted advertising expenditures for our COMPUSTAT sample. The two series, which are correlated at $r = .89$, are remarkably similar. We are therefore confident that the periods we identified as recessionary were indeed periods of economic slowdown.

Model: Estimating Advertising-Earnings Relation

Earnings are a function of all firm assets. For accounting purposes, assets are categorized as tangible or intangible. Because there is no objective standard for measuring advertising and research and development as intangible assets, current accounting procedure expenses these expenditures at the time they occur. However, if advertising and R&D expenditures contribute to future earnings, it follows that earnings in any particular year are determined to some extent by both prior-year and current-year expenditures. Therefore, the asset values of advertising and R&D expenditures by definition equal the contribution of each year's expenditures to future earnings:

$$\text{Earnings}_{it} = g\,(\text{ATGassets}_{it}, \text{RDasset}_{it}, \text{ADasset}_{it}) \quad (1)$$

where ATGassets equals the tangible and intangible assets recorded by firm i's accounting system, RDasset equals the R&D asset, ADasset equals the advertising asset, and g equals the earnings process.

The R&D asset (RDasset) in Equation 1 can be defined as $\sum \eta_{i,t-k} * \text{RD}_{i,t-k}$ where $\eta_{i,t-k}$ is the contribution of a dollar in R&D expenditure in year $t-k$ ($k = 0, \ldots, n$) to earnings in year t (Lev and Sougiannis 1996). Similarly, the advertising asset (ADasset) can be defined as $\sum \nu_{i,t-k} * \text{AD}_{i,t-k}$ where $\nu_{i,t-k}$ is the contribution of a dollar in advertising expenditure in year $t-k$ ($k = 0, \ldots, n$) to earnings in year t (Graham and Frankenberger 2000). Substituting the two asset definitions into Equation 1 results in

$$\text{Earnings}_{it} = g(\text{ATGassets}_{it}, \sum \eta_{i,t-k} * \text{RD}_{i,t-k}, \sum \nu_{i,t-k} * \text{AD}_{i,t-k}) \quad (2)$$

Results

A listing of mean and median market value and average accounting values for the sample firms is presented in Table 3. Means are larger than medians in all cases, indicating the need to scale the data to compensate for the influence of different-sized firms in our regressions. The skewness results from some very large firms in our sample and violates an assumption of normality. Scaling, or dividing by a size-related variable such as assets or sales, substantially reduces the presence of non-normalities in financial data; c.f. Foster (1986).

Consumer products firms show the largest mean market values, assets, shareholders' equity, sales, and operating earnings ($3,464, $2,405, $737, $2,747, and $513 million, respectively). Consumer products firms also have the largest mean advertising expenditures ($101 million). Only 30% of the consumer products firms report research and development expenditures (mean = $200 million). Industrial products firms show smaller mean market values and the smallest mean assets, shareholders' equity, sales, and operating earnings ($2,708, $1,261, $494, $1,144, and $277 million, respectively). Industrial products firms have the smallest mean advertising expenditures ($29 million), but the largest percentage of firms (74%) reporting R&D expenditures (mean = $79 million). Service firms have the smallest mean market values and larger mean assets, shareholders' equity, sales, and operating earnings ($2,554, $2,096, $560, $1,432, and $340 million, respectively) and advertising expenditures ($30 million). Only 5% of the service firms report R&D expenditures (mean = $235 million). Graham and Frankenberger (2000) and Zinkan and Cheng (1992) report similar

differences between consumer, industrial, and service advertisers.

General Advertising-Earnings Regression Model

We operationalize the earnings-asset relation expressed in Equation 2 with the following regression model:

$$\text{Earnings}_{i,t} = \beta_0 + \beta_1\text{Assets}_{i,t} + \beta_2[\Sigma\eta_{i,t-k} * \text{RD}_{i,t-k}] + \beta_3\text{ADV}_{i,t} + \beta_4\text{ADdif}_{i,t-1\text{ to }t} + \beta_5\text{ADdif}_{i,t-2\text{ to }t-1} + \beta_6\text{ADdif}_{i,t-3\text{ to }t-2} + \beta_7\text{MADV}_{i,t} + \beta_8\text{MADdif}_{i,t-1\text{ to }t} + \beta_9\text{MADdif}_{i,t-2\text{ to }t-1} + \beta_{10}\text{MADdif}_{i,t-3\text{ to }t-2} + \beta_{11}\text{ROI}_{i,t-1} + \beta_{12}\text{Debt}_{i,t-1} + e_{i,t} \quad (3)$$

where:
Earnings = operating income
Assets = accounting assets
RD = research and development expense
ADV = advertising expense
ADdif = year-on-year differences in advertising expense
MADV = mean sample or industry advertising-to-sales ratios
MADdif = year-on-year changes in the mean advertising to sales ratios of the other firms in the sample
ROI = net income divided by average common shareholders' equity
Debt = total liabilities

For our purpose, earnings must represent the effect of tangible and intangible assets, including the effect of the unrecorded intangible assets—advertising and R&D. Earnings are therefore defined as operating income before subtracting depreciation, advertising, and R&D expenses. Depreciation is not subtracted because it is a "paper" expense that does not represent a physical flow of cash out of the firm. To subtract depreciation would artificially underestimate the actual cash flowing into the firm. We do not subtract advertising and R&D because they represent arbitrary write-offs of unrecorded assets. The inclusion of advertising, R&D, and depreciation is in our case primarily a theoretical distinction, however, as regression results using net income and operating income after subtracting depreciation, advertising, and R&D obtain similar results.

R&D expenses, a significant unrecorded asset, would likely result in a missing-variable problem if not included in our regressions (Lev and Sougiannis 1996). However, R&D expenditures are reported by only 46% of the firms in our sample (approximately 30% of the consumer products companies, 74% of the industrial products companies, and 5% of the service firms). To simultaneously estimate the contribution of R&D and advertising to earnings would considerably reduce our sample and potentially misrepresent the average R&D effect. One way to avoid these problems is to borrow an R&D estimate from another piece of research, a procedure commonly adopted in finance research when sample sizes are too small to meaningfully estimate regression parameters. For the R&D effect we therefore borrow the Lev and Sougiannis parameter estimates (the η) of the yearly contribution of R&D expenditures to current earnings. Thus, $\Sigma\eta_{i,t-k} * \text{RD}_{i,t-k}$ equals the sum of the yearly reported R&D values multiplied by the regression coefficients reported by Lev and Sougiannis representing R&D's yearly contributions to earnings across the various industries (e.g., for industrial products firms, $\Sigma\eta_{i,t-k} * \text{RD}_{i,t-k} = (1.09 * \text{RD}_t) + (1.10 * \text{RD}_{t-1}) + (.81 * \text{RD}_{t-2})$). However, we also estimated η's ourselves, using data from firms reporting R&D expenditures, with results similar to those reported below.

Model 2 predicts that current- and prior-year advertising levels contribute to current-year earnings. However, yearly advertising levels are likely to be serially correlated. Therefore in our regressions we separate yearly advertising levels into two components: current-year advertising expenditures (ADV) and year-on-year change in advertising expenditures (ADdif). Placed together in the regression, the β_3 coefficient (ADV) represents the aggregate contribution of

Table 4

General Relation between Advertising Changes and Earnings

$$\text{Earnings}_{i,t} = \beta_0 + \beta_1\text{Assets}_{i,t} + \beta_2[\Sigma\eta_{i,t-k} * \text{RD}_{i,t-k}] + \beta_3\text{ADV}_{i,t} + \beta_4\text{ADdif}_{i,t-1\text{ to }t} + \beta_5\text{ADdif}_{i,t-2\text{ to }t-1} + \beta_6\text{ADdif}_{i,t-3\text{ to }t-2} + \beta_7\text{MADV}_{i,t} + \beta_8\text{MADdif}_{i,t-1\text{ to }t} + \beta_9\text{MADdif}_{i,t-2\text{ to t}-1} + \beta_{10}\text{MADdif}_{i,t-3\text{ to t}-2} + \beta_{11}\text{ROI}_{i,t-1} + \beta_{12}\text{Debt}_{i,t-1} + e_{i,t}$$

		Assets	RD	ADV	ADdif			MADV	MADdif			ROI	Debt		
	β_0	β_1	β_2	β_3	β_4	β_5	β_6	β_7	β_8	β_9	β_{10}	β_{11}	β_{12}	*n*	Adj.R^2
All	.088 *	.080 ***	.458 ***	1.334 ***	.630 ***	.380 ***	.211 ***	–.068 **	12.583 ***	8.395 ***	5.789 ***	.811 *	–.029 ***	16,147	.84
Consumer	.158	.078 ***	.541 ***	1.230 ***	.516 ***	.304 ***	.149 **	–.101	8.878 ***	5.536 ***	4.337 ***	.664	–.054 ***	7,628	.87
Industrial	.040	.078 ***	.441 ***	1.434 ***	1.178 ***	.597 **	.270 *	–.027	14.575 ***	10.272 ***	4.297 ***	.558	–.019 *	6,700	.85
Service	–.071	.072 ***	.544 **	1.778 ***	.402	.528 *	.337	–.047	21.023 ***	11.491 **	15.952 ***	26.776 **	–.036 *	1,819	.79

Notes: Earnings equals operating earnings before depreciation, advertising, and research and development expenditures; Assets equals average plant and equipment, inventory, and long-term investments; $\Sigma\eta_{i,t-k} * \text{RD}_{i,t-k}$ equals the four-year contribution of research and development expenditures to earnings; ADV equals current-year advertising expenditures; and ADdif equals year-on-year differences in advertising expenditures. MADV equals the mean current-year advertising expenditures and MADdif equals the mean year-on-year change in advertising for the firms in each regression. ROI equals prior-year return on equity; Debt equals prior-year liabilities. *p*-values (*** ≤ .001, ** ≤ .01, * ≤.05, two-tailed) are derived using White's (1980) consistent covariance estimates.

current- and prior-year average advertising expenditure to current- and future-year earnings, while the β_4 through β_6 coefficients (ADdifs) represent the *incremental* contributions of year-to-year differences in advertising expenditures to current- and future-year earnings. Thus, the sum of $\beta_3 * \text{ADV}_t$, $\beta_4 * \text{ADdif}_{t-1\text{ to }t}$, $\beta_5 * \text{ADdif}_{t-2\text{ to }t-1}$, and $\beta_6 * \text{ADdif}_{t-3\text{ to }t-2}$ provides an estimate of the advertising asset $\Sigma\nu_{i,t-k} * \text{AD}_{i,t-k}$. However, the ADdif variables are our primary variables of interest.

See Appendix 1 for a discussion of specification errors of Model 3.

Advertising-earnings regression results

Table 4 presents the earnings regression results for the combined sample and the results for consumer products, industrial products, and service firms. Average assets, research and development expenditures, and advertising expenditures contribute to earnings for more than one period, as shown by estimates β_1 through β_3. The coefficient relating assets to earnings (β_1) is statistically significant at the less-than-.001 level in all four regressions. The coefficient for the contribution of R&D expenditures to earnings (β_2) is also statistically significant at the .01 level in all of the regressions.

Advertising makes its greatest contribution to earnings in the year of the expenditure and then declines over subsequent years. All regressions show current-year advertising coefficients (β_3) greater than one for relations between current-year advertising and earnings. The presence of coefficients greater than one implies that the contribution of an advertising expenditure

exceeds the nominal value of the expenditure, which indicates that advertising creates value when the present value of this benefit exceeds its cost. Service firms receive the largest current-year value for advertising expenditures, with a first-year contribution (β_3) of 1.778 times the cost. The β_4 through β_6 coefficients (ADdifs) are positive in all four regressions and different from zero in all but the service company regression. Thus it appears that changes in inflation-adjusted advertising expenditures incrementally contribute to current- and future-year earnings. Service firms show the fewest advertising asset years, with only the second-year coefficient (β_8) different from zero.

Of our covariate variables, mean year-on-year industry-level changes in advertising (MADdifs, $\beta_8 - \beta_{10}$) and prior-year liabilities (Debt, β_{12}) are consistent explainers of current-year earnings. The significance of the MADdif variables suggests a strong relation between a firm's earnings and the general advertising levels of other firms. Whether the general advertising levels represent spillover effects or general economy-wide factors is not clear. Even so, the significance of the MADdif variables suggests that the simultaneity controls are important factors in explaining current- and future-year earnings. However, the significance of the ADdif variables suggests that firms' own advertising policies are equally important.

Only the all-firms regression shows a current-year earnings effect for mean advertising expenditures (MADV, β_7). The effect of prior-year return-on-equity (ROI, β_{11}) in the all-firms regression is perhaps a reflection of its strong effect on earnings in the service firms regression.

Market value and advertising assets

We use a regression based on the theoretical work of Tobin (1978) to provide confidence that our procedures are capturing advertising's economic value. A firm's market value in the Tobin context is expressed as $\text{MarketValue}_{i,t} = q(\text{Assets}_{i,t} - \text{Liabilities}_{i,t})$ where q is a multiplier (hypothetically equaling one). We add the unrecorded R&D and advertising assets to the Tobin model to obtain Equation 4.

$$\text{MarketValue}_{i,t} = \beta_0 + \beta_1\text{NETassets}_{i,t} + \beta_2\text{RDasset}_{i,t} + \beta_3\text{ADasset}_{i,t} + e_{i,t} \quad (4)$$

where MarketValue equals the end-of-year share price multiplied by number of common shares outstanding and NETassets equals recorded assets less recorded liabilities and preferred stock.

Both RDasset and ADasset are calculated by summing prior-year expenditures' remaining contributions to earnings. Estimates of advertising expenditures' contributions to earnings are derived from the earnings regressions shown in Table 4. Because the three-year base advertising expenditure (ADV) contributes to earnings over three years, the current year and two future years, the current-year advertising assets includes the contribution of the advertising base to two future years. Similarly, changes in advertising (ADdif) contribute to current-year earnings and for up to two future years' earnings. Thus, current-year advertising changes contribute to two future years, and prior-year advertising changes contribute to one future year. As an example, the average consumer products firm's advertising asset is calculated (ADV * 1.230) + [$\text{ADdif}_{t-1\text{ to }t}$ * (.304 + .149)] + ($\text{ADdif}_{t-2\text{ to }t-1}$ * .149). R&D asset values are calculated similarly using the coefficients supplied by Lev and Sougiannis (1996).

Issues of aggregation bias

As discussed in Appendix 1, aggregation bias can affect the size of the coefficients resulting from this analysis. However, the level of aggregation should not affect the conclusions regarding recessionary effects. What is important here is not which level of aggregation is used, but that the level that is used remains consistent across recessionary and nonrecessionary economic periods. Furthermore, annual data provide a planning period of sufficient

Table 5

Regression Coefficients for the Advertising Asset-Market Value Relation

$$\text{MarketValue}_{i,t} = \beta_0 + \beta_1 \text{NETassets}_{i,t} + \beta_2 \text{RDasset}_{i,t} + \beta_3 \text{ADasset}_{i,t} + e_{i,t}$$

A: ADasset Calculated Based on Table 4 Coefficients

		NETassets	RDasset	ADasset		
Industry	β_0	β_1	β_2	β_3	***n***	**Adj. R^2**
All	7.494 *	3.692 ***	3.254 ***	8.523 ***	12,981	.23
Consumer	17.055	3.798 ***	.843	6.143 ***	6,233	.23
Industrial	7.363 **	3.123 ***	4.500 ***	11.286 ***	5,546	.25
Service	1.386	5.048 ***	4.494	6.965 *	1,202	.21

B: ADasset Calculated Using Koyck Procedure

		NETassets	RDasset	ADasset		
Industry	β_0	β_1	β_2	β_3	***n***	**Adj. R^2**
All	7.511 *	3.788 ***	3.310 ***	10.650 ***	12,981	.23
Consumer	17.023	3.828 ***	.861	7.245 ***	6,233	.23
Industrial	7.276 **	3.132 ***	4.508 ***	18.418 ***	5,546	.25
Service	1.312	5.112 ***	4.540	13.724	1,202	.21

Notes: MarketValue equals end-of-year share price multiplied by number of common shares outstanding; NETassets equals recorded assets less recorded liabilities and preferred stock. RDasset equals the four-year contribution of research and development expenditures to earnings. ADasset equals the asset value of advertising expenditure changes derived from the regression results shown in Table 4 in Panel A and the asset value of advertising derived using the Koyck (1954) procedure in Panel B.

p-values (*** ≤ .001, ** ≤ .01, * ≤ .05, two-tailed) are derived using White's (1980) consistent covariance estimates.

Table 6
Implied Average Advertising Asset Values

Industry	All Firm-Years	Percentage of Reported Assets	Recession Increases	Percentage of All Firm-Years	Recession Decreases	Percentage of All Firm-Years
All	$82 ($62)	4.3 (3.3)	$89*	8.5	$82	-
Consumer	$124 ($99)	5.2 (4.1)	$132*	6.5	$124	-
Industrial	$42 ($28)	3.3 (2.2)	$47*	11.9	$39*	7.1
Service	$54 ($30)	2.6 (1.43)	$53	-	$53	-

Notes: Advertising assets calculated by multiplying each firm-year advertising and advertising change variable by coefficients obtained from the regressions shown in Table 7. ( ) values obtained from Koyck distributed-lag procedure. Dollar values are in millions. * Different from all-years value at *p*-values ≤ .001. Hyphen (-) represents no change.

duration to capture postrecession effects from in-recession changes in advertising policy.

Results of the Regressions

Panel A of Table 5 presents the results of the market value regressions (Equation 4). The number of firm-years is lower than in the earnings regression because some firms have missing market value data. As expected, and consistent with prior market research (Fama 1970), the coefficients relating net assets to market value (β_1) are significant in all four regressions (p-values ≤ .001). The β_1 coefficients are all greater than one, suggesting that accounting values are significantly less than their market values. Also as expected, and consistent with Lev and Sougiannis (1996), the coefficients relating the R&D assets to market value (β_2) are positive in all four regressions, although different from zero in only two. The two regressions that are not different from zero are the consumer and service firms regressions, the two industries with the lowest percentage of firms reporting R&D expenditures. The β_2 coefficient is largest for industrial products firms (4.500), suggesting the greater importance of R&D for firms in that industry.

All regressions show a statistically significant relation between advertising asset value and market value. The coefficient relating the advertising asset to market value (β_3) is largest for industrial products firms, suggesting the importance of the three-year advertising effect to the firms in this industry (11.286, p-value ≤ .001). Consumer products firms show the smallest β_3 coefficient (6.143, p-value ≤ .001). The results provide additional evidence that market participants consider advertising assets when valuing firms.

Advertising assets and the Koyck distributed-lag model

Our calculation of advertising asset value is derived by summing the contributions to earnings of current- and prior-year advertising expenditures. A familiar alternative approach is described in Koyck (1954) and elsewhere. In

our context, the Koyck model takes the form $Earnings_{i,t} = \beta_0 + \lambda Earnings_{i,t-1} + \beta_1 + ADV_{i,t} + [\beta_2 Assets_{i,t} + \beta_3(\Sigma\eta_{i,t-k} * RD_{i,t-k}) + \beta_4 MADV_{i,t} + \beta_5 ROI_{i,t-1} + \beta_6 Debt_{i,t-1}] + e_{i,t}$ with the response to advertising calculated as $\beta_1 * ADV_{i,t} + (\lambda * \beta_1 * ADdif_{i,t-1 \text{ to } t}) + (\lambda^2 * \beta_1 * ADdif_{i,t-2 \text{ to } t-1}) + (\lambda^3 * \beta_1 * ADdif_{i,t-3 \text{ to } t-2})$. Panel B of Table 5 shows the advertising asset-market value regression results using Koyck estimates of advertising value. Pearson correlations of the advertising-asset variable and the Koyck advertising variable result in r_P coefficients of approximately .96, suggesting they may be derived from similar underlying economic processes. Given the high correlation between the two variables, the only meaningful difference between them rests in the magnitudes of the coefficients on the ADasset variable (β_3).

The first two columns of Table 6 present advertising asset values calculated using our approach and the Koyck procedure, with the Koyck values shown in parentheses. Overall, advertising assets average $82 million and approximately 4.3% of average reported assets. As a percentage of total assets, implied advertising assets are largest in the consumer products industry (5.2%) and smallest in the services industry (3.3%). In all cases, smaller average values for advertising assets are derived from the Koyck model compared with the model provided in Table 4.

The Koyck procedure, therefore, provides added confidence in the reliability of our results. A benefit of our procedure over the Koyck procedure, however, is its ability to test whether differential year-by-year effects occur during recessions. We now examine how yearly advertising changes during recessions are reflected in current and future earnings.

Incremental effects: increases/decreases in advertising during recessions

We separate the effects of increases in advertising during recessions and decreases in advertising during recessions from effects during nonrecessionary periods with a modification to Equation 4. The modification involves a dummy variable technique described in Neter, Wasserman, and Kuter (1983, 337–9). Specifically we use indicator variables (I_R, D_R, and R) to add interaction variables such that Equation 4 becomes

$$\begin{aligned} Earnings_{i,t} &= \beta_0 + \beta_1 Assets_{i,t} + \beta_2(\Sigma\eta_{i,t-k} * RD_{i,t-k}) \\ &+ \beta_3 ADV_{i,t} + \beta_{4.0} ADdif_{i,t-1 \text{ to } t} + \beta_{4.1} I_R * ADdif_{t-1 \text{ to } t} \\ &+ \beta_{4.2} D_R * ADdif_{i,t-1 \text{ to } t} \\ &+ \beta_{5.0} ADdif_{i,t-2 \text{ to } t-1} + \beta_{5.1} I_R * ADdif_{i,t-2 \text{ to } t-1} \\ &+ \beta_{5.2} D_R * ADdif_{i,t-2 \text{ to } t-1} + \beta_{6.0} ADdif_{i,t-3 \text{ to } t-2} \\ &+ \beta_{6.1} I_R * ADdif_{i,t-3 \text{ to } t-2} + \beta_{6.2} D_R * ADdif_{i,t-3 \text{ to } t-2} \\ &+ \beta_7 MADV_{i,t} + \beta_{7.1} R * MADV_{i,t} \\ &+ \beta_8 MADdif_{i,t-1 \text{ to } t} + \beta_{8.1} R * MADdif_{i,t-1 \text{ to } t} \\ &+ \beta_9 MADdif_{i,t-2 \text{ to } t-1} + \beta_{9.1} R * MADdif_{i,t-2 \text{ to } t-1} \\ &+ \beta_{10} MADdif_{i,t-3 \text{ to } t-2} + \beta_{11} R * MADdif_{i,t-3 \text{ to } t-2} \\ &+ \beta_{12} ROI_{i,t-1} + \beta_{13} Debt_{i,t-1} + e_{i,t} \end{aligned} \quad (5)$$

where all variables are as previously defined except for I_R (D_R) that takes the value of one if advertising during a recession increased (decreased) and zero otherwise and R that takes the value of one if a recession year and zero otherwise.

In Equation 5 the coefficients $\beta_{4.0}$, $\beta_{5.0}$, and $\beta_{6.0}$ represent the contribution of advertising changes to current and future earnings when the advertising changes occur during nonrecessionary periods. These coefficients are expected to be positive and different from zero, consistent with the results shown in Table 4. Also in Equation 5, the coefficients $\beta_{4.1}$, $\beta_{5.1}$, and $\beta_{6.1}$ represent the *incremental* contributions of increases in advertising expenditures during recessionary periods. The multipliers relating recession-year advertising increases to current and future earnings are calculated by combining $\beta_{4.0}$ with $\beta_{4.1}$, $\beta_{5.0}$ with $\beta_{5.1}$, and $\beta_{6.0}$ with $\beta_{6.1}$. If advertising increases during recessions have different effects from increases during nonrecessionary periods, then $\beta_{4.1}$, $\beta_{5.1}$, and $\beta_{6.1}$ coefficients will be different from zero. A positive, nonzero coefficient will indicate that advertising increases during recessions create more value than advertising increases during nonrecessionary periods.

Table 7

Effects of Advertising Changes during Recessions

$$\text{Earnings}_{i,t} = \beta_0 + \beta_1\text{Assets}_{i,t} + \beta_2(\Sigma\eta_{i,t-k} * \text{RD}_{i,t-k}) + \beta_3\text{ADV}_{i,t} + \beta_{4.0}\text{ADdif}_{i,t-1\text{ to }t} + \beta_{4.1}\text{I}_\text{R}*\text{ADdif}_{t-1\text{ to }t} + \beta_{4.2}\text{D}_\text{R}*\text{ADdif}_{t-1\text{ to }t} + \beta_{5.0}\text{ADdif}_{i,t-2\text{ to }t-1} + \beta_{5.1}\text{I}_\text{R} * \text{ADdif}_{i,t-2\text{ to }t-1} + \beta_{5.2}\text{D}_\text{R}*\text{ADdif}_{i,t-2\text{ to }t-1} + \beta_{6.0}\text{ADdif}_{i,t-3\text{ to }t-2} + \beta_{6.1}\text{I}_\text{R} * \text{ADdif}_{i,t-3\text{ to }t-2} + \beta_{6.2}\text{D}_\text{R} * \text{ADdif}_{i,t-3\text{ to }t-2} + \beta_7\text{MADV}_{i,t} + \beta_{7.1}\text{R} * \text{MADV}_{i,t} + \beta_8\text{MADdif}_{i,t-1\text{ to }t} + \beta_{8.1}\text{R} * \text{MADdif}_{i,t-1\text{ to }t} + \beta_9\text{MADdif}_{i,t-2\text{ to }t-1} + \beta_{9.1}\text{R} * \text{MADdif}_{i,t-2\text{ to }t-1} + \beta_{10}\text{MADdif}_{i,t-3\text{ to }t-2} + \beta_{11}\text{R} * \text{MADdif}_{i,t-3\text{ to }t-2} + \beta_{12}\text{ROI}_{i,t-1} + \beta_{13}\text{Debt}_{i,t-1} + e_{i,t}$$

		Assets	RD	ADV	$\text{ADdif}_{t-1\text{ to }t}$			$\text{ADdif}_{t-2\text{ to }t-1}$			$\text{ADdif}_{t-3\text{ to }t-2}$				
						I_R	D_R		I_R	D_R		I_R	D_R		
Industry	β_0	β_1	β_2	β_3	$\beta_{4.0}$	$\beta_{4.1}$	$\beta_{4.2}$	$\beta_{5.0}$	$\beta_{5.1}$	$\beta_{5.2}$	$\beta_{6.0}$	$\beta_{6.1}$	$\beta_{6.2}$	***n***	**Adj. R^2**
All	.069	.079 ***	.455 ***	1.289 ***	.622 ***	1.506 ***	−.822 *	.338 ***	1.805 ***	−.162	.250 ***	.078	.070	16,147	.86
Consumer	.115	.077 ***	.537 ***	1.199 ***	.495 ***	1.226 *	−.593	.267 **	1.568 **	−.077	.062 *	.066	.062	7,628	.88
Industrial	.010	.077 ***	.439 ***	1.358 ***	1.222 ***	2.322 **	−1.169 *	.631 **	1.780 *	.114	.543 ***	.161	−.623	6,700	.85
Service	−.082	.071 ***	.550 **	1.752 ***	.389	1.645	−.817	.481 *	1.823	.387	.217	−.817	.799	1,819	.79

Notes: Earnings equals operating earnings before depreciation, advertising and research, and development expenditures; Assets equals average plant and equipment, inventory, and long-term investments; $\Sigma\eta_{i,t-k} * \text{RD}_{i,t-k}$ equals the four-year contribution of research and development expenditures to earnings; ADV equals current-year advertising expenditures; and ADdif equals year-on-year differences in advertising expenditures. I_R (D_R) is an indicator variable equaling one if advertising during a recession increased (decreased) and zero otherwise. MADV equals the mean current-year advertising expenditures, and MADdif equals the mean year-on-year change in advertising for the firms in each regression. R is an indicator variable equaling one if a recession year and zero otherwise. ROI equals prior-year return on equity and Debt equals prior year liabilities. MADV, MADdif, ROI, and Debt results are essentially as shown in Table 4.
p-values (*** ≤ .001, ** ≤ .01, * ≤ .05, two-tailed) are derived using White's (1980) consistent covariance estimates.

The $\beta_{4.2}$, $\beta_{5.2}$, and $\beta_{6.2}$ coefficients represent the *incremental* multipliers for decreases in advertising during recessions with respect to the multipliers for nonrecessionary periods ($\beta_{4.0}$, $\beta_{5.0}$, and $\beta_{6.0}$). The multipliers relating recession-year advertising decreases to earnings are calculated by combining $\beta_{4.0}$ with $\beta_{4.2}$, $\beta_{5.0}$ with $\beta_{5.2}$, and $\beta_{6.0}$ with $\beta_{6.2}$. If decreasing advertising expenditures during recessions erodes value more than decreasing expenditures during nonrecessionary periods, then the $\beta_{4.2}$, $\beta_{5.2}$, and $\beta_{6.2}$ coefficients will be positive and different from zero.

Table 7 presents the overall and industry regression results testing for differential effects for increases and decreases in advertising expenditures during recessions. The coefficients relating general current- and prior-period advertising changes during nonrecessionary periods ($\beta_{4.0}$, $\beta_{5.0}$, and $\beta_{6.0}$) across all the companies and the three industry regressions are generally similar in size and significance to their counterparts in Table 5. Specifically, the coefficients are positive and different from zero in all regressions except the service industry regression. In that regression, the first- and third-year

advertising effects ($\beta_{4.0}$ and $\beta_{6.0}$) are positive but not different from zero. Also, and consistent with the results presented in Table 5, the multipliers on advertising changes decline with time. Except for the service industry regression, the largest multiplier occurs for current-year changes and the smallest multiplier occurs for third-year advertising changes.

Our tests of recessionary advertising changes indicate positive incremental effects for increasing advertising during a recession for the recession year and for the following year. The $\beta_{4.1}$ coefficients, relating current year-on-year recessionary advertising increases, are positive in all regressions and different from zero in the all-companies, consumer, and industrial firms regressions ($\beta_{4.1}$ = 1.506, p-value ≤ .001; $\beta_{4.1}$ = 1.226, p-value ≤ .05; and $\beta_{4.1}$ = 2.322, p-value ≤ .01). Therefore, the multiplier for current-year recessionary advertising increases exceeds the multiplier for current-year nonrecessionary periods; .622 against 2.128 (.622 + 1.506) for the all-companies regression; .495 against 1.721 (.495 + 1.226) for the consumer firms regression; and 1.222 against 3.544 (1.222 + 2.322) for the industrial firms regression. The $\beta_{5.1}$ coefficients, relating one-year-prior recessionary advertising increases, are also positive in all regressions and different from zero in the all-companies, consumer, and industrial firms regressions ($\beta_{5.1}$ = 1.805, p-value ≤ .001; $\beta_{5.1}$ = 1.568, p-value ≤ .10; and $\beta_{5.1}$ = 1.780, p-value ≤ .05).

Our tests of recessionary decreases in advertising indicate few incremental effects. The $\beta_{4.2}$ coefficients, relating current year-on-year recessionary advertising decreases, are negative but different from zero only in the all-companies and industrial firms regressions ($\beta_{4.2}$ = −.822, p-value ≤ .05 and $\beta_{4.2}$ = −1.169, p-value ≤ .05). Therefore, the multiplier for current-year recessionary advertising decreases is less than the current-year multiplier for nonrecessionary periods; .622 against −.200 (.622 + [−.822]) for the all-companies regression and 1.222 against .053 (1.222 − 1.169) for the industrial firms regression. However, tests do not indicate the multipliers on recessionary decreases differ from zero (i.e., Ho: $\beta_{4.0} + \beta_{4.2} = 0$). Prior-year recessionary advertising decreases show no incremental effects. The $\beta_{5.2}$ and $\beta_{6.2}$ coefficients are not different from zero, suggesting those recessionary-decrease multipliers are no different from zero.

Although included as variables in the regressions, the results for the MADV, MADdif, ROI, and Debt variables are not shown in Table 7 because the results for those variables are essentially as shown in Table 4. Specifically, MADV is different from zero in all regressions, the MADdif variables are different from zero in all but the service firms regression, ROI is different from zero only in the service firms regression, and debt is different from zero in all four regressions.

Returning to Table 6, the fourth and fifth columns show implied advertising asset values for recession increases and the percentage by which they exceed the all-firm-years advertising assets shown in the second column. To calculate the values we again multiply each firm's advertising and advertising-difference values by corresponding (nonzero) coefficients from Table 7 and average them across the firms in each regression. The implied average advertising asset for all firms that increase advertising during a recession equals $89 million, compared with the implied advertising asset for all firms over all years—$82 million—an 8.5% increase. For consumer products firms, advertising increases during recessions create implied advertising values of $132 million, compared with $124 million for all consumer firm-years, a 6.5% increase. Industrial products firms have implied recession advertising assets of $47 million, compared with $42 million over all industrial firm-years, an 11.9% increase. The implied advertising assets for service firms during recessions does not differ from the advertising asset over all service firm-years.

The sixth and seventh columns in Table 6 show the implied advertising asset values for reces-

sion decreases and the percentage by which they exceed the all-firm-years advertising assets shown in the second column. Only for industrial firms is there a difference between implied advertising assets resulting from decreases in advertising during recessions. For those firms, advertising assets fall to $39 million from $42 million (a decline of 7.1%) when firms reduce their advertising during a recession.

In summary, overall and for consumer and industrial products firms, current-year recessionary increases in advertising create added value that extends through the year following a recession. Conversely, we find little evidence, outside of a current-year effect for industrial products firms, that recessionary decreases have incremental effects for current or future earnings. Similarly, on average, neither increases nor decreases in advertising during recessions have effects beyond two years following a recession.

Implications for Managers

This study indicates that advertising has long-term benefits that exceed its cost. Advertising contributes most to earnings in the year of the expenditure, but the same expenditure continues to contribute to firm performance for up to three years. Advertising is also shown to have an asset value that is considered by investors when evaluating the market value of a firm. Managers who invest in advertising not only create future earnings for the firm, but in doing so send a positive signal about future performance to investors. Decision makers can therefore defend advertising increases by pointing to the resulting enhanced value creation.

Trade reports argue that recessions are particularly opportune times to increase advertising, and this appears to be true for companies selling consumer and industrial products. The two-year benefit of recessionary advertising increases may represent an added-confidence signal to these firms' customers during a period of economic uncertainty, a cue that is acted upon by investors. The effect disappears by year three, but by this time the economy likely has begun to recover. At the same time, budget administrators can console themselves that when forced to temporarily reduce advertising, the effect on future earnings may not be overly consequential. Firms reducing advertising during a recession appear to maintain the status quo; they may lose momentum, but as long as they survive (recall that nonsurvivors were not included in our sample), past advertising efforts appear to carry them through.

Although companies in the services industry showed no benefit from increased recessionary advertising spending, they were not harmed by reduced recessionary spending. This result should not imply that advertising spending has no effect either way for services companies. Recall that, on average, advertising makes a long-term contribution to earnings for all firms, even if the services firms show a statistically significant effect only during the second year. Our speculation is that the analysis used in this study may not adequately capture the effect of advertising in the services industry, which may fluctuate quarterly rather than yearly. This interesting question alludes to the aggregation issues mentioned previously, but remains to be addressed by future research, as does a series of other questions.

For example, this study demonstrates that decreased recessionary advertising spending does not hobble most firms' financial performance, but the analysis does not tease out why this is so. Is it due to advertising spillover, individual firm overspending, or some other factor that we have yet to consider? The analysis presented describes only *what* results occur (for example, that recessionary advertising decreases show little financial consequence), but not *why* they occur. Our results capture only average, economy-wide results, but we are similarly interested in what happens to firms on the margin. For example, it may be that for some firms, increases in average industry advertising could increase earnings of other firms in the

industry at the expense of their own earnings. The influence of more narrowly defined industries is also of interest. The analysis reported herein is limited to three broad industry categories (i.e., consumer, industrial, and service) to maintain statistical parsimony, but results are likely to vary the further these industries are parsed into narrower categories. A related question is what financial performance effects are shown at shorter time durations (for example, quarterly) and if they differ from the longer-term effects shown here.

In summary, overall and for consumer and industrial products firms, current-year recessionary increases in advertising create added value that extends through the year following a recession. Conversely, we find little evidence, outside of a current-year effect for industrial products firms, that recessionary decreases have incremental effects for current or future earnings. Similarly, on average, neither increases nor decreases in advertising during recessions have effects beyond two years following a recession.

In conclusion, as is often true of research, this study raises more questions than it can adequately answer. It does, however, generally confirm the long-held notion illustrated in John O'Toole's quote at the beginning of the paper: For most companies, the most productive decision is to increase rather than decrease advertising spending during a recession. ■

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Appendix 1

Model 3 Specification Errors

Issues of Simultaneity

Model 3 raises two simultaneity issues related to the underlying relation between advertising and earnings. First, Erickson and Jacobson (1992) argue that advertising is likely viewed by many managers as a discretionary expenditure. Advertising expenditures, therefore, may depend to some extent on a firm's profitability or other spending constraints. This possibility raises the issue that profitability could determine advertising level—which in turn determines profitability. To control for such firm-specific simultaneity issues we ran the regressions with two discretionary spending covariates identified in Erickson and Jacobson (1992): lagged return on investment (ROI: net income divided by average common shareholders' equity) and lagged debt level (total liabilities). Covariates are used as additional (and potentially omitted) variables with the goal of reducing autocorrelation of error terms. Both our variables are measured as of one year prior to the current reporting year (i.e., $t = -1$).

The second advertising simultaneity issue relates to general economy-wide factors, particularly the general level of advertising expenditures. Specifically, it is possible that general economic conditions simultaneously affect both our dependent variable (outputs in the form of earnings) and our independent variables (capital in the form of advertising). For example, an increase in general demand could increase both earnings and the marginal return from investing in advertising. Additionally, as previously discussed, one firm's earnings are potentially affected by other firms' advertising expenditures. To compensate for the simultaneity issues related to industry advertising levels (and economy-wide economic conditions), we include in each regression four additional covariates: $MADV_t$, $MADdif_{t-1\ to\ t}$, $MADdif_{t-2\ to\ t-1}$, and $MADdif_{t-3\ to\ t-2}$. MADV equals the mean advertising-to-sales ratio of the other firms in the regression, and the MADdif variables equal year-on-year changes in the mean advertising-to-sales ratios of the other firms in the regression.

Issues of Omitted-Variable Bias

There are any number of variables besides advertising changes that can influence firm earnings. For any variable that has a positive (negative) influence on earnings and is omitted from the model, there is an upward (downward) bias in the MADdif coefficients. The inclusion of the R&D, ROI, and debt variables potentially reduces some of this bias. Other variables that might have been included, but for which data are unavailable, are changes in competitive ad spending and marketing mix variables such as price and distribution channel changes.

Issues of Aggregation Bias

Because we use annual financial-statement data (as opposed to quarterly, monthly, or a smaller data interval) to estimate the relation between advertising and earnings, the regression coefficients for advertising effects are potentially subject to what Leone (1995) calls aggregation bias. According to Leone, "In estimating sales response models, when higher levels of aggregate data are used. . . the estimate on the lag coefficient for sales decreases, and

both the estimated (computed) duration interval of advertising and the estimated current-period advertising effect increase purely due to 'aggregation bias'" (p. 145). This type of bias occurs when short-term advertising effects are compounded into annual data. For this reason we urge caution in interpretation of regression coefficients indicating advertising carryover effects greater than one year.

Issues of Scale and Heteroscedasticity

The skewness of our data is apparent from Table 3 and reflects the presence, as in most samples containing financial data, of some very large firms. Such differences in scale contribute to heteroscedastic issues where, although estimators remain unbiased, regressions will not result in minimum-variance unbiased estimators (i.e., coefficient standard errors are likely to be too small). It is common procedure in the finance literature to reduce potential scale problems by standardizing (i.e., dividing) variables on both sides of the equation, including intercepts, by size-related, firm-specific measures such as total assets, market value, or sales. Because assets are an independent variable and, later, market value is a dependent variable, we divide all variables appearing in the regression equations by total sales. To scale the intercept we create a variable equaling the inverse of sales and suppress the intercept regression function. However, suppressing the intercept likely inflates reported R^2s, suggesting caution in their interpretation.

Despite the standardization procedure, heteroscedasticity remains in some of the regressions. For this reason all *p*-values are derived using White's (1980) consistent covariance estimates. White's procedure adjusts standard errors upwards. Finally, we include indicator variables corresponding to industry types and year. The coefficients on those variables generally are not significant at *p*-values < .10 and are therefore not reported in the following results.

Issues of Multicollinearity

All variables are inflation adjusted to equate all values in real terms to 1971 dollar values (the first year in the sample). Inflation-adjusted differences in advertising are likely to be much less correlated with following years' advertising differences. Low Pearson correlations (the largest equals .116 between $ADdif_{t-2\ to\ t-1}$ and $ADdif_{t-3\ to\ t-2}$) support this assertion.

Outliers

In addition, for each of the regression models estimated we performed conventional influence diagnostics as described in Belsley, Kuh, and Welsch (1980). There were no observations having an RSTUDENT greater than 1, suggesting that the results are not driven by a few influential observations.

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