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Kapil TULI

Anirban MUKHERJEE

Singapore Management University, anirbanm@smu.edu.sg

Marnik G. DEKIMPE

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On the Value Relevance of Retailer Advertising Spending and Same-store Sales Growth

Kapil R. Tuli [a,*,1], Anirban Mukherjee [a,1,2], Marnik G. Dekimpe [b,c,1,3]

[a] *Lee Kong Chian School of Business, Singapore Management University, 50 Stamford Road, Singapore 178899, Singapore*
[b] *Tilburg University, Warandelaan 2, 5000 LE Tilburg, The Netherlands*
[c] *Catholic University Leuven, Belgium*

Abstract

In response to recent calls to study factors that determine a retailer's stock price, this study draws on signaling theory to examine the impact of two key marketing metrics that are widely disclosed by retailers to investors, advertising spending and growth in same-store sales (COMPS), and highlights the moderating role of various firm- and sector-specific factors. Using a stock-response model estimated on a sample of 1,646 observations for 257 retailers, the authors find that the value relevance of advertising spending and COMPS depends on the financial condition of, and the competitive pressures faced by, the retailer. In addition, the positive effect of COMPS on stock returns is found to be stronger in the presence of decreases in advertising spending.

Keywords: Value relevance; Advertising spending; COMPS; Same store sales growth; Earnings; Leverage; Firm value

Introduction

In spite of recent assertions that "it would be particularly useful to develop an understanding of the factors that influence a *retailer's* stock price" (Petersen et al. 2009, p. 106, italics added), few studies have considered if (and how) investors react to unanticipated changes in marketing metrics in the *retail* industry. This is surprising, as an increasing number of studies have recently examined whether marketing metrics are value relevant, i.e., whether unanticipated changes in marketing metrics have a significant effect on stock returns, above and beyond the effects of conventional accounting and financial metrics (see Srinivasan and Hanssens 2009 for a recent review).

Interestingly, most prior research on the value relevance of marketing metrics either uses a cross-industry sample where retailers constitute only a small portion of the sample (e.g., Bharadwaj, Tuli, and Bonfrer, 2011; Mizik and Jacobson 2008),[4] or focuses on other industries, such as automobiles (Srinivasan et al. 2009) or pharmaceuticals (Gu and Li 2010). However, significant cross-industry differences are known to exist in the financial valuation of marketing metrics (see Jacobson and Mizik 2009). Accordingly, the primary objective of this study is to examine whether, and to what extent, two marketing metrics widely reported by retailers, advertising spending and growth in same-store sales, are valued by investors. The study draws on signaling theory (see Aboody and Lev 2000 or Cohen and Dean, 2005; see also Kirmani and Rao 2000 and Joshi and Hanssens 2010 for recent discussions in a marketing context), and seeks to contribute to the literature along three key dimensions.

Value relevance of advertising in a retail setting

First, the current study presents perhaps the first examination of the value relevance of advertising spending by retailers. While prior research has examined the link between advertising spending and financial performance for manufacturing firms or for a broad cross-section of industries, the findings have been mixed; some studies find a positive link, others, a negative link, and still others, an insignificant link (Kim and McAlister 2011).

* Corresponding author. Tel.: +65 6828 0434; fax: +65 6828 0777.
E-mail addresses: kapilrtuli@smu.edu.sg (K.R. Tuli), anirbanm@smu.edu.sg (A. Mukherjee), M.G.Dekimpe@uvt.nl (M.G. Dekimpe).

[1] The authors are listed in random order, and contributed equally to the paper. The paper was written while the third author was visiting Singapore Management University as the Tommy Goh Visiting Professor in Entrepreneurship and Business.

[2] Tel.: +65 6828 1932; fax: +65 6828 0777.
[3] Tel.: +31 13 466 3423; fax: + 31 13 466 8354.

[4] For example, the retail sector accounts for approximately 30% of the observations in Bharadwaj et al. (2011, p. 94).

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In a meta-analysis of 88 models linking market value to advertising spending, Conchar, Crask, and Zinkhan (2005) find the observed range of values for their effect to be very wide, ranging from −5.98 to +9.50, without a modal effect size. Moreover, most of the models studied were specified in levels, and therefore susceptible to the well-known spurious-regression phenomenon (Srinivasan and Hanssens 2009). Among the more limited set of studies with a change or growth measure as criterion variable, an insignificant meta-analytic effect was found.

Importantly, the question whether the same principles that apply for manufacturers hold for retailers as well remains unanswered (see Petersen et al. 2009, p. 109). While many retailers spend a significant portion of their marketing budget on advertising (Ailawadi et al. 2009, p. 52),[5] most prior research on advertising's effects on investors has taken a manufacturer's point of view (for example, Joshi and Hanssens 2010 focus on personal-computer and athletic-shoe manufacturers, while Srinivasan et al. 2009 study automobile manufacturers). However, there is a growing awareness of important differences between manufacturers and retailers in their communication objectives, tools and outcome measures (see e.g., Ailawadi et al. 2009, Table 1 for a recent overview). For example, Kumar, Shah, and Venkatesan (2006) argue that while manufacturers focus on brand performance, retailers are interested in the performance of an entire category or chain (Raju 1992), rather than in specific brands within that category (chain). Given these differences, it is important to also examine the value relevance of advertising spending in the retail sector.

Value relevance of COMPS

Second, the current study examines the value relevance of growth in same-store sales, an important metric that is widely reported by retailers. Growth in same-store sales is the year-to-year percentage change in the sales of stores open for at least 12 months. This industry-specific metric is often referred to as "COMPS" by analysts (e.g., Cole and Jones 2004), and is argued to be the most closely watched metric to assess retail performance (Curtis 2007). In their review of marketing metrics, Farris et al. (2006) call COMPS "at the heart of retail analysis" (p. 106), while Maxham, Netemeyer, and Lichtenstein (2008) include it as one of the most important store performance metrics. Importantly, analysts consider COMPS a credible signal of the marketing performance of a retailer (e.g., Carroll and Cwynski, 2006). For example, Motley Fool, one of the largest investor information websites, in describing the signaling value of COMPS, notes:

> "First and foremost, rising COMPS are good. They indicate that more people are coming to buy things at the stores, or are paying more for the same things they bought a year ago, or some combination of the two. Either way, sales are increasing without the added costs associated with opening new stores. This shows that marketing is doing well and that the brand is popular with consumers . . ." (Motleyfool.com, 2007, p. 1).

Moderator analysis

Third, the current study contributes to extant literature (see Table 1) by improving our understanding of contextual factors that affect the degree to which investors value marketing-related metrics, such as, advertising spending and COMPS, as recently called for by Kimbrough and McAlister (2009, p. 318). Developing hypotheses on, and empirically testing the role of moderators is important, as it advances theory development by identifying boundary conditions for existing theory. Whetten (1989, p. 492), for example, argues that "contextual factors set the boundaries of generalizability, and as such constitute the range of the theory." (For more recent arguments in support of the role of moderators in theory development, see MacInnis 2011, p. 144 or Yadav 2010, p. 7). Prior research (see Table 1) has predominantly focused on the main effects of advertising spending and COMPS. In contrast, we also examine the moderating impact of various contextual factors.

Specifically, we examine the degree to which the value relevance of COMPS is affected by unanticipated changes in advertising spending. This is important, as it allows us to assess the combined (and possibly synergistic) effect of two key marketing metrics disclosed by retailers. We also investigate to what extent the value relevance of both COMPS and advertising spending is contingent on signals of the firm's financial condition (i.e., firm earnings and leverage), and assess the moderating impact of a key indicator of the competitive environment faced by the firm, sector concentration.

We proceed as follows. First, we provide the conceptual background. Next, we describe the dataset and introduce the modeling approach used to test the hypotheses. After that, we discuss the empirical results, and conclude with a discussion of the implications of the study.

Advertising and comps as signals for investors

According to the efficient-markets hypothesis, the stock price of a firm reflects the discounted net present value of future cash flows (Fama 1998). Stock returns, therefore, reflect investors' opinion about a firm such that a positive (negative) stock return indicates a more (less) favorable investor evaluation of the firm. As such, if a marketing metric is likely to influence future cash flows, an unanticipated change in this metric (i.e., a change not expected by investors) is likely to have an effect on the stock returns of the firm (Mizik and Jacobson 2004; Srinivasan and Hanssens 2009).

Publicly-listed firms disclose both accounting and non-accounting metrics to investors in order to lower the information asymmetry between the investors and managers (see Aboody and Lev 2000; Cohen and Dean, 2005). This information asymmetry exists as a firm's managers will have more accurate information about the firm's future prospects as compared to investors (see Akerlof 1970). As such, unanticipated changes in such metrics constitute valuable signals for investors (Joshi

[5] In 2009, publicly-listed retail firms spent almost $29 billion on advertising. This figure is obtained by summing the disclosed advertising values in COMPUSTAT for all retail firms (SIC code 5000–5999).

Table 1
Examples of studies examining value relevance of advertising and COMPS.

Study	Focal marketing metric(s)	Effect on stock returns or firm value	Sample industries	Moderators examined
Other constructs				
Anderson, Fornell, and Mazvancheryl (2004)	Customer satisfaction	Positive	Multiple	Industry concentration
Mittal et al. (2005)	Customer satisfaction	Positive	Multiple	Dual emphasis on cost reduction and revenue expansion
Mizik and Jacobson (2008) [a]	Brand attributes	Positive/no effect	Multiple	None
Luo, Homburg, and Wieseke (2010)	Customer satisfaction	Positive	Multiple	Industry concentration and financial market uncertainty
Bharadwaj, Tuli, and Bonfrer (2011)[c]	Perceived brand quality	Positive	Multiple	Earnings and industry concentration
ADV and COMPS				
Erickson and Jacobson (1992)	Advertising spending	Negative	Manufacturers	None
Joshi and Hanssens (2010)	Advertising spending	Positive	Athletic shoes and P.C. manufacturers	None
Osinga et al. (2011)	Advertising spending	No main effect, but a significant positive effect after de-regulation	Pharmaceutical manufacturers	Effect of regulation allowing direct to consumer advertising
Kim and McAlister (2011) [b]	Advertising spending	Negative/positive	Multiple	None
Luo and de Jong (2012)	Advertising spending	Positive	Multiple	None
Francis, Schipper, and Vincent (2003)	COMPS	Positive	Restaurants	None
Cole and Jones (2004)	COMPS	Positive	Retailers	None
Current study	Advertising spending and COMPS	No significant effect of Advertising spending. Positive and significant effect of COMPS	Retailers	Interaction between the two marketing metrics. Earnings, leverage, and sector concentration

[a] Mizik and Jacobson (2008) find that unanticipated changes in brand energy and brand relevance have a significant positive effect on stock returns. However, other brand attributes, differentiation, esteem, and knowledge do not have a significant effect on stock returns.

[b] Kim and McAlister (2011) find that the effect of unanticipated changes in advertising spending on stock returns depends on the measure of advertising used. A measure based on advertising spending disclosed by a firm in its annual report has a significant negative effect on stock returns. In contrast, an alternative measure based on the estimates of advertising spending by Kantar Media Inc., results in a significant positive effect on stock returns.

[c] Relative to the Bharadwaj et al. (2011) study, we (i) focus on a different setting (retailers versus a broad cross-section of industries), (ii) different marketing metrics (Advertising and COMPS versus Quality), (iii) assess the interaction between both aforementioned metrics, thereby allowing for synergy effects between them, and (iv) consider the potential moderating impact of an important additional financial metric, leverage.

and Hanssens 2010; Kim and McAlister 2011; Kirmani and Rao 2000). The value-relevance literature relies on the notion that unanticipated changes in such metrics are credible signals not only of the recent performance of a firm, but also of its future performance (e.g., Lev and Thiagarajan 1993; Mizik and Jacobson 2004, 2008). Consequently, investors are likely to react to unanticipated changes in these metrics, resulting in a significant effect on stock returns. Building on this theoretical foundation, recent literature in marketing examines the signaling value of unanticipated changes in advertising spending of manufacturing firms. Two studies in accounting have also examined the value relevance of unanticipated changes in COMPS (see Table 1).

It can be argued that advertising spending and COMPS are already reflected in some of the accounting metrics.[6] However, recent research argues that these variables are likely to be perceived as distinct signals that provide credible information about future cash flows *above and beyond* accounting metrics. In terms of advertising, firms are required (through Financial Reporting Requirement No. 44) to report this metric if they consider it to contain "material" information for investors (see e.g. Heitzman, Wasley, and Zimmerman, 2010). Advertising is also shown to be both a signal of the intrinsic health of the firm (Simpson 2008) and of its future demand (Desai 2000). As summarized by Srinivasan and Sihi (2012, p. 111), "when firms have high advertising expenditures. . .*they are signaling to stock market participants* that they anticipate their advertising. . .to be effective and that their future performance is likely to be superior." (italics added). Empirical evidence of advertising's signaling value towards investors was provided in Chauvin and Hirschey (1993, p. 128), who concluded that data on advertising appear to help investors form expectations about future cash flows.

COMPS, in turn, is widely reported by retailers, as it perceived to be very informative about the retailers' recent and future performance (Cole and Jones 2004; Francis, Schipper, and Vincent, 2003). Given that both advertising spending and COMPS are widely followed by analysts and investors, misreporting these numbers can have significant reputation and even

[6] For example, earnings = sales − costs; advertising spending is expensed in the year that the expenditure is occurred and therefore, it is a component of earnings. Similarly, COMPS contributes to Earnings, as COMPS is a component of sales.

legal costs for the firm. Moreover, it has been shown (see e.g. Simpson 2008) that firms that report advertising in the post-FRR 44 period are those firms for which advertising is most effective (see also Srinivasan and Sihi 2012), supporting further the signaling value of advertising (see Kirmani and Rao 2000, p. 69 for an extensive discussion on this issue). We draw on this research tradition, and examine the role of both advertising spending and COMPS as value-relevant signals for investors following publicly-listed retailers.

Advertising and stock returns

Advertising spending of a firm can be an important signal for investors, as it indicates the ability of a firm to deploy the resources necessary to attract new customers and/or to reinforce their value proposition to existing customers (Chauvin and Hirshey 1993; Desai 2000; Joshi and Hanssens 2009, 2010). For investors tracking the stock of a retailer, advertising spending is a key marketing instrument used by the retailer to influence brand or channel switching (Simester et al. 2009), to build store image and store traffic (Iyer, Soberman, and Villas-Boas, 2005), and/or to lower price elasticity (Shankar and Krishnamurthy 1996). Prior research also argues that advertising creates consumer awareness and enhances brand loyalty (McAlister, Srinivasan, and Kim, 2007). Therefore, an unanticipated increase in advertising spending is a signal that the retailer is likely to have a higher probability of attracting new customers or to increase the spending of its existing customer base, thus resulting in higher future cash flows. These future cash flows may also be less volatile, as more loyal customers tend to have a more stable re-purchase pattern. Therefore, consistent with Srivastava, Shervani, and Fahey's (1998) argument that higher and more stable cash flows enhance shareholder value, we expect that investors will have a positive valuation of unanticipated increases in advertising spending. Formally,

H1. An unanticipated increase (decrease) in advertising spending will have a positive (negative) effect on stock returns.

COMPS and stock returns

COMPS is the year-to-year percentage change in the sales of retail stores open for at least 12 months, and is perhaps the most closely watched metric to assess retail performance (Curtis 2007; Maxham, Netemeyer, and Lichtenstein, 2008). Importantly, investors consider COMPS a good measure of past performance (quality) and a credible signal of its future performance (see Carroll and Cwynski, 2006). Not only does COMPS use each store as its own control variable (Ployhart, Weekley, and Ramsey, 2009), which ensures comparability (Farris et al. 2006), it also reveals to investors the source of the communicated revenue change; i.e., revenue coming from an existing set of stores rather than from a change in the scale of the operations (e.g., by opening or acquiring new stores; Cole and Jones 2004). As pointed out in the aforementioned quote from Motley Fool, COMPS signals how well the retail concept is received, and can be seen as a measure of the retailer's intrinsic strength or equity. Not surprisingly, financial analysts and investors widely expect unanticipated changes in COMPS to be a strong indicator of the probability of customers continuing to purchase with a retailer, resulting in higher future cash flows (see Cole and Jones 2004; Francis, Schipper, and Vincent, 2003). Therefore, we expect,

H2. An unanticipated increase (decrease) in COMPS will have a positive (negative) effect on stock returns.

Contextual influences

Recent literature suggests the need for studies in the marketing–finance interface to adopt a contingency perspective, and to examine factors that influence the *degree* to which investors value marketing metrics (Kimbrough and McAlister 2009, p. 318). Investors seldom evaluate specific marketing metrics in isolation. When multiple marketing metrics are reported together, investors are likely to consider the unanticipated changes in one marketing metric in light of the unanticipated changes in the other metric. Indeed, research on signaling shows that a recipient's evaluation of a given signal can be influenced by another signal (see Basuroy, Desai, and Talukdar, 2006; Erdem, Swait, and Louviere, 2002). This suggests that it is important to study the interaction between COMPS and advertising spending.

Research in finance and accounting has also shown that investors take firm- and sector-level factors into consideration when evaluating the prospects of a firm (Hou and Robinson, 2006; Lang and Lundholm 1996). In a similar vein, we develop hypotheses that outline the moderating effects of both firm-level metrics (firm earnings and leverage) and a key sector-level metric (sector concentration) on the value relevance of our two marketing variables.

We focus on these factors, as they reflect fundamental attributes of the financial situation of a firm and the environment in which it operates. According to a survey of over 400 executives, CFOs view earnings as the key metric considered by investors and financial analysts (Graham, Harvey, and Shiva, 2005; also see Dichev and Tang 2008). Leverage, that is, the degree of debt of a firm, is central to the capital structure of a firm that affects its conduct with various stakeholders, for example, suppliers, customers, and employees (see Bae, Kang, and Wang, 2011). From the perspective of marketing research and retailing, it is important to assess the moderating impact of these variables, as the financial health of a retailer is likely to have an impact on both its marketing strategy and the effect of its strategies. For example, Chevalier and Scharfstein (1996) find that retailers with a higher level of debt are likely to adopt a marketing strategy of higher prices, even though it is likely to lower their market share and future profits (see also Campello 2003; Fresard 2010). Finally, sector concentration reflects the degree of competition faced by a firm, and is a signal of the structural characteristics of a firm's environment likely to affect its marketing strategy (Szymanski et al. 1993; see also Rotemberg and Woodford 1991).

COMPS and advertising

When advertising spending serves as a signal of unobservable service quality (Tellis and Fornell 1988), higher advertising spending should be incurred primarily by high-quality retailers who are confident that they will be able to recoup their advertising expenditures through future sales. An increase in COMPS combined with an increase in advertising spending is then a combined 'double-positive' signal that (a) the merchandising and in-store assortment of the retailer will continue to attract customers, and that (b) the retailer is willing (and able) to invest in further increases in customer awareness and loyalty (through the increased advertising spending). This should make the increases in COMPS more likely to persist, and therefore serve as a signal of sustainable higher future cash flows.

In contrast, an increase in COMPS combined with a decrease in advertising spending is likely to be a 'mixed' signal that although the retailer has the right assortment/merchandise that brings about repeat customers, he might be sacrificing his long-term interests by cutting back on advertising spending, and thereby compromise future customer loyalty. Indeed, there could be a perception that managers are temporarily increasing their COMPS by re-allocating their marketing budgets to costly price promotions that deliver immediate results, as opposed to more long-run investments in advertising (Deleersnyder et al. 2009). Taken together, the preceding arguments suggest that an unanticipated increase in COMPS is likely to be valued more (less) in the presence of unanticipated increases (decreases) in advertising spending. Formally,

H3a. The effect of an unanticipated change in COMPS on stock returns is stronger (weaker) in the presence of unanticipated increases (decreases) in advertising spending.

Alternatively, one could argue that increases in COMPS that are realized without any additional marketing support (such as additional advertising spending) is an even stronger signal of the intrinsic value (strength) of the retail concept. This is because an unanticipated increase in COMPS accompanied by an unanticipated decrease in advertising spending is a signal that the firm remains able to attract new customers and/or gain a higher share of wallet of existing customers, even without an additional expense in advertising (Kim and McAlister 2011). Indeed, according to some analysts an unanticipated decrease in an expense item, (advertising spending), combined with increasing output metric (COMPS), can be viewed as signals of greater efficiency of that retailer (e.g., Palepu, Healy, and Bernard, 2000). This suggests an alternative hypothesis:

H3b. The effect of an unanticipated change in COMPS on stock returns is stronger (weaker) in the presence of unanticipated decreases (increases) in advertising spending.

Moderating role of firm earnings

Earnings reflect the performance of the firm in a given period, and indicate its ability to generate revenues at appropriate costs. Importantly, firm earnings are persistent in nature (e.g., Dichev and Tang 2008); that is, an unanticipated increase (decrease) in earnings is a signal for investors that the future earnings of the firm are likely to also be higher (lower) than prior expectations (Dechow 1994). As a result, unanticipated increases (decreases) in earnings have been shown to have a positive (negative) impact on stock returns (Kothari 2001).

An unanticipated increase in earnings, therefore, is a signal for investors that the retailer is likely to have the ability and the resources (i.e., cash/retained earnings) to maintain and enhance its marketing initiatives, such as advertising spending to increase store loyalty, or to make investments in store layout. This is important, as recent research in finance shows that firms with more current resources are likely to outperform their competitors in the future (e.g., Fresard 2010). In combination, unanticipated advertising/COMPS and earning increases then reinforce the quality of each others' signal.

In contrast, an unanticipated decrease in firm earnings indicates that the current increases in advertising spending or COMPS have not been able to yield enough performance benefits to cover the additional costs, which may signal a loss of control (Kim and McAlister 2011). One might also argue that decreasing earnings along with increasing COMPS is a signal that such increases are due to aggressive price promotions that increase current sales at the expense of current and future earnings (cf. Pauwels et al. 2004). Accordingly, we expect:

H4. The effect of an unanticipated change in advertising spending on stock returns is stronger (weaker) in the presence of unanticipated increases (decreases) in earnings.

H5. The effect of an unanticipated change in COMPS on stock returns is stronger (weaker) in the presence of unanticipated increases (decreases) in earnings.

Moderating role of firm leverage

Leverage is the ratio of total long-term debt to the total assets of a firm (Bae, Kang, and Wang, 2011). An unanticipated increase in leverage is a negative signal for investors, because it reflects the need of the firm to borrow more money to fund its current and future operations, and its inability to generate cash flows on its own to fund the same. Literature in accounting argues that customers, suppliers, and employees are reluctant to do business with a highly-leveraged firm because financial difficulties can affect its ability to honor its (implicit) contracts with these constituents (Maksimovic and Titman 1991). Consistent with this prediction, studies show that high leverage lowers the firm's ability to maintain favorable relationships with customers and suppliers (e.g., Banerjee, Dasgupta, and Kim, 2008; Kale and Shahrur 2007). In addition, high leverage can constrain a retailer's ability to gain market share by cutting prices, and is likely to lead to lower sales growth (Campello 2003, 2006; Chevalier and Scharfstein 1996).

An unanticipated increase in advertising spending or COMPS along with an unanticipated increase in leverage, therefore, is a 'mixed' signal: while a retailer is investing more in advertising and deriving more sales from existing stores, there is likely to be a negative impact on its long-run relationship with key

stakeholders due to the increase in leverage. For example, even though advertising spending or COMPS have increased, the increase in leverage is likely to limit the ability of a retailer to make future investments in refurbishing existing stores, or devote enough resources to maintain, let alone enhance, the relationship with key stakeholders (cf. Kale and Shahrur 2007). This, in turn, suggests that the future benefits from advertising spending or COMPS are likely to be lower when accompanied by unanticipated increases (versus decreases) in leverage. In addition, the combination of increased advertising spending with higher leverage may signal a loss of spending control, which is likely to reduce future earnings (Kim and McAlister 2011). As a result, investors are likely to react less positively to unanticipated increases in advertising spending or COMPS in the presence of unanticipated increases in leverage. Formally,

H6. The effect of an unanticipated change in advertising spending on stock returns is weaker (stronger) in the presence of unanticipated increases (decreases) in leverage.

H7. The effect of an unanticipated change in COMPS on stock returns is weaker (stronger) in the presence of unanticipated increases (decreases) in leverage.

Moderating role of sector concentration

Sector concentration indicates the degree of competition in a sector, such that higher (lower) sector concentration indicates lower (higher) competition. An increase in sector concentration indicates that the sector evolves more towards an oligopoly, as a few firms dominate the sector, due to higher barriers to entry and lower choice for consumers (Giroud and Mueller 2011). Therefore, an unanticipated increase in sector concentration is a positive signal for investors, as it indicates that the retailer is likely to face lower competitive pressure. Also, profit margins tend to be higher in concentrated markets (Ramaswamy, Gatignon, and Reibstein, 1994), which should again be valued positively by investors.

As noted earlier, an unanticipated increase in advertising spending and COMPS indicates that the probability of customers continuing to choose the retailer in the future is also higher. Such higher probability and subsequent higher cash flows are more likely when there is an unanticipated increase in sector concentration. This is because there will be less competitive pressure on the retailer, and therefore a greater probability that he can extract faster and greater consumer response for his advertising dollars (cf. Chakravarty and Grewal 2011), and/or that COMPS increases will be persistent. Indeed, literature in finance finds that investors reward firms for their investments in intangibles (e.g., R&D) in more (versus less) concentrated sectors (e.g., Doukas and Switzer 1992).

In summary, from an investor perspective, unanticipated increases in COMPS/advertising spending combined with an unanticipated increase in sector concentration represents a combination of two positive signals about the future cash flows of the firm. Thus, we expect:

Table 2
Examples of firms included in our sample.

2-Digit SIC	Firm names
51	Diedrich Coffee, OfficeMax
52	Home Depot, Lowes, Tractor Supplies Inc
53	Costco, Dillard, Macy's
54	Arden Group, Albertsons, Kroger's
55	America's Car-Mart, Autonation Inc, Autozone, Pepboys
56	Burlington, GAP, Nordstrom
57	BestBuy, Circuit City, Radioshack
58	Jack in the Box, McDonald's Corp, Wendy's
59	CVS, Longs Drug Stores, Walgreen

H8. The effect of an unanticipated change in advertising spending on stock returns is stronger (weaker) in the presence of unanticipated increases (decreases) in sector concentration.

H9. The effect of an unanticipated change in COMPS on stock returns is stronger (weaker) in the presence of unanticipated increases (decreases) in sector concentration.

Research methodology

Data collection

We collected the stock price, accounting variables, and marketing metrics for all publicly-listed firms belonging to the Retail Industry (firms listed in SIC codes 5000–5999). The accounting and marketing metrics were obtained from Standard & Poor's COMPUSTAT database, while the stock-returns data was collected from the University of Chicago's Center for Research in Equity Prices (CRSP). Data on risk factors were obtained from the website of Dr. Kenneth French.[7] Since COMPUSTAT provides industry-specific marketing metrics, such as COMPS for firms in the retail industry, for fiscal years 2000–2010, we focus on firms during this period that provide at least 2 consecutive years of data (see Bharadwaj, Tuli, and Bonfrer, 2011 for a similar practice). Following precedence, we only consider those firms that report their advertising spending (see Erickson and Jacobson 1992; McAlister, Srinivasan, and Kim, 2007). In addition, we do not consider firms that have a stock price less than $1 as they are highly volatile, have low liquidity and can bias the results in a sample (Avramov, Chordia, and Goyal, 2006). This results in 1,646 observations across 257 firms in nine 2-digit SIC codes. Table 2 gives examples of firms in the 2-digit SIC codes in our sample, and Table 3 outlines the descriptive statistics of firms in our sample.

Measures

Table 4 outlines the definitions, measures, data sources, and support from prior literature for the variables used in this study.

[7] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

Table 3
Descriptive statistics ($N = 1646$).[c]

	Variable	Mean	*SD*	Min	Max
1	Excess stock return	0.19	0.83	−0.97	7.38
2	Firm earnings[d]	0.09	0.11	−0.84	0.56
3	Leverage[d]	0.17	0.25	0.00	3.68
4	Revenues[d]	2.04	0.72	0.13	6.98
5	Assets[e]	6.71	1.73	1.41	12.10
6	Sector concentration	0.11	0.09	0.05	0.50
7	COMPS	0.01	0.06	−0.16	0.21
8	Advertising spending[f]	0.03	0.02	0.00	0.20

SD: standard deviation.
Min: minimum.
Max: maximum.
[c] *N*: number of observations.
[d] Earnings, leverage, and revenues are normalized by the total assets reported by the firm.
[e] Assets is the logarithm of the total assets of the firm.
[f] Advertising spending is the ratio of advertising expenses of the firm to the total sales of the firm.

Firm stock return

We use the following formula to calculate the stock returns of firm i in sector j during fiscal year t:

$$S_{ijt} = \frac{(\text{MCAP}_{ijt} + \text{DIV}_{ijt} - \text{MCAP}_{ij(t-1)})}{\text{MCAP}_{ij(t-1)}} \quad (1)$$

MCAP_{ijt} is the market capitalization of firm i in sector j at the end of year t, and DIV_{ijt} is the dividends paid by the firm during the year t. The excess stock returns for each firm is the difference between the stock returns and the risk-free rate of return, i.e., the annual return for the U.S. treasury (Rf_t).

Risk factors

Similar to our measure of excess firm stock returns, we use annual returns for a value-weighted portfolio of all stocks listed on the NASDAQ, AMEX, and NYSE (MR_t) and the annual return for the U.S. treasury (Rf_t). Annual returns are also calculated for the size (SMB_t), market-to-book (HML_t), and momentum (UMD_t) portfolio.

Independent variables

We use "income before interest and taxes" scaled by total assets (measured as the year-end total assets reported by a firm) as a measure of a firm's earnings. We measure leverage as the ratio of total long-term debt to the total assets of a firm. Firm revenues are measured by the total sales, again scaled by the total assets of the firm. Hence, all three variables are scaled by the same variable. Data on COMPS is obtained directly from the industry-specific metrics file of COMPUSTAT. As it is a percentage, we do not divide it by any scaling factor. To capture a firm's advertising intensity, we follow standard practice (see e.g., McAlister, Srinivasan, and Kim, 2007), and use the firm's advertising to sales ratio. We calculate sector concentration by using the Herfindahl concentration ratio for all firms within a 2-digit SIC code. Finally, following Mizik and Jacobson (2008), we include the (log-transformed) total assets to control for any remaining size differences.

Table 4
Definitions, measures, and literature sources for independent variables.

Variable	Description of underlying construct	Specific data source	Example of prior literature support
Excess stock market returns	Annual returns from a value weighted portfolio of all stocks listed on NASDAQ, AMEX, and NYSE, less the returns from investing in US treasury bonds	Kenneth French Website	Srinivasan et al. (2009)
Risk free rate of returns	Annual returns from investing in US treasury bonds	Kenneth French Website	Srinivasan et al. (2009)
Size portfolio returns	Annual returns from the Fama and French (1993) size portfolio	Kenneth French Website	Fama and French (1993)
Market-to-book portfolio returns	Annual returns from the Fama and French (1993) market-to-book portfolio	Kenneth French Website	Fama and French (1993)
Momentum factor	Annual returns from the Carhart (1997) momentum factor portfolio	Kenneth French Website	Carhart (1997)
Firm earnings	The ratio of earnings before interest and taxes to total assets	COMPUSTAT [DATA ITEM '*ebit*', '*at*']	Mizik and Jacobson (2004)
Leverage	The ratio of total long-term debt to total assets of a firm	COMPUSTAT [DATA ITEM '*dltt*', '*at*']	Bae, Kang, and Wang, 2011
Revenues	The ratio of total sales to total assets	COMPUSTAT [DATA ITEM '*revt*', '*at*']	Bharadwaj, Tuli, and Bonfrer (2011)
Sector concentration	Herfindahl concentration index for SIC two digit	COMPUSTAT [DATA ITEM 'revt']	Fang, Palmatier, and Steenkamp (2008)
Advertising spending	Advertising spending divided by total sales	COMPUSTAT [DATA ITEM '*xad*', 'at']	McAlister, Srinivasan, and Kim (2007)
COMPS	Growth in sales of stores open for at least 12 months	COMPUSTAT [DATA ITEM '*rtlcs*']	Cole and Jones (2004)

Table 5
Correlation matrix.[a]

	Variable	Symbol	1	2	3	4	5	6	7	8	9	10	11	12
1	Excess stock return	$S_{ijt} - \mathrm{Rf}_t$	1.00											
2	Excess stock market returns	$\mathrm{MR}_t - \mathrm{Rf}_t$	**0.31**	1.00										
3	Fama–French size factor	SMB_t	**0.27**	**0.33**	1.00									
4	Fama–French book-to-market factor	HML_t	0.03	**−0.33**	0.02	1.00								
5	Carhart momentum factor	UMD_t	**−0.35**	**−0.68**	**−0.39**	**0.26**	1.00							
6	UC in firm earnings	$\mathrm{U}\Delta(\mathrm{EAR})_{ijt}$	**0.31**	**−0.07**	0.03	**0.20**	**0.05**	1.00						
7	UC in leverage	$\mathrm{U}\Delta(\mathrm{LEV})_{ijt}$	**−0.06**	0.00	−0.03	−0.01	−0.01	**−0.06**	1.00					
8	UC in revenue	$\mathrm{U}\Delta(\mathrm{REV})_{ijt}$	−0.02	**0.11**	0.01	−0.03	**−0.09**	**−0.11**	**−0.13**	1.00				
9	UC in assets	$\mathrm{U}\Delta(\mathrm{TA})_{ijt}$	**0.22**	**−0.08**	**0.12**	**0.08**	−0.01	**0.30**	**0.15**	**−0.59**	1.00			
10	UC in sector concentration	$\mathrm{U}\Delta(\mathrm{SC})_{jt}$	0.02	**0.18**	**0.08**	**−0.13**	**−0.16**	**−0.10**	0.03	−0.01	**−0.05**	1.00		
11	UC in advertising spending	$\mathrm{U}\Delta(\mathrm{AD})_{ijt}$	**−0.05**	**−0.11**	−0.03	**−0.05**	**0.06**	**−0.16**	0.01	**−0.06**	0.02	**−0.07**	1.00	
12	UC in COMPS	$\mathrm{U}\Delta(\mathrm{COMPS})_{ijt}$	**0.32**	0.02	0.00	0.02	−0.01	**0.46**	**−0.08**	**0.07**	**0.22**	**−0.05**	**−0.11**	1.00

UC: unanticipated changes.
[a] All correlations in bold are significant at $p < .05$.

Unanticipated changes

Following recent literature (e.g., Bharadwaj, Tuli, and Bonfrer, 2011; Mizik and Jacobson 2004; Srinivasan et al. 2009), we use a first-order auto-regressive model to depict the time-series properties of each accounting and marketing metric (Y), and use the residuals from this model as a measure of the unanticipated changes in these variables:

$$Y_{ijt} = \theta_0 + \theta_1 Y_{ijt-1} + \sum_{j=2}^{J} \theta_j (S_j) + \sum_{t=2}^{T} \lambda_t (Y_t) + \eta_{ijt} \qquad (2)$$

where Y_{ijt} = metric under consideration (e.g., firm earnings); θ_1 = first-order autoregressive coefficient for 'Y' depicting the persistence of the variable; S_j = dummy variable indicating whether the firm belongs to sector 'j'; θ_j = coefficient for the sector dummy variable; Y_t = dummy variable indicating whether the observation is from year 't'; θ'_t = coefficient for the year dummy variable.

The unanticipated changes in Y_{ijt} are represented by η_{ijt}. When estimating these models, we allow errors from each firm to be correlated with each other, i.e., to be clustered by firm (Petersen 2009). The residual values (η_{ijt}), thus obtained, are then used as unanticipated changes in the marketing and accounting metrics in the empirical models used to test the hypotheses. Table 5 outlines the correlation matrix for the values of the unanticipated changes in the model.[8]

Stock-response model

Following Srinivasan and Hanssens (2009), we use a stock-response model to assess the value relevance of advertising spending and COMPS (see also Bharadwaj, Tuli, and Bonfrer, 2011; Srinivasan et al. 2009). Consistent with prior research (e.g., Osinga et al. 2011), we start with a model where excess stock returns are modeled as a function of the conventional four-factor benchmark model comprising four control variables: excess stock market returns ($\mathrm{MR}_t - \mathrm{Rf}_t$), and returns from the size (SMB_t) portfolio, book-to-market (HML_t) portfolio, and momentum portfolio (UMD_t).

As existing information is already reflected in current stock prices, adding unanticipated changes allows the researcher to study how investors respond to new information (Srinivasan and Hanssens 2009). Therefore, we add unanticipated changes in advertising intensity and COMPS resulting in a model M1 that tests the value relevance of these metrics. That is, the significance of γ_1 and γ_2 in M1 indicates whether unanticipated changes in advertising spending and COMPS provide incremental information in explaining stock returns not yet captured through any of the financial variables.

$$\begin{aligned}(S_{ijt} - R_{ft}) = {} & \alpha + \alpha_{ij} + \beta(\mathrm{MR}_t - \mathrm{Rf}_t) + s(\mathrm{SMB}_t) \\ & + h(\mathrm{HML}_t) + u(\mathrm{UMD}_t) + \gamma_1(\mathrm{U}\Delta\mathrm{AD}_{ijt}) \\ & + \gamma_2(\mathrm{U}\Delta\mathrm{COMPS}_{ijt}) + \varepsilon_{ijt} \qquad (\mathrm{M1})\end{aligned}$$

where S_{ijt} = stock returns of firm i in sector j during year t; Rf_t = risk-free rate of returns during year t calculated using U.S. treasury bonds; MR_t = stock-market returns during year t; SMB_t = Fama and French (1993) size portfolio returns during year t; HML_t = Fama and French (1993) book-to-market value portfolio returns during year t; UMD_t = Carhart (1997) momentum factor portfolio returns during year t; $\mathrm{U}\Delta\mathrm{AD}_{ijt}$ = unanticipated changes in advertising spending; $\mathrm{U}\Delta\mathrm{COMPS}_{ijt}$ = unanticipated changes in COMPS; ε_{ijt} = Error term.

α_{ij} are fixed effects, defined as deviations from α (the grand mean), with $\sum_i \alpha_{ij} = 0$. As such, also $\sum_j \sum_i \alpha_{ij} = 0$.

To this model, we now add unanticipated changes in various accounting metrics and other control variables that have been used extensively in prior research (e.g., Bharadwaj, Tuli, and Bonfrer, 2011; Kothari 2001): earnings, leverage, revenues,

[8] Although the use of an AR(1) model is consistent with extant literature (e.g., Bharadwaj, Tuli, and Bonfrer, 2011; Srinivasan et al., 2009), it can be argued that a higher-order model (e.g., AR(2)) model might be more appropriate for generating the unexpected changes in the independent variables. We find that our results do not change if we use a higher-order AR model to generate unanticipated changes in the independent variables. In line with prior literature, we therefore report our results for AR(1) based models, as this avoids a further drop in the number of observations following the use of higher-order lags.

assets, and sector concentration. By adding those control variables to the model, we make the test for the value relevance of our marketing metrics (advertising spending and COMPS) more conservative, in that we will test whether they have value relevance *over and above* any information already contained in those control variables. This is especially important because advertising spending is likely to influence both current and future revenues and earnings. Therefore, any additional effects on stock returns in the presence of current earnings and revenues as control variables will reflect advertising's longer-term effects on revenues and earnings (see Joshi and Hanssens 2010; Kim and McAlister 2011). Similarly, the change in COMPS may then provide additional information on the origin (or quality) of a revenue or earnings increase. Importantly, M2, is analogous to earlier models used to establish the value relevance of marketing metrics (e.g., Bharadwaj, Tuli, and Bonfrer, 2011; Osinga et al. 2011; Srinivasan et al. 2009).

$$\begin{aligned}(S_{ijt} - R_{ft}) = {} & \alpha + \alpha_{ij} + \beta(\mathrm{MR}_t - R_{ft}) + s(\mathrm{SMB}_t) \\ & + h(\mathrm{HML}_t) + u(\mathrm{UMD}_t) + \gamma_1(\mathrm{U}\Delta\mathrm{AD}_{ijt}) \\ & + \gamma_2(\mathrm{U}\Delta\mathrm{COMPS}_{ijt}) + \gamma_3(\mathrm{U}\Delta\mathrm{EAR}_{ijt}) \\ & + \gamma_4(\mathrm{U}\Delta\mathrm{LEV}_{ijt}) + \gamma_5(\mathrm{U}\Delta\mathrm{TA}_{ijt}) \\ & + \gamma_6(\mathrm{U}\Delta\mathrm{REV}_{ijt}) + \gamma_7(\mathrm{U}\Delta\mathrm{SC}_{jt}) + \varepsilon_{ijt} \qquad \text{(M2)}\end{aligned}$$

where $\mathrm{U}\Delta\mathrm{EAR}_{ijt}$ = unanticipated changes in firm earnings; $\mathrm{U}\Delta\mathrm{LEV}_{ijt}$ = unanticipated changes in leverage; $\mathrm{U}\Delta\mathrm{TA}_{ijt}$ = unanticipated changes in assets; $\mathrm{U}\Delta\mathrm{REV}_{ijt}$ = unanticipated changes in revenues; $\mathrm{U}\Delta\mathrm{SC}_{jt}$ = unanticipated changes in sector concentration.

Model estimation and validation

We use a fixed-effects time-series panel model to estimate M2. Following Wooldridge (2009, p. 482), we use the within transformation to account for the fixed effects α_{ij}.[9] In addition, we follow Petersen (2009), and use cluster-robust standard errors that relax the assumption of error independence, and allow for correlation within a cluster. We consider observations from an individual firm as a cluster, and allow for correlations within this cluster (see Mizik and Jacobson 2009, p. 321).

As shown in Table 6, the model containing only the financial variables and marketing metrics (M1) is significant ($p < .01$) with an R-square of 0.29. Unexpected changes in COMPS have a positive impact ($p < .01$) on the retailer's stock return. No such effect is found for advertising ($p > .10$). Model M2 outlines the effects when also including the accounting and other control variables. The R-square of the model increases to 0.34 and, importantly, a likelihood-ratio test supports the inclusion of these metrics in the model (χ^2 (5) = 124.99, $p < .01$). We therefore discuss the results of this model in more detail.

Results for the four factors are consistent with the literature in finance (Fama and French 1993), which finds that excess market returns (0.74, $p < .01$), the size portfolio (0.86, $p < .01$), and the book-to-market portfolio (0.51, $p < .01$) have a positive impact on excess stock returns (for similar results, see Bharadwaj, Tuli, and Bonfrer, 2011). Returns from the momentum factor, in contrast, have a negative impact on stock returns (−0.57, $p < .01$). As mentioned by Srinivasan and Hanssens (2009), there are no definite priors about the expected sign of the momentum factor. The effects of the accounting variables are largely consistent with prior literature (e.g., Dechow 1994; Kothari 2001), as we find that unanticipated changes in earnings have a positive effect (2.97, $p < .01$) and those in assets have a positive effect (0.63, $p < .05$) on excess stock returns.

As for the two key marketing metrics, we again find no support for the value relevance of advertising (5.25, $p > .10$),[10] which is consistent with the meta-analytic result in Conchar, Crask, and Zinkhan (2005, p. 454) on models with a return or growth metric as dependent variable. However, unexpected changes in COMPS remain highly significant (3.52, $p < .01$). This supports the notion that investors indeed pay considerable attention to this retail-specific metric, since unexpected changes in this metric translate in significant changes in stock price.

Even though M2 is consistent with recent literature in marketing (e.g., Osinga et al. 2011; Srinivasan et al. 2009), it makes a number of implicit assumptions that should be empirically tested. First, it can be argued that rather than the four-factor model, it is better to use the Fama–French (1993) three-factor model or the capital asset pricing model (CAPM) to account for the expected returns (see Bharadwaj, Tuli, and Bonfrer, 2011). Accordingly, we examine whether our conclusions change if we use either of these alternative models. We find that the four-factor model used in this study provides a significantly better fit than either the three-factor model or CAPM.[11] Importantly, the use of these alternative models does not change our conclusions.

Second, while M2 assumes that unanticipated changes in advertising spending and COMPS are exogenous, it is important to formally test this assumption. We followed the recent procedure in Lamey et al. (2012), and derived instruments for the unanticipated changes in the advertising spending and COMPS terms in M2 from auxiliary regressions on the average of the competitors' unanticipated changes in advertising or COMPS, along with all other exogenous regressors of M2 (with competitors determined on the 2-digit SIC level). The predicted values from these regressions were subsequently added to M2 (thereby implementing the Wu version of Hausman's endogeneity test). They were highly insignificant, ($p > .35$ for the joint test),

[9] As such, we link firm-specific deviations in the regressors to firm-specific deviations of the dependent variable (from their respective time-averaged value), and therefore exploit the over-time variation in the data to estimate the parameters of interest (Cameron and Trivedi, 2005, p. 703).

[10] One could argue that the impact of advertising will already be reflected in the impact of COMPS, as advertising precedes COMPS in the value chain. However, even when omitting COMPS from the model, the impact of unanticipated advertising changes remains highly insignificant, both in model M1 and model M2.

[11] CAPM: $(S_{ijt} - \mathrm{Rf_t}) = \alpha + \beta(\mathrm{MR}_t - \mathrm{Rf_t}) + \varepsilon_{ijt}$; Fama–French (1993): $(\mathrm{S_{ijt}} - \mathrm{Rf_t}) = \alpha + \beta(\mathrm{MR_t} - \mathrm{Rf_t}) + \mathrm{s(SMB_t)} + \mathrm{h(HML_t)} + \varepsilon_{\mathrm{ijt}}$; A likelihood-ratio test shows that the four-factor model provides a better fit than the Fama-French model (χ^2 (1) = 51.88; $p < 0.01$) and the CAPM (χ^2 (3) = 108.18; $p < 0.01$).

Table 6
Results of value relevance models.[a]

	M1		M2		M3	
	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.
Constant	0.05	(0.02)***	0.06	(0.02)***	0.04	(0.02)**
Four factors						
$MR_t - Rf_t$	0.62	(0.10)***	0.74	(0.10)***	0.76	(0.10)***
SMB_t	1.14	(0.23)***	0.86	(0.24)***	0.86	(0.23)***
HML_t	0.89	(0.12)***	0.51	(0.14)***	0.48	(0.15)***
UMD_t	−0.58	(0.12)***	−0.57	(0.12)***	−0.55	(0.12)***
Main effects						
$U\Delta(AD)_{ijt}$	4.50	(3.74)	5.25	(3.63)	−0.42	(3.49)
$U\Delta(COMPS)_{ijt}$	5.63	(0.47)†††	3.52	(0.48)†††	3.12	(0.48)†††
Accounting metrics						
$U\Delta(EAR)_{ijt}$			2.97	(0.61)***	3.44	(0.67)***
$U\Delta(LEV)_{ijt}$			−0.55	(0.43)	−0.35	(0.43)
$U\Delta(REV)_{jt}$			0.06	(0.14)	0.02	(0.14)
$U\Delta(TA)_{ijt}$			0.63	(0.29)**	0.55	(0.27)**
$U\Delta(SC)_{jt}$			0.13	(0.81)	−0.07	(0.80)
Contingency view						
$U\Delta(COMPS)_{ijt} \times U\Delta(AD)_{ijt}$					−68.89	(24.89)†††
$U\Delta(AD)_{ijt} \times U\Delta(EAR)_{ijt}$					104.20	(38.80)†††
$U\Delta(AD)_{ijt} \times U\Delta(LEV)_{ijt}$					−1.57	(35.37)
$U\Delta(AD)_{ijt} \times U\Delta(SC)_{jt}$					302.08	(102.74)†††
$U\Delta(COMPS)_{ijt} \times U\Delta(EAR)_{ijt}$					16.58	(5.38)†††
$U\Delta(COMPS)_{ijt} \times U\Delta(LEV)_{ijt}$					−1.02	(7.68)
$U\Delta(COMPS)_{ijt} \times U\Delta(SC)_{jt}$					33.19	(18.58)††
N		1646		1646		1646
R^2		0.29		0.34		0.36
F-statistic		$(6, 256) = 88.44^{***}$		$(11, 256) = 67.03^{***}$		$(18, 256) = 45.17^{***}$
Likelihood Ratio Test				$\chi^2\ (5) = 124.99^{***}$		$\chi^2\ (7) = 43.09^{***}$
Maximum VIF		2.02		2.05		2.06

[a] Coeff: coefficient; S.E.: standard error.
** $p < .05$.
*** $p < .01$ (two sided).
†† $p < .05$.
††† $p < .01$ (one sided).

indicating that endogeneity of advertising and COMPS is not an issue.

Third, even though the time span of the data (10 years) was not overly large, we assessed whether the impact of unexpected changes in advertising spending and COMPS differed between economic expansion and contractions periods.[12] These were defined following the procedure outlined in Lamey et al. (2012). Specifically, the Hodrick and Prescott (1997) filter was applied to real GDP to obtain the cyclical fluctuations (GDP_t^c) in the state of the economy, which we used to delineate periods of expansion ($\Delta GDP_t^c > 0$) and contraction ($\Delta GDP_t^c \leq 0$). Adding to M2 an interaction term between, respectively, $U\Delta AD_{ijt}$ ($U\Delta COMPS_{ijt}$) and a contraction dummy allowed us to test for a differential effect across both parts of the business cycle. No evidence of such difference was found for advertising ($p > .60$) or for COMPS ($p > .50$).[13]

In summary, we find very robust evidence for both the value relevance of COMPS, and the absence of such value relevance for advertising. However, these findings come (in line with most prior work in the marketing-finance interface) from a main-effects-only model. As indicated before, a key contribution of our research is to also look at moderating factors.[14]

[12] We thank the review team for this useful suggestion.

[13] It is important to note that the test for differences across business cycles is likely to have lower power as we only have 10 years of data and tests of differences across business cycles typically require data across several decades (see Lamey et al., 2012). In addition, a related argument is that the marketing strategy of a retailer is likely to be a function of its liquidity (Chevalier and Scharfstein, 1996). As such, it is important to use liquidity (i.e., ratio of current assets to current liabilities, see Tuli and Bharadwaj, 2009) as a control variable in M2, and to also examine whether the effects of advertising spending and COMPS differ across high- and low-liquidity firms. We find that including liquidity as an additional covariate in M2 does not change our basic conclusions. Furthermore, we find that the addition of interaction terms between the two marketing metrics and liquidity does not provide a better fit than M2, as the two terms are not significant ($F(2, 255) = 1.51$, $p > 0.20$).

[14] We chose to first validate M2 before extending it with the different interaction terms. One could also conduct endogeneity tests on M3 below, in which case one would have to test for the endogeneity of all interaction terms. Given that we have seven interaction terms, this would require seven additional valid instruments. As the main-effect tests for endogeneity were highly insignificant, we are confident that, even with the interaction terms added, the impact of endogeneity will remain limited (see Hoetker and Mellewigt, 2009 for a similar reasoning). Likewise, one could add three-way interactions to test for a differential effect of each

Testing for moderating effects

To test the moderator hypotheses, we augment M2 with the product term of advertising spending and COMPS on the one hand, and the aforementioned moderators on the other hand.

$$\begin{aligned}(S_{ijt} - R_{ft}) = {} & \alpha + \alpha_{ij} + \beta(\mathrm{MR}_t - R_{ft}) + s(\mathrm{SMB}_t) \\ & + h(\mathrm{HML}_t) + u(\mathrm{UMD}_t) + \gamma_1(\mathrm{U}\Delta\mathrm{EAR}_{ijt}) \\ & + \gamma_2(\mathrm{U}\Delta\mathrm{LEV}_{ijt}) + \gamma_3(\mathrm{U}\Delta\mathrm{TA}_{ijt}) \\ & + \gamma_4(\mathrm{U}\Delta\mathrm{REV}_{ijt}) + \gamma_5(\mathrm{U}\Delta\mathrm{SC}_{jt}) \\ & + \gamma_6(\mathrm{U}\Delta AD_{ijt}) + \gamma_7(\mathrm{U}\Delta\mathrm{COMPS})_{ijt} \\ & + \gamma_8(\mathrm{U}\Delta\mathrm{AD}_{ijt} \times \mathrm{U}\Delta\mathrm{COMPS}_{ijt}) \\ & + \gamma_9(\mathrm{U}\Delta\mathrm{AD}_{ijt} \times \mathrm{U}\Delta\mathrm{EAR}_{ijt}) + \gamma_{10}(\mathrm{U}\Delta\mathrm{AD}_{ijt} \\ & \times \mathrm{U}\Delta\mathrm{LEV}_{ijt}) + \gamma_{11}(\mathrm{U}\Delta\mathrm{AD}_{ijt} \times \mathrm{U}\Delta\mathrm{SC}_{jt}) \\ & + \gamma_{12}(\mathrm{U}\Delta\mathrm{COMPS}_{ijt} \times \mathrm{U}\Delta\mathrm{EAR}_{ijt}) \\ & + \gamma_{13}(\mathrm{U}\Delta\mathrm{COMPS}_{ijt} \times \mathrm{U}\Delta\mathrm{LEV}_{ijt}) \\ & + \gamma_{14}(\mathrm{U}\Delta\mathrm{COMPS}_{ijt} \times \mathrm{U}\Delta\mathrm{SC}_{jt}) + \varepsilon_{ijt} \qquad \text{(M3)}\end{aligned}$$

The likelihood-ratio test supports M3 over the main-effects-only model (χ^2 (7) = 43.09, $p < .01$). In addition, M3 has a maximum VIF of 2.06, which is within the often-proposed cut-off value of 5.0, indicating that multicollinearity is not a concern (Judge et al. 1988) in this extended model either.

As the unexpected changes have a zero mean by construction (see Eq. (2)), the main-effect parameters for advertising and COMPS test H1 and H2 at the mean of the various moderators. At this level, we again do not find support for H1, as unanticipated changes in advertising spending do not have a significant effect on excess stock returns (-0.42, $p > .10$). However, in strong support for H2, we find once more that unanticipated changes in COMPS (3.12, $p < .01$) are value relevant (again, at the mean of the moderators). These results are in line with the main-effects model discussed before. Consistent with H3b, we find that the interaction of COMPS with advertising spending is negative and significant (-68.89, $p < .01$). H4 and H5 are strongly supported as well, as we find that the interaction of firm earnings with both advertising spending (104.20, $p < .01$) and COMPS (16.58, $p < .01$) are positive and significant. Although the effects of interactions of advertising spending and COMPS with leverage are in the expected direction, they fail to reach statistical significance. Hence, H6 and H7 are not supported. However, consistent with H8 and H9, we find that the interaction of advertising spending with sector concentration is positive and significant (302.08, $p < .01$), as is the interaction of COMPS with sector concentration (33.19, $p < .05$). The significance of these moderators provides a potential explanation for the conflicting results found in large-sample analyses (e.g., Kim and McAlister 2011) and meta-analyses (see Conchar, Crask, and Zinkhan, 2005), because these studies do not consider the moderating impact of these factors in examining the effects of advertising spending on stock returns.

We visualize the significant interaction effects in Figs. 1 and 2. Fig. 1a shows that the effect of an unanticipated increase (decrease) in advertising spending becomes stronger (weaker) in the presence of unanticipated increases (decreases) in firm earnings. Similarly, Fig. 1b shows that the effect of an unanticipated increase (decrease) in advertising spending becomes stronger (weaker) in the presence of an unanticipated increase (decrease) in sector concentration. Fig. 2 gives a similar representation for the COMPS measure.

Considering both marketing metrics jointly allows us to examine their relative magnitudes, and to study the interaction between them. We find that the investor community pays more attention to the industry-specific metric COMPS than to advertising spending. Drawing on the Delta rule (Kelley 1947; see Fornell, Rust, and Dekimpe, 2009 for a recent marketing application), we computed the significance of the total effect of both metrics, using the associated moderator values observed in our sample. Of the 1,646 observations, only 302 (18.35 percent) were value relevant ($p < .05$, two-sided) for advertising spending, as opposed to 1,547 (95.44 percent) for COMPS. A proportion test revealed that COMPS was value relevant in a larger fraction of observations ($z = 44.43$, $p < .01$).

We find a significant interaction between COMPS and advertising spending such that the marginal effect of an unanticipated increase in COMPS on stock returns is weaker (stronger) in the presence of unanticipated increases (decreases) in advertising spending (see Fig. 2a). This suggests that investors are more cautious about the ability of COMPS to predict future cash flows if they find that there has been a corresponding increase in advertising spending. This could be due to concerns that COMPS are being driven mostly by the surge in advertising spending (as opposed to other marketing mechanisms, such as merchandising, assortment mix, store location), and therefore might not be sustainable in the future periods.

Discussion

Since most prior work in the marketing-finance interface has focused on manufacturing firms, recent literature calls for research whether the same principles also hold for retail firms (Petersen et al. 2009). Accordingly, the current study examines the value relevance of the two marketing metrics that are most widely and consistently disclosed by retailers: the more general advertising spending variable (also studied in other sectors) and the retail-specific COMPS measure. In doing so, we respond to Gupta and Zeithaml's (2006) call for more research linking different types of marketing metrics to a firm's financial performance (value), that is, (i) what firms do (i.e., advertising spending), and (ii) the outcome of their actions (i.e., COMPS as a store performance indicator). Our findings have both theoretical and managerial implications.

interaction term across economic expansions and contractions. However, given that this would also require the addition of all possible two-way interactions (Cohen et al., 2003), the number of parameters to estimate and interpret would become excessive. We therefore opted to do all validity/robustness checks on (M2).

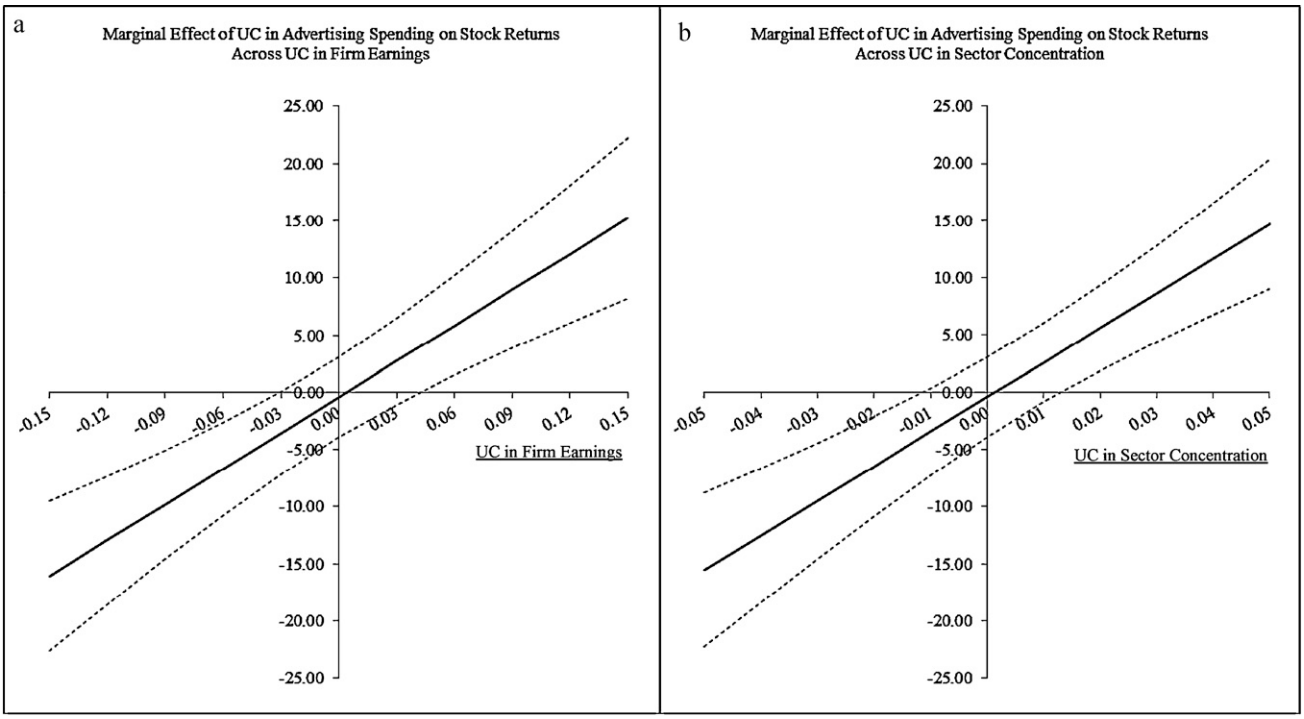

Fig. 1. Moderating impact of firm earnings and sectors concentration on the effect of unanticipated changes (UC) in advertising spending on excess stock returns. The dotted lines indicate ±one standard deviation of the marginal effects of advertising spending on stock returns calculated across unanticipated changes in firm earnings (or sector concentration) by holding the unanticipated changes in all other independent variables at zero.

The key theoretical contribution of this study is that we identify moderating factors that influence the value relevance of these two marketing metrics. Developing hypotheses on, and testing the role of, moderators is important, as it advances theory development by identifying boundary conditions for existing theory. To the best of our knowledge, prior studies in marketing (e.g., Joshi and Hanssens 2009, 2010; Srinivasan et al. 2009) and accounting (e.g., Cole and Jones 2004; Francis,

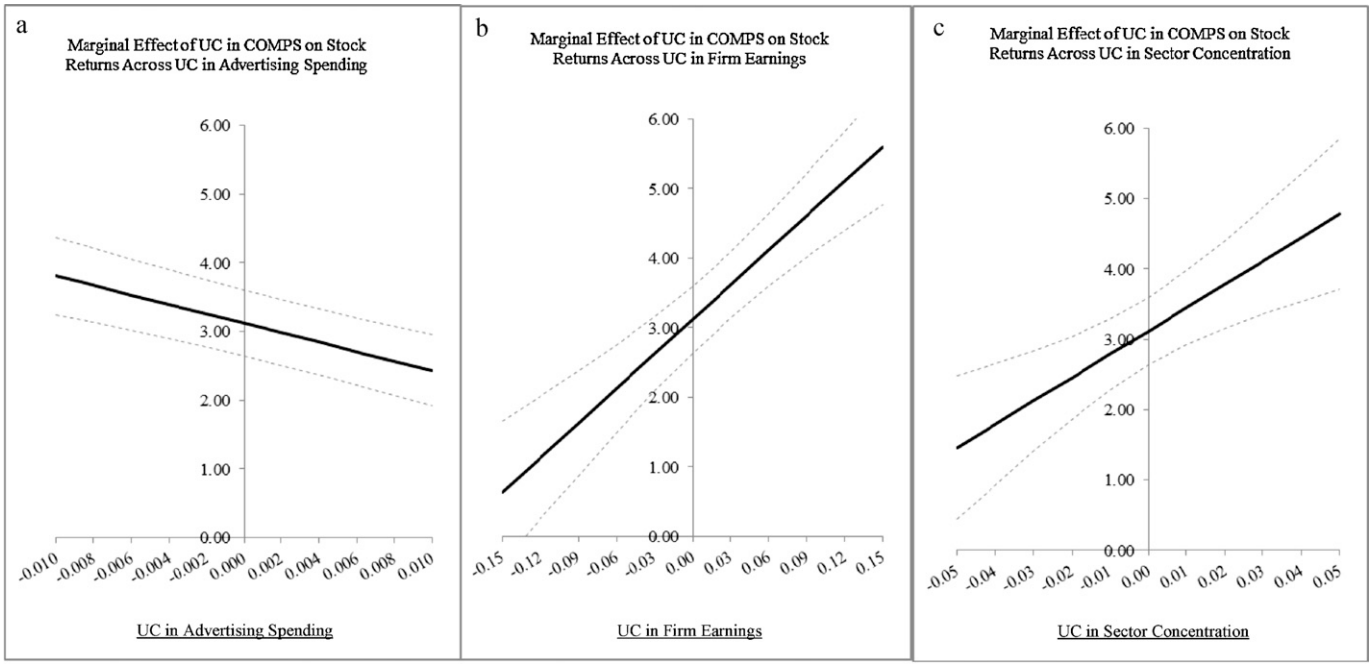

Fig. 2. Moderating impact of advertising spending, firm earnings, leverage, and sector concentration on the effect of unanticipated changes (UC) in COMPS on excess stock returns. The dotted lines indicate ±one standard deviation of the marginal effects of COMPS on stock returns calculated across unanticipated changes in the moderating variable (i.e., advertising spending, firm earnings, leverage, or sector concentration) by holding the unanticipated changes in all other independent variables at zero.

Schipper, and Vincent, 2003) have not explored whether the value relevance of advertising spending and COMPS differs in the presence of firm- and/or sector-specific financial signals (see Table 1). The current study underscores the importance of these moderators, and offers three key insights.

First, in contrast to recent findings of a significant main effect of advertising spending on stock returns in specific industries such as automobiles (Srinivasan et al. 2009), athletic shoes/personal computers (Joshi and Hanssens 2010) and pharmaceuticals (Osinga et al. 2011), we find that the advertising spending of a retailer has a significant positive effect on its stock returns only in the presence of sufficiently large unanticipated increases in earnings. This implies that retail managers will find it more difficult to justify their actions on the basis of a demonstrable appreciation by the financial markets when the firm goes through difficult times (i.e., when firm earnings fall),[15] and when CEOs and CFOs are likely to already be in a cost-cutting mindset. This can explain why, when budgets are cut within the organization, marketing is among the first to be considered (Deleersnyder et al. 2009).

Second, the moderating effects of financial and sector variables also bring to light a contingency view to COMPS, a metric that is viewed as critical for retailers by investors, analysts, and senior managers. Financial markets tend to have a lower appreciation of COMPS of retailers who have a corresponding decrease in earnings (see also Fig. 2b). These results are consistent with the argument that increases in COMPS accompanied by decreases in earnings could signal an attempt by the retailer to buy out its sales by offering deep discounts. We also find that the value relevance of COMPS depends on the competition faced by the firm, as measured by the sector's concentration (Fig. 2c). This suggests that investors tend to appreciate marketing metrics more in an environment with lower competitive intensity, as the firm is likely to derive more out of its marketing initiatives in the absence of competitive threats.

Finally, a more holistic approach to financial communications is called for, given that different marketing signals influence one another. While increases in a retailer's COMPS are valued positively by the market, this is even more so when realized without an increase in (expensive) advertising support (see also Fig. 2a). In that case, an even stronger signal of the intrinsic strength of the underlying concept is provided. Prior research has typically looked at the signaling value of different marketing metrics in isolation. Our research suggests that this may lead to biased estimates of their overall impact, and suggests that managers should adopt a more integrated view in their communication to financial stakeholders.

Directions for future research

The current study presents a starting point for research into investors' evaluation of a retailer's stock price. As such, several areas for future research remain. First, we focused on advertising spending and COMPS, as these constitute two key marketing metrics that are widely and consistently disclosed by retailers. The evolution in COMPS will itself be driven in part by a variety of retail-specific metrics, such as store accessibility and/or customers' perceptions of the retailer's brand quality. Still, one could try to quantify the value impact of each of these individual dimensions in a more direct way. One starting point could be to conduct an event study around the disclosure of discrete marketing initiatives in a given domain (e.g., a major store redesign to improve customers' quality perceptions or the launch of a new sales campaign) to assess investor reactions. Alternatively, one could try to add unanticipated changes in an aggregate brand-quality metric to our framework. For example, Bharadwaj et al. (2011) focused on a quality metric taken from Harris Interactive's EquiTrend database. Merging our data with the data used in that study resulted in too few observations, however, to reliably estimate our model. Similarly, future studies could look at the moderating effects of other company- or industry-specific factors to enhance our understanding of when investors pay more or less attention to a retailer's marketing metrics.

Second, recent literature has used VAR models to distinguish the direct and indirect effects of advertising spending on stock returns (see e.g. Joshi and Hanssens 2010). Given that we identify a number of moderators in the current study, it raises the question whether these factors would have similar moderating effects on both the direct and indirect effects of advertising spending. For example, it can be argued that while financial factors such as earnings and leverage are likely to matter to investors (and moderate the direct effects), they are unlikely to matter as much to consumers (and hence, the indirect effects). Other moderators, however, may matter more to consumer than investors. More research is needed on the differential effects of key moderators on, respectively, the direct and indirect route.

Finally, future studies may explore the value relevance of other industry-specific metrics. For example, firms in the lodging industry routinely report the average revenue per room and room-occupancy rates. Studies could, therefore, examine the value relevance of these metrics in addition to the currently studied (more general) marketing metrics, especially since our results suggest that financial markets may even pay more attention to industry-specific measures.

[15] Interestingly, our results support prior research (see e.g. the survey results of Graham, Harvey, and Shiva, 2005) that earnings are the prime metric investors and analysts use to assess a firm's financial health.

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