Attracting Investor Attention through Advertising

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This Draft: January 2014

Abstract

This paper provides evidence that managers adjust firm advertising, in part, to attract investor attention and influence short-term stock returns. First, I show that increased advertising spending is associated with a contemporaneous rise in retail buying and abnormal stock returns, and is followed by lower future returns. Next, I document a significant increase in advertising spending prior to insider sales, and a significant decrease in the subsequent year. Additional analyses suggest that the inverted-V-shaped pattern in advertising spending around insider sales is most consistent with managers' opportunistically adjusting firm advertising to exploit the temporary return effect to their own benefit. (*JEL* G12, G14)

Keywords: Advertising, Investor attention, Insider sales, Equity issues.

*This paper is a revised version of Chapter 2 of my doctoral dissertation at Yale University. For helpful comments, I thank David Hirshleifer, two anonymous referees, Ulf Axelson, Malcolm Baker, Nick Barberis, James Choi, Lauren Cohen, Ingolf Dittmann, John Doukas, Will Goetzmann, Robin Greenwood, Umit Gurun, Mike Hertzel, Gur Huberman, Byoung-Hyoun Hwang, Li Jin, Matti Keloharju, Dasol Kim, Peter Kondor, Andrew Metrick, Phil Ostromogolsky, Antti Petajisto, Christopher Polk, Peter Roosenboom, Laura Starks, Per Stromberg, Siew Hong Teoh, Paul Tetlock, and seminar participants at Helsinki School of Economics, London School of Economics, Nottingham Business School, Rotterdam School of Management, Stockholm School of Economics, Yale School of Management, and NBER Behavioral Economics Meeting. Financial support from the Paul Woolley Center at the London School of Economics is gratefully acknowledged. All remaining errors are my own. Send correspondence to: Dong Lou, Department of Finance, London School of Economics and Political Science, Houghton Street, London WC2A 2AE, UK; telephone: +44 2071075360. Email: d.lou@lse.ac.uk.

1 Introduction

Recent research has found that advertising has an important impact on the liquidity and breadth of ownership of stocks (e.g., Grullon, Kanatas, and Weston (2004)). This is intriguing as advertising is intended to increase the awareness of a firm's products rather than its securities. Nevertheless, there appears to be a spillover effect. In this paper, I start by providing evidence of this spillover effect of advertising on stock returns. In particular, I show that an increase in advertising spending is accompanied by a contemporaneous rise in retail buying and higher abnormal stock returns, and is followed by lower future returns. I then ask whether firm managers are aware of this spillover effect of product-market advertising. Evidence from insider sales, as well as seasoned equity offerings and stock-financed acquisitions, appears consistent with the view that managers opportunistically adjust advertising spending, in part, to influence short term stock returns.

There are good reasons to believe that advertising has a temporary stock return effect. For example, as argued by Barber and Odean (2008), an investor has to search through thousands of stocks when making a buy decision, but only the limited number of stocks he already holds when making a sell decision. To the extent that attention is a scarce resource, investors are more likely to buy attention-grabbing stocks than to sell them.[1] Furthermore, since advertising is designed to attract attention, an increase in advertising can temporarily boost firm value by generating more buy orders than sell orders. In a related vein, while advertising almost never portrays the underlying product or firm in a comprehensive and objective manner, investors with limited attention/processing capacity may take advertising at face value and respond overly optimistically, thus resulting in a temporary price overshooting.[2]

This prediction of a spillover effect is corroborated by the data. Firms in the top decile ranked by year-to-year changes in advertising spending outperform those in the bottom decile by 12.85%

[1]There is a vast empirical literature on investors' limited attention. For an incomplete list, see Huberman and Regev (2001); Hong, Torous, and Valkanov (2007); Hou (2007); Cohen and Frazzini (2008); DellaVigna and Pollet (2009); Hirshleifer, Lim, and Teoh (2009). Hirshleifer (2001) provides a review of this and related topics.

[2]This effect can be exacerbated by a recent finding that news media tend to use a more positive slant to reward higher advertising spending (see, e.g., Gurun and Butler (2010)). If some investors are unaware of the potential incentive problems of news agencies, they may be falsely led to bid up the stock price.

(t=6.72) in the ranking year, and yet underperform by 6.96% (t=-3.53) and 9.84% (t=-4.52) in the following two years, respectively. Adjusting the portfolio returns for size, value, momentum, and liquidity factors has virtually no impact on the return pattern. In further analyses, I show that the documented return effect is significantly stronger for firms producing consumer products, for firms with lower analyst coverage, lower institutional ownership, and more intense retail trading, and for firms whose brand names are more reminiscent of the firm name. These results provide additional support for an investor-attention-based interpretation of the return pattern, and are largely inconsistent with investment-/growth-option-based explanations.

Given that advertising can attract investor attention and impact stock returns in the short run, I then examine whether firm managers are aware of this spillover effect, and in particular, the extent to which managers adjust firm advertising to exploit investors' limited attention. Anecdotal evidence suggests that managers indeed use advertising to influence market perceptions and stock returns. An October 2003 issue of the *Wall Street Journal* reports: "United Technologies Corp has launched an advertising campaign focused on the Wall Street area and a Times Square building looking into a Morgan Stanley trading room [...] seeks to overcome the view that it is steady, but not a star and to correct what it believes is a 20% discount in its share price against those of peers."

To empirically test managers' opportunistic behavior in setting firm advertising policy, I examine variations in advertising spending in periods when stock prices matter the most. I focus on insider equity sales (as opposed to firm equity offerings) in my main analysis, as insider sales are unlikely to be directly motivated by firms' investment opportunities, and are thus unrelated to advertising through an investment channel. The main prediction of the opportunistic advertising view is that there should be an inverted-V-shaped pattern in advertising spending around periods of insider sales; that is, we should observe a sharp increase in advertising spending before insider sales to pump up the stock price, and a significant decrease in advertising spending in the subsequent year.

This prediction is borne out in the data. After controlling for various firm characteristics that are known to predict insider trading, such as past stock returns and stock liquidity, advertising spending

in the years prior, contemporaneous, and subsequent to insider sales are 5.3% (p <0.01) higher, 5.9% (p <0.01) higher, and 5.1% (p <0.01) lower than the other years (i.e., years that are not adjacent to insider sales), respectively. Taking the average annual advertising spending of $42 million in my sample, these coefficients imply that firms increase their advertising spending by almost $5 million dollars in the two years leading up to insider sales. Further, a one-standard-deviation increase in the aggregate amount of insider sales in a year is associated with a 2.01% (p <0.01) increase in advertising spending in the contemporaneous year and a 2.76% (p <0.05) decrease in the subsequent year. There is a similar inverted-V-shaped pattern in advertising spending around seasoned equity offerings and stock-financed acquisitions. In contrast, there is no clear pattern in advertising spending around debt issues or cash-financed acquisitions.

The finding that advertising spending is higher prior to but lower subsequent to insider equity sales is potentially consistent with a market-timing view. That is, rather than opportunistically adjust advertising to temporarily inflate stock prices shortly before planned equity sales, managers opportunistically time their equity sales in response to planned advertising campaigns. For example, firms may optimally choose to increase advertising spending before the launch of a new product, which consequently drives up the stock price, managers then take advantage of this inflated valuation by selling their equity shares. It is worth pointing out that even this alternative interpretation is broadly consistent with the main thesis of the paper: Managers use all levers under their control to exploit investors' imperfect rationality; the lever may be a particular investment decision or the exact timing of their equity sales.

I provide a number of pieces of evidence that cut against this market timing view—i.e., increased advertising triggers insider sales. First, instead of examining the actual selling by top managers, I use vesting schedules of restricted equity holdings as an instrument for insider sales. Since vesting schedules are determined at the time of stock grants (which are usually years in advance), they are unlikely to be influenced by future advertising spending. In addition, vesting of restricted shares has a significant impact on insider selling decisions. Taken together, vesting of restricted shares

represents a material, yet relatively exogenous variation in the amount of insider selling in each period. The result from this instrument-variable approach supports the opportunistic advertising view: Firms increase advertising spending by 5.8% (p <0.05) in years with instrumented insider selling.

Moreover, under the opportunistic managerial behavior view, advertising spending shortly before insider sales is less motivated by sound business planning, and more by the objective to attract investor attention. Consequently, advertising in these periods should be less effective in driving future sales. Indeed, the correlation between changes in advertising spending and future sales growth is significantly lower in years with insider sales than in years without insider sales; this correlation is in fact statistically zero for insider-selling years. This result implies that opportunistic advertising is a potentially wasteful investment (on the order of millions of dollars) from the long-run firm value perspective, as it does not translate into higher future product sales.

Finally, I repeat the same analysis on lower-level managers, such as the chief financial officer and chief technology officer, who are usually informed about firm operations, but have little control over advertising spending. Consistent with the opportunistic advertising interpretation, there is no significant pattern in advertising spending around equity sales by lower-level insiders. Overall, the evidence presented in this paper generally supports the view that increased advertising attracts investor attention and boosts stock returns in the short run, and that managers, who are aware of this return pattern, opportunistically adjust advertising spending to inflate short-term stock prices before equity sales.

2 Related Literature

The findings of this paper are closely tied to recent studies on managerial incentives to manipulate market perceptions and short-term stock prices. Stein (1996) argues that in an inefficient market, managers with a short horizon exploit investors' imperfect rationality by catering to time-varying investor sentiment. In a related vein, Hirshleifer and Teoh (2003) and Hirshleifer, Lim, and

Teoh (2004) model managers' strategic disclosure behavior in settings with attention-constrained investors. A large volume of empirical studies subsequently confirm these predictions: Many important firm decisions, such as dividend policy, stock splits, firm name, and disclosure policy, are at least partially motivated by short-term share price considerations.[3] This paper contributes to this fast-growing literature by providing additional evidence that managers also make important investment decisions such as advertising, in part, to influence short-term firm value.

The results on manager behavior also complement prior literature on earnings management around equity issuance.[4] The literature documents a substantial increase in abnormal accruals and/or a decrease in discretionary spending (e.g., R&D spending) in the few years before initial public offerings (IPO) and seasoned equity offerings (SEO), in order to boost the offering price.[5] This paper, in contrast, documents that managers increase advertising spending, potentially at the expense of reported earnings before insider sales and other forms of equity sales, highlighting the importance of advertising and its short-term return effect.

This paper also contributes to the vast literature on investors' limited attention in financial markets. Prior studies find that attention-grabbing events, such as abnormal trading volume, extreme stock returns, index additions and deletions, crossing price limits, and media coverage can lead to higher turnover and stock returns in the short run, but lower returns subsequently.[6] The common theme underlying these prior studies and this paper is that investors are more likely to buy and hold stocks that have recently attracted their attention, which in turn drives up the returns of these attention-grabbing stocks.

The return result is also related to a large literature on shareholder value creation of marketing spending. The marketing literature, usually using high frequency (e.g., monthly) marketing spend-

[3]See, for example, Aboody and Kasznik (2000); Cooper, Dimitrov, and Rau (2001); Baker and Wurgler (2004a,b); Cooper, Gulen, and Rau (2005); Baker, Greenwood, and Wurgler (2009); Polk and Sapienza (2008); Greenwood (2009). Baker, Ruback, and Wurgler (2007) provide an excellent review of this topic.

[4]See, for example, Teoh, Wong, and Rao (1998); Teoh, Welch, and Wong (1998a,b); Darrough and Rangan (2005); Graham, Harvey, and Rajgopal (2005); Roychowdhury (2006).

[5]In a related vein, Coles, Hertzel, and Kalpathy (2006) show that managers also manipulate earnings around stock option reissues.

[6]See, for example, Gervais, Kaniel, and Mingelgrin (2001); Chen, Noronha, and Singal (2004); Seasholes and Wu (2007); Barber and Odean (2008); Lehavy and Sloan (2008); Fang and Peress (2009); Kaniel, Li, and Starks (2010).

ing data but focusing on a small number of industries, finds that marketing spending positively predicts firm value in the short run.[7] This positive return effect can arise both from a cash-flow channel (i.e., an immediate sales increase) and a brand-equity channel (i.e., an unobserved effect on long-run future sales). My paper differs from this literature in that it documents a significant negative association between advertising and future stock returns at a yearly horizon, possibly driven by attention-motivated trading.

The closest studies to mine are Grullon, Kanatas, and Weston (2004), Frieder and Subrahmanyam (2005), and Chemmanur and Yan (2009). Grullon, Kanatas, and Weston (2004) and Frieder and Subrahmanyam (2005) document that firms with larger advertising spending or higher brand visibility have a larger investor base and higher stock liquidity.[8] Chemmanur and Yan (2009), on the other hand, provide evidence that firms of the good type signal their higher valuation before equity issuance by increasing product-market advertising and subsequently experience lower IPO/SEO first day returns. Building upon existing evidence on the attention effect of advertising, this paper contributes to the literature by a) documenting a temporary return effect of advertising, and b) linking this temporary return effect to managers' opportunistic behavior.

3 Data

3.1 Firm Characteristics

Data on firm advertising expenditures (data45), total assets (data6), sales (data12), and capital expenditures (data128) are obtained from the Compustat annual tape for the period of 1974 to 2010. The starting year of the sample is determined by the availability of advertising spending

[7] See, for example, Rao and Bharadwaj (2008); Srinivasan and Hanssens (2009); Srinivasan, Pauwels, Silva-Risso, and Hanssens (2009); Joshi and Hanssens (2010); Osinga, Leeflang, Srinivasan, and Wieringa (2011).

[8] In an independent study, Chemmanur and Yan (2010) report a similar return effect induced by product market advertising. This paper differs importantly from Chemmanur and Yan (2010) in that it focuses on the link between this return effect and managerial behavior around equity sales. An earlier paper, Fehle, Tsyplakov, and Zdorovtsov (2005), studies the stock return pattern of firms that advertise in Super Bowl broadcasts, and finds a short-term price appreciation that does not revert in the long run. In a more recent study, Keloharju, Knpfer, and Linnainmaa (2011) show that individuals' product market choices can influence their investment decisions, using data from the automotive and brokerage industries.

data in Compustat. I exclude firm-year observations with missing advertising-spending information from the sample. As a robustness check, I also treat missing advertising spending as zero and obtain similar results. I then merge the Compustat sample with the CRSP monthly stock file to obtain data on stock returns, market capitalizations, and trading volume. I further augment the sample with quarterly institutional holdings and monthly small order imbalances, obtained from Thomson Financial's CDA/Spectrum database, and the Trade and Quote (TAQ) and Institute for the Study of Security Markets (ISSM) databases, respectively. Following prior literature, I calculate institutional ownership as the total shares held by institutional investors scaled by the shares outstanding at the end of the previous quarter. Small orders are defined as those below \$5,000 in size, and the monthly order imbalance is constructed as the total buy orders minus sell orders scaled by the sum of the two.

To mitigate the effect of outliers, I winsorize all change (e.g., annual growth in advertising spending) and ratio (e.g., the advertising-spending-to-sales ratio) variables at the 1st and 99th percentiles. Table I presents the summary statistics of the sample. As shown in Panel A, the subsample of firms with non-missing advertising spending data is similar to that with missing advertising spending data: The former is slightly larger than the latter in terms of size and net earnings, and the two subsamples have similar age and market-to-book ratios. The average advertising spending in my sample is slightly over \$42 million a year and account for about 4.33% of annual sales and 4.73% of total assets. The average annual growth of advertising spending is 27.56%. These figures indicate that advertising constitutes a non-trivial part of firms' investment decisions.

3.2 Other Variables

3.2.1 Insider Sales

Insiders, broadly defined as directors and executives, are required to report all changes in their company holdings to the Securities and Exchange Commission (SEC) through Forms 3, 4, and 5. Insider trading data are obtained from the Thomson Financial Insider Filing database. To ensure

data quality, I exclude all observations with a cleanse code of "A" or "S," indicative of a failed cleansing attempt, from the sample. I retrieve three variables from the insider-filing database: the date of each transaction, the number of shares bought (or sold), and the price at which the transaction took place. I further exclude observations where the transaction price is greater than three times or less than one third of the closing price on the transaction day, as these are likely to be data errors.

I follow the rule suggested by Thomson Financial to classify insiders into two categories based on their role in the firm. Top-level insiders include the chairman of the board, the chief executive officer, the chief operating officer, the general counsel, and the president. Second-tier insiders include the vice chairman, the advisory committee, the compensation committee, the executive committee, the finance committee, the technology committee, the chief financial officer, the chief investment officer, the chief technology officer, the treasurer, the secretary, the beneficial owners, and the officers of the parent company and divisional officers. For the main analysis, I focus on top-level insiders only, who have the ultimate control over firm investment.

For each firm-year, I calculate aggregate insider sales as the total shares sold by all insiders in the year scaled by the number of shares outstanding. I define an event year as one in which the total amount of insider sales is above the 25th percentile of the sample distribution. The 25% cutoff is to weed out situations where insiders sell a tiny fraction of the available shares and hence have weak incentives to (temporarily) inflate stock prices. I obtain similar results with alternative cutoff values (e.g., 0%, 10%, or 50%). My results are also robust to using the continuous insider-selling variable (as shown in Panel C of Table VI and Table X).

3.2.2 Restricted Shares

To identify relatively exogenous shocks to insider selling (which hopefully are independent from advertising spending decisions), I use vesting schedules of restricted equity holdings to instrument for insider selling. Firms are required to report the number of restricted shares acquired by top

managers upon vesting under FAS 123R, which came into effect in December 2004. The data on the vesting of restricted shares owned by the top five executives are obtained from Compustat's Executive Compensation database, and are available for the period of 2005 to 2010.

To gain a better understanding of the vesting data, I obtain the vesting schedules for a smaller sample of firms from Equilar for the period of 2006 to 2008. Around one third of all restricted stock grants in this sample vest in a single year (i.e., a cliff vesting schedule). Among the remaining two-thirds of the observations where restricted stock grants vest gradually (i.e., a graded vesting schedule), the number of years over which these grants vest varies considerably from two to ten years, with three and four years being the most popular choices.[9] Overall, there is a significant amount of variation in the number of shares vesting in each year.

3.2.3 Equity and Debt Issues

Public equity and debt issues for all US firms are obtained from Thomson Financial's Securities Data Corporation (SDC) database. For equity issues, I exclude all IPOs because the coverage of advertising spending in pre-IPO years is incomplete in Compustat. In particular, I retrieve from SDC the date of each public equity (debt) offering and the principal amount received. For each firm-year, I then calculate the total equity (debt) issuance as the aggregate principal amount received in all equity (debt) issues in that year, divided by the market capitalization of the firm. Finally, I categorize an event year as one in which there is at least one equity (debt) issue.

3.2.4 Stock- and Cash-Financed Acquisitions

Stock- and cash-financed acquisitions are also obtained from the SDC database. I only retain observations where it is clear that the deal is 100% financed by equity or 100% financed by cash. I then calculate the total proceeds involved in all stock- or cash-financed acquisitions over a year as a fraction of the acquirer's market capitalization. An event year is then defined as one in which there is at least one stock- or cash-financed acquisition.

[9] Less than 10% of the restricted stock grants in this sample has a performance-based vesting schedule.

Panel B of Table I reports the summary statistics of these corporate events. The average size of insider sales in a year is 1.22% of shares outstanding, with a standard deviation of 2.21%. These figures may seem small in absolute terms, but could account for a large fraction of managers' wealth. The average amount of shares vesting in a year is 0.20% of shares outstanding, with a standard deviation of 0.27%. The average proceeds received from equity and debt issues in a year account for 17.74% and 26.47% of the firm's market value, respectively. Finally, the total transaction values of stock- and cash-financed acquisitions in a year are 36.07% and 12.53% of the acquirer's market capitalization, respectively.

4 Advertising Spending and Stock Returns

Prior research finds that product-market advertising attracts investor attention. In this section, I extend this result by examining stock return implications of product-market advertising. In particular, attention-constrained investors are more prone to buying attention-grabbing stocks than to selling them. Advertising, which is designed to attract attention, can cause stock prices to temporarily overshoot by generating more buy orders than sell orders. The exact prediction of this limited-attention hypothesis is that an increase in advertising spending should be accompanied by a contemporaneous rise in stock price, and followed by lower future stock returns.

4.1 Stock Return Results

I start by conducting a calendar-time portfolio analysis, where stocks are ranked by changes in advertising spending in the previous year. To avoid any market microstructure issues, I follow prior literature (e.g., Jegadeesh and Titman (2001)) to exclude stocks with a price below five dollars a share and whose market capitalization would place it in the bottom NYSE size decile. I also require minimum advertising spending of $100,000 a year, to mitigate the impact of outliers when computing changes in advertising spending. Using different cutoffs (e.g., $50,000 or $200,000) does not affect my results.

At the end of each month, I sort all firms with non-missing advertising spending data into decile portfolios, based on the percentage change in advertising spending. I use percentage changes rather than dollar changes, as the marginal effect of an advertising dollar on consumer/investor attention is likely decreasing in the total amount of adverting spending. For instance, a $1 billion increase in advertising spending by General Motors, which already spends billions of dollars on advertising each year, may have a small incremental effect on investor awareness, whereas a $1 million increase in advertising spending by an internet start-up may go a long way to reach out to potential investors. The decile portfolios are then held for two years and are rebalanced each month to maintain equal weights.

Table II reports monthly returns to these decile portfolios. As can be seen from Panel A, changes in advertising spending in a year are significantly and positively associated with contemporaneous stock returns. The difference in excess stock returns between the top and bottom deciles ranked by ΔAD is 1.07% (t=6.72) per month in the portfolio formation year. There is a significant reversal pattern in the subsequent two years. The spread in monthly returns between the top and bottom deciles ranked by ΔAD is -58 bp (t=-3.54) and -82 bp (t=-4.52) in the following two years, respectively. In other words, the positive return accrued to the long-short portfolio in the formation year is completely reversed by the end of year two. Adjusting the portfolio returns by the size, value, momentum, and liquidity factors, or by the Daniel, Grinblatt, Titman, and Wermers (1997) (DGTW) characteristics-based benchmark has virtually no impact on this return pattern.[10]

Panel B repeats the same analysis using industry-adjusted ΔAD to address the potential concern that the documented return pattern is driven by industry-wide fluctuations in advertising spending. Specifically, in each year, I subtract the industry average advertising spending growth from individual firms' advertising spending growth, and use this difference to sort firms into deciles. The results are similar to those reported in Panel A. The return spread between the top and bottom

[10]The return spreads remain large and statistically significant after adjusting for the investment factor model introduced by Hou, Xue, and Zhang (2012). The difference in monthly alpha between the top and bottom deciles ranked by ΔAD is 99bp (t=5.18) in the contemporaneous year, and -56bp (t=-3.96) in the subsequent year.

deciles ranked by industry-adjusted ΔAD is 84 bp (t=5.74) per month in the portfolio formation year, and is -56 bp (t=-3.53) and -88 bp (t=-5.57) per month in the subsequent two years.[11]

As a robustness check, I divide the whole sample into two sub-periods around a regulatory change in year 1994. The Accounting Standards Executive Committee issued Statement of Position (SOP) 93-7—Reporting on Advertising Costs—on June 15th 1994, which changed the practices companies followed to expense their advertising costs. As shown in Panels C and D, the return patterns in the two sub-periods are similar to that for the full sample both in terms of economic magnitudes and statistical significance. In sum, the results from Table II show a robust inverted-V-shaped return pattern in periods of increased advertising spending.

To further isolate the marginal effect of advertising on future stock returns, I conduct the following Fama-MacBeth return forecasting regression:

$$RET_{i,s} = \alpha + \beta * \Delta AD_{i,t} + \gamma * Control + \varepsilon_{i,s}, \tag{1}$$

where the dependent variable, $RET_{i,s}$, is the monthly stock return in the subsequent period. The independent variable of interest is the change in advertising spending in years t. I then control for growth in total assets, sales, and capital expenditures in year t, all of which are significantly correlated with changes in advertising spending. Additional control variables include firm size, book-to-market ratio, past returns, equity issuance (as defined in Daniel and Titman (2006)), turnover, and discretionary accruals (as in Xie (2001)).

The regression results are shown in Table III. The dependent variable in columns 1 and 2 is the monthly stock return in the following year. The coefficients imply that a one-standard-deviation increase in ΔAD is associated with a 20.2 bp (p <0.01) decrease in monthly returns in the subsequent year in a univariate regression, and a 9.3 bp (p <0.05) decrease in monthly returns in a multi-variate regression. Columns 3 and 4 examine stock returns in year two. After

[11] Following Gormley and Matsa (2013), I also conduct a Fama-MacBeth return regression controlling for industry-fixed effects; that is, I include industry dummies in every cross section, thus allowing firm industry attributes to vary each month. The results are unchanged.

controlling for the list of known stock return predictors, a one-standard-deviation increase in ΔAD is associated with a a 9.3 bp (p <0.01) decrease in monthly stock returns for the second year.[12]

In columns 5-8, I conduct similar forecasting regressions for future earnings announcement day returns, defined as the three-day cumulative return around an earnings announcement. Consistent with the results on monthly returns shown in the first four columns, changes in advertising spending also significantly negatively forecast future earnings announcement day returns. For example, after controlling for a host of variables that are known to forecast future earnings surprises and earnings announcement returns, a one-standard-deviation increase in ΔAD forecasts lower quarterly earnings announcement returns of 15bp and 17bp in years one and two, respectively. It is worth noting that this result on earnings announcement day returns is unlikely to be explained by a risk/investment-based interpretation, a point I will return to in Section 4.2.

The coefficients on other control variables are generally consistent with prior findings. For example, both asset growth and investment growth negatively forecast future stock returns (Cooper, Gulen, and Schill (2008), Titman, Wei, and Xie (2004)). Importantly, advertising spending remains statistically significant in forecasting stock returns after controlling for these firm characteristics. In sum, the evidence shown in this section, from both calendar-time portfolio analyses and Fama-MacBeth return regressions, suggests that increased advertising is associated with a contemporaneous rise in stock returns, and followed by lower future returns. Moreover, this inverted-V-shaped return pattern is unrelated to common risk factors and previously-known return determinants, and is robust to alternative definitions of ΔAD and different sample periods.

4.2 Alternative Interpretations

The documented return pattern is potentially consistent with alternative interpretations, however. For example, a signalling model may predict that, while the content of advertising is generally uninformative about the firm's future profitability and growth prospects, the act of advertising

[12] As a further robustness check, I also examine stock returns in months 7 to 18 after fiscal year ends, as many firms delay their annual reporting by as much as six months. The results are similar to those reported in columns 1 and 4.

itself can serve as a value-relevant signal to the market, as only firms with good future prospects can afford to advertise.[13] Therefore, increased advertising spending should naturally lead to higher valuation. This signalling channel, while consistent with the initial stock price run-up in periods with increased advertising, can not explain the subsequent complete return reversal.

The reversal pattern, however, can be consistent with an investment-based asset pricing model. For example, the Q-theory predicts that a reduction in a firm's cost of capital increases the marginal value of its investment, which would then induce a negative correlation between investment and future stock returns (e.g., Cochrane (1991, 1996); Zhang (2005); Liu, Whited, and Zhang (2009)). In addition, models of growth options predict that when firms exercise their growth options, since growth options are riskier than assets in place, these firms would have lower risk, thus lower average returns, going forward (e.g., Berk, Green, and Naik (1999); Carlson, Fisher, and Giammarino (2004)). I provide a number of additional tests that cut against these investment-based interpretations, and that are more in favor of the limited-attention story.

4.2.1 Retail Investor Trading and Short Interest

Since retail investors are generally more attention and resource constrained relative to institutional investors, an immediate prediction of the limited-attention story is that retail investors should be more affected by product market advertising, and are thus the net buyers in firms with increased advertising spending. Following prior research on retail vs. institutional trading (e.g., Barber, Odean, and Zhu (2009) and Hvidkjaer (2008)), I label stock trade orders (from TAQ and ISSM) that are smaller than $5,000 as the ones submitted by retail investors. This simple rule to identify retail vs. institutional trading has been shown to be effective until early 2000, at which point the NYSE introduced decimalization to its pricing system and institutions in response started to break up their orders. Thus, I restrict my analysis to the pre-2000 period when conducting the following

[13] See, e.g., Nelson (1974); Grossman and Shapiro (1984); Kihlstrom and Riordan (1984); Milgrom and Roberts (1986); Chemmanur and Yan (2009).

Fama-MacBeth regression:

$$IMBAL_{i,s} = \alpha + \beta * \Delta AD_{i,t} + \gamma * Control + \varepsilon_{i,s}, \tag{2}$$

where $IMBAL_{i,s}$ is the monthly small-trade imbalance, defined as the number of small buy orders minus the number of small sell orders, scaled by the total number of small orders in that month. I also define $IMBAL$ based on the total dollar volume of buy and sell orders and the results are almost identical. The list of controls includes growth in firm assets, sales, and capital expenditures, past stock returns at various horizons, firm size, book-to-market, firm age, and turnover.

In the first two columns of Table IV, the dependent variable is the monthly small-trade imbalance in the year contemporaneous to changes in advertising spending. The result shows that retail investors are net buyers of firms that increase their advertising spending. After controlling for other confounding factors, a one-standard-deviation increase in advertising spending is associated with a 3.4% (p <0.01) increase in monthly small-trade imbalance in the same year. There also appears to be an attention spillover effect to the following year. As shown in columns 3 and 4, where the dependent variable is the monthly small-trade imbalance in year t+1, a one-standard-deviation increase in advertising spending is associated with a 1.7% (p <0.1) increase in monthly small-trade imbalance. In sum, the results from Table IV suggest that product-market advertising indeed has a strong impact on retail investors' buying behavior, consistent with the view that retail investors are generally more attention constrained than their institutional peers.

I next examine variations in short interest around the time of increases in advertising. If the documented increase in firm valuation is indeed driven by an investor (in)attention channel, we would expect arbitrageurs to have an incentive to bet against this inflated valuation by shorting the stock. To this end, I conduct a similar regression as equation (2), except that now the dependent variable is the monthly change in short interest (as a percentage of shares outstanding).

As can be seen from columns 5 and 6 of Table IV, an increase in advertising is contemporaneously

associated with an increase in short interest. In particular, after including a host of control variables, a one-standard-deviation increase in ΔAD in a year is associated with a contemporaneous rise in short interest of over 60bp (5bp per month * 12 months). Relative to the average short interest of 4.3% in my sample, this increase represents an over 14% jump in short interest. Columns 7 and 8 report changes in short interest in the following year. There is a marginally significant spillover effect to the next year. These results on short interest, coupled with the pattern in retail trading, lend support to the behavioral interpretation: product-market advertising attracts the attention of less sophisticated investors, leading to a higher valuation; smart investors, understanding the temporary nature of the attention effect, bet against this inflated valuation by shorting the security.

4.2.2 The Mechanism

To further distinguish the limited-attention story from alternative interpretations, I exploit cross-sectional variations in the effect of advertising on investor attention. Specifically, I introduce an additional interaction term to equation (1):

$$RET_{i,s} = \alpha + \beta_1 * \Delta AD_{i,t} + \beta_2 * \Delta AD_{i,t} * IND_{i,t} + \beta_3 * IND_{i,t} + \gamma * Control + \varepsilon_{i,s}, \qquad (3)$$

where IND is a binary variable whose value depends on various firm characteristics. A positive (negative) coefficient on the interaction term then indicates a weaker (stronger) temporary return effect of advertising for firms with an IND score of one relative to firms with a score of zero.

The first set of firm characteristics I consider captures the salience of advertising to investors. Since advertising for consumer products (e.g., the iPhone) is more attention-grabbing than advertising for industrial products (e.g., silicon plates), the return effect of advertising should be stronger for firms in consumer-product industries than in other industries. In a similar vein, the return effect should also be stronger for firms with lower analyst coverage, as investors in these firms have fewer alternative information sources and may have to rely on advertising for information.

The results are consistent with both predictions. As shown in columns 1 and 2 of Table V,

the coefficient on the interaction term between ΔAD and a dummy that equals one for firms in consumer-product industries and zero otherwise is -0.18 (p <0.05), and the coefficient on the interaction term between ΔAD and a dummy that equals one if the firm is above the median analyst coverage (adjusted for firm size) is 0.21 (p <0.01). In other words, advertising is associated with a much stronger temporary return effect for firms in consumer-product industries and for those with lower analyst coverage.

The second set of firm characteristics reflects institutional vs. retail demand. Since retail investors are more likely to be attracted to firms with increased advertising, we expect the return reversal pattern to be stronger when there is more retail buying (or simply share turnover) contemporaneous to increased advertising. Similarly, the return effect should also be stronger for firms with higher retail ownership, as these stocks are the preferred habitat of retail investors. The results shown in columns 3 to 5 support these predictions. The temporary return effect of advertising is indeed stronger for firms experiencing more intense retail buying (or higher share turnover) in the year contemporaneous to increased advertising, as well as for firms with larger retail ownership prior to the increase in advertising.

The third firm characteristic measures the similarity between product brand names and the firm name. In particular, the closer the two names, the easier it is that investors can associate product-market advertising to the underlying firm. A direct measure of the similarity between product names and the firm name, however, requires considerable discretion. Consider, for example, Microsoft (the firm) and MSN (the brand), where MSN is an abbreviation for Microsoft Network. It is unclear that investors would immediately think of Microsoft when they see MSN. To get around this issue, I proxy for this similarity using the number of product brands each firm has, as reported by Nielson Media, for the period 2004-2010. The underlying premise is that firms with a larger number of products usually have a distinct brand name for each individual product, which tends to be also distinct from the firm name. For example, Procter & Gamble, which operates in more than 10 consumer product markets with over 100 products, has a unique brand for each of its

products (e.g., Crest toothpaste, Cover Girl makeup, Dawn dishwashing detergent, etc.), none of which bears any resemblance to the company name. The evidence presented in column 6 of Table V supports this prediction. The return effect of advertising is significantly weaker for firms with a larger number of product brands (adjusted for firm size).

The final test along the same line is motivated by Gurun and Butler (2012). Upon entry into a market, Craigslist grabs a substantial portion of noncorporate advertising (classifieds) revenues from traditional news outlets, thus making local media more susceptible to supplying slant in response to corporate advertising. Consistent with this hypothesis, the authors find evidence that the sensitivity of local media slant to firms' advertising spending increases significantly after Craigslist's entry into their market. I extend this idea to also examine the impact on firm valuation. If local media slant responds more strongly to advertising after Craigslist's entry, provided that investors do not fully understand media biases, advertising may have a stronger impact on firm valuation after Craigslist's entry events. To test this, I introduce a *Craigslist* dummy that takes the value of one if Craigslist is present in the same zip code as the firm's headquarter, and zero otherwise.[14]

The results support my prediction. While the coefficient on the interaction term is insignificantly negative for the full sample of firms, it is statistically significant and economically meaningful for small stocks, whose market capitalization is below the median cut off of the NYSE sample (shown in column 7 of Table V). This is consistent with the idea that a) small stocks tend to be geographically concentrated, and are thus more likely to advertise in local media, and b) small stocks are held more by local investors, who are more likely to be affected by local media slant. Together, these additional analyses on the underlying mechanism lend further support to the limited-attention interpretation of the documented return pattern, and are inconsistent with the alternative, risk/investment-based explanations.

[14]In other words, the Craigslist dummy is set to one after Craigslist's entry into the market. I want to thank Umit Gurun for sharing his Craigslist data with me.

5 Advertising Spending around Equity Sales

If product-market advertising can attract investor attention and temporarily boost stock returns, a natural question to ask is whether firm managers are aware of this temporary return effect, and more important, the extent to which managers adjust firm advertising to exploit investors' bounded rationality.[15] To empirically test managers' opportunistic behavior, I examine variations in advertising spending in periods when short-term stock prices matter the most. I focus on periods of insider equity sales as opposed to firm equity offerings in my main analysis, as insider selling is unlikely be motivated by firm's investment opportunities (or lack thereof), and thus is less correlated with advertising spending through an investment channel. The main prediction of the opportunistic managerial behavior hypothesis is that we should observe an inverted-V-shaped pattern in advertising spending around insider sales; in particular, we should see a sharp increase in advertising spending before insider sales to pump up the stock price, and a significant decrease in advertising spending in the subsequent year.

5.1 Advertising Spending around Insider Selling

In each fiscal year, I compute the aggregate amount of insider equity sales as the total number of shares sold by all top executives divided by the number of shares outstanding at the end of the previous year. The list of top executives, as defined by Thomson Financial, includes the chairman of the board, the chief executive officer, the chief operating officer, the general counsel, and the president.[16] I then define an event year as one in which the amount of insider sales is above the 25th percentile of the sample distribution. The 25% threshold is imposed to weed out situations where managers sell a tiny fraction of the shares available and thus do not have a strong incentive to (temporarily) inflate stock prices. The results are by and large unchanged if I instead use 0%, 10%, or 50% as the cutoff. Specifically, I conduct the following pooled OLS regression with firm-year

[15] A crucial feature of the data is the long lasting return effect and gradual reversal pattern of advertising as documented in the previous section. It allows me to tie a firm investment decision, which does not switch frequently, to managers' motivations to exploit the temporary return effect.

[16] The results are similar if I use insider sales net of insider purchases, or focus solely on the CEO and President.

observations:

$$AD_{i,t} = \alpha + \beta_1 * PreEvent_{i,t} + \beta_2 * Event_{i,t} + \beta_3 * PostEvent_{i,t} + \gamma * Control + \varepsilon_{i,t}, \quad (4)$$

where the dependent variable is the logarithm of advertising spending in year t.[17] Among the list of independent variables, $Event_t$ is an indicator function that equals one if year t is an event year, and zero otherwise. For all non-event years, $PreEvent_t$ is set to one if t+1 is an event year, and $PostEvent_t$ is set to one if t-1 is an event year, and zero otherwise. If both $PreEvent_t$ and $PostEvent_t$ are equal to one (i.e., the following and previous years are both event years), both dummies are reset to zero, as the prediction on advertising spending in year t is unclear in this case. Thus, the coefficients on these binary variables, $PreEvent_t$, $Event_t$, and $PostEvent_t$, indicate the extent to which managers adjust advertising spending in the years prior, contemporaneous, and subsequent to insider sales relative to all other years (i.e., years not adjacent to insider sales), respectively.

I control for past stock returns and share turnover measured over various horizons to address the concern that advertising spending and insider sales may be jointly determined by firms' past performance and stock liquidity. Other control variables include lagged firm assets, sales, market capitalization, book-to-market ratio, firm age, return volatility, and the Kaplan and Zingales (1997) index of financial constraints. I also include year-fixed effects in all regressions to subsume market-wide fluctuations in advertising spending and insider selling.

The regression results are reported in Panel A of Table VI. There is a clear inverted-V-shaped pattern in advertising spending around insider selling. As shown in column 1, where I also control for lagged adverting spending, the average advertising spending in the years prior, contemporaneous, and subsequent to insider sales is 5.3% (p <0.01) higher, 6.9% (p <0.01) higher, and 3.9% (p <0.01) lower than that in other years, respectively. Taking the mean (median) annual advertising

[17] For robustness checks, I also use industry-adjusted advertising spending as the dependent variable and obtain similar results.

spending of \$42 (\$2.2) million in my sample, these coefficients imply that firms in the years prior, contemporaneous, and subsequent to insider sales spend \$2.2 (\$0.12) million more, \$2.9 (\$0.15) million more, and \$1.6 (\$0.09) million less on advertising relative to other years, respectively. The coefficients on the control variables are similar to those in prior literature. For example, advertising spending is highly persistent over time and is significantly correlated with firm sales and assets.

Column 2 conducts a similar regression analysis, except that now I include firm-fixed effects, rather than lagged advertising spending, in the regression. This is to control for unobserved, but time-invariant firm characteristics that can drive both advertising spending and insider sales. The result is virtually identical to that presented in column 1. The average advertising spending in the years prior, contemporaneous, and subsequent to insider sales is 5.3% (p <0.01) higher, 5.9% (p <0.01) higher, and 5.1% (p <0.01) lower than that in the other years. Column 3 uses a scaled version of advertising spending—i.e., advertising spending divided by lagged firm sales—as the dependent variable. The results are by and large unchanged. The average advertising-spending-to-sales ratio in the years prior, contemporaneous, and subsequent to insider sales is 4.9% (p <0.01) higher, 5.9% (p <0.01) higher, and 4.9% (p <0.01) lower than that in the remaining years.

As a robustness check, and to address the concern that advertising spending may have a non-linear relation with some of the control variables, I also conduct a matched-sample analysis. In particular, the treatment group includes firm-year observations where year t (the year in question) is an event year and none of the surrounding four years (i.e., t-2, t-1, t+1, and t+2) is an event year. I then construct a potential matching sample that includes all firm-year observations where both year t and the surrounding four years are non-event years. For each observation in the treatment sample, I then identify a matching firm (with replacement) as the one with the closet propensity score based on a set of firm characteristics: industry, firm size, the book-to-market ratio, and past stock returns. My results are also robust to using the average of the closet three or five matching firms.

There are in total 1,041 firm-year observations in the treatment sample with valid matching

firms. I then calculate the differences in advertising spending between year t and the four adjacent years for both the treatment sample and the matching sample. I report the difference in difference between the two samples in Panel B of Table VI. As shown in column 2, relative to the matching sample, the average advertising spending in year t of an event firm is 6.28% (p <0.05), 2.59% (p <0.1), 4.38% (p <0.05), and 9.83% (p <0.01) higher than that in years t-2, t-1, t+1, and t+2, respectively. In other words, there is a significant increase in advertising spending in the two years before insider selling, and a significant decrease in advertising spending in the two years after.

Moreover, if managers opportunistically adjust advertising to temporarily inflate stock prices in order to maximize the proceeds from equity sales, we would expect the inverted-V-shaped pattern in advertising spending to be more pronounced when there is a larger amount of insider selling. This prediction is borne out in the data. Panel C reports the same regression analysis as in Panel A except that now I include three additional independent variables in the regression: the actual amount of insider selling in the following, present, and previous years. For example, the coefficients in column 2 (which also includes firm-fixed effects) imply that a one-standard-deviation increase in the aggregate amount of insider sales in a year is associated with a 2.01% (p <0.01) increase in advertising spending in the same year and a 2.76% (p <0.05) decrease in advertising spending in the subsequent year.

5.2 The Market-Timing View

The pattern that advertising spending is higher prior to but lower subsequent to insider sales is potentially consistent with an alternative, market-timing view. Market timing refers to the practice of selling securities at abnormally high prices and buying securities at abnormally low prices. So, rather than opportunistically adjust advertising to temporarily inflate stock prices around planned equity sales, managers may opportunistically time their equity sales in response to planned advertising campaigns. In particular, as investors are attracted to increased advertising and thus push up the stock price, managers may then sell their stakes to take advantage of this

advertising-induced overvaluation. It is worth pointing out, however, that this alternative market-timing interpretation is broadly consistent with the main thesis of the paper: Managers use all levers under their control to exploit investors' bounded rationality; the lever could be a particular investment decision or the exact timing of their equity sales. Nonetheless, I provide a number of additional pieces of evidence that cut against this market-timing interpretation, and that are more in favor of the opportunistic advertising view.

5.2.1 An Instrument-Variable Approach: Restricted Shares Vesting

The cleanest way to separate the opportunistic advertising view from opportunistic trading is to identify exogenous shocks to insider selling decisions. To this end, I exploit variations in the amount of restricted shares that vest in each year. First, top executives tend to sell a significant fraction of their restricted equity holdings as soon as they vest.[18] Second, vesting schedules are determined at the time of the stock grants, which are usually a few years in advance; it is thus unlikely that advertising spending years down the road can influence vesting schedules that were set up in the past. Consequently, vesting schedules of restricted shares represent a material and relatively exogenous variation in insider selling decisions in each period.

I compute the aggregate amount of restricted shares vesting in each year as the total number of shares acquired by the top five executives due to vesting, divided by the number of shares outstanding at the end of the previous year. I choose to focus on restricted stock shares rather than restricted incentive stock options, because of the tax code associated with incentive options. In particular, the gains from exercising incentive options are taxed as personal income if the acquired shares are sold immediately, but are taxed as long-term capital gains if the shares are sold at least one year after option exercising. If managers do not sell their acquired shares immediately after option exercising to save on tax, they then have little incentive to inflate stock prices at the time of option exercising or vesting. There is, however, no such differential tax treatment for selling

[18] Huddart and Lang (1996) and Fu and Ligon (2010) show that top executives exercise a significant fraction of their stock options upon vesting.

restricted shares.

The regression results for the instrument-variable analysis are reported in Table VII. The first two columns repeat the baseline OLS regression (same as Panel A of Table VI) on the subsample of firms with available vesting data. In this subsample, firms increase their advertising spending by 4.8% in years with insider selling, similar to the result in the full sample. Column 3 shows the first-stage IV regression. Consistent with the idea that insiders sell some of their restricted holdings upon vesting, there is a significant correlation between restricted shares vesting in a year and the actual selling by top executives in the same period. In columns 4 and 5, I repeat the same analysis as in columns 1 and 2, except that now the main independent variable is the instrumented insider sales from the first-stage regression. The coefficient on the instrumented event dummy of 5.8% is similar in magnitude to that reported in columns 1 and 2. In sum, the evidence shown in Table VII suggests a similar pattern in advertising spending around *pre-planned* equity sales, lending support to the opportunistic advertising interpretation.

5.2.2 The Sensitivity of Future Sales to Advertising Spending

If managers indeed opportunistically adjust advertising spending to pump up the stock price before insider sales, we expect to see a weaker correlation between advertising spending and future sales growth in periods of insider sales than in other years. First, advertising in these periods is less driven by firms' investment/growth opportunities, which are usually associated with higher future sales growth. In addition, advertising around insider sales is more about attracting stock-market investors and less about attracting product-market consumers—the anecdote of United Technologies Corp is a perfect example for this point; thus, advertising in these periods should be less effective in driving future sales.

To test this idea, I conduct a simple regression analysis where the dependent variable is the sales growth in a year and the main independent variable is the change in advertising spending in the previous year. I also include an interaction term between lagged changes in advertising

spending and an event dummy that equals one if there is some insider selling in the same year. The prediction is that we should see a positive coefficient on lagged changes in advertising spending and a significantly negative coefficient on the interaction term.

As shown in Table VIII, ΔAD significantly and positively predicts future sales growth in periods without insider sales, and this predictability drops significantly in periods with insider sales. For example, the coefficients in column 4 imply that a one-standard-deviation increase in ΔAD is associated with a 2.7% (p <0.01) increase in firm sales in the subsample where the event dummy is zero, and is associated with a 1.6% (insignificant) decrease in firm sales in the subsample where the event dummy is equal to one. This difference of 4.3% between the two subsamples is statistically significant at the 1% level.

This pattern of sales growth also suggests that opportunistic advertising around insider sales imposes a non-trivial cost on shareholders, as higher advertising spending in these periods does not translate into higher future product sales. I explore how corporate governance may mitigate this agency issue in Section 5.2.4.

5.2.3 Lower-Level Insiders

Another way to differentiate between the opportunistic advertising and opportunistic trading views is to focus on executives that are informed about firm operations (so that they can time their equity sales), but have little control over investment decisions, such as advertising. For this purpose, I repeat the same set of analyses, but focusing now on equity sales by lower-level insiders. To alleviate any concern of data mining, I use the definition of second-tier insiders provided by Thomson Financial, which includes the vice chairman, the advisory committee, the compensation committee, the executive committee, the finance committee, the technology committee, the chief financial officer, the chief investment officer, the chief technology officer, the treasurer, the secretary, the beneficial owners, and the officers of the parent company and divisional officers.

As shown in Table IX, there is no significant pattern in advertising spending around equity sales

by lower-level insiders. The coefficient estimates on the pre-event, event, and post-event dummies are only one third of those based on top-level insiders (Table VI), and none of these coefficients are statistically significant.

5.2.4 Operation Complexity and Corporate Governance

The opportunistic advertising interpretation has two additional predictions. First, the documented inverted-V-shaped pattern in advertising spending around insider sales should be more pronounced when top managers have more direct control over detailed investment decisions. For example, in conglomerate firms, it is usually the divisional managers rather than headquarter managers who have the ultimate control over the exact timing and magnitude of advertising spending. Thus, we should see more opportunistic advertising by top executives in single-segment firms than in multi-segment firms. In untabulated results, I show that relative to conglomerate firms, stand-alone firms increase their advertising spending by 5.9% (p <0.05) more in years of insider sales.

Second, as already alluded to in the sales growth test, managers' opportunistic advertising before own equity sales reflects a conflict of interest between top executives and their shareholders. To the extent that corporate governance can help alleviate agency issues, we expect managerial opportunistic behavior to decrease in corporate governance. To test this idea, I construct a binary *dictator* variable that equals one if the governance index of Gompers, Ishii, and Metrick (2003) is above 12 and zero otherwise.[19] In untabulated results, I find that dictatorship firms increase their advertising spending by 25.5% (p <0.1) more than non-dictatorship firms in years of insider selling.

5.3 Advertising Spending around Other Forms of Equity Sales

If managers are aware of the temporary return effect of advertising and opportunistically adjust advertising to take advantage of it, we would expect a similar inverted-V-shaped pattern in advertising spending around other types of equity sales. In this section, I examine two additional

[19] Around 7% of the sample is classified as dictatorship firms.

forms of equity sales: seasoned equity offerings and stock-financed acquisitions.[20] Specifically, in each year, I calculate the aggregate amount of equity issues as the total proceeds from all seasoned equity offerings in the year scaled by the firm's market capitalization at the end of the previous year. An event year is defined as having at least one seasoned equity offering.

The results are shown in Panel A of Table X. The average advertising spending in the years prior, contemporaneous, and subsequent to equity issues is 3.8% (p <0.01), 7.7% (p <0.01), and 0.8% (insignificant) higher than that in other years, respectively. Taking the mean (median) annual advertising spending of \$42 (\$2.2) million in my sample, these coefficients imply that firms in the years prior and contemporaneous to seasoned equity offerings spend \$1.6 (\$0.08) million and \$3.2 (\$0.17) million more on advertising than other years. In addition, a one-standard-deviation increase in the aggregate amount of equity issues in a year is associated with a 3.66% (p <0.01) increase in advertising spending in the prior year, a 5.89% (p <0.01) increase in the contemporaneous year, and a 2.86% (p <0.1) decrease in the subsequent year. In contrast, there is no clear pattern in advertising spending around debt issues (columns 3 and 4).

In Panel B, I examine variations in advertising spending around stock-financed acquisitions, where an event year is defined as having at least one 100%-stock-financed acquisition. The average advertising spending by the acquirer in the year contemporaneous to stock-financed acquisitions is 14.0% (p <0.01) higher than that in other years. Further, a one-standard-deviation increase in the aggregate transaction value in a year is associated with a 4.76% (p <0.05) increase in advertising spending in the same period. Again, in a placebo test, I find no similar pattern in advertising spending around cash-financed acquisitions (columns 3 and 4). In sum, the results shown in Table X suggest that the inverted-V-shaped advertising pattern around equity sales is a robust phenomenon, unlikely to be driven solely by firms' investment opportunities and funding needs.

[20] I focus on seasoned equity offerings rather than initial public offerings because firms are not required to report their advertising spending prior to going public.

6 Conclusion

This paper contributes to the fast-growing literature on managers' short-termist behavior by providing evidence that managers opportunistically adjust advertising spending to pump up the stock price before selling their own shares. I start by documenting a significant spillover effect of product-market advertising on stock market returns; there is a significant contemporaneous rise in stock price as increased advertising, which is then reversed in the following years. I then examine the extent to which managers opportunistically adjust advertising to exploit its temporary return effect. There is a sharp increase in advertising spending shortly before insider sales, and a significant decrease in the following year. A similar pattern also arises around seasoned equity offerings and stock-financed acquisitions, but is absent for debt issues and cash-financed acquisitions. Further evidence suggests that this inverted-V-shaped pattern is most consistent with managers' opportunistically adjusting advertising to exploit its temporary return effect.

More broadly, the findings in this paper imply that some important firm decisions may be, in part, motivated by short-term stock price considerations. While I highlight one particular channel in this paper, a potentially interesting direction for future research is to identify similar opportunistic behavior in other aspects of firm operations that also have short-term stock return implications.

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Table I: Summary Statistics

This table reports summary statistics of the sample that spans the period 1974 to 2010. Panel A: This panel is the summary of firms with missing and non-missing advertising spending data. Data on advertising spending (data45), total assets (data6), equity (data216), annual sales (data12), income (data18), and firm age are obtained from COMPUSTAT annual files. The COMPUSTAT sample is then merged with CRSP monthly stock files to obtain market capitalization. To reduce the impact of outliers, the following variables: the market-to-book ratio, advertising spending to sales ratio, advertising spending to assets ratio, and annual growth in advertising spending, are winsorized at the 1st and 99th percentiles. To further ensure data quality, the first two years of financial data of each firm from COMPUSTAT are excluded from the sample. Panel B: This panel contains the summary for various corporate events, including insider selling, restricted shares vesting, equity issues, debt issues, and stock- and cash-financed acquisitions (only acquirers are considered). Insider sales (restricted shares vesting) are defined as the aggregate number of shares sold (vested) across all top executives over a year scaled by the shares outstanding. Equity issues, debt issues, and stock and cash-financed acquisitions are defined as the total principal amount involved in these transactions over a year divided by the market capitalization of the firm. All variables in panel B are winsorized at the 99th percentile.

Panel A: Advertising Spending (1974 – 2010)

	Firms with AD spending			Firms missing AD spending		
Firm Characteristics	Mean	Median	Stdev	Mean	Median	Stdev
Market Cap (Million $)	1784	93	10975	1170	95	7986
Total Assets (Million $)	3034	163	33884	2828	133	27028
Sales (Million $)	1480	120	8120	1102	109	5733
Net Earnings (Million $)	76.58	3.73	799.46	57.45	3.33	553.52
Firm Age	15.31	12.00	11.85	15.57	12.00	12.29
Market to Book	2.48	1.52	3.42	2.65	1.46	3.91
Advertising (Million $)	42.09	2.16	219.14			
AD to Sales ratio	4.33%	2.06%	7.33%			
AD to Assets ratio	4.73%	2.27%	7.27%			
% Growth in AD	27.56%	10.16%	84.23%			
No Obs		66,113			122,370	

Panel B: Various Corporate Events

	From	Obs	All Obs with AD	Mean	Median	Stdev
Insider sales and restricted shares vesting						
Insider sales	1986	9,005	45,034	1.22%	0.48%	2.21%
Restricted shares vesting	2006	2,170	9,275	0.20%	0.10%	0.27%
Other corporate events						
Equity issues	1974	3,458	66,113	17.74%	13.50%	17.86%
Debt issues	1974	4,979	66,113	26.47%	15.74%	35.02%
Stock-financed acquisitions	1980	490	55,689	36.07%	16.41%	45.73%
Cash-financed acquisitions	1980	2,869	55,689	12.53%	7.30%	14.13%

Table II: Calendar-Time Portfolio Returns

This table shows calendar-time equal-weighted monthly returns to portfolios sorted by changes in log advertising spending (ΔAD). Panel A: Portfolios are ranked by changes in advertising spending in the previous fiscal year, and are rebalanced every month using the most recent advertising spending data. The portfolios are then held for two years. Panels B: Portfolios are sorted by industry-adjusted changes in advertising spending from the previous fiscal year. Panels C and D: These two panels report subsample analyses, where portfolios are ranked by changes in advertising spending in the previous fiscal year. Years 1994 and 1995 are excluded from the analysis due to a regulatory change on the reporting of advertising expenditures introduced in 1994. To deal with overlapping portfolios in each holding month, the equal-weighted average return across portfolios formed in different months is reported (as Jegadeesh and Titman (1993)). A number of risk benchmarks are employed here: the Fama-French three-factor model, the Carhart four-factor model, and the Daniel, Grinblatt, Titman and Wermers (2006, DGTW) characteristics-adjustment model. T-statistics, shown in parentheses, are computed based on standard errors corrected for serial-dependence with 12 lags. 5% statistical significance is indicated in bold.

Decile	Excess	3-factor alpha	4-factor alpha	DGTW adjusted	Excess	3-factor alpha	4-factor alpha	DGTW adjusted	Excess	3-factor alpha	4-factor alpha	DGTW adjusted
	Year 0, the formation year				Year 1 after portfolio formation				Year 2 after portfolio formation			
Panel A: Sort by ΔAD, 1974-2010												
1	-0.13%	-0.49%	-0.39%	-0.31%	0.79%	-0.07%	0.31%	0.10%	1.18%	0.31%	0.43%	0.22%
10	0.94%	0.72%	0.57%	0.56%	0.20%	-0.56%	-0.17%	-0.34%	0.36%	-0.40%	-0.14%	-0.39%
10 - 1	**1.07%**	**1.21%**	**0.96%**	**0.87%**	**-0.58%**	**-0.49%**	**-0.48%**	**-0.44%**	**-0.82%**	**-0.71%**	**-0.57%**	**-0.62%**
	(6.72)	(8.72)	(6.99)	(5.50)	(-3.54)	(-3.24)	(-3.07)	(-3.13)	(-4.52)	(-3.88)	(-2.88)	(-3.70)
Panel B: Sort by industry-adjusted ΔAD, 1974-2010												
1	0.15%	-0.39%	-0.36%	-0.36%	0.72%	-0.09%	0.32%	0.01%	1.26%	0.46%	0.55%	0.31%
10	0.99%	0.56%	0.52%	0.41%	0.16%	-0.61%	-0.27%	-0.40%	0.38%	-0.42%	-0.29%	-0.40%
10 - 1	**0.84%**	**0.95%**	**0.88%**	**0.77%**	**-0.56%**	**-0.52%**	**-0.59%**	**-0.41%**	**-0.88%**	**-0.88%**	**-0.84%**	**-0.71%**
	(5.74)	(6.91)	(5.86)	(5.36)	(-3.53)	(-3.15)	(-3.22)	(-2.62)	(-5.57)	(-5.53)	(-4.85)	(-4.66)

Decile	Excess	3-factor alpha	4-factor alpha	DGTW adjusted	Excess	3-factor alpha	4-factor alpha	DGTW adjusted	Excess	3-factor alpha	4-factor alpha	DGTW adjusted
	Year 0, the formation year				Year 1 after portfolio formation				Year 2 after portfolio formation			
Panel C: Sort by ΔAD, 1974-1993												
1	0.01%	-0.39%	-0.40%	-0.38%	0.65%	-0.03%	0.26%	0.02%	1.00%	0.28%	0.47%	0.14%
10	1.21%	0.90%	0.73%	0.59%	0.05%	-0.66%	-0.42%	-0.43%	0.07%	-0.57%	-0.25%	-0.57%
10 - 1	**1.20%**	**1.29%**	**1.13%**	**0.97%**	**-0.60%**	**-0.62%**	**-0.68%**	**-0.46%**	**-0.93%**	**-0.85%**	**-0.71%**	**-0.71%**
	(5.92)	(7.23)	(6.22)	(5.14)	(-3.04)	(-3.19)	(-3.28)	(-2.76)	(-4.86)	(-4.60)	(-3.86)	(-3.94)
Panel D: Sort by ΔAD, 1996-2010												
1	-0.16%	-0.47%	-0.38%	-0.32%	0.86%	-0.08%	0.32%	0.06%	1.32%	0.43%	0.43%	0.24%
10	0.72%	0.50%	0.40%	0.38%	0.31%	-0.50%	-0.08%	-0.34%	0.57%	-0.21%	-0.11%	-0.40%
10 - 1	**0.89%**	**0.97%**	**0.78%**	**0.70%**	**-0.55%**	**-0.43%**	**-0.40%**	**-0.41%**	**-0.77%**	**-0.64%**	**-0.54%**	**-0.64%**
	(4.37)	(5.21)	(4.48)	(3.38)	(-2.44)	(-2.25)	(-2.10)	(-2.38)	(-2.46)	(-2.37)	(-2.22)	(-2.30)

Table III: Fama-MacBeth Return Regressions

This table reports forecasting regressions of stock returns on changes in advertising spending and other control variables that are known to predict stock returns. The dependent variable in columns 1 and 2 is the monthly stock return in the year following the fiscal year end; in columns 3 and 4, it is the monthly stock return in the second year following the fiscal year end; in columns 5 and 6, it is the quarterly earnings announcement return in the year following the fiscal year end; and in columns 7 and 8, it is the quarterly earnings announcement return in the second year following the fiscal year end. The independent variable of interest is the change in log advertising spending (ΔAD) in the previous fiscal year. $\Delta ASSETS$, $\Delta SALES$, and $\Delta CAPEX$, are changes in log assets, sales, and capital expenditures in the same fiscal year. Other control variables include cumulative stock returns at various horizons, firm size, the market-to-book ratio, firm age, aggregate equity issuance in the previous four years as defined in Daniel and Titman (2006), discretionary accruals as defined in Xie (2001), and average monthly turnover in the previous year. Coefficients are estimated using the Fama-MacBeth approach. Standard errors, shown in brackets, are corrected for serial-dependence with 12 lags. *, **, *** denote statistical significance at the 90%, 95%, and 99% level, respectively.

	Monthly stock returns in year 1		Monthly stock returns in year 2		Earnings anncmnt returns in year 1		Earnings anncmnt returns in year 2	
(X 100)	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
ΔAD	-0.24***	-0.11**	-0.21***	-0.11***	-0.32**	-0.18*	-0.35***	-0.20**
	[0.07]	[0.05]	[0.05]	[0.04]	[0.15]	[0.10]	[0.14]	[0.09]
$\Delta ASSETS$		-0.79***		-1.23***		-0.18		-0.96
		[0.27]		[0.23]		[0.26]		[1.02]
$\Delta SALES$		-0.18		0.26		1.08		1.03
		[0.31]		[0.25]		[0.71]		[1.08]
$\Delta CAPEX$		-0.08		-0.08		-0.14		-0.51
		[0.06]		[0.07]		[0.16]		[0.30]
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R^2	0.07	0.09	0.06	0.08	0.12	0.16	0.11	0.16
No Obs	386,488	386,488	351,985	351,985	76,588	76,588	76,627	76,627

Table IV: Retail Investor Order Imbalance and Short Interest

This table reports regressions of monthly small trade imbalances and monthly changes in short interest on changes in advertising spending and other control variables. The dependent variable in columns 1-4 is the number of small buy orders minus the number of small sell orders, divided by the total number of small orders in a month, where small orders are defined as those below $5,000 in size. In columns 5-8, it is the monthly change in short interest (as a percentage of shares outstanding). The independent variable of interest is the change in log advertising spending (ΔAD). $\Delta ASSETS$, $\Delta SALES$, and $\Delta CAPEX$, are changes in log assets, sales, and capital expenditures in the same fiscal year. Other control variables include cumulative stock returns at various horizons, firm size, the market-to-book ratio, firm age, and average monthly turnover in the fiscal year. In columns 1, 2, 5, and 6, the month small trade imbalance and change in short interest are measured in the same year as ΔAD, and in columns 3, 4, 7, and 8, they are measured in the following year. Coefficients are estimated using the Fama-MacBeth approach. Standard errors, shown in brackets, are corrected for serial-dependence with 12 lags. *, **, *** denote statistical significance at the 90%, 95%, and 99% level, respectively.

	Monthly ImbNum in year 0		Monthly ImbNum in year 1		$\Delta ShortInterest$ in year 0		$\Delta ShortInterest$ in year 1	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
ΔAD	0.10***	0.04***	0.07***	0.02*	0.06***	0.04***	0.02*	0.01
	[0.01]	[0.01]	[0.02]	[0.01]	[0.02]	[0.01]	[0.01]	[0.01]
$\Delta ASSETS$		0.20***		0.20***		0.10***		0.07**
		[0.03]		[0.02]		[0.03]		[0.03]
$\Delta SALES$		0.14***		0.10***		0.06**		0.01
		[0.02]		[0.02]		[0.03]		[0.02]
$\Delta CAPEX$		0.01*		0.01		0.01		0.02*
		[0.01]		[0.01]		[0.01]		[0.01]
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R^2	0.03	0.05	0.03	0.05	0.05	0.07	0.04	0.06
No Obs	130,812	130,812	127,029	127,029	181,262	181,262	173,694	173,694

Table V: Mechanism of the Return Effect

This table reports forecasting regressions of stock returns on changes in advertising spending and other control variables. The dependent variable is the monthly stock return in months 7-18 after the fiscal year end. The independent variable of interest is the change in log advertising spending (ΔAD) in the previous fiscal year. $\Delta ASSETS$, $\Delta SALES$, and $\Delta CAPEX$, are changes in log assets, sales, and capital expenditures in the same fiscal year. Other control variables include cumulative stock returns at various horizons, firm size, the market-to-book ratio, firm age, aggregate equity issuance in the previous four years as defined in Daniel and Titman (2006), discretionary accruals as defined in Xie (2001), and average monthly turnover in the fiscal year. The regressions also include a list of interaction terms between ΔAD and dummy variables. $Consumer\ industry$ is an indicator variable that takes the value of 1 if the firm operates in a consumer-product industry based on the Fama-French five-industry definition and 0 otherwise. In columns 2-6, the indicator variable takes the value of 1 if the corresponding firm characteristic is above the sample median and 0 otherwise. Retail trading is defined as the number of small buy orders minus that of small sell orders, divided by the total number of small orders in the previous year. $\#\ brands$ is the number of brands a firm has (as reported by Nielson Media). Analyst coverage, institutional ownership, and the number of product brands are all adjusted by firm size. Finally, $Craigslist$ is a dummy that takes the value 1 if Craigslist is present in the same zip code as the firm's headquarter, and 0 otherwise. Coefficients are estimated using the Fama-MacBeth approach. Standard errors, shown in brackets, are corrected for serial-dependence with 12 lags. *, **, *** denote statistical significance at the 90%, 95%, and 99% level, respectively.

Monthly stock returns in year 1 (skip 6 months)							
(X 100)	[1]	[2]	[3]	[4]	[5]	[6]	[7]
ΔAD	-0.08*	-0.29**	-0.11*	-0.05	-0.17**	-0.23*	-0.11
	[0.05]	[0.12]	[0.07]	[0.09]	[0.07]	[0.12]	[0.12]
$Dummy$	0.16	-0.11	-0.21	-0.20	0.14	-0.19	0.25
	[0.17]	[0.15]	[0.20]	[0.14]	[0.17]	[0.23]	[0.25]
ΔAD * $Dummy$	-0.18**						
(Consumer Industry)	[0.08]						
ΔAD * $Dummy$		0.21***					
(High Analyst Coverage)		[0.07]					
ΔAD * $Dummy$			-0.25**				
(High Retail Buying)			[0.10]				
ΔAD * $Dummy$				-0.21**			
(High Turnover)				[0.08]			
ΔAD * $Dummy$					0.10*		
(High Institution Holdings)					[0.06]		
ΔAD * $Dummy$						0.18**	
(High # Brands)						[0.07]	
ΔAD * $Dummy$							-0.21*
(Craigslist)							[0.11]
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R^2	0.09	0.11	0.12	0.10	0.09	0.06	0.09
No Obs	369,561	285,526	138,315	342,832	304,440	31,670	41,212

Table VI: Advertising Spending around Insider Sales

This table reports analyses of advertising spending around insider sales. The sample period is 1986 to 2010. Panel A reports a panel regression. The dependent variable in columns 1 and 2 is the logarithm of advertising spending (AD) in year t, and in column 3, it is the logarithm of the advertising spending to sales ratio. The independent variables of interest are three event-related dummies. A year is labelled an event year if the amount of insider sales (AMT) is above the 25th percentile of the sample distribution, where AMT is defined as the total number of shares sold by all top-level directors and offices in a year scaled by shares outstanding of the firm. $PreEvent$, $Event$, and $PostEvent$ are indicator variables, which are equal to 1 if the following year, the current year, and the previous year are an event year, respectively, and 0 otherwise. $ASSETS$ and $SALES$ are the logarithm of total assets and sales, respectively. Other control variables include cumulative stock returns at various horizons, the return volatility, firm size, the market-to-book ratio, firm age, average monthly turnover in the fiscal year, and the KZ index. Year fixed effects are included in column 1, and both year and firm fixed effects are included in columns 2 and 3. Standard errors, shown in brackets, are clustered at the firm level. Panel B reports the differences in changes in log advertising spending around event years between the treatment group and matching firms. A matching firm is the one with the closet propensity score from the firm in question based on a set of firm characteristics: industry, firm size, book-to-market ratio, and past stock returns. Panel C reports a similar regression as in Panel A, with three additional independent variables: the actual amount of insider selling in the following ($PreEvent\_AMT$), current ($Event\_AMT$), and previous ($PostEvent\_AMT$) years. *, **, *** denote statistical significance at the 90%, 95%, and 99% level, respectively.

Panel A: Panel regression of AD_t			
	[1]	[2]	[3]
$PreEvent_t$	0.053***	0.053***	0.049***
	[0.016]	[0.018]	[0.018]
$Event_t$	0.069***	0.059***	0.059***
	[0.009]	[0.011]	[0.011]
$PostEvent_t$	-0.039***	-0.051***	-0.049***
	[0.015]	[0.018]	[0.018]
$SALES_{t-1}$	0.031***	0.198***	-0.658***
	[0.004]	[0.012]	[0.012]
$ASSETS_{t-1}$	0.006	0.496***	0.397***
	[0.005]	[0.015]	[0.015]
AD_{t-1}	0.940***		
	[0.003]		
Other Controls	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Firm Fixed Effects	No	Yes	Yes
Adj-R^2	0.95	0.94	0.80
No Obs	27,232	29,306	29,306

Panel B: Propensity score matching		
	No Obs	Event firms - Matching firms
$AD_t - AD_{t-2}$	1,041	6.28%**
$AD_t - AD_{t-1}$	1,041	2.59%*
$AD_t - AD_{t+1}$	1,041	4.38%**
$AD_t - AD_{t+2}$	1,041	9.83%***

Panel C: Panel regression of AD_t			
	[1]	[2]	[3]
$PreEvent_t$	0.020	0.029	0.029
	[0.019]	[0.022]	[0.022]
$Event_t$	0.019*	0.007	0.007
	[0.010]	[0.013]	[0.013]
$PostEvent_t$	-0.028	-0.031	-0.028
	[0.018]	[0.022]	[0.021]
$PreEvent\_AMT_t$	0.873**	0.524	0.524
	[0.354]	[0.345]	[0.335]
$Event\_AMT_t$	0.744***	0.911***	0.880***
	[0.213]	[0.306]	[0.300]
$PostEvent\_AMT_t$	-0.634**	-1.245**	-1.282**
	[0.270]	[0.588]	[0.579]
$SALES_{t-1}$	0.030***	0.198***	-0.658***
	[0.004]	[0.012]	[0.012]
$ASSETS_{t-1}$	0.006	0.496***	0.397***
	[0.005]	[0.015]	[0.015]
AD_{t-1}	0.939***		
	[0.003]		
Other Controls	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Firm Fixed Effects	No	Yes	Yes
Adj-R^2	0.95	0.94	0.80
No Obs	27,232	29,306	29,306

Table VII: Vesting of Restricted Shares

This table reports advertising spending around insider sales using an instrument-variable approach. Columns 1 and 2 report the baseline OLS regression where the dependent variables are the logarithm of advertising spending (AD_t) and the logarithm of the advertising spending to sales ratio ($(AD/SLS)_t$), respectively. Column 3 shows the first stage regression where the dependent variable is a dummy that takes the value of one if some insiders sell their shares in year t ($Event_t$). Columns 4 and 5 report the two-stage least squares regression where the dependent variables are the logarithm of advertising spending (AD_t) and the logarithm of the advertising spending to sales ratio ($(AD/SLS)_t$), respectively. $Vesting_t$ is a dummy variable that takes the value of one if some restricted shares vest in year t. $Instrumented\ Event_t$ is the fitted value from the first-stage regression. $ASSETS$ and $SALES$ are the logarithm of total assets and sales, respectively. Other control variables include cumulative stock returns at various horizons, the return volatility, firm size, the market-to-book ratio, firm age, average monthly turnover, and the KZ index. Both year and firm fixed effects are included in all regression specifications. Standard errors, shown in brackets, are clustered at the firm level. *, **, *** denote statistical significance at the 90%, 95%, and 99% level, respectively.

2SLS regressions with restricted shares vesting					
	[1]	[2]	[3]	[4]	[5]
	Baseline OLS		1st Stage	2SLS	
Dependent Variable	AD_t	$(AD/SLS)_t$	$Event_t$	AD_t	$(AD/SLS)_t$
$Event_t$	0.048***	0.049***			
	[0.018]	[0.018]			
$Vesting_t$			0.598***		
			[0.160]		
$Instrumented\ Event_t$				0.058**	0.062**
				[0.027]	[0.029]
$SALES_{t-1}$	0.134*	-0.659***	0.038***	0.125*	-0.705***
	[0.075]	[0.085]	[0.006]	[0.071]	[0.077]
$ASSETS_{t-1}$	0.584***	0.457***	-0.013**	0.580***	0.472***
	[0.066]	[0.068]	[0.006]	[0.064]	[0.066]
Other Controls	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes
Adj-R^2	0.94	0.81	0.31	0.94	0.81
No Obs	8,544	8,544	8,544	8,544	8,544

Table VIII: Sensitivity of Future Sales to Advertising Spending

This table reports analyses of the sensitivity of future sales to advertising spending. The sample period is 1986 to 2010. The dependent variable in all columns is the percentage change in annual sales ($\Delta SALES$). The independent variable of interest is the lagged percentage change in advertising spending (ΔAD). A year is labelled an event year if the amount of insider sales (AMT) is above the 25th percentile of the sample distribution, where AMT is defined as the total number of shares sold by all top-level directors and offices in a year scaled by shares outstanding of the firm. $Event$ is an indicator variable, which is equal to 1 if the year in question is an event year, and 0 otherwise. $\Delta ASSETS$ and $\Delta SALES$ are the percentage change in total assets and sales, respectively. Other control variables include cumulative stock returns at various horizons, the return volatility, firm size, the market-to-book ratio, firm age, average monthly turnover in the fiscal year, and the KZ index. Year fixed effects are included in all regression specifications. Standard errors, shown in brackets, are clustered at the firm level. *, **, *** denote statistical significance at the 90%, 95%, and 99% level, respectively.

Panel regression of $\Delta SALES_{t+1}$				
	[1]	[2]	[3]	[4]
ΔAD_t	0.085***	0.091***	0.027***	0.032***
	[0.005]	[0.005]	[0.005]	[0.006]
$Event_t$		-0.063***		-0.069***
		[0.006]		[0.006]
$\Delta AD_t \times Event_t$		-0.057***		-0.051***
		[0.017]		[0.017]
$\Delta SALES_t$			0.115***	0.116***
			[0.015]	[0.015]
$\Delta ASSETS_t$			0.262***	0.262***
			[0.011]	[0.011]
Other Controls	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Firm Fixed Effects	No	No	No	No
Adj-R^2	0.07	0.08	0.20	0.21
No Obs	28,059	28,059	28,059	28,059

Table IX: Advertising Spending around Sales by Lower-Level Insiders

This table reports analyses of advertising spending around sales by lower-level insiders, as defined by Thomson Financial. The sample period is 1986 to 2010. The dependent variable in columns 1 and 2 is the logarithm of advertising spending (AD) in year t, and in column 3, it is the logarithm of the advertising spending to sales ratio. The independent variables of interest are three event-related dummies. A year is labelled an event year if the amount of insider sales (AMT) is above the 25th percentile of the sample distribution, where AMT is defined as the total number of shares sold by all lower-level directors and offices in year t scaled by shares outstanding of the firm. $PreEvent$, $Event$, and $PostEvent$ are indicator variables, which are equal to 1 if the following year, the current year, and the previous year are an event year, respectively, and 0 otherwise. $ASSETS$ and $SALES$ are the logarithm of total assets and sales, respectively. Other control variables include cumulative stock returns at various horizons, the return volatility, firm size, the market-to-book ratio, firm age, average monthly turnover in the fiscal year, and the KZ index. Year fixed effects are included in column 1, and both year and firm fixed effects are included in columns 2 and 3. Standard errors, shown in brackets, are clustered at the firm level. *, **, *** denote statistical significance at the 90%, 95%, and 99% level, respectively.

Advertising spending around sales by lower-level insiders			
	[1]	[2]	[3]
$PreEvent_t$	0.021	0.015	0.013
	[0.015]	[0.019]	[0.019]
$Event_t$	0.019*	0.018	0.020
	[0.010]	[0.012]	[0.012]
$PostEvent_t$	-0.021	-0.019	-0.014
	[0.018]	[0.021]	[0.021]
$SALES_{t-1}$	0.048***	0.176***	-0.677***
	[0.006]	[0.028]	[0.026]
$ASSETS_{t-1}$	0.007	0.486***	0.386***
	[0.004]	[0.032]	[0.031]
AD_{t-1}	0.923***		
	[0.004]		
Other Controls	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Firm Fixed Effects	No	Yes	Yes
Adj-R^2	0.94	0.94	0.79
No Obs	35,836	38,595	38,595

Table X: Other Corporate Events

This table reports analyses of advertising spending around various corporate events: equity and debt issues in Panel A, and stock- and cash-financed acquisitions in Panel B (only acquirers are considered). The sample period of Panel A is 1974 to 2010 and that in Panel B is 1980 to 2010. The dependent variable in all columns of both panels is the logarithm of advertising spending (AD) in year t. The independent variables of interest are three event-related dummies. A year is labelled an event year if there is at least one transaction of the particular type under consideration. In Panel A, AMT is defined as the total proceeds from equity issues (columns 1 and 2) and debt issues (columns 3 and 4) in year t scaled by the market capitalization of the firm. In Panel B, AMT is defined as the total transaction value of stock-financed acquisitions (columns 1 and 2) and cash-financed acquisitions (columns 3 and 4) in year t scaled by the market capitalization of the firm. $PreEvent$, $Event$, and $PostEvent$ are indicator variables, which are equal to 1 if the following year, the current year, and the previous year are an event year, respectively, and 0 otherwise. $PreEvent\_AMT$, $Event\_AMT$, and $PostEvent\_AMT$ are the actual AMT in the following, current, and previous years, respectively. $ASSETS$ and $SALES$ are the logarithm of total assets and sales, respectively. Other control variables include cumulative stock returns at various horizons, the return volatility, firm size, the market-to-book ratio, firm age, average monthly turnover in the fiscal year, and the KZ index. Both year and firm fixed effects are included in all columns. Standard errors, shown in brackets, are clustered at the firm level. *, **, *** denote statistical significance at the 90%, 95%, and 99% level, respectively.

Panel A: Advertising spending around equity issues and debt issues

	[1]	[2]	[3]	[4]
$PreEvent_t$	0.038**	0.019	0.012	0.004
	[0.017]	[0.023]	[0.016]	[0.020]
$Event_t$	0.077***	0.041**	0.025	0.016
	[0.014]	[0.019]	[0.017]	[0.015]
$PostEvent_t$	0.008	0.021	0.023	0.027
	[0.015]	[0.021]	[0.014]	[0.018]
$PreEvent\_AMT_t$		0.205**		0.032
		[0.100]		[0.047]
$Event\_AMT_t$		0.330***		0.033
		[0.080]		[0.036]
$PostEvent\_AMT_t$		-0.160*		-0.015
		[0.083]		[0.041]
$SALES_{t-1}$	0.266***	0.266***	0.296***	0.296***
	[0.012]	[0.012]	[0.013]	[0.013]
$ASSETS_{t-1}$	0.457***	0.457***	0.402***	0.403***
	[0.015]	[0.015]	[0.015]	[0.015]
Other Controls	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes
Adj-R^2	0.95	0.95	0.94	0.94
No Obs	26,111	26,111	23,381	23,381

Panel B: Advertising spending around stock- and cash-financed mergers				
	[1]	[2]	[3]	[4]
$PreEvent_t$	0.037	0.017	0.003	0.009
	[0.050]	[0.062]	[0.019]	[0.025]
$Event_t$	0.140***	0.098*	-0.017	-0.030
	[0.042]	[0.052]	[0.016]	[0.020]
$PostEvent_t$	0.025	0.023	0.014	0.024
	[0.044]	[0.056]	[0.020]	[0.026]
$PreEvent\_AMT_t$		0.048		-0.047
		[0.051]		[0.126]
$Event\_AMT_t$		0.104**		0.104
		[0.053]		[0.092]
$PostEvent\_AMT_t$		0.003		-0.069
		[0.042]		[0.125]
$SALES_{t-1}$	0.208***	0.208***	0.274***	0.274***
	[0.030]	[0.030]	[0.017]	[0.017]
$ASSETS_{t-1}$	0.414***	0.412***	0.447***	0.447***
	[0.040]	[0.040]	[0.021]	[0.021]
Other Controls	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes
Adj-R^2	0.94	0.94	0.96	0.96
No Obs	4,446	4,446	15,806	15,806