

**ESSAYS ON ADVERTISING SPENDING DURING THE GREAT  
RECESSION AND REAL EARNINGS MANAGEMENT USING  
ADVERTISING BUDGETS**

by

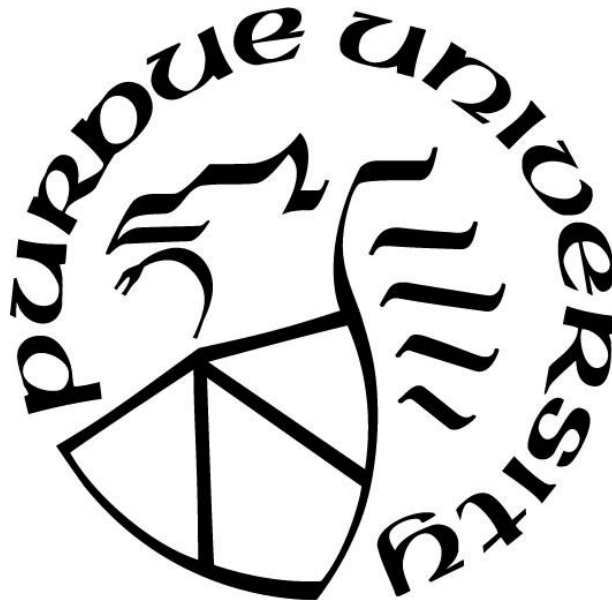
**Utsav Shenava**

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**THE PURDUE UNIVERSITY GRADUATE SCHOOL**  
**STATEMENT OF COMMITTEE APPROVAL**

Dr. William Robinson, Chair

Krannert School of Management

Dr. Manohar Kalwani

Krannert School of Management

Dr. Wreetabrata Kar

Krannert School of Management

Dr. Dinesh Gauri

Sam Walton School of Business

**Approved by:**

Dr. Yanjun Li

Head of the Graduate Program

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## ABSTRACT

Author: Shenava, Utsav. PhD

Institution: Purdue University

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Title: Essays on Advertising Spending during Great Recession and Real Earnings Management using Advertising Budgets.

Committee Chair: William Robinson

In my main dissertation essay, I investigate advertising spending during a recession. Advertising plays an important role in creating awareness, preference and purchase intent for many products and services. However, advertising is often cut when a firm needs to control costs. This empirical study examines a unique set of factors which motivated 553 firms to change their advertising spending during the Great Recession. The first half of the Great Recession had a moderate 2% decline in GDP and 1% to 2% cuts in advertising spending. The seasonality effect was weaker, which indicates that firms were not as likely to carryover spending from the prior year. The peak of the Great Recession had a GDP decline as high as 7%, which is considered severe. Average advertising spending declined by 13%. In addition to the seasonality effect, decreasing sales decreased advertising spending. Increasing firm risk tends to decrease advertising spending during the peak of the Great Recession, but not before. Finally, firms in high advertising intensity industries, where advertising is strategically important, had modest budget cuts. In contrast, firms in low-intensity industries had much larger percentage cuts.

The second essay examines real earnings management using advertising budgets” examines. Real earnings management occurs when managers change real activities to meet or beat important earnings benchmarks. Advertising has a limited short-term impact on firm sales for many products. Therefore, when a firm’s earnings are below key benchmarks for a fiscal quarter

(year), managers are compelled to reduce advertising expenditures to boost earnings. This study examines factors which persuade firms to manage earnings using advertising budgets. Similar to earlier studies, we find firms suspect of managing earnings upwards reducing advertising expenses. The findings indicate that B2C firms are more likely to manage earnings by reducing advertising expenses than B2B firms. The findings also reveal that suspect firms which spend more in high advertising elasticity mediums such as TV do not reduce advertising spending as much as firms which spend more in low advertising elasticity mediums such as newspapers and magazines. The study also find evidence to suggest that suspect firms which report advertising expenditure in their income statement make smaller advertising spending cuts than firms which don't report advertising expenditure. Finally, earnings management activity is much stronger during the last quarter of the fiscal year.

## **CHAPTER 1. WHY DID ADVERTISING SPENDING DECLINE DURING THE GREAT RECESSION?**

### **1.1 Introduction**

What factors motivate a firm to change advertising spending during a recession? This is an important managerial issue because lower sales and profits during a recession can pressure a firm to reduce costs. As Deleersnyder et al. (2009, p. 623) point out, “Every time the economy enters a downturn, advertising budgets seem to be among the first to be cut.”

Numerous research studies examine advertising spending during recessions. Tellis and Tellis (2009) summarize key results from 40 research studies. Important empirical results describe a) the relationship between total advertising spending and the economy and b) how advertising spending influences both sales and profits. More recently, Srinivasan, Lilien, and Sridhar (2011) examine various consumer and industrial goods markets to estimate how advertising spending should change during a recession.

Our empirical study builds on this earlier research and makes two key contributions. First, a unique set of variables helps explain advertising spending during the Great Recession. These variables are a seasonality effect, sales growth, firm risk, and industry advertising intensity. Second, instead of considering all recessions the same, the difference between a moderate and severe recession is also examined. While the first half of the Great Recession was generally considered moderate, the second half was severe.

For example, according to the International Monetary Fund (Claessens and Kose 2018), a moderate recession is associated with a decline of about 2% in GDP, while a severe recession is 5% or higher. Based on these guidelines, the first half of the 2008-2009 Great Recession was moderate and the second half severe. This is because seasonally adjusted real GDP declined by

roughly 2% in the first half of the Great Recession and by as much as 8% in the second half (FRED Economic Data 2019). In addition, in the AdSpender data below, total advertising spending declined by roughly 1% to 2% in the first half of the Great Recession versus 13% in the second half.

The data cover advertising spending by 553 publicly traded firms from the first quarter of 2006 through the end of the Great Recession in 2009. Advertising spending is from the AdSpender data. Financial data are from quarterly financial reports, the Center for Research in Security Prices (CRSP), and Kenneth French's web site. Combining these four data sets allows us to estimate the impact of seasonality, sales growth, firm risk, and industry advertising intensity on advertising spending.

As mentioned above, firms made small cuts to advertising spending in the early part of the Great Recession. During this moderate recession, the seasonality effect has a significantly weaker impact versus the pre-recession. This indicates that advertising spending is under greater scrutiny during a moderate recession, which makes it less likely that last year's spending will be continued.

Greater changes in advertising spending arose during the peak of the Great Recession. Some evidence indicates the seasonality effect is even weaker during the peak of the Great Recession. Again, the prior year's advertising spending is less likely to be continued in the current quarter.

For sales growth, there is an asymmetric effect. Advertising spending does not significantly increase when sales increase, but it declines when sales decline. This indicates that during a severe recession, managers often have a difficult time increasing advertising spending when sales grow, but are often forced to cut back when sales decline.

Increasing firm risk significantly reduces advertising spending during the peak of the Great Recession, but not before. (Firm risk is measured using both stock market and accounting data.) Thus, for most firms, a moderate recession does not cause enough financial stress to significantly reduce advertising spending, but it can happen during a severe recession.

Finally, at the peak of the Great Recession, firms in high advertising-intensity industries made small percentage reductions in their spending. Firms in low advertising-intensity industries had much larger percentage cuts. In high-advertising intensity industries, like consumer nondurables and consumer services, advertising often plays an important strategic role. These managers are reluctant to make big cuts to advertising spending. This is not the case in low-advertising intensity industries, like industrial products and business services, where advertising is much more discretionary.

## 1.2 Conceptual Framework and Hypotheses

### 1.2.1 Research on Advertising During Recessions

There are several empirical studies on advertising during recession. A key research question that these studies try to answer is whether firms should decrease, increase or maintain their advertising spending during a recession. Most of these studies investigate the impact of advertising during recession on firm performance (both performance during recession and performance post-recession). Some of the performance indicators examined include firm sales, earnings and market share. Firms cut discretionary expenditures such as advertising during recessionary phase when there is a downturn or slowdown in economic activity (Deleersnyder et al. 2009; Picard 2001). Consumer spending declines during recessions which leads to a decline in

consumer demand which in turn leads to a decline in sales. Thus, a recession lowers return on advertising investment which may motivate firms to cutback advertising expenditures.

There is empirical support to decrease advertising expenditure during recession (Beil and King 2003; Kijewski 1982; Lamey et al. 2007). Beil and King (2003) report the biggest drop in return on investment (ROI) for firms that have made the largest increase in advertising spending during a recession. Kijewski (1982) finds that the average ROI of firms that increase advertising during recession is very similar to firms that decrease advertising during recession. Lamey et al. (2007) find that national brands (which have heavy advertising support) lose market share to private labels during a recession. Tellis and Tellis (2009) review additional studies that support decreasing advertising spending during recession.

There is also strong empirical support to increase or maintain advertising spending during a recession (Biel and King 2003; Frankenberger and Graham 2003; Kamber 2002; Kijewski 1982; Vaile 1927). These studies report that increasing or maintaining advertising spending during a recession can lead to an increase in sales, profits and market share both during recession and post-recession. Vaile (1927) finds that sales increases with increase in advertising spending during recession. The study also finds that sales decrease with decrease in advertising spending during recession, but not to the extent observed in categories that did not spend on advertising.

Kamber (2002) finds that there is a seven percent annual sales growth for firms that increase or maintain advertising spending during recession and no significant sales growth for firms that decrease advertising spending during recession. The difference in sales growth between the two groups widens post-recession (at the end of the fifth year there is a 25% difference in sales growth between the two groups). Kamber (2002) also finds a positive

correlation between increased advertising spending during recession and sales growth post-recession.

Biel and King (2003) and Kijewski (1982) have shown that firms can increase their market share if they make large increases in advertising spending during recession. These studies also find that increasing advertising spending during a recession is more effective than increasing advertising spending during an expansion if the goal is to increase market share. Similarly, another study by Frankenberger and Graham (2003) has shown that increasing advertising spending during recession is more effective than increasing advertising spending during an expansion if the goal is to increase firm earnings. Frankenberger and Graham (2003) also report an increase in firm earnings post-recession for firms that increase advertising spending during recession.

Thus, there is substantial empirical evidence to support a firm's decision to increase or maintain advertising expenditure during recession. A key reason to increase advertising spending during recession is that on average firms are cutting their advertising budget during recession. This increases advertising effectiveness because there are now less rival advertisements in various advertising mediums. Thus, recession provides a unique opportunity for firms to proactively differentiate their products by giving them additional room in an already crowded advertising space.

### 1.2.2 Advertising Spending During the Great Recession

Figure 1.1 provides a conceptual framework for how advertising spending changed during the Great Recession. The three time periods are the pre-recession, early recession, and peak recession, which are defined in the data section below. The hypotheses cover seasonal spending, sales growth, firm risk, and industry advertising importance. The hypotheses also

consider the severity of the Great Recession, with the first half being moderate and the second half severe.

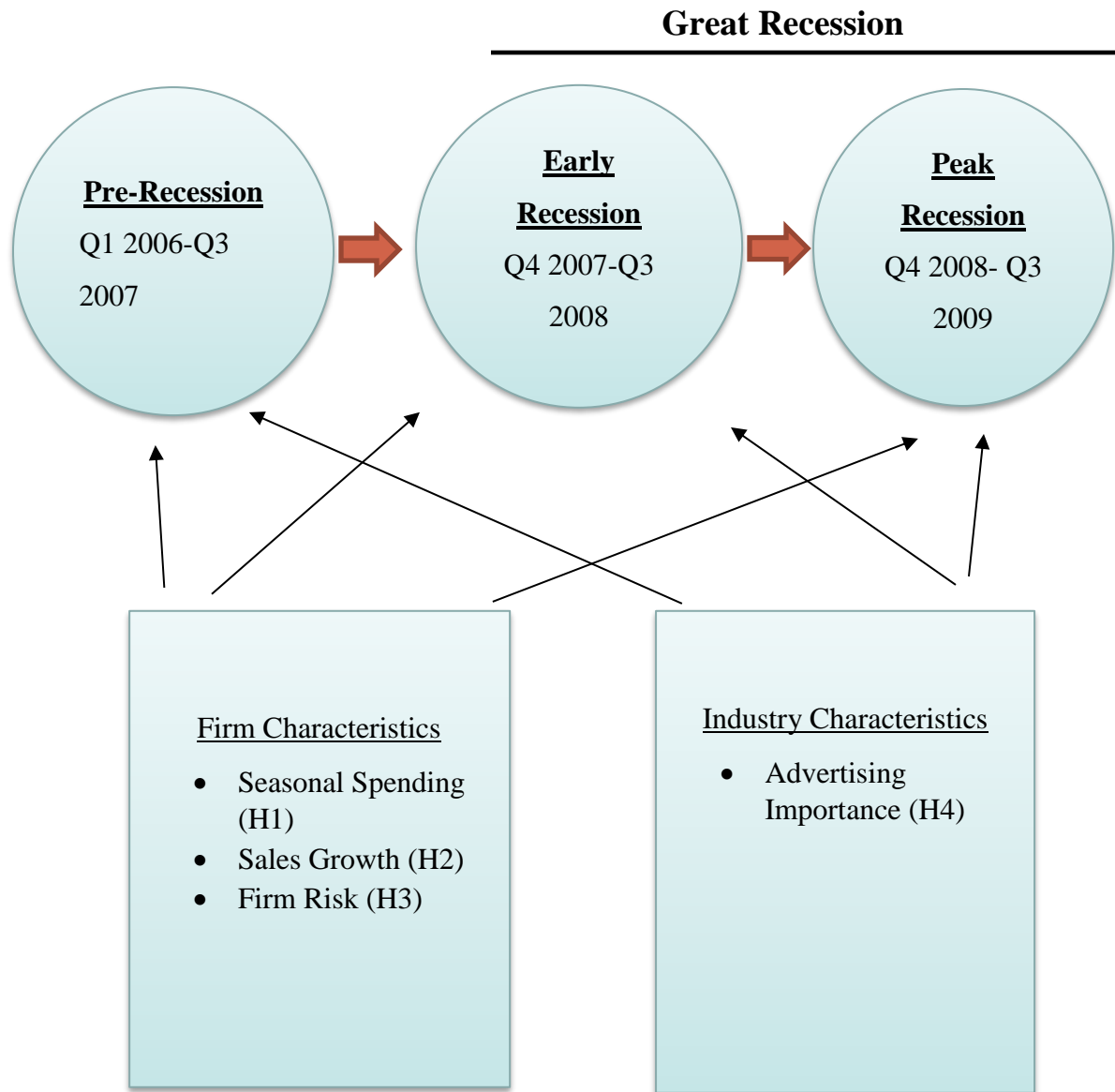


Figure 1.1 Conceptual Framework and Hypotheses

It is difficult to predict the start of a recession and its severity. Here are two examples from An, Jalles, and Loungani (2018). They report that from 1992 to 2014, only 5 out of 153 recessions around the world were forecasted in April of the prior year. Also, in the Great Recession's first calendar year, the 2008 consensus growth forecast for the United States was

3%. Instead, GDP declined by 3%. Forecasting a recession is difficult because economic shocks, like political crises, are difficult to anticipate. Behavioral factors like an economist's reputational risk and slowly changing prior beliefs can also play a role.

Because it is difficult to predict the start of a recession, it is unlikely that advertising spending during the prerecession would be influenced by the upcoming Great Recession. This helps isolate the impact of the Great Recession on advertising spending during its first half. Because it is also difficult to predict the severity of a recession, this helps isolate the severity of the Great Recession on advertising spending during its second half.

In a recession, the net present value of advertising spending is likely to decline. Uncertainty about the length and severity of the recession can reduce expected cash flows in both the current and future time periods. Increased uncertainty can increase risk and the net present value's discount rate, which makes it more difficult to invest in advertising.

The hypotheses below discuss why it is often in the firm's best interest to reduce advertising spending during a recession. Of course, there are important examples when spending cuts are myopic, which are not in the firm's best interests. Myopic management has been reported for firms that attempt to avoid an earnings miss (Chakravarty and Grewal 2011) or want to boost short-term profits to support a seasoned equity offering (Mizik and Jacobson 2007). These types of myopic management arise in special situations. In contrast, the broad sample of 553 firms below are assumed to generally behave in the firm's best interests.

While R&D spending and capital investments can also be cut during a recession, there are two key reasons why advertising is examined. First, advertising spending should be relatively easy to change during a recession. This is because it is more costly to make short-term changes

to R&D spending and capital investments. For example, firing and then rehiring engineers who are working on these projects is more costly than just buying fewer television commercials.

Second, the AdSpender data provide accurate estimates for spending in the United States. While quarterly financial data provides insights into R&D spending and capital investments, the financial data are for worldwide operations and not just the United States. There can be important differences when a firm has international exposure, so it is difficult to identify when spending cuts were motivated by the Great Recession in the United States.

### 1.2.3 Seasonal Spending

A firm's advertising spending in any given quarter is partly determined by how much the firm spent in the prior year's quarter. Seasonal spending is often driven by the seasonal nature of consumer spending.

During a recession, managers are under pressure to trim discretionary expenditures such as advertising. Managers want to get the optimum value for their advertising expenditure. For example, during the Great Recession, McDonald's Global Chief Marketing Officer said, "we are using the recession as an occasion to review our spends, and see whether we are getting value for every penny that we spend" (Saha 2009). Thus, during a recession, managers often pay less attention to historical spending and more attention to current and future cash flows, which can be at risk. This yields:

*H1a: Due to the seasonality effect of advertising, higher advertising spending in the same quarter last year tends to increase advertising spending in the current quarter.*

*H1b: The seasonality effect of advertising is weaker during a moderate recession and is further weakened during a severe recession.*

#### 1.2.4 Sales Growth

A firm's advertising budget is dependent on its sales level and its sales growth potential. This is why many firms set their advertising budget as a percentage of sales (Lilien, Kotler, and Moorthy 1992). Managers can also be pressured to reduce advertising expenditures when sales decline.

During a recession, many consumers are less responsive to marketing communications. If so, during a recession, managers are more likely to reduce advertising expenditures. This is especially true when they experience a sales decline.

However, when sales increase during a recession, it can be difficult to increase advertising spending. Budget constraints and slow economic activity make it more difficult for a firm to increase advertising spending. If so, there is an asymmetric effect of sales on advertising spending during a recession. This is because it is difficult to increase spending when sales increase, but ad spending is often cut when sales decrease. This yields:

*H2a: An increase (decrease) in the current quarter's sales tends to increase (decrease) advertising spending.*

*H2b: During a moderate recession, a decrease in the current quarter's sales tends to decrease advertising spending, but an increase does not increase advertising spending. This asymmetric effect is even stronger during a severe recession.*

#### 1.2.5 Overview of Firm Risk

Firm risk is generally studied using either a risk measure based on volatility of a firm's stock return or a risk measure based on distress in a firm's financials (Rego, Billett, and Morgan 2009). Finance and marketing literature have largely used firm risk measures based on stock

return volatility (Ang et al. 2006; French, Schwert, and Stambaugh 1987; Fu 2009; Madden, Fehle, and Fournier 2006, McAlister, Srinivasan, and Kim 2007; Singh, Faircloth, and Nejadmalayeri 2005). There are various models to estimate firm risk based on stock return volatility including capital asset pricing model (CAPM), the Fama-French three-factor model and the Carhart four-factor model. These models consider total firm risk as the variability in a firm's stock return (Markowitz 1999; Sharpe 1964). The higher the variability in stock return, the higher the uncertainty in predicting future return. Therefore, firm risk increases with increase in stock return variability.

Total firm risk can be decomposed into two components-- systematic risk and idiosyncratic risk. Systematic risk (or beta as it is widely known) is the sensitivity of the firm's stock to the overall changes in the stock market. It is constructed such that the overall stock market has a beta equal to one. When a firm has a beta less than one, it means that the change in the firm's stock return is less than the change in market's return. When a firm has a beta greater than one, it means that the change in the firm's stock return is greater than the change in market's return.

According to portfolio theory, investors can reduce part of the total firm risk (i.e. nonsystematic or idiosyncratic risk) by holding a diversified portfolio of stocks (Lintner 1965; Markowitz 1952; Sharpe 1964). The portion of the total firm risk that cannot be diversified is the systematic risk component. Thus, systematic risk is the variability in a firm's stock returns due to various macro-economic factors that affect all firms alike. Many prior marketing studies have measured firm risk using systematic risk (Madden, Fehle, and Fournier 2006, McAlister, Srinivasan, and Kim 2007; Singh, Faircloth, and Nejadmalayeri 2005; Sorescu and Spanjol 2008).

Idiosyncratic risk is the risk specific to a firm due to various strategies it pursues and can be eliminated by holding a diversified portfolio of stocks. Therefore, idiosyncratic risk is the variability in a firm's stock returns due to various firm-specific factors. Marketing studies have used idiosyncratic risk in the context of firm-specific strategies such as breakthrough innovation, brand strength and corporate social performance (Luo and Bhattacharya 2009; Rego, Billett, and Morgan 2009; Sorescu and Spanjol 2008).

Risk measures based on financial vulnerability are commonly used in accounting and finance literature. These include measures that reflect financial distress, measures that predict bankruptcy and measures that reflect debt burden. Firms that are in distress have a greater probability of declaring bankruptcy. Thus, financial distress measures are widely used to predict bankruptcy in accounting literature, due to which "financial distress" and "bankruptcy risk" terms are often used interchangeably. Financial ratios have been traditionally used to measure financial distress or to predict bankruptcy. The most relevant financial ratios for this purpose are those that measure profitability, liquidity and solvency (Altman 2000). Early research on bankruptcy prediction were based on univariate analysis of financial ratios that reflected some form of firm distress (Beaver 1966). Subsequent studies performed multivariate analysis of financial ratios to measure firm distress (Altman 1968, Deakin 1972, Ohlson 1980).

Altman's Z-Score is by far the most popular model for estimating the distress level in firms. Altman (1968) measures firm distress based on a weighted sum of five financial ratios that capture liquidity, profitability, asset productivity, insolvency and capital-turnover. Finance literature has also evaluated firm risk based on firm debt. Debt based risk measures determine firm's ability to fulfil existing obligations and take on new ones. The risk arising from a debt is basically the risk of defaulting, i.e. higher probability of not repaying debts (Merton 1974).

Researchers have examined various debt based risk measures including credit ratings and debt ratios. May (1995) uses debt ratios and stock return variance as proxies for firm risk. Rego, Billett and Morgan (2009) measure firm risk based on firm's credit ratings. Credit rating reflects a firm's ability to repay existing debts and is therefore used as an indicator for firm risk. Bankruptcy or distress based risk measures are generally preferred over debt based risk measures. Bankruptcy risk measures such as Altman's Z-Score are holistic measures of firm risk because it encompasses multiple indicators of financial vulnerability. In comparison, debt based risk measures are unidimensional and, thus, may not fully reflect firm risk that arises from various sources of financial vulnerability.

#### 1.2.6 Firm Risk

Firms are financially risky when they have volatile and uncertain financial returns. Firm risk increases with increase in stock return variability. Risky firms are also associated with greater financial distress, higher debt burden, and a higher chance of bankruptcy.

There is empirical evidence that advertising lowers firm risk. For example, Singh, Faircloth, and Nejadmalayeri (2005) report that increased advertising spending tends to reduce systematic risk. McAlister, Srinivasan, and Kim (2007) find that high advertising intensity and research and development intensity lowers a firm's systematic risk. However, the financial health of a firm can also influence advertising spending.

During a recession, risky firms face additional financial constraints. These include lower liquidity, credit constraints, decline in consumer spending, greater uncertainty of future revenues and lower returns on marketing expenditures. Therefore, during a recession, risky firms should be under even greater pressure to reduce advertising expenditures. This yields:

*H3a: Increasing firm risk tends to decrease advertising spending.*

*H3b: The impact of firm risk on advertising spending is greater during a moderate recession than prior to it. The impact is even stronger during a severe recession.*

### 1.2.7 Overview of Industry Advertising Importance

Advertising is not equally important in every industry. In some industries, advertising is very relevant to firms because it is the most important marketing tool to create awareness and preference for their products. There are also industries in which advertising is more discretionary and less relevant to firm operations. Advertising intensity is an effective proxy for advertising importance and is generally measured as the ratio of advertising spending to sales.

Prior literature has examined various determinants of advertising intensity, and industry differences in advertising intensity. Farris and Buzzell (1979) find that advertising intensity varies with product characteristics, market characteristics and firm strategies. Balasubramanian and Kumar (1990) find that market growth, market share and their interaction are good predictors of advertising intensity. Andras and Srinivasan (2003) examine differences in advertising intensity between consumer product firms and manufacturing product firms. Willis and Rogers (1998) find that advertising intensity in oligopolies depends on the relative degree of market share parity among leading firms in the industry. Few other studies have examined the impact of advertising intensity on firm profits. (Miller 1969).

Advertising intensity can vary at the industry level due to number of factors including consumer response to advertising in the industry (also known as advertising elasticity), target market profile (e.g. business market, consumer market), tangibility of products, industry life cycle and competition in the industry. Advertising intensity is generally larger in industries with high advertising elasticity. For example, consumer durables and consumer non-durables may serve the same market, but consumer non-durables are expected on average to have higher advertising

intensity than consumer durables. Consumer durable goods typically require more information search than consumer non-durable goods before a purchase decision is made. Therefore, advertising will have a greater impact on purchase intent for consumer non-durables than consumer durables.

Additionally, consumer non-durables generally have a much higher purchase frequency than consumer durables. Thus, consumers are more likely to respond to advertising of consumer non-durable goods than to advertising of consumer durable goods. A strong consumer response to advertising provides better returns on advertising investments, and this can persuade firms to increase advertising expenditures. Therefore, advertising intensity increases with advertising elasticity. Additionally, purchase related risks for consumer non-durables are much smaller in comparison to consumer durables. These risks could include monetary risks, product failure risks and quality related risks. Thus, advertising will be more effective, in creating preference and purchase intent, for consumer non-durables than for consumer durables.

Consumer markets typically have larger advertising intensity than business markets. This is partly because consumer markets are usually much larger than business markets. Thus, more advertising dollars are required in consumer markets to create awareness or preference for a product in comparison to business markets. Secondly, in consumer markets, advertising is the most effective instrument to create awareness for a product. In business markets, there are other ways to create awareness such as trade shows, industry conferences, seminars and sales force. Lastly, consumer markets are generally less knowledgeable about their products in comparison to business markets. Therefore, advertising is much more important in consumer markets than in business markets to communicate product related benefits.

There are studies that find advertising intensity is larger in consumer markets than in business markets. Andras and Srinivasan (2003) find that consumer product firms have higher advertising intensity than manufacturing product firms. Farris and Buzzell (1979) observe a similar trend in their study. Product tangibility may also influence advertising intensity. Nicolao, Irwin and Goodman (2009) show that consumers are happier when they purchase experiential products than tangible products. Consumers also tend to delay purchasing tangible products more than intangible products, because tangible purchases can create a feeling of guilt in the minds of consumers (Danziger 2004). Thus, consumer service firms should also have high advertising intensity.

Advertising intensity is generally high in the introductory and growth phases of a product when there is a lot of room to improve market penetration. Advertising intensity should have a similar relationship with industry life cycle i.e. greater advertising intensity in new and growing industries. Advertising helps firms to differentiate its products from those of its rivals. Strong competition may force all relevant firms in the industry to spend at much higher levels on advertising. Thus, advertising intensity can also be high if the industry has strong competition. In our study, the industries are classified at a broad level, and are therefore competitive and mature industries. Thus, industry differences in advertising intensity are partly due to industry differences in advertising elasticity, target market profile and product tangibility.

#### 1.2.8 Industry Advertising Importance

Advertising plays an important role in creating awareness, interest, and preference and purchase intent for a product or service. However, as discussed in the previous section, advertising's importance varies across industries due to factors such as the consumer response to advertising, target market profile (e.g. business market, consumer market), tangibility of

products, industry life cycle, and competition. When advertising is strategically important, managers may view advertising as a necessary expenditure. If so, during a recession, managers in high advertising importance industries are less likely to cut the budget.

Managers in low advertising importance industries though will find it relatively easy to reduce advertising spending. This is because advertising is more discretionary than necessary. This yields:

*H4a: An increase in industry advertising intensity tends to increase firm advertising spending.*

*H4b: During a moderate recession, there will be greater percentage spending cuts in low versus high advertising intensity industries. This difference is even greater during a severe recession.*

### 1.3 Data

Table 1.1 summarizes the key variable definitions and data sources. Advertising spending data is from Ad\$ponder, which is managed by Kantar TNS. Ad\$ponder tracks all advertisers including public, private, government, and non-profit organizations. Advertisements are tracked in twelve important media channels including network TV, cable TV, spot TV, syndication, national newspapers, newspapers, magazines, Sunday magazines, network radio, spot radio, outdoor, and internet advertising.

Advertising expenditures are calculated based on existing rates in the respective media channels. Advertising expenses are calculated every month, which allows us to estimate spending for each quarter. Since the accounting and financial data are at the firm level, advertising spending is estimated for each firm. Advertising spending covers the twelve media channels mentioned above.

Table 1.1 Key Variable Definitions

Variable	Definition	Measure
$Ad_t$	Advertising spending in period t	Quarterly advertising expenditure (USD '000s) from AdSpender.
$Ad_{t-4}$	Advertising spending in the same quarter last year	Quarterly advertising expenditure (USD '000s) from AdSpender.
<b>Sales Growth</b>	Growth in sales (year-over-year)	Natural log of one plus sales in quarter t minus the natural log of one plus sales in quarter t-4. Quarterly dollar sales (USD '000s) from COMPUSTAT. Equals 0 if sales declined.
<b>Sales Decline</b>	Decline in sales (year over year)	Natural log of one plus sales in quarter t minus the natural log of one plus sales in quarter t-4. Quarterly dollar sales (USD '000s) from COMPUSTAT. Equals 0 if sales increased.
<b>Recession</b>	Dummy variable for the Great Recession	Equals 1 if period is between 2007Q4-2009Q3, 0 otherwise.
<b>Peak Recession</b>	Dummy variable for " <i>Peak Recession</i> " phase	Equals 1 if period is between 2008Q4-2009Q3, 0 otherwise.
<b>Industry Ad Intensity</b>	Industry advertising intensity	Total industry advertising spending/Total industry dollar sales (as percentage). Measured quarterly for each industry.
<b>Firm Risk</b>	Aggregate measure of firm risk	Aggregate measure of firm risk based on two distinct risk measures- Systematic Risk and Z-Score. This firm risk index is created using the first principal component.
<b>Firm Size</b>	Continuous variable for firm size	Natural log of one plus total asset in quarter t. Quarterly total assets (USD '000s) from COMPUSTAT.

While Ad\$ponder provides accurate estimates of quarterly spending, the spending is limited to the twelve media channels. It does not include advertising production costs, product placement, or direct-mail. In contrast, many studies use advertising expenditures reported by publically traded firms in their financial statements. This is not a direct measure of advertising because it also includes promotional expenses.

In quarterly financial statements, advertising is an optional line item, so many firms do not report their advertising. For example, Kim and McAlister (2011) estimate that 37% of leading national advertisers do not report their advertising expenditures. Therefore, the Ad\$ponder data are used because it has relatively accurate spending estimates and includes all of the major firms that advertise in the United States.

Quarterly advertising expenditures are gathered for 2005-09. The sample is limited to firms that had average annual advertising spending of at least \$100,000. This allows us to focus on leading national advertisers and avoid the innumerable small advertisers that did not consistently invest in advertising over time. Firms that are not publicly traded are dropped because of missing financial data.

There are more than 1,000 publicly traded firms in the raw data. In this list, some firms have inconsistent spending. For example, Buckle Inc. spent \$4.5 million on advertising between 2005 and 2009. It spent \$4.3 million in 2005 and 2006 and only \$.2 million between 2007 and 2009. In fact, during many quarters, Buckle had zero advertising.

Because this study explains changes in advertising spending over time, firms that did not consistently spend on advertising were deleted. These are firms that did not have advertising spending for at least 10 quarters between Q4 2006 and Q3 2009.

Quarterly financial information such as sales and total assets are gathered from COMPUSTAT. Stock prices and stock returns are from the Centre for Research on Stock Prices (CRSP). Stock price related risk components such as the three Fama-French factors and momentum factor are collected from Kenneth French's Dartmouth website. Firms in the sample are either traded on the NASDAQ or NYSE. Firms from highly regulated industries such as financials, healthcare, and utilities are deleted. Foreign firms traded as ADRs and firms with a recent initial public offering are also deleted (i.e. firms whose initial public offering was after Q3 2005).

For the final sample of 553 firms, mean (median) quarterly advertising spending is \$18.0 million (\$1.3 million). Mean (median) quarterly sales is \$2641 million (\$555 million). The sample spans seven industries -- consumer non-durables, consumer durables, consumer services, industrial non-durables, industrial durables, business services and retailers. These industries have important differences based on the target market (business vs. consumer), product tangibility (goods vs. services) and product durability (durables vs. non-durables).

### 1.3.1 Advertising Spending during the Great Recession

Table 1.2's first column reports the percentage change in quarterly year-over-year spending for 2006-09. This is for the sample's 553 publicly traded firms. Some of the largest percentage spending reductions occurred between Q4 2008 and Q3 2009. This was the peak of the Great Recession.

TNS Media Intelligence, which manages the AdSpender data, reports a 14.2% decline in total advertising spending in Q1 2009 (Bachman 2009). Nielsen reports a 12% decline in total advertising spending for the same period (Nielsen 2009). However, in our sample, the total advertising spending declined by 7.7% in Q1 2009.

Table 1.2 Percentage Change in Quarterly Advertising Spending

<b>Period</b>	<b>Study Sample</b>	<b>Full Sample</b>
2006Q1	4.9%	5.7%
2006Q2	-0.6%	2.7%
2006Q3	2.5%	4.1%
2006Q4	-0.7%	5.0%
2007Q1	-5.8%	0.2%
2007Q2	-2.9%	-0.7%
2007Q3	-0.8%	0.1%
2007Q4	0.7%	-1.7%
2008Q1	1.3%	0.1%
2008Q2	-6.6%	-3.3%
2008Q3	0.6%	-0.8%
2008Q4	-6.0%	-8.7%
2009Q1	-7.7%	-14.6%
2009Q2	-2.1%	-13.6%
2009Q3	-10.3%	-16.2%

*Note: Table 1.2 reports percentage change in advertising spending (year over year) for each quarter between Q1 2006 and Q3 2009. The first column results are based on the sample of 553 publicly traded firms that are examined in this study. The second column results are based on the full sample of firms (which includes public firms, private firms, government organizations and non-profit firms) that have an average annual advertising expenditure of at least \$100,000 in AdSpender*

The figure is lower because our sample is limited to publicly traded firms. For example, for the 100 leading national advertisers, TNS Media Intelligence reports an 8.1% decline in total advertising spending in Q1 2009 (Johnson 2009). These are mainly publicly traded firms. This figure is closer to the 7.7% decline in our sample.

Note, AdSpender collects advertising data of all national advertisers including public firms, private firms, government organizations, and non-profit organizations. The second column in Table 1.2 reports the percentage change in quarterly advertising spending for the full sample which have an average annual spending of at least \$100,000.

For the full sample, advertising spending declined by 14.6% in Q1 2009. This is close to the 14.2% decline in advertising spending reported by TNS Media Intelligence (Bachman 2009) and to the 12% decline reported by Nielsen (Nielsen 2009).

Some of the biggest cuts in advertising spending occurred between Q4 2008 to Q3 2009. In Table 1.3, the second column in Panel A (Table 1.3) reports the median percentage change in total advertising spending (year-over-year) during this period at the industry level. Industrial durables, industrial nondurables and business services have some of the highest reductions in advertising spending. Consumer durables and retailers also make significant cuts to their advertising budget, but not to the extent observed in industrial firms and business services. Consumer non-durables and consumer services have the lowest reductions in advertising spending.

Table 1.3 Industry & Media Advertising Spending Trends

**Panel A: Median Percentage Change in Total Advertising Spending in Each Industry at the Peak of The Great Recession**

<b>Industry</b>	<b>Number of Firms</b>	<b>Peak Recession (Q4 2008– Q3 2009)</b>
Consumer Non-durables	85	-6.8%
Consumer Durables	59	-20.5%
Consumer Services	130	-11.2%
Industrial Non-durables	43	-30.9%
Industrial Durables	65	-26.1%
Business Services	82	-27.2%
Retailers	89	-15.6%
<b>Total</b>	<b>553</b>	<b>-15.0%</b>

Table 1.3 continued

**Panel B: Cost Per Thousand (CPM) Trends**

<b>CPM</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
<b>National Broadcast TV</b>	0.5%	2.1%	5.7%	4.0%
<b>Cable TV</b>	-0.5%	-2.0%	-2.0%	1.0%
<b>Spot TV</b>	5.5%	-6.7%	-4.0%	-13.0%
<b>Network Radio</b>	1.9%	1.4%	2.3%	-5.0%
<b>Spot Radio</b>	-1.0%	-2.6%	1.2%	-8.7%
<b>Newspapers</b>	5.8%	4.6%	4.1%	1.0%
<b>Magazines</b>	3.0%	5.0%	4.0%	1.0%
<b>Out-of-Home</b>	6.0%	6.0%	3.0%	0.0%
<b>Internet-Display</b>	-	-	-	-1.9%

*Note: Panel A reports the median percentage change in total advertising spending (year over year) in each industry at the peak of the Great Recession. The second column is for the “Peak Recession” phase defined in this study (between Q4 2008 and Q3 2009). The third column is for the peak recession phase as per NBER data (between Q3 2008 and Q2 2009). Panel B reports the CPM cost trends in all the key advertising media between 2006-09. Cost trend for internet display begins in 2009. These figures are from Havas Media (2014) report.*

While the spending cuts in Tables 1.2 and 1.3 are assumed to arise from lower budgets, it is possible they arose naturally from declining advertising rates. In Table 1.3, Panel B reports the CPM (cost-per-thousand advertising impressions) annual cost trends for key advertising media (Havas Media 2014).

As mentioned above, 2009 has the greatest spending declines and spans most of the severe recession. Advertising rates declined significantly in spot TV and spot radio, by 13% and 8.7% respectively. More than 90% of the firms in our sample allocate less than five percent of their advertising spending to these two media. In contrast, advertising rates increased for network TV, cable TV and newspapers. Because of these mixed results, there is no evidence to suggest that advertising spending decreased during the Great Recession due to declining advertising rates.

### 1.3.2 Defining the Pre-recession and Recession Time Periods

Many studies define recessionary periods based on the National Bureau of Economic Research (NBER) guidelines. Examples include Dube, Hitsch and Rossi (2018) and Srinivasan, Lilien, and Sridhar (2011). The NBER defines a recession when there “is a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production and wholesale-retail sales” (NBER 2008). Real GDP holds the most weight when measuring economic activity.

Other factors such as real income, employment, industrial production and wholesale-retail sales are also considered. According to the NBER, the Great Recession began in December 2007 and ended in June 2009 (Isidore 2010). This 18-month recession is the longest economic downturn since the Great Depression (Murray 2010). However, economic activity and advertising spending are not always comparable. Because this study primarily examines advertising spending during the Great Recession, we consider information from both the NBER and AdSpender when defining the three time periods.

For the three time periods, the pre-recession is from Q1 2006 to Q3 2007, the early recession is from Q4 2007 to Q3 2008, and the peak recession is from Q4 2008 Q4 to Q3 2009. The pre-recession is prior to the Great Recession, as defined by the NBER. There was normal economic activity, which was reflected in a steady increase in GDP.

The early recession started in Q4 2007. According to the NBER, the Great Recession started in Q4 2007. Also, advertising spending in most quarters of the early recession was generally constant. The only exception is Q2 2008, when advertising declined by 6.6%.

The peak recession started in Q4 2008 and ended in Q3 2009. This is when there was a significant decline in economic activity (FRED Economic Data 2019). This is also when firms made the biggest cuts in advertising spending (Table 1.2).

According to the NBER, the 2008-09 recession officially ended in Q2 2009. This is when the decline in economic activity halted. However, the economy and advertising spending did not recover immediately. In Table 1.2, for Q3 2009, there is a 10.3% spending decline. This is why Q3 2009 is included in the peak recession.

The two recession periods are generally consistent with how the International Monetary Fund (IMF) defines a moderate versus a severe recession. According to the IMF, “recessions typically last about a year and often result in a significant output cost (Claessens and Kose 2018). In particular, a moderate recession is usually associated with a decline of 2 percent in GDP. For severe recessions, the decline is closer to 5 percent.

In the first half of the Great Recession, the highest percentage decline in seasonally adjusted real GDP is 2.3% (FRED Economic Data 2019). In the second half, the highest percentage decline is 8.4% (FRED Economic Data 2019). Therefore, based on the IMF guidelines, the Great Recession’s first half can be classified as moderate and the second half as severe.

To provide an historical perspective, since 1947, there have been 25 quarters when real GDP declined by at least 2% (seasonally adjusted annual rate) from the preceding quarter (FRED Economic Data 2019). For these 25 quarters, in 8 quarters real GDP declined by at least 4.8%. These GDP declines can be considered severe. Thus, while most quarterly GDP declines during a recession are moderate, almost a third of the quarterly GDP declines since WWII were severe.

### 1.3.3 Seasonal Spending

While the hypotheses are tested using the fully specified model described below, some initial insights are provided from the descriptive statistics. For the seasonality hypothesis, the average correlation between ad spending in the current quarter versus the prior year's quarter is .41 in the pre-recession, .41 in the early recession, and .33 in the peak recession. The median for the current quarter's spending relative to the prior year's spending (taken as a ratio) is 1.01 in the pre-recession, .97 in the early recession, and .85 in the peak recession. These results provide initial support for the seasonality hypothesis and how its impact is weakened during a recession.

### 1.3.4 Sales Growth

Table 1.4 reports the median percentage change in quarterly advertising spending for different levels of sales change. In the pre-recession, firms are decreasing or increasing advertising spending only when there is a large percentage change in sales. In the early recession, advertising spending is sensitive to declining sales. The results indicate that firms are making larger advertising spending cuts when sales decrease. However, when sales increase, advertising spending does not increase.

Table 1.4 Median Percentage Change in Quarterly Advertising Spending for Different Sales Change Levels

<b>Sales Change</b>	<b>% Change in Quarterly Ad Spending (Median)</b>		
	<b>Pre-Recession</b>	<b>Early Recession</b>	<b>Peak Recession</b>
<b>-25% to -50%</b>	-8.2%	-19.7%	-46.6%
<b>-10% to -25%</b>	.0%	-18.6%	-24.2%
<b>-1% to 10%</b>	.0%	-9.4%	-8.3%
<b>0% to 10%</b>	.1%	-.7%	-6.7%

Table 1.4 continued

<b>10% to 25%</b>	5.0%	.0%	.0%
<b>25% to 50%</b>	3.6%	.5%	3.0%

*Note: Table 1.4 reports the median percentage change in quarterly advertising spending in each phase for different levels of sales decline and sales growth (year-over-year). To make it comparable to other phases, the “Pre-Recession” phase here is between 2006Q4 and 2007Q3*

A similar trend arises in the peak recession, with advertising spending cuts being even larger as sales decline. These results support an asymmetric effect of sales on advertising spending during the Great Recession. This is because many firms reduce advertising spending when sales decline, but are not increasing spending when sales increase.

### 1.3.5 Firm Risk

In the finance literature, two stock market based measures of risk are the firm’s total stock return in the prior year and systematic risk. Systematic risk is also known as beta. It estimates how an individual stock’s return is related to the overall market return. (More details are provided in the appendix.) For example, if a firm’s beta is 1.2, when the overall market increases by 10%, the firm’s stock price tends to increase by 12%.

Firm risk is also measured using accounting data. Higher risk is associated with greater financial distress, higher debt, and a higher chance of filing for bankruptcy. Altman’s (1968) Z-Score is used, with more detail provided in the appendix. The mean (median) Z-Score in our sample is 4.1 (3.3), which is safely above bankruptcy cutoffs used in accounting literature (Altman 2000).

While all three risk measures have merit, during the Great Recession, the firm’s 12 month stock market return did not effectively measure firm risk. This is probably because many stocks dropped 50% or more in price, which can signal high risk. However, many firms with stock price

declines of 50% or more were financially sound. Some examples are General Electric, American Express, United Health, Boeing, and Caterpillar. Thus, firm risk is measured using both systematic risk and Altman's Z-Score.

Table 1.5 reports the median percentage change in quarterly advertising spending in each phase for systematic risk and Altman's Z-Score. The high risk category is for firms in the top quartile, low risk is the bottom quartile, and medium risk in the middle fifty percent.

Table 1.5 Median Percentage Change in Quarterly Advertising Spending in Each Phase for Different Firm Risk Measures

Firm Risk Measures	Risk Status	% Change in Quarterly Ad Spending (Median)		
		Pre-Recession	Early Recession	Peak Recession
<b>Systematic Risk</b>	<b>Low Risk</b>	.0%	-1.0%	-12.4%
	<b>Medium Risk</b>	1.4%	-3.9%	-14.2%
	<b>High Risk</b>	2.4%	-2.7%	-21.6%
<b>Z Score</b>	<b>Low Risk</b>	.2%	.0%	-3.8%
	<b>Medium Risk</b>	2.4%	-1.0%	-15.9%
	<b>High Risk</b>	.00%	-8.7%	-21.4%

*Note: Table 1.5 reports the median change in quarterly advertising spending in each phase for three different firm risk measures. Systematic risk is the beta value. Z-Score is the firm distress measure proposed by Altman (1968). High risk group are firm risk observations in the top quartile indicating high levels of firm risk. Low risk group are firm risk observations in the bottom quartile indicating low levels of firm risk. Medium risk group are firm risk observations in between the bottom and top quartiles and indicate moderate levels of firm risk. Risk profile cutoffs are based on firm risk observations in each phase*

In Table 1.5, during the peak recession, riskier firms had larger advertising spending cuts. These results are consistent for both firm risk measures. During the early recession, a similar trend is observed for Altman's Z-Score. The magnitude of advertising spending cuts is smaller versus the peak recession and there is no clear relationship with systematic risk. Finally, during the pre-recession, there is no clear relationship between firm risk and advertising spending.

Overall, these descriptive results indicate that firm risk influenced advertising spending more during the peak of the Great Recession than prior to it.

### 1.3.6 Industry Advertising Intensity

Industry advertising intensity is a proxy for industry advertising importance. In Table 1.6, Panel A reports descriptive statistics for advertising intensity in each industry. Consumer firms have higher advertising intensity than industrial firms. Non-durables have higher advertising intensity than durables; however, this is limited only to consumer firms. Consumer services and non-durables have the highest advertising intensity, while industrial firms and business services have the lowest.

To provide descriptive insights into the hypothesis testing results, the industries are categorized into three groups. “High” advertising intensity industries consist of consumer non-durables and consumer services. They prioritize advertising because it helps them to differentiate their products and drive firm sales. “Low” advertising intensity industries consist of industrial firms and business services. They consider advertising to be more discretionary and less relevant to firm operations. “Medium” advertising intensity industries are in between the two extremes, consisting of consumer durables and retailers.

Table 1.6 Advertising Intensity Statistics

#### Panel A: Descriptive Statistics for Industry Advertising Intensity

Industry	min	p25	p50	p75	max	Ad Importance
Consumer Non-durables	2.0%	2.1%	2.3%	2.4%	2.5%	High
Consumer Durables	.7%	.8%	.83%	1.0%	1.3%	Medium
Consumer Services	1.7%	2.0%	2.1%	2.1%	2.7%	High
Industrial Non-durables	.0%	.0%	.0%	.1%	.1%	Low
Industrial Durables	.1%	.1%	.1%	.2%	.2%	Low
Business Services	.1%	.2%	.2%	.3%	.3%	Low
Retailers	.4%	.5%	.6%	.7%	.9%	Medium

Table 1.6 continued

**Panel B: Median Percentage Change in Total Advertising Spending in Each Phase for Different Industry Advertising Intensity Groups**

	% Change in Total Ad Spending (Median)		
	Pre-Recession	Early Recession	Peak Recession
<b>High Industry Ad Intensity</b>	1.2%	.4%	-9.2%
<b>Medium Industry Ad Intensity</b>	1.1%	-7.4%	-18.6%
<b>Low Industry Ad Intensity</b>	-1.2%	-12.5%	-26.2%

*Note: Panel A reports descriptive statistics of advertising intensity for each industry between Q1 2006 and Q3 2009. Advertising intensity of an industry is the ratio of total advertising spending to total sales in that industry. Panel B reports the median percentage change in total advertising spending in each phase (year over year) for different industry advertising intensity groups. High industry advertising intensity group consists of consumer non-durables and consumer services. Medium industry advertising intensity group consists of consumer durables and retailers. Low industry advertising intensity group consist of industrial durables, industrial non-durables and business services. To make it comparable to other phases, the “Pre-Recession” phase here is between 2006Q4 and 2007Q3.*

In Table 1.6, Panel B reports the median percentage change in spending across the high, medium, and low advertising intensity industries. In the pre-recession, there were no significant spending changes. In the early recession, advertising percentage spending cuts increased as industry advertising intensity decreased. In the peak recession, advertising percentage spending cuts once again increase with decreases in industry advertising intensity. Note, the magnitude of advertising spending cuts in the peak recession is much larger versus the early recession. These results indicate the impact of industry advertising importance on firm spending is greater during the peak of the Great Recession than prior to it.

#### 1.4 Model Specification and Estimation

The panel data regression model below tests our hypotheses. The coefficients are estimated with a standard OLS estimation procedure. Unobservable firm characteristics are controlled by including firm fixed effects. Standard errors are clustered at the firm level.

$$\begin{aligned}
 (1) \ln(1 + Ad_t) = & \alpha_0 + \beta_1 \text{Recession}_t + \beta_2 \text{Peak Recession}_t + \beta_3 \ln(1 + Ad_{t-4}) + \\
 & \beta_4 \ln(1 + Ad_{t-4}) * \text{Recession}_t + \beta_5 \ln(1 + Ad_{t-4}) * \text{Peak Recession}_t + \\
 & \beta_6 \text{Sales Growth}_t + \beta_7 \text{Sales Growth}_t * \text{Recession}_t + \beta_8 \text{Sales Growth}_t * \\
 & \text{Peak Recession}_t + \beta_9 \text{Sales Decline}_t + \beta_{10} \text{Sales Decline}_t * \text{Recession}_t + \\
 & \beta_{11} \text{Sales Decline}_t * \text{Peak Recession}_t + \beta_{12} \text{Firm Risk}_t + \beta_{13} \text{Firm Risk}_t * \\
 & \text{Recession}_t + \beta_{14} \text{Firm Risk}_t * \text{Peak Recession}_t + \beta_{15} \text{Industry Ad Intensity}_t + \\
 & \beta_{16} \text{Industry Ad Intensity}_t * \text{Recession}_t + \beta_{17} \text{Industry Ad Intensity}_t * \\
 & \text{Peak Recession}_t + \beta_{18} \text{Firm Size}_t + \text{FirmDummy} + \varepsilon_t
 \end{aligned}$$

where  $\text{Sales Growth}_t = \ln(1 + \text{Sales}_t) - \ln(1 + \text{Sales}_{t-4})$  if  $\text{Sales}_t - \text{Sales}_{t-4} \geq 0$ ,

otherwise  $\text{Sales Growth}_t = 0$

&  $\text{Sales Decline}_t = \ln(1 + \text{Sales}_t) - \ln(1 + \text{Sales}_{t-4})$  if  $\text{Sales}_t - \text{Sales}_{t-4} < 0$ ,

otherwise  $\text{Sales Decline}_t = 0$

The dependent variable is the natural log of one plus advertising spending in quarter  $t$ . The natural log helps reduce the impact of outliers.  $\text{Recession}_t$  is a dummy variable for the “*Early Recession*”.  $\text{Peak Recession}_t$  is a dummy variable for the “*Peak Recession*”.  $\beta_1$  and  $\beta_2$  capture the main effect of the “*Early Recession*” and “*Peak Recession*”. The “*Pre-Recession*” is the excluded category.  $\beta_3$  measures the seasonality effect of advertising in the “*Pre-Recession*”. The

interaction coefficients,  $\beta_4$  and  $\beta_5$ , measure changes in seasonality effect of advertising in the “*Early Recession*” and “*Peak Recession*”.

*Sales Growth<sub>t</sub>* is the growth in sales in quarter t (expressed as natural log of one plus sales in quarter t minus the natural log of one plus sales in quarter t-4). If sales decreased in quarter t, the variable equals zero. *Sales Decline<sub>t</sub>* is the decline in sales in quarter t (expressed as natural log of one plus sales in quarter t minus the natural log of one plus sales in quarter t-4). This variable equals zero when sales increase. Thus,  $\beta_6$  and  $\beta_9$  capture the effect of sales growth and sales decline on advertising spending in the “*Pre-Recession*”. The interaction coefficients,  $\beta_7$ ,  $\beta_8$ ,  $\beta_{10}$  and  $\beta_{11}$ , capture the asymmetric effect of sales on advertising spending in the “*Early Recession*” and “*Peak Recession*”.

*Firm Risk* is a continuous variable for firm risk. The appendix describes how the index aggregates systematic risk and Z-Score using the first principal component<sup>1</sup>.  $\beta_{12}$  captures the impact of firm risk on advertising spending in the “*Pre-Recession*” phase. The interaction coefficients,  $\beta_{13}$  and  $\beta_{14}$ , capture the additional impact of firm risk on advertising spending in the “*Early Recession*” and “*Peak Recession*”. *Industry Ad Intensity* is a continuous variable for industry advertising intensity. It is measured by total advertising spending as a percentage of total industry sales.  $\beta_{15}$  estimates the impact of industry advertising intensity on firm advertising spending in the “*Pre-Recession*”. The interaction coefficients,  $\beta_{16}$  and  $\beta_{17}$ , estimate changes in advertising spending in the “*Early Recession*” and “*Peak Recession*” due to the influence in industry advertising intensity.

An additional explanatory variable is *Firm Size*, which is the natural log of one plus total assets in quarter t. Larger firms should spend more on advertising because it is a fixed cost that can be spread over more unit sales, which is an important economy of scale. *Firm Dummy*

variables are fixed effects that capture unobservable firm characteristics which are constant over time.

## 1.5 Results

Table 1.7 reports the results for three different models. In Model 1, firm fixed effects are not considered and the early and peak recession phases are combined in a single recession dummy variable. In Model 2, firm fixed effects are added to Model 1. Model 3 adds a peak recession dummy variable, which tests for differences across a moderate versus a severe recession. Because Model 3 is fully specified, it is used for the hypothesis testing.

For H1a, the results indicate a strong seasonality effect of advertising in all three models ( $\beta_3 = .83, p < .01$ ;  $\beta_3 = .28, p < .01$ ;  $\beta_3 = .28, p < .01$ ). The seasonality effect of advertising is smaller in Models 2 and 3 versus Model 1. This is because Models 2 and 3 control for unobservable firm fixed effects. In Model 3, a 1% increase in advertising spending in the same quarter last year increases current quarter advertising spending by .28%. (The coefficient is an elasticity as both the variables are log transformed.)

For H1b, during the early recession, the total seasonality effect is weakened from .28% to .25% ( $\beta_4 = -.03, p < .05$ ). During the peak recession, the total seasonality effect is weakened once again by .03% to .22%. (The coefficient estimate is only significant using a one-tailed test). Overall, the empirical evidence illustrates the importance of seasonality in advertising spending and how it weakens during both a moderate and severe recession.

Table 1.7 Hypothesis Testing Results

		Model 1		Model 2		Model 3	
<b>ln(1+Ad(t))</b>	<b>Predicted Sign</b>	<b>Coef.</b>	<b>t-stat</b>	<b>Coef.</b>	<b>t-stat</b>	<b>Coef.</b>	<b>t-stat</b>
<b>Constant</b>		.21	1.35	<b>4.77***</b>	<b>6.40</b>	<b>4.95***</b>	<b>6.64</b>
<b>Recession</b>		<b>-.37**</b>	<b>-2.48</b>	-.07	-.49	.02	.14
<b>Peak Recession</b>						-.19	-1.03
<b>ln(1+Ad(t-4))</b>	+ (H1a)	<b>.83***</b>	<b>56.93</b>	<b>.28***</b>	<b>9.55</b>	<b>.28***</b>	<b>9.64</b>
<b>Recession*ln(1+Ad(t-4))</b>		.01	.59	<b>-.03*</b>	<b>-1.95</b>	<b>-.03**</b>	<b>-1.99</b>
<b>Peak Recession*ln(1+Ad(t-4))</b>	- (H1b)					-.03	-1.45
<b>Sales Growth</b>	+ (H2a)	-.34	-1.46	<b>-.51*</b>	<b>-1.71</b>	<b>-.56*</b>	<b>-1.89</b>
<b>Recession*Sales Growth</b>		.50	1.36	<b>.74*</b>	<b>1.88</b>	<b>.84**</b>	<b>2.01</b>
<b>Peak Recession*Sales Growth</b>	+ (H2b)					.43	.81
<b>Sales Decline</b>	+ (H2a)	<b>.90**</b>	<b>2.28</b>	.15	.31	.02	.04
<b>Recession*Sales Decline</b>		<b>.87*</b>	<b>1.67</b>	<b>1.73***</b>	<b>2.99</b>	.36	.71
<b>Peak Recession*Sales Decline</b>	+ (H2b)					<b>1.71***</b>	<b>2.58</b>
<b>Firm Risk</b>	- (H3a)	-.02	-.71	.03	.74	.04	.97
<b>Recession*Firm Risk</b>		<b>-.09**</b>	<b>2.24</b>	<b>-.08*</b>	<b>-1.80</b>	.04	.99
<b>Peak Recession*Firm Risk</b>	- (H3b)					<b>-.21***</b>	<b>-3.41</b>
<b>Industry Ad Intensity</b>	+ (H4a)	<b>.22***</b>	<b>5.78</b>	<b>.23**</b>	<b>2.15</b>	<b>.27**</b>	<b>2.49</b>
<b>Recession*Industry Ad Intensity</b>		<b>.12**</b>	<b>2.29</b>	<b>.15***</b>	<b>2.67</b>	.08	1.44
<b>Peak Recession*Industry AdIntensity</b>	+ (H4b)					<b>.23***</b>	<b>3.10</b>
<b>Firm Size</b>		<b>.11***</b>	<b>6.19</b>	.21	1.63	.18	1.38
<b>Firm-fixed Effects</b>		No		Yes		Yes	
<b>Observations</b>		6995		6995		6995	
<b>R<sup>2</sup></b>		.79		.86		.86	

*Note: Table 1.7 reports the results for three different empirical models. The first model combines the two recession phases. The second model adds firm-fixed effects. The third model distinguishes between the early and peak recession. Firm risk is calculated by aggregating systematic risk and Z-Score into a single index using the first principal component. Standard errors are clustered at the firm level and are adjusted for heteroskedasticity. \*\*\*/\*\*/\* indicates significance at the 1%, 5% and 10% levels respectively (based on two-tailed tests).*

For H2a, there is no empirical support for the sales growth hypotheses. During the pre-recession, it is surprising that sales growth has a negative rather than a positive impact on spending ( $\beta_6 = -.56$ ,  $p < .10$ ). In addition, a sales decline does not significantly reduce spending ( $\beta_9 = .02$ , n.s.).

For H2b, the impact of growing sales in the early recession is positive and significant ( $\beta_7 = .84$ ,  $p < .05$ ). Also, the impact in the peak recession is positive, but not significant ( $\beta_8 = .43$ , n.s.). Note, the total impact of sales growth on advertising spending during the Great Recession needs to be combined with the  $-.56$  estimate from the pre-recession. The combined estimate in the early recession is  $.84$  less  $.56$  which equals  $.28$ . In the peak recession, it is  $.43$  less  $.56$  which equals  $-.13$ . Because these combined estimates are not statistically significant, increasing sales during the Great Recession does not appear to increase advertising spending.

During the early recession, a decline in sales does not have a significant impact on advertising spending. During the peak recession though, declining sales has a significant impact on spending ( $\beta_{11} = 1.71$ ,  $p < .01$ ). A 1% decline in sales (year-over-year) leads to a 1.7% decline in advertising spending. Overall, these results indicate that even with growing sales, many firms do not increase their advertising spending during a recession. Declining sales though during a severe recession can force spending cuts.

For H3, increasing firm risk does not significantly decrease spending in the pre-recession or in the early recession. However, during the peak recession, firm risk has a negative and significant effect on advertising spending ( $\beta_{14} = -.21$ ,  $p < .01$ ). Here a firm's advertising spending decreased by nearly 19% when firm risk increased by one standard deviation. These results indicate that firm risk had a greater impact on advertising spending at the peak of the Great Recession than prior to it.

For H4a, it is not surprising that firm advertising increases with increases in industry advertising intensity ( $\beta_{15} = .27, p < .05$ ). For H4b, the empirical results highlight key differences across the two recession phases. During the early recession, industry advertising intensity has no incremental impact on advertising spending ( $\beta_{16} = .08, n.s.$ ). However, during the peak recession, industry advertising intensity has a positive impact on advertising spending ( $\beta_{17} = .23, p < .01$ ).

Note, this positive difference does not arise from firms in high advertising intensive industries spending more on advertising. Instead, it arises because firms in high advertising intensity industries made smaller spending cuts during the peak recession versus low advertising intensity industries.

In summary, firms made small cuts to advertising spending in the early recession, which mainly arose from a weaker seasonality impact. Here the prior year's spending was less likely to be carried over into the current year. In the peak recession, firms made larger spending cuts when sales declined, as firm risk increased, and in low advertising intensity industries.

## 1.6 Robustness Tests

### 1.6.1 Reverse Causality

The empirical model above estimates the impact of sales changes on advertising spending. However, the direction of causation could be reversed. This is when increased advertising increases sales. While advertising can increase sales, please note that advertising expenditure is less than 2% of sales for more than 80% of the firm-quarter observations. This suggests that the impact of advertising on sales is generally modest.

To empirically address this reverse causation, sales growth is replaced by its lagged value by one quarter. The main hypothesis testing results do not change. We also perform a Granger-causality Wald test between sales and advertising spending, with consistent hypothesis testing results.

### 1.6.2 Endogeneity Issues

Some of the independent variables such as firm risk and sales pose simultaneity problems. This is because sales can be jointly determined by advertising spending and firm risk can also be influenced by advertising spending.

An instrumental variable estimation procedure helps correct for these endogeneity issues. The instruments are one period lagged values of sales and firm risk. The model is then re-estimated using the instrumental variables. The hypothesis testing results are not materially different from those described above.

### 1.6.3 Alternative Firm Risk Specifications

The findings are tested for robustness with alternate specifications of firm risk. We used individual measures of firm risk-- systematic risk and Z-Score-- instead of an aggregate firm risk measure. Systematic risk (beta) is widely used in practice to measure the variation in a firm's stock price due to changes in the stock market. Leading investment firms such as Fidelity, Merrill Lynch and Value Line use systematic risk in their investment portfolio decisions (McAlister, Srinivasan, and Kim 2007). Also, prior marketing studies have measured firm risk using systematic risk (Madden, Fehle, and Fournier 2006, McAlister, Srinivasan, and Kim 2007; Singh, Faircloth, and Nejadmalayeri 2005). Altman's Z-Score is an accounting measure of firm risk which accounts for various sources of financial distress within a firm.

Table 1.8 Robustness Results

Dependent Variable: ln(1+Ad(t))	Systematic Risk		Annual Stock Return		Z-Score	
	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
<b>Constant</b>	<b>4.43***</b>	<b>6.04</b>	<b>4.29***</b>	<b>5.75</b>	<b>4.57***</b>	<b>6.15</b>
<b>Recession</b>	-.07	-.50	.00	.01	-.03	-.18
<b>Peak Recession</b>	-.01	-.06	-.17	-.87	-.06	-.30
<b>ln(1+Ad(t-4))</b>	<b>.28***</b>	<b>9.77</b>	<b>.28***</b>	<b>9.55</b>	<b>.27***</b>	<b>9.66</b>
<b>Recession*ln(1+Ad(t-4))</b>	<b>-.03*</b>	<b>-1.81</b>	<b>-.03*</b>	<b>-1.94</b>	<b>-.03*</b>	<b>-1.91</b>
<b>Peak Recession *ln(1+Ad(t-4))</b>	-.03	-1.19	-.03	-1.25	-.03	-1.33
<b>Sales Growth</b>	<b>-.47*</b>	<b>-1.65</b>	-.39	-1.40	-.27	-1.00
<b>Recession *Sales Growth</b>	<b>.71*</b>	<b>1.74</b>	.54	1.32	.49	1.22
<b>Peak Recession *Sales Growth</b>	.29	.53	.20	.37	.09	.16
<b>Sales Decline</b>	.03	.08	.04	.11	-.03	-.07
<b>Recession *Sales Decline</b>	.42	.99	.45	1.05	.34	.69
<b>Peak Recession *Sales Decline</b>	<b>1.75***</b>	<b>3.35</b>	<b>1.73***</b>	<b>3.28</b>	<b>1.74***</b>	<b>2.71</b>
<b>Firm Risk</b>	.04	1.24	-.00	-.02	-.08	-1.08
<b>Recession *Firm Risk</b>	.05	.94	-.05	-.36	.05	.80
<b>Peak Recession *Firm Risk</b>	<b>-.18***</b>	<b>-2.57</b>	-.15	-.88	<b>-.17**</b>	<b>-2.00</b>
<b>Industry Ad Intensity</b>	<b>.26**</b>	<b>2.45</b>	<b>.25**</b>	<b>2.36</b>	<b>.25**</b>	<b>2.45</b>
<b>Recession*Industry Ad Intensity</b>	<b>.10*</b>	<b>1.71</b>	<b>.12**</b>	<b>2.07</b>	.10	1.59
<b>Peak Recession *Industry Ad Intensity</b>	<b>.20***</b>	<b>2.77</b>	<b>.23***</b>	<b>3.18</b>	<b>.26***</b>	<b>3.47</b>
<b>Firm Size</b>	<b>.27**</b>	<b>2.11</b>	<b>.29**</b>	<b>2.32</b>	<b>.26**</b>	<b>1.97</b>
<b>Observations</b>	7411		7591		7428	
<b>R<sup>2</sup></b>	.87		.86		.86	

*Note: Table 1.8 reports estimation results for the main model with alternate firm risk measures. Three firms risk measures are tested: systematic risk, annual stock return and Z-Score. Standard errors are clustered at the firm level and are adjusted for heteroskedasticity. \*\*\*/\*\*/\* indicates significance at the 1%, 5% and 10% levels respectively (based on two-tailed p-values).*

We also test the findings with an alternate measure of firm risk based on annual stock return. Annual stock return is the percentage change in stock price over the last four quarters. According to efficient market hypothesis, stock prices should reflect all sources of firm risk. Therefore, annual stock return should also be an effective measure of firm risk. Table 1.8 reports estimation results for these three firm risk measures. The seasonality effect of advertising is consistently observed in all estimation results. Once again, there is some evidence to suggest that the seasonality effect of advertising is weakened during the Great Recession. We obtain consistent results for the asymmetric effect of sales on advertising spending during peak recession. The impact of industry advertising intensity on firm advertising spending is similar to estimates in the main model.

The main effect of firm risk on advertising spending is not significant in all models. Therefore, we cannot conclude that advertising spending decreases with increase in firm risk as hypothesized in H3a. However, during the “Peak Recession” phase, firm risk has a negative and significant effect on advertising spending in two of the three models (i.e. with systematic risk and Z-Score as firm risk measures). Annual stock return did not work well as firm risk measure, probably because stock prices were not good indicators of financial distress or financial vulnerability during the Great Recession. When stock prices declined during the Great Recession, for many firms it was more due to extraneous market factors than due to some inherent financial weakness.

Systematic risk indicates how volatile a firm’s stock price is relative to the market, and this volatility reflects the financial position of firms. Similarly, Z-Score reflects financial vulnerability of a firm based on its indicators such as liquidity, leverage and profitability. Therefore, it is not surprising that these two risk measures work best. The estimation results

reveal that the impact of firm risk on advertising spending is greater during the peak of the Great Recession than prior to it. The findings also show that advertising spending increases with firm size in all models. Overall, the empirical results are robust to alternate specifications of firm risk.

### 1.7 Discussion

What factors motivate managers to change advertising spending during a recession? A firm's advertising spending is partly driven by last year's spending in the same quarter. During a recession, managers are under pressure to reduce discretionary expenditures such as advertising. Therefore, managers are likely to pay less attention to historical spending when setting their advertising budgets. The empirical results indicate the seasonality effect of advertising was weaker during both phases of the Great Recession.

Many firms set advertising budgets as a percentage of their sales. This relationship though is not automatically maintained in a recession. Empirically, sales growth does not have a significant impact on advertising spending during either half of the Great Recession. This indicates that even when sales are growing during a recession, it is not easy for marketing managers to increase their advertising spending.

When sales decline during a recession, there are important differences between the moderate and severe phases of the Great Recession. During the first half, which was moderate, decreasing sales did not have a significant impact on advertising spending. In contrast, during the peak of the Great Recession, declining sales significantly reduced advertising spending. This indicates that when sales decline during a moderate recession, firms are often willing to weather the storm. This is less likely to arise during a severe recession, when declining sales often force advertising spending cuts.

Does increasing firm risk tend to decrease advertising spending? Again, an important difference arises between the first and second halves of the Great Recession. When firm risk is measured by combining stock market and accounting data, there is no significant impact during the first half of the Great Recession. During the second half though, increasing firm risk significantly reduces advertising spending. This indicates that increasing firm risk during a moderate recession is typically not enough to reduce the advertising budget. During a severe recession though, higher levels of firm risk can motivate spending cuts.

The importance of advertising varies across industries. Advertising is relatively important for consumer nondurables and consumer services, where it is often considered necessary to compete. Advertising is less important for industrial goods and services, where it is often considered discretionary.

During the first half of the Great Recession, there were no significant changes in spending across these industries, which have very different spending patterns. During the second half of the Great Recession, the spending differences widened. Firms in high advertising intensity industries had minor cuts in spending. The gap widened because firms in low advertising intensity industries had much larger percentage spending cuts. This indicates that advertising spending is more likely to be cut during a severe recession when the spending is discretionary and not strategically important.

#### 1.7.1 Research Limitations and Future Research

While the AdSpender data is more comprehensive and accurate than data from quarterly financial statements, it has its own drawbacks. AdSpender does not track advertising production costs, direct-mail advertising and product placement advertising. According to feedback from an AdSpender manager, most of the advertising spending estimates are accurate. The major

exception is internet advertising, which is difficult to track. Because our data ends in 2009, this should not be a major problem because internet advertising was still relatively minor.

The greatest measurement error may arise from the firm sales data in COMPUSTAT. For firms with international operations, the reported sales include international sales. Because the Great Recession was not uniform across the world in terms of magnitude and time, there may be an important difference between global and domestic sales growth. Random measurement error tends to weaken empirical results, so this could explain why sales growth does not have a significant impact on advertising spending in the pre-recession and during both phases of the Great Recession.

Advertising expenditures are also influenced by competition. Firms in more competitive industries typically require larger advertising budgets to successfully differentiate their product from their rivals. Because the data are at the firm level, it usually spans numerous products and markets, which makes it difficult to identify specific competitors.

To the extent that competition is fixed from one quarter to the next, it will be controlled by adjusting for fixed effects. For most firms, this seems like a reasonable assumption. This is because most of the 553 firms are in mature industries where competition is relatively stable from one quarter to the next.

Finally, while the data analysis addresses key variables that influence advertising spending, data are not readily available for other key variables, like new product launches. Future research could use experiments and surveys with managers to identify other key variables that influence ad spending during a recession.

### 1.7.2 Conclusions

During a recession, should advertising spending be increased, decreased, or maintained? Quelch (2008) recommends maintaining advertising spending. This was good advice during the first half of the Great Recession, which was considered moderate. In this period, advertising spending was largely maintained with minor spending cuts of 1% to 2%. These minor spending cuts appear to arise because the prior year's spending was less likely to be maintained.

In contrast, it is much more difficult to maintain spending during a severe recession. This is because spending cuts averaged 13% during the second half of the Great Recession, which was severe. They arose from declining sales, increasing firm risk, and when firms in low advertising intensity industries made large percentage spending cuts.

In conclusion, advertising spending is largely maintained during a moderate recession. For most firms, spending is not significantly increased or decreased. During a severe recession though, declining sales and increasing firm risk often motivate large spending cuts. This is especially true in industries where advertising is considered discretionary and is not necessary to remain competitive.

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## **CHAPTER 2. REAL EARNINGS MANAGEMENT USING ADVERTISING BUDGETS**

### **2.1 Introduction**

Earnings management has been an important area of research in accounting literature. Healy and Wahlen (1999) define earnings management as transactions which alter financial performance of firms to either mislead stakeholders or to influence contractual outcomes. There are two earnings management strategies- real earnings management and accrual-based earnings management. Both these strategies are used by firms to manage yearly (or quarterly) earnings with a goal to meet or beat certain earnings benchmarks. Accrual-based earnings management is achieved by changing accounting methods. According to Dechow and Skinner (2000), a firm's choice of generally accepted accounting principles (GAAP) can be used to obscure or mask true economic performance. The passage of Sarbanes-Oxley Act in 2002 has declined accrual-based earnings management activities and has significantly increased real earnings management activities (Cohen, Dey and Lys 2008). Therefore, lately, many studies have examined real earnings management activities (Chapman and Steenburgh 2011, Gunny 2010, Roychowdhury 2006).

Real earnings management involves changing a firm's operational activities. Roychowdhury (2006) defines real earnings management as "departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations" (p337). Examples of real earnings management methods include increasing promotions to boost sales, decreasing discretionary expenditures such as advertising and R&D and increasing production to reduce cost of goods sold. It is well known that managers use these real earnings management

methods to improve short-term performance of firms at the cost of long-term value (Graham, Harvey and Rajgopal 2005).

Marketing activities such as promotions can have an immediate impact on sales. Promotional activities such as price discounts are commonly used by firms to lift sales. Chapman and Steenburgh (2011) find soup manufacturers increase promotional activities such as price discounts, feature advertisements and aisle displays to boost quarterly earnings. However, in the process, they sacrifice long-term value to meet short-term earnings benchmarks. On the other hand, marketing activities such as advertising has limited impact on sales and a large carry-over effect in future periods. Therefore, investments on marketing activities such as advertising may not reap immediate benefits in terms of additional revenue (or profits) to many firms.

Managers who have a myopic perspective in marketing are willing to cut advertising expenditures when they are behind earnings targets. Cohen, Mashruwala and Zach (2009) find firms reduce advertising expenditures to avoid losses and earnings decline. Roychowdhury (2006) finds firms reduce discretionary expenditures such as advertising to improve reported earnings. There are other scenarios too where firms manage earnings using advertising expenditures to increase short-term financial performance. For example, firms typically reduce advertising expenditures during a recession under financial pressure (Tellis and Tellis 2009). Mizik and Jacobson (2007) find that some firms inflate their stock market valuation by cutting marketing expenditures at the time of a seasoned equity offering.

This study has two important contributions. Firstly, we investigate factors which motivate firms to manage earnings using advertising expenses. Prior studies on real earnings management in the context of advertising have mainly found evidence of firms reducing advertising expenses to improve earnings (Cohen, Mashruwala and Zach 2009, Roychowdhury 2006). These studies

don't provide any insights as to why firms choose advertising expenses to manipulate their earnings. This study explores this issue in some detail.

Secondly, this study investigates differences in earnings management using advertising expenses due to changes in a range of factors including advertising media profile, firm performance, financial reporting choice, target market profile, and time of the fiscal year. The results provide new insights on real earnings management using advertising expenses. For example, the results indicate suspect B2C firms reduce advertising spending by a larger proportion than suspect B2B firms. The findings show suspect firms make smaller advertising cuts in high advertising elasticity media like TV versus print media. Firms which report advertising expenses in their income statement are also making smaller advertising cuts in comparison to firms which don't report advertising expenses. The proportion of advertising cuts is much larger in the last fiscal quarter versus the earlier quarters.

Like earlier studies, we find firms reduce advertising expenses to meet earnings benchmarks such as analysts forecast, earnings per share for the same quarter last year and reporting a loss. The impact of factors such as advertising media profile (TV Ad vs Print Ad), firm performance (Increasing Margin vs Decreasing Margin), financial reporting choice (Reporting Ad vs Not Reporting Ad) and target market profile (B2C vs B2C) have not been investigated in earlier studies on real earnings management using advertising expenditures. This will be of interest to not just managers who strategize competitive marketing actions but also to analysts and advertising agencies who closely monitor marketing actions of firms.

The study is organized as follows. The next section discusses the key hypotheses tested in this study and reviews relevant literature on earnings management. The data analysis section provides details on the data collection process and descriptive statistics of key variables. In the

following sections, we discuss the estimation methodology and analyze our estimation results. In the conclusion section, we discuss key contribution of this study and its managerial implications.

## 2.2 Theory and Hypotheses

### 2.2.1 Advertising Spending

Many firms find promotions very effective to increase immediate sales. Marketing studies have supported the strong short-term impact of promotions (Gupta 1988, Kamakura and Russell 1989). This is also indirectly supported by studies which find firms increasing promotions to manage earnings in the short-term (Chapman and Steenburgh 2011). In contrast, advertising typically has a limited ability to lift short-term sales. The carryover effect of advertising is much larger than the immediate effect (Tellis 2009). Therefore, firms do not always use advertising as an instrument to directly increase sales. This motivates managers to reduce advertising spending when they lag behind key earnings benchmarks. Graham, Harvey and Rajgopal (2005) report that nearly 80% of executives in their survey are willing to reduce discretionary expenditures such as advertising to meet their financial objectives.

Past empirical studies on earnings management have found evidence of firms reducing advertising spending to meet or beat earnings benchmarks. Roychowdhury (2006) finds firms reduce discretionary expenses such as advertising to manage earnings. Cohen, Mashruwala and Zach (2009) also find firms reduce advertising spending to avoid losses, meet earnings forecast and avoid earnings decline. This leads us to our baseline hypothesis which replicates earlier studies:

*H1: A firm suspected of managing its earnings upward will reduce its advertising spending*

### 2.2.2 Advertising Intensity

Advertising intensity is the ratio of total advertising expenditure to total sales. It varies from one category to another depending on several factors. For example, in product categories which have strong sales response to advertising (i.e. high advertising elasticity) typically have high advertising intensity. Past studies have shown that advertising intensity varies with market characteristics. Firms which have a consumer target market have higher advertising intensity than firms which have a business target market (Andras and Srinivasan 2003, Farris and Buzzell 1979). The stage of the product life cycle can also influence advertising intensity. In the introduction and growth stage, firms typically have high advertising elasticity as advertising is important to create awareness, interest and loyalty to their products (Parsons 1975). Thus, firms will have high advertising intensity during these stages in comparison to those in maturity and decline stages.

Managers are willing to reduce discretionary expenditures to meet relevant earnings benchmarks for their firm (Graham, Harvey and Rajgopal 2005). Discretionary expenditures include advertising expenditures, R&D expenditures and selling, general and administrative (SG&A) expenditures. Examples of SG&A expenditures include expenses on employee training, salaries, utilities, travel etc. A firm is more likely to reduce advertising expenditure from all these options to manage its earnings if the expenditure is typically high with respect to its sales. The ratio of total advertising expenditure to total sales is commonly referred to as advertising intensity.

High advertising intensity provides a large buffer for firms to successfully manage their earnings by cutting advertising spending. Firms with small advertising budgets may not be able to meet their earnings benchmarks by just reducing advertising spending. Additionally, firms with high advertising intensity can cover up their tracks if they are reducing advertising spending

by small margins to manage earnings. Reducing a large expenditure by a small margin will not attract too much attention from the investor community and other stakeholders.

Advertising intensity varies between firm due to several factors. For example, the stage of the product life cycle can also influence advertising intensity. In the introduction and growth stage, firms typically have high advertising intensity as advertising is important to create awareness, interest and loyalty to their products (Parsons 1975). The sample in this study largely consists of mature publicly traded firms which makes product life cycle a redundant factor.

Advertising intensity can vary with market characteristics. Typically, firms which have a consumer target market spend a significantly larger fraction of their revenue on advertising activities in comparison to firms which target business markets. There is empirical evidence to support this claim. Andras and Srinivasan (2003) find advertising intensity is much higher for consumer firms than manufacturing firms. Farris and Buzzell (1979) find similar differences between consumer firms and industrial firms. This leads us to our second hypothesis:

*H2: A firm suspected of managing its earnings upward will reduce its advertising expenditure by a larger share if it is a business-to-consumer (B2C) firm than a business-to-business (B2B) firm*

### 2.2.3 Gross Margin

Gross margin is a robust indicator of the financial health of any business. When firms experience declining margins, it is perceived negatively in the financial markets (Lev and Thiagarajan 1993). Gross margin can decrease for several reasons including increasing raw material costs, declining product demand or declining prices. On the other hand, margins increase due to economies of scale, learning curve and greater pricing power. Typically, advertising spending increases with increase in price-cost margin (Schmalensee 1976). Declining

margins compels firms to reduce discretionary expenditures such as advertising. Thus, advertising spending and gross margins are expected to have a positive correlation.

Empirical studies have found evidence of earnings management for firms with deteriorating gross margins. Beneish (1999) finds the probability of earnings management increases with decrease in gross margins. Datta, Iskandar-Datta and Singh (2013) find more earnings manipulation in firms with lower product market pricing power. Typically, the goal of earnings management activities is to meet or just beat earnings benchmarks (Roychowdhury 2006). Suspect firms which successfully increase its margin to beat earnings benchmarks are more likely to make a big reduction in discretionary expenditures. If the margins are declining even after managing real activities, it signals firms are not making significant cutbacks to improve their margin. This leads us to our third hypothesis:

*H3: A firm suspected of managing its earnings upward is likely to reduce advertising spending by a larger share when its gross margin increases versus when its gross margin decreases*

#### 2.2.4 Advertising Mediums

Many firms have an integrated marketing campaign for their products. These firms want to capitalize on the synergy effect of advertising in multiple channels (Naik and Raman 2003, Naik and Peters 2009). These synergies are there within offline and online media, and also between them (Chang and Thorsen 2004; Dijkstra, Buijtsels, and Van Raaij 2005). However, not all advertising channels are effective in driving firm sales. The relative effectiveness of media channels has been a topic of interest in marketing literature. Media channels such as TV are very effective for advertising. Sethuraman, Tellis, and Briesch (2011) find TV advertising has higher short-run advertising elasticity than print advertising. They attribute it to the fact that print advertisements cannot not arouse emotions in the manner TV advertisements can. Robinson

(2009) finds TV advertising is very effective in generating sales by increasing brand awareness. Danaher and Dagger (2013) find advertising on traditional media such as catalogs, direct mail and TV are more effective than advertising on social media to improve offline revenue.

Firms are aware about the effectiveness of individual media channels in generating sales. This is one of the factors firms consider when allocating advertising budget for each media channel. As mentioned earlier, firms don't use advertising as an instrument to directly generate sales. Firms mainly spend on advertising with an objective to increase awareness, interest and preference for their products. Thus, they will choose a media mix that can meet these short-term goals and higher sales will be an indirect end result of achieving these goals.

Firms are typically under pressure to reduce discretionary expenditures such as advertising when they are lagging behind important earnings benchmarks. However, if firms believe their advertising investment will have a strong influence on immediate sales or profits, they may not make significant cuts in advertising spending. This is more likely to happen with advertising budgets in media channels such as TV which have high advertising elasticity. This leads us to our fourth hypothesis:

*H4: A firm suspected of managing its earnings upward will reduce advertising expenditures by a smaller share in high advertising elasticity media channels like TV in comparison to low elasticity channels like newspapers and magazines*

#### 2.2.5 Reporting Status

Firms can report their advertising expenditures in their income statements. Prior to 1994, it was mandatory for firms to report advertising expenditures in their income statement. Security and Exchange Commission's (SEC) Financial Reporting Release No 44 (FRR44) in 1994 made it optional for firms to separately disclose advertising expenses (Simpson 2008). As a result,

many firms do not disclose advertising expenditures. Kim and McAlister (2011) found around 37% of the leading national advertisers do not disclose their advertising expenditures. Many empirical studies on real earnings management in the context of advertising examined only firms which reported advertising spending (Cohen, Dey, and Lys 2008, Roychowdhary 2006) to avoid any measurement bias. In our next hypothesis, we test whether firms use this optional disclosure of advertising expenditure for the purpose of real earnings management.

The investor community examine the financial health of a firm by analyzing various elements including the financials reported by the firm. Firms which report advertising expenditure in their income statement would not want to indicate that they are meeting their earnings benchmarks by reducing advertising spending. In contrast, firms which do not report advertising expenditures, can spending conservatively on advertising without raising red flags. These firms club advertising expense with other expenses such as supplies, salaries, maintenance, travel etc. These are jointly reported as SG&A expenditure in the income statement. This makes it very difficult for analysts or investors to know how much these firms are spending on each item. This allows them to improve their earnings close to their earnings benchmarks using advertising budgets and thus makes them look financially robust in the eyes of their investors. This leads us to our fifth hypothesis:

*H5: A firm suspected of managing its earnings upward will reduce advertising expenditures by a smaller share if it discloses advertising expenditure in its income statement*

#### 2.2.6 End of Fiscal Year

Managers prefer to manipulate earnings using real activities over accrual activities (Graham, Harvey and Rajgopal 2005). It is not always possible for firms to manipulate accruals to the extent they need to beat earnings benchmarks (Roychowdhury 2006). This is especially

true in the last quarter of the fiscal year when auditors pay greater attention to accrual actions than before. It is also difficult for firms to predict how close they will get to their earnings targets for the fiscal year in the earlier quarters. At the beginning of the last fiscal quarter, firms will be able to quantify the extent by which they need to manipulate earnings to successfully beat their annual earnings benchmarks. Therefore, earnings management through real activities such as advertising will become stronger in the last fiscal quarter. This leads us to our sixth hypothesis:

*H6: A firm suspected of managing its earnings upward will reduce its advertising expenditure by a larger share in the last quarter of the fiscal year versus earlier quarters*

## 2.3 Research Design

### 2.3.1 Data and Sample

Advertising expenditures of publicly traded firms were collected from AdSpender database. AdSpender tracks domestic advertising expenditures in twelve key advertising channels. These include TV, radio, newspapers, magazines and internet. It provides a breakdown of advertising expenditures in individual channel for all types of advertisers including government and non-profit organizations. Advertising expenses are estimated based on current advertising rates within the tracked channel during each calendar quarter. Advertising rates are provided either by the channel operators or in some cases by the advertisers and advertising agencies. AdSpender allows advertising expenditures to be aggregated at the brand, firm and product category level. AdSpender data is more reliable than advertising expenses reported by firms in their income statement which can also include promotional expenses. Also, not all firms report their advertising spending as it is an optional line item (Kim and McAlister 2011). One drawback of

AdSpender data is that it does not include advertising expenses that are difficult to track such as direct-mail advertising, product placement advertising and advertising production expenses.

Advertising expenditures are gathered from 2003 to 2017 for each calendar quarter. We collected advertising expenditures of leading national advertisers in the U.S. Firms with small advertising budgets are less likely to manage earnings using advertising for a fiscal quarter or year.

Therefore, we included only firms which have at least an average annual advertising spending of \$100,000 in this study. We also included only publicly traded firms. Limiting to publicly traded firms allows us to collect accounting and financial data from other secondary data sources. Firms from regulated industries such as financial services, utilities and healthcare firms are dropped as their advertising spending can be driven by a different set of factors. Only firms which had initial public offering (IPO) before 2003 are included in the sample to ensure that we have complete data for all variables. Foreign firms that are traded as American Depositary Receipt (ADR) in the U.S. are also dropped from the sample because their accounting and financial data can be influenced by their foreign operations.

Some firms don't consistently spend on advertising in all quarters in the time frame selected. Thus, we selected only firms which spend on advertising for at least half the quarters between 2003 and 2017. After meeting all the above-mentioned criteria, we have a total sample size of 749 firms. Broadly, these include consumers firms, business firms, durables, nondurables and services. Information from balance sheet and income statement is collected using COMPUSTAT. These include data on firm sales, total assets, advertising reporting status and quarterly earnings. COMPUSTAT returns advertising expense as blank for firms which do not report advertising expenditure in their income statement. Data on actual quarterly earnings, analyst forecasts, and analyst coverage information is obtained from Institutional Brokers

Estimate System (I/B/E/S) database. Analyst forecast is the mean estimate of all the analyst estimates of a firm's quarterly earnings made just before the quarter begins.

### 2.3.2 Identifying Suspect Firms

There are a number of earnings benchmarks which firms can target in order to report a robust financial performance. However, past empirical studies have mainly used three key earnings benchmarks which firms try to meet or exceed. This includes analyst consensus estimate for the current period, earnings for the same period last fiscal year and earnings in the current period. Graham, Harvey and Rajgopal (2005) find CFOs are motivated to beat analyst consensus estimate and earnings for the same quarter last year. This helps them to build confidence about their firm performance with investors and improve stock prices. Missing these benchmarks by small margins can be viewed by stakeholders as poor financial management and can have strong repercussions on stock prices. Similarly, small earnings losses can indicate firms are unable to effectively manage their finances.

Firms are suspected of managing earnings using real activities if they just avoid falling short of any of these earnings benchmarks. Thus, on a quarterly basis, suspect firms are those which just beat analyst forecast for the quarter, just beat earnings for the same quarter last year and just avoid a loss. We define suspect firms as (1) whose EPS for the current quarter is 0 to 2 cents above the EPS for the same quarter in last fiscal year (Zhang 2012), (2) whose EPS over the previous four quarters is between 0 and 10% below the consensus analysts' estimate (Chapman and Steenburgh 2011), (3) whose ratio of earnings before extraordinary items to lagged assets is between 0 and .01 over four quarters (Gunny 2010). The proposed hypotheses are tested by combining the three suspect groups.

## 2.4 Model Specification and Estimation

Wright (2009) theorizes an advertising model in which a firm's advertising spending is a function of its advertising elasticity and its gross margin. In this study, we use this as the foundation and define the advertising spending of a firm for quarter  $t$  as below.

$$(1) Ad_t = \text{Gross Margin}_t * \text{Advertising Elasticity}_t$$

Similarly, the firm's advertising spending for quarter  $t-4$  is the following.

$$(2) Ad_{t-4} = \text{Gross Margin}_{t-4} * \text{Advertising Elasticity}_{t-4}$$

Dividing equation 1 and 2 leads to the model below which is then rewritten as equation 3.

$$\begin{aligned} Ad_t / Ad_{t-4} &= (\text{Gross Margin}_t / \text{Gross Margin}_{t-4}) \\ &* (\text{Advertising Elasticity}_t / \text{Advertising Elasticity}_{t-4}) \end{aligned}$$

$$(3) \text{Advertising Ratio}_t = \text{Margin Ratio}_t * \text{Ad Elasticity Ratio}_t$$

Equation 3 is the baseline model to test the hypotheses. Industry fixed effects are included to control for heterogeneity at the industry level that do not vary over time. Time fixed effects are included to control for heterogeneity over time which cannot be explained by other variables. The model is estimated using a standard OLS estimation procedure and standard errors are clustered at the firm level. The panel data regression model for the estimation process is defined below.

(4)  $\ln(\text{Advertising Ratio}_t)$

$$\begin{aligned}
&= \alpha_0 + \beta_1 \text{Suspect}_t + \beta_{11} \text{Suspect}_t * \text{B2C}_t + \beta_2 \ln(\text{Margin Ratio})_t \\
&+ \beta_3 \text{Suspect}_t * \ln(\text{Margin Ratio})_t + \beta_{33} \text{Suspect}_t * \ln(\text{Margin Ratio})_t \\
&* \text{B2C}_t + \beta_4 \ln(\text{Ad Elasticity Ratio})_t + \beta_5 \text{Suspect}_t * \ln(\text{Ad Elasticity Ratio})_t \\
&+ \beta_{55} \text{Suspect}_t * \ln(\text{Ad Elasticity Ratio})_t * \text{B2C}_t + \beta_6 \text{TV Ad Intensity} \\
&+ \beta_7 \text{Suspect}_t * \text{TV Ad Intensity}_t + \beta_{77} \text{Suspect}_t * \text{TV Ad Intensity}_t * \text{B2C}_t \\
&+ \beta_8 \text{Report Ad}_t + \beta_9 \text{Suspect}_t * \text{Report Ad}_t + \beta_{99} \text{Suspect}_t * \text{Report Ad}_t \\
&* \text{B2C}_t + \beta_{10} \ln(\text{Firm Growth})_t + \text{TimeDummies} + \text{IndustryDummies} + \varepsilon_t
\end{aligned}$$

The dependent variable is the growth in advertising spending over four quarters expressed as the natural log of the ratio of advertising spending in quarter  $t$  to advertising spending in quarter  $t-4$ .  $\text{Suspect}_t$  is a categorical variable for firms suspected of managing earnings upwards in quarter  $t$ . It equals zero if the firm does not belong to any of the three suspect groups defined in the previous section. Otherwise, it equals the number of suspect definitions it satisfies in each quarter.  $\beta_1$  measures the extent by which a firm suspected of managing earnings will increase or decrease advertising spending.

An interaction variable  $\text{B2C}_t$  tests the second hypothesis. This is a dummy variable indicating whether a firm is a business-to-consumer firm or not.  $\beta_{11}$  identifies differences in real earnings management (using advertising expenses) between a suspect B2C firm and a suspect B2B firm. The next term  $\ln(\text{Margin Ratio})_t$  is the growth in gross margin over four quarters expressed as the natural log of the ratio of gross margin in quarter  $t$  to gross margin in quarter  $t-4$ .  $\beta_2$  measures the impact of growth (decline) in gross margin on a firm's advertising spending.  $\beta_3$ , the interaction coefficient estimates the difference in the impact of margin on advertising spending between suspect and non-suspect firms.

Table 2.1 Key Variable Definitions

Variable	Definition	Measure
<b>Advertising Ratio</b>	Growth in advertising spending over four quarters	Ratio of advertising spending in current quarter to advertising spending in the same quarter last year.
<b>Suspect</b>	Categorical variable for firms which are suspect of managing their earnings upwards	Equals the number of suspect definitions satisfied out of the three listed below. (1) Earnings per share (EPS) for the current quarter beats EPS for the same quarter last year by 2 cents. (2) Quarterly EPS miss consensus analyst forecast (made in the last four quarters) by 0 to 10%. (3) Just avoids reporting a quarterly loss (i.e. Ratio of earnings before income and taxes to total assets is between 0 and 0.01 over the last four quarters). Equals 0 if none of the three criteria are met.
<b>Margin Ratio</b>	Growth in gross margin over four quarters	Ratio of margin in the current quarter to margin in the same quarter last year. Margin is sales less costs of goods sold (COGS) and selling, general and administrative expense (SG&A). If COGS or SG&A is missing, margin is equal to operating income after depreciation (OIAD).
<b>Ad Elasticity Ratio</b>	Growth in advertising elasticity over four quarters	Ratio of advertising elasticity in the last quarter to advertising elasticity in the same quarter last year. Advertising elasticity is measured as the ratio of advertising spending to gross margin.
<b>TV Ad Intensity</b>	TV advertising intensity	Ratio of total TV advertising spending to total advertising spending between 2005-16.
<b>Report Ad</b>	Dummy variable for firms which report advertising expense	Equals 1 if a firm reports advertising expense in its income statement, otherwise 0.
<b>Firm Growth</b>	Growth in total assets over four quarters	Ratio of total assets (USD '000s) in current quarter to total assets in the same quarter last year.
<b>B2C</b>	Dummy variable for B2C firms	Equals 1 if the firm is a business-to-consumer (B2C) firm, otherwise 0.
<b>Last Q</b>	Dummy variable for the last quarter of the fiscal year	Equals 1 if the current quarter is the last quarter for the fiscal year, otherwise 0.

Advertising Elasticity<sub>t</sub> is the growth in advertising elasticity over the last four quarters and is expressed as the natural log of the ratio of advertising elasticity in the last quarter to advertising elasticity in same quarter last year. Advertising elasticity is estimated by taking the ratio of the firm's advertising spending to its gross margin (Wright 2009).  $\beta_4$  measures whether changes in a firm's advertising elasticity influences its advertising spending. The interaction coefficient,  $\beta_5$ , identifies whether the effect of advertising elasticity on advertising spending varies between suspect and non-suspect firms.

*TV Ad Intensity<sub>t</sub>* is used to test hypothesis 3. It is measured by the ratio of total TV advertising expenditure to total advertising expenditure between 2005-16. This includes cable TV, network TV and syndicated TV spending. In this model specification,  $\beta_6$  measures the overall effect of TV advertising on advertising spending.  $\beta_7$  tests hypothesis 4 by examining whether suspect firms are less likely to reduce advertising spending in high advertising elasticity channels like TV.

*Report Ad<sub>t</sub>* is a dummy variable indicating a firm has reported its advertising expenditure in its income statement for quarter t. With this test variable,  $\beta_8$  measures whether reporting advertising expenses impact how firms spend on advertising.  $\beta_9$  tests hypothesis 5 by examining whether a firm reporting its advertising expense will be cautious about managing its earnings upwards using its advertising budget. Advertising spending is known to be a function of firm size and this is controlled by including Firm Growth<sub>t</sub> in the model. This is the growth in total assets over four quarters expressed as the natural log of the ratio of total assets in quarter t to total assets in quarter t-4. Industry and time dummies are included to control for shocks that are specific to industry and those which vary with time respectively.

The coefficients  $\beta_{33}$ ,  $\beta_{55}$ ,  $\beta_{77}$  and  $\beta_{99}$  for the three-way interaction terms measure earnings management differences (using advertising expenses) between a suspect B2C firm and a suspect B2B firm due to changes in margin ratio, advertising elasticity ratio, TV advertising intensity and reporting status respectively. We examine if there are differences in earnings management activity using advertising expenses in the last fiscal quarter compared to earlier quarters by introducing an interaction term Last  $Q_t$  in place of  $B2C_t$  in model 4. This is a dummy variable for the last quarter of the fiscal year. The proposed model is as below.

(5)  $\ln(\text{Advertising Ratio}_t)$

$$\begin{aligned}
 &= \alpha_0 + \beta_1 \text{Suspect}_t + \beta_{11} \text{Suspect}_t * \text{Last } Q_t + \beta_2 \ln(\text{Margin Ratio})_t \\
 &+ \beta_3 \text{Suspect}_t * \ln(\text{Margin Ratio})_t + \beta_{33} \text{Suspect}_t * \ln(\text{Margin Ratio})_t \\
 &* \text{Last } Q_t + \beta_4 \ln(\text{Ad Elasticity Ratio})_t \\
 &+ \beta_5 \text{Suspect}_t * \ln(\text{Ad Elasticity Ratio})_t \\
 &+ \beta_{55} \text{Suspect}_t * \ln(\text{Ad Elasticity Ratio})_t * \text{Last } Q_t + \beta_6 \text{TV Ad Intensity} \\
 &+ \beta_7 \text{Suspect}_t * \text{TV Ad Intensity}_t + \beta_{77} \text{Suspect}_t * \text{TV Ad Intensity}_t * \text{Last } Q_t \\
 &+ \beta_8 \text{Report Ad}_t + \beta_9 \text{Suspect}_t * \text{Report Ad}_t + \beta_{99} \text{Suspect}_t * \text{Report Ad}_t \\
 &* \text{Last } Q_t + \beta_{10} \ln(\text{Firm Growth})_t + \text{TimeDummies} + \text{IndustryDummies} + \varepsilon_t
 \end{aligned}$$

## 2.5 Results

### 2.5.1 Summary Statistics

Table 2.2 reports correlation coefficients between all key variables. The advertising ratio has positive and significant correlations with margin ratio, advertising elasticity ratio, and firm growth ( $p < 0.01$  for all correlations). It has negative and significant correlation with suspect firms

( $p < 0.05$ ). These correlations are in the expected direction. Interestingly, TV advertising intensity and reporting advertising variables have a positive and significant correlation ( $p < 0.01$ ).

Table 2.2 Correlation Matrix between Model Variables

Variable	1	2	3	4	5	6	7
1 Advertising Ratio	1.00						
2 Margin Ratio	.03***	1.00					
3 Ad Elasticity Ratio	.31***	-.14***	1.00				
4 Suspect	-.02**	-.06***	.02***	1.00			
5 TV Ad Intensity	.00	-.02**	.00	.03***	1.00		
6 Report Ad	.00	.02***	-.01	.00	.17***	1.00	
7 Firm Growth	.03***	.07***	.02***	-.01	-.02***	.02***	1.00

*Note: Table 2.2 reports correlation between each pair of variables in the proposed model. Variables which are ratios are log transformed as defined in the model. See Table 2.1 for variable definitions. \*\*\*/\*\*/\* indicates significance at the 1%, 5% and 10% levels respectively.*

Panel A in Table 2.3 reports descriptive statistics for key variables in the proposed model. The mean advertising ratio is 2.1 and the median is 1.0. On average, firms spend around 36% of their advertising budget on TV ads. Around 68% of the firms report advertising spending in the income statement.

Panel B in Table 2.3 reports suspect related summary statistics. Around 10%, 16.5% and 3.1% of the observations meet the first, second and third suspect condition respectively. These figures are close to those found in past studies (Gunny 2010, Zhang 2012). Nearly 21% of the observations satisfy only one suspect condition out of the three. Around 2% of the observations

satisfy only two suspect conditions out of the three. Only .01% observations (or three firm-quarters) satisfy all three suspect conditions. Thus, it is unusual for firms to satisfy all three suspect conditions simultaneously.

Table 2.3 Summary Statistics

**Panel A: Descriptive Statistics of Key Variables**

	<b>Mean</b>	<b>25%</b>	<b>50%</b>	<b>75%</b>	<b>Std Dev</b>
<b>Advertising Ratio</b>	2.11	.66	1.00	1.46	4.34
<b>Margin Ratio</b>	1.22	.87	1.06	1.23	.72
<b>Ad Elasticity Ratio</b>	2.01	.49	.89	1.44	4.27
<b>TV Ad Intensity</b>	.36	.06	.31	.62	.30
<b>Report Ad</b>	.68	.00	1.00	1.00	.47
<b>Firm Growth</b>	1.11	.98	1.04	1.13	.31

**Panel B: Descriptive Statistics of Suspect Variable**

	<b>Observations</b>	<b>Total Observations</b>	<b>Percentage</b>
<b>Suspect 1</b>	1762	17634	9.99%
<b>Suspect 2</b>	2907	17604	16.51%
<b>Suspect 3</b>	659	21133	3.12%
<b>Meets 1 criteria</b>	4477	21477	20.85%
<b>Meets 2 criteria</b>	421	21477	1.96%
<b>Meets 3 criteria</b>	3	21477	.01%

*Note: Panel A reports descriptive statistics for all variables in the proposed model. Suspect 1 are firms which just beat EPS for the same quarter last year. Suspect 2 are firms which just miss analysts' forecast. Suspect 3 are firms which just avoid a loss over four quarters. Variables which are ratios are winsorized at 2.5% level. Panel B reports suspect variable statistics. See Table 2.1 for variable definitions.*

### 2.5.2 Estimation Results

Table 2.4 reports the estimation results highlighting differences in advertising spending between suspect B2C firms and suspect B2B firms. The coefficient  $\beta_{11}$  for the interaction between suspect and B2C dummy variables is negative and significant ( $p < .01$ ), while the main suspect variable coefficient  $\beta_1$  is not significant. This suggests suspect B2C firms reduce advertising spending by a larger proportion than suspect B2B firms (as predicted in H2). Table 2.4 results provide no signs of earnings management in B2B firms using advertising budgets. Therefore, in Table 2.5 we report estimation results for only suspect B2C firms highlighting differences in how suspect firms spend on advertising in the last fiscal quarter versus earlier quarters. These results are used to discuss the remaining hypothesis tests.

Table 2.4 B2C Firms versus B2B Firms

	(1)		(2)		(3)	
<b>ln (Advertising Ratio)</b>	<b>Coef.</b>	<b>t-stat</b>	<b>Coef.</b>	<b>t-stat</b>	<b>Coef.</b>	<b>t-stat</b>
<b>Constant</b>	.02	1.10	.03	.54	-.04	-.71
<b>Suspect</b>	-.04	-.83	-.03	-.58	.00	-.07
<b>Suspect *B2C</b>	<b>-.22***</b>	<b>-2.89</b>	<b>-.21***</b>	<b>-2.88</b>	<b>-.24***</b>	<b>-3.00</b>
<b>ln (Margin Ratio)</b>	<b>.22***</b>	<b>7.55</b>	<b>.19***</b>	<b>6.58</b>	<b>.18***</b>	<b>6.21</b>
<b>Suspect*ln (Margin Ratio)</b>	-.14	-1.35	-.15	-1.52	-.16	-1.61
<b>Suspect*ln (Margin Ratio) *B2C</b>	<b>-.12**</b>	<b>-2.55</b>	<b>-.11**</b>	<b>-2.37</b>	<b>-.10**</b>	<b>-2.16</b>
<b>ln (Ad Elasticity Ratio)</b>	<b>.30***</b>	<b>20.96</b>	<b>.30***</b>	<b>20.70</b>	<b>.30***</b>	<b>20.28</b>
<b>Suspect* ln (Ad Elasticity Ratio)</b>	-.02	-.57	-.02	-.56	-.02	-.58
<b>Suspect* ln (Ad Elasticity Ratio) *B2C</b>	-.03	-.61	-.03	-.61	-.03	-.59
<b>TV Ad Intensity</b>	-.01	-.21	.00	-.18	.01	.24
<b>Suspect* TV Ad Intensity</b>	-.01	.09	-.01	.09	-.01	-.06
<b>Suspect* TV Ad Intensity *B2C</b>	<b>.22***</b>	<b>2.63</b>	<b>.21**</b>	<b>2.54</b>	<b>.23***</b>	<b>2.58</b>
<b>Report Ad</b>	-.01	-.63	-.01	-.53	-.03	-1.41

Table 2.4 continued

<b>Suspect* Report Ad</b>	-0.04	-0.76	-0.05	-0.83	-0.07	-1.17
<b>Suspect* Report Ad *B2C</b>	.07	1.12	.08	1.20	.10	1.51
<b>ln (Firm Growth)</b>	.04	1.36	.03	1.17	<b>.05*</b>	<b>1.86</b>
<b>Quarter-fixed Effects</b>	No		Yes		Yes	
<b>Industry-fixed Effects</b>	No		No		Yes	
<b>Observations</b>	18587		18587		18587	
<b>R<sup>2</sup></b>	.10		.11		.12	

*Note: Table 2.4 reports estimation results highlighting differences in advertising spending between suspect B2C firms and suspect B2B firms. The first column reports estimation results without controlling for industry and year effects. The second column controls for year fixed effects in the model. The third column controls for both industry and year fixed effects. Standard errors are clustered at the firm level and are adjusted for heteroskedasticity. \*\*\*/\*\*/\* indicates significance at the 1%, 5% and 10% levels respectively (based on two-tailed tests).*

In Table 2.5, the main suspect term coefficient  $\beta_1$  is negative and significant ( $p < .05$ ) indicating firms suspected of managing earnings are on average reducing advertising spending to meet earnings benchmarks (as predicted in H1). This replicates prior research on using advertising spending to manage earnings upwards.

The margin and advertising elasticity coefficients  $\beta_2$  and  $\beta_4$  are positive and significant ( $p < .01$ ) in all three tables. Thus, as expected advertising spending will on average increase with increase in margin and advertising elasticity. The coefficient for the interaction between margin ratio and suspect variable is not significant. Thus, there is no evidence of firms decreasing advertising spending with increase in gross margin (as predicted in H3). Similarly, the coefficient for the interaction between advertising elasticity ratio and suspect variable is not significant.

Table 2.5 Suspect B2C Firms During the Last Fiscal Quarter

	(1)		(2)		(3)	
<b>ln (Advertising Ratio)</b>	<b>Coef.</b>	<b>t-stat</b>	<b>Coef.</b>	<b>t-stat</b>	<b>Coef.</b>	<b>t-stat</b>
<b>Constant</b>	<b>.06*</b>	<b>1.93</b>	.02	.25	.01	.13
<b>Suspect</b>	<b>-.19**</b>	<b>-2.33</b>	<b>-.18**</b>	<b>-2.25</b>	<b>-.18**</b>	<b>-2.19</b>
<b>Suspect *Last Q</b>	<b>-.43***</b>	<b>-3.21</b>	<b>-.42***</b>	<b>-3.16</b>	<b>-.41***</b>	<b>-3.07</b>
<b>ln (Margin Ratio)</b>	<b>.12***</b>	<b>3.45</b>	<b>.10***</b>	<b>3.00</b>	<b>.10***</b>	<b>2.72</b>
<b>Suspect*ln (Margin Ratio)</b>	.00	-.06	.00	-.14	.00	.07
<b>Suspect*ln (Margin Ratio) *Last Q</b>	-.07	-1.04	-.07	-1.00	-.06	-.93
<b>ln (Ad Elasticity Ratio)</b>	<b>.28***</b>	<b>13.95</b>	<b>.28***</b>	<b>13.50</b>	<b>.27***</b>	<b>13.23</b>
<b>Suspect* ln (Ad Elasticity Ratio)</b>	-.03	-.57	-.03	-.63	-.03	-.61
<b>Suspect* ln (Ad Elasticity Ratio) *Last Q</b>	.07	.93	.07	.98	.08	1.00
<b>TV Ad Intensity</b>	.02	-.60	.02	-.52	.01	.21
<b>Suspect* TV Ad Intensity</b>	<b>.21**</b>	<b>2.03</b>	<b>.19*</b>	<b>1.91</b>	<b>.20*</b>	<b>1.90</b>
<b>Suspect* TV Ad Intensity* Last Q</b>	<b>.31**</b>	<b>2.52</b>	<b>.29**</b>	<b>2.37</b>	<b>.29**</b>	<b>2.30</b>
<b>Report Ad</b>	<b>-.05*</b>	<b>-1.78</b>	<b>-.05*</b>	<b>-1.79</b>	-.03	-1.25
<b>Suspect* Report Ad</b>	.06	.87	.07	.92	.06	.85
<b>Suspect* Report Ad* Last Q</b>	<b>.23*</b>	<b>1.95</b>	<b>.23*</b>	<b>1.95</b>	<b>.22*</b>	<b>1.87</b>
<b>ln (Firm Growth)</b>	<b>.06*</b>	<b>1.78</b>	<b>.06*</b>	<b>1.89</b>	<b>.06**</b>	<b>2.02</b>
<b>Quarter-fixed Effects</b>	Yes		Yes		Yes	
<b>Industry-fixed Effects</b>	No		No		Yes	
<b>Observations</b>	9139		9139		9139	
<b>R<sup>2</sup></b>	.10		.11		.12	

*Note: Table 2.5 reports estimation results for B2C firms which are suspect of managing earnings upwards during the last fiscal quarter. The first column reports estimation results without controlling for industry and year effects. The second column controls for year fixed effects in the model. The third column controls for both industry and year fixed effects. Standard errors are clustered at the firm level and are adjusted for heteroskedasticity. \*\*\*/\*\*/\* indicates significance at the 1%, 5% and 10% levels respectively (based on two-tailed tests).*

Table 2.5 results show that the coefficient  $\beta_7$  for the interaction between suspect and TV advertising intensity variables is positive and significant ( $p < .10$ ) suggesting suspect firms reduce

advertising spending by a smaller share in TV media in comparison to print media (as predicted in H4). The coefficient  $\beta_9$  for the interaction between suspect and report ad variables is not significant. The coefficient  $\beta_{99}$  is positive and significant ( $p < .10$ ) suggesting suspect firms in the last fiscal quarter reduce advertising spending by a smaller margin when they report advertising expenses versus when they don't report (as predicted in H5).

The coefficient  $\beta_2$  for the interaction between suspect and last quarter dummy variables is negative and significant ( $p < .01$ ). The suspect coefficient  $\beta_1$  too is negative and significant ( $p < .05$ ) but its absolute value is smaller than  $\beta_2$  suggesting advertising cuts are much larger in the last fiscal quarter (as predicted in H6). The coefficient  $\beta_{77}$  is positive and significant ( $p < .05$ ) and larger than  $\beta_7$  indicating firms are implementing larger advertising cuts in print media versus TV media in the last fiscal quarter.

## 2.6 Conclusion

It is well known that firms manage their earnings upward when they fall short of key earnings benchmarks. Past accounting and marketing literature find firms using marketing actions such as advertising and promotions to beat earnings targets. In the context of advertising, empirical studies have mainly found evidence of firms reducing advertising spending to improve earnings. We extend this research topic by investigating why firms are motivated to use advertising budgets to manage their earnings upward. This is important to know because not all firms use advertising budgets to manage earnings. Even among firms which manage earnings using advertising budgets, each firm can have a unique rationale to use advertising budgets to manage earnings upward.

The findings in this study confirm previous accounting studies which find firms are pressured to reduce advertising spending when they need to cross certain earnings benchmarks. Many corporate executives consider advertising expense as discretionary in nature because its impact on firm revenue is typically small in the immediate quarters and it is difficult to predict the success of advertising campaigns without making the necessary investment. Thus, when firms must beat certain earnings targets, they will not hesitate to cut advertising spending.

The findings in this study indicate that earnings management activity using advertising budget is much stronger for B2C firms than B2B firms. This is mainly because B2C firms spend a significant proportion of their revenue on advertising activities which gives it more room to manage earnings successfully and avoid scrutiny when they make small advertising cuts. The findings also show suspect firms making bigger advertising spending cuts in the last quarter of the fiscal year. There is greater auditor scrutiny in the last fiscal quarter and firms can also accurately predict how close they are to their earnings targets. Therefore, real earnings management activities such as advertising cuts typically get greater priority in the last quarter of a fiscal year.

A firm's gross margin can improve when it reduces its advertising expenses. However, this is not guaranteed and can depend on multiple factors such as input costs, pricing power and other variable expenses. Suspect firms are more likely to make larger advertising cuts when they increase their margins. Suspect firms with declining margins suggest a small-scale attempt in managing earnings using real activities. This study shows evidence to support this prediction in the full sample, however, the evidence was weak when tested for only B2C firms.

Advertising is known to have a small short-term effect on sales and a large carry-over effect. However, advertising elasticity varies from one advertising channel to another. Our

results suggest the profile of advertising channels chosen by firms influences its earnings management strategy using advertising budgets. Advertising channels such as TV are more effective in driving short-term sales than mediums such as magazines and newspapers. Firms which are under pressure to beat earnings benchmarks will not want to bet against channels that can generate sales in a short span of time. Promotional activities such as discounts, features and displays are known to improve short-term sales. As a result, firms hesitate to make significant cuts to these marketing expenditures. Our findings show that firms reduce advertising spending by a smaller proportion in high advertising elasticity media like TV versus print media

Reducing advertising spending can raise a red flag about the financial health of the firm because the financial community closely tracks income statements of firms which includes advertising expenses. Firms which do not separately report advertising spending will jointly report it under SG&A expenditure. These firms can manage their earnings upward without revealing the exact breakdown. In contrast, firms which separately report advertising expense in their income statement, allow analysts to closely scrutinize their advertising spending. These firms are less likely to reduce advertising spending by a big margin to manage their earning upward. The study finds evidence to suggest that suspect firms which report advertising spending reduce advertising spending by a smaller share than firms which don't report advertising spending.

The findings in this study will be of interest to managers who strategize competitive marketing actions. Firms which are falling behind earnings targets can be expected to manage advertising budgets based on the conditions discussed in this study. Advertising agencies and analysts tracking firms will also find the results of this study relevant in their line of work. Advertising agencies can design advertising campaigns based on a firm's financial performance

and its past advertising profile. Analysts can identify whether advertising cuts are strategically implemented to spend optimally or to increase firm earnings.

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## APPENDIX A. SYSTEMATIC RISK

**Systematic Risk:** Systematic risk measures the sensitivity of the firm's stock price to changes in the stock market. It is estimated using Carhart's four-factor model for expected stock returns.

Carhart's four factor model adds a momentum factor to the well-known Fama-French three-factor model for expected stock returns (the three factors are market factor, size factor and value factor). Data on these four factors are obtained from Kenneth French's website. Carhart's four-factor stock return model is estimated for every two-year moving window using monthly data:

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

where,  $R_{it}$  is the stock return of firm  $i$  in period  $t$ ;  $R_{rf,t}$  is the risk-free rate of return in period  $t$ ;  $R_{mt}$  is the average market rate of return in period  $t$ ;  $\beta_i$  is an estimate of systematic risk for firm  $i$ ;  $SMB_t$  is the return on a value weighted portfolio of small stocks less the return of big stocks;  $HML_t$  is the return on a value weighted portfolio of high book-to-market stocks less the return on a value weighted portfolio of low book-to-market stocks; and  $UMD_t$  is the average return on two high prior-return portfolios less the average return on two low prior-return portfolios.

## APPENDIX B. Z SCORE

**Z Score:** *Z-Score* is a categorical variable for Altman's Z-Score which measures firm distress or probability of bankruptcy (Altman 1968). It equals two for all Z-Score observations in the top quartile indicating high level of distress. It equals zero for all Z-Score observations in the bottom quartile indicating low level of distress. All remaining Z-Score observations are equal to one. Altman (1968) finds a combination of five financial ratios that are good predictors of distress level in a firm (or predictor of bankruptcy). Altman uses these five ratios to estimate a discriminant function which is used to measure firm distress or bankruptcy. Data for these five ratios are obtained from COMPUSTAT. Altman's estimated discriminant function is shown below

$$Z = .012X_1 + .014X_2 + .033X_3 + .006X_4 + .999X_5$$

where  $X_1$  = working capital/total assets,

$X_2$  = retained earnings/total assets,

$X_3$  = earnings before interest and taxes/total assets,

$X_4$  = market value equity/book value of total liabilities,

$X_5$  = sales/total assets, and

$Z$  = overall index.