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# Attracting Investor Attention through Advertising

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# Attracting Investor Attention through Advertising *

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**Abstract**

This paper provides empirical evidence that managers adjust firm advertising expenditures to influence investor behavior and short-term stock prices. First, this paper shows that increased advertising spending is associated with individual investor buying and a contemporaneous rise in abnormal stock returns, which is then reversed in subsequent years. Second, there is a significant rise in firm advertising expenditures prior to insider sales and seasoned equity offerings. This large increase is followed by a significant decrease in advertising expenditures in the subsequent year. This pattern of advertising expenditures is consistent with the idea that managers are exploiting the return effect induced by advertising to the benefit of the existing shareholders and/or themselves.

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# 1 Introduction

Recent research has found that advertising has important effects on the liquidity and breadth of ownership of stocks (e.g., Grullon, Kanatas, and Weston (2004)). This is surprising as advertising is intended to increase the awareness of a firm's products rather than its securities. Nevertheless, there is evidently a spillover effect. In this paper, I provide additional evidence of the effect of advertising on stock returns. In particular, I show that an increase in advertising expenditures is accompanied by buying pressure from individual investors and higher contemporaneous stock returns, and followed by lower subsequent returns. I next analyze whether firm managers are aware of this spillover effect on stock returns, and report that managers strategically adjust their advertising expenditures to influence short-term stock prices around equity sales.

There are two potential channels through which (changes in) advertising can cause higher contemporaneous stock returns and lower subsequent returns. The first mechanism draws upon a particular market friction – the short-sales constraint. Investors face a formidable search problem when deciding what stocks to buy, and therefore a simple rule of thumb is to focus on only the stocks that catch their attention. Selling decisions, on the other hand, pose much less of an intellectual challenge; since a large number of investors do not engage in short selling, their search problem is confined within the stocks they already hold.[1] As a result, investors' purchases are tilted toward attention-grabbing stocks, while their sales are not. Therefore, an increase in advertising, which raises a firm's visibility among investors, can boost the firm value in the short run by generating more buy orders than sell orders. Moreover, since individual investors are more attention- and resource- constrained, and face higher costs of short selling, they are more likely to be affected by advertising than institutional investors.

The second channel relies on behavioral biases in the way investors process information. Advertising has two intrinsic features that make it an unlikely source of information: a) advertising rarely contains new information; and b) advertising almost never portrays a product or a company in a comprehensive and objective manner. However, if investors are unable to differentiate stale from true information and/or biased from objective descriptions, they may react to advertising

[1] Individual investors on average hold three stocks in their portfolios (e.g., Odean (1999)), and mutual funds hold around 100 stocks (e.g., Wermers (2000)).

erroneously.[2] In particular, investors may think a firm that appears repeatedly in advertising have growth prospects that are not anticipated by the market and hence bid up its stock price. Given that individual investors are less sophisticated than institutional investors, we expect such an effect to be more pronounced among the former group.

Both the friction-based and behavioral views have the following two predictions. First, an increase in advertising expenditures should be accompanied by higher contemporaneous stock returns, and followed by lower subsequent returns. Moreover, given that the total investor attention is likely fixed at each point in time, one firm's gain is another's loss; therefore the reverse is true for a decrease in advertising expenditures (H1). Second, the humped-shaped portfolio return pattern is likely driven by individual investor trading, since they are more heavily influenced by advertising than institutional investors (H2).

Given that (changes in) advertising can have short-term stock price implications, an immediate question is whether firm managers are aware of the return pattern induced by advertising and take advantage of the return effect for the benefits of the current shareholders and themselves. If managers are focused only on maximizing long-term firm values, advertising expenditures should be determined by its marginal effect on product sales. In reality, managers also care about short-term stock prices, for a number of reasons. For example, managerial compensation is importantly determined by the stock prices at which their options are exercised and stocks are sold. Similarly, the amount raised in an equity offering is a linear function of the current stock price. A testable prediction is therefore that if managers are aware of the stock return effect of advertising, they are more likely to use advertising to influence short-term stocks prices around insider sales and new equity issuances, precisely when the potential benefits are larger (H3).

To systematically test the three hypotheses outlined above, I conduct analyses using data on firm advertising expenditures for the period 1974 – 2006. First, I analyze the effect of (changes in) advertising on contemporaneous and subsequent stock returns, and on individual investors' portfolio choices. Next, I examine the advertising pattern around equity sales by testing whether the advertising expenditures in the years prior to, during, and following equity sales are significantly different from the expenditures in an average year.

The empirical results provide strong support for all three hypotheses. Advertising is associated

[2]Huberman and Regev (2001) and Tetlock (2008) find that investors tend to respond to stale information.

with significant positive returns in the contemporaneous year and significant negative returns in the subsequent two years. Specifically, the spread between the four-factor alpha of the top and bottom deciles sorted by annual changes in advertising expenditures is 12.8% (t=4.83) in the *formation* year, and -9.2% (t=-3.73) and -6.6% (t=-2.04) in post-formation years one and two, respectively. The strong reversal pattern suggests that investors' initial response to changes in advertising is indeed biased and excessive. In addition, the return pattern is significantly stronger among firms producing consumer goods (e.g., Apple Computer) than those producing non-consumer goods (e.g., US Steel), consistent with the intuition that advertising for consumer goods (e.g., iPod) is more likely to attract consumer/investor attention.

Second, as predicted, individual investors hold more shares in stocks with larger advertising expenditures (relative to total assets or sales), and are the net buyers in firms that increase their advertising expenditures. A one-standard-deviation increase in advertising expenditures, *ceteris paribus*, leads to an increase in individual investor ownership by more than 1.4% in the stock. Similarly, doubling a firm's advertising spending in a year is associated with a 2.7% increase in the order imbalance (i.e., $\frac{buy\ order - sell\ order}{buy\ order + sell\ order}$) among small trades in each month of the year.[3]

More Interestingly, managers appear to be aware of the return pattern induced by advertising, and seem to use advertising strategically around equity sales. The advertising expenditures in the years prior to, during, and following insider sales are 2.9% (t=2.07) *higher*, 5.0% (t=3.12) *higher*, and 4.6% (t=2.50) *lower* than an average year, respectively. In addition, a 1% increase in the total value sold by insiders in a year is associated with a 1.1% (t=2.51) increase in advertising spending in the previous year. The sharp decrease (from 5.0% to -4.6%) in advertising expenditures in the year following insider sales is inconsistent with many alternative hypothesis. Since the unconditional AR(1) coefficient of $\Delta$ advertising expenditures is only -0.08 (as shown in a later analysis), any feasible interpretation of the advertising pattern documented here must also explain the sharp reversal in advertising expenditures immediately following insider sales.

The analysis of seasoned equity offerings reveals similar manager behavior. In the years prior to, during, and following new equity issuances, the advertising expenditures of a typical firm are 5.7% (t=2.07), 7.8% (t=3.62), and 0.9% (t=0.46) higher than those in an average year, respectively.

[3]Small trades are defined as those below $5,000, which are likely to be submitted by individual investors. See Barber, Odean, and Zhu (2007) for a more detailed description of how the variable is constructed.

The results again suggest that firms' advertising policies are partially driven by the maximization of short-term stock prices.

One alternative explanation of the hump-shaped advertising pattern around equity sales is that, rather than opportunistically adjust firm advertising expenditures to serve *pre-determined* equity sales, managers opportunistically sell their shares when their company stocks are overpriced. One feasible story that is also consistent with the sharp reversal in advertising expenditures immediately after equity sales is as follows. New product launches are often accompanied by a large contemporaneous rise in advertising spending and thereby can inflate the underlying stock prices. Knowing that the stocks are overpriced, managers sell their shares. Since firms usually do not maintain the high level of advertising spending after the product launches are complete, opportunistic selling immediately following new product launches can give rise to a similar pattern in advertising expenditures as the one documented in this paper. Some further analysis, however, suggests that this reverse-causality argument (i.e., abnormal advertising *causes* equity sales) is unlikely to be the case. First, there is a much weaker pattern in advertising expenditures around equity sales by lower-ranking insiders, and there is no visible pattern around equity purchases. If firm managers are trading to exploit mispricing in the equity market, we expect similar behavior among lower-ranking officers (e.g., the CFO and the CIO) and in the case of equity purchases. Moreover, the hump-shaped pattern in advertising expenditures is significantly stronger among firms with weaker corporate governance (measured by the Governance Index proposed in Gompers, Ishii, and Metrick (2003)) and among those that operate in only one industry (measured by two-digit SIC codes). Both findings are consistent with the strategic advertising view: weak corporate governance leaves managers with more freedom to engage in activities that maximize personal benefits, and a simple firm structure gives the top-level managers more direct control over detailed firm operations such as advertising.

Finally, although this paper focuses on a particular firm operation – advertising, the findings of this study are consistent with a related explanation: managers strategically adjust *other* types of firm operations (e.g., to expedite or delay new product launches and entries to new geographic markets) around *pre-determined* equity sales to maximize the sale proceeds, and these operations happen to be causing the hump-shaped pattern in advertising expenditures. While this alternative explanation is perfectly plausible, it is not a competing hypothesis to the one proposed and tested

in this paper. In fact, these mechanisms have a consistent underlying theme – managers alter some firm operations to influence investor behavior and stock returns in the short run. I leave it to future research to disentangle which particular firm operation is the most likely to be affected by the maximization of short-term stock prices.

This paper proceeds as follows. The next section discusses the related literature. Section 3 describes the data and screening procedures. Section 4 examines the return effect of advertising. Section 5 analyzes managers' using advertising to affect investor behavior and short-term stock prices. Finally, section 6 concludes.

## 2 Related Literature

The findings of this paper are closely related to the literature on earnings management (e.g., Teoh, Wong, and Rao (1998); Teoh, Welch, and Wong (1998a,b); Darrough and Rangan (2005); Graham, Harvey, and Rajgopal (2005); Roychowdhury (2006)). For example, the accounting literature finds that managers tend to increase abnormal accruals and/or to reduce discretionary spending in pre-IPO/SEO years in order to boost reported earnings and hence the proceeds. This paper, in contrast, shows that managers are sometimes willing to sacrifice earnings to increase advertising. The seemingly conflicting choices by managers highlight the potential (short-term) effect of advertising on investor behavior and stock returns. Moreover, while the previous studies focus on the channel of investors' inability to dissect and understand different components of earnings, this paper suggests that managers also exploit investors' limited attention to boost short-term stock prices.

The results on manager behavior also complement those of recent studies on managers' catering incentives. For example, Cooper, Dimitrov, and Rau (2001), Baker and Wurgler (2004a,b), Cooper, Gulen, and Rau (2005), Baker, Ruback, and Wurgler (2007), Baker, Greenwood, and Wurgler (2008), and Polk and Sapienza (2008) document that managers maximize short-term stock prices by catering to investor sentiment using dividend policies, the number of shares outstanding, and firm names. This paper suggests that managers also use firm advertising to influence stock prices. A notable difference from the previously-documented catering channels is that advertising is part of firm operation/investment and may cause more damages to firm values than the previously identified mechanisms, as valuable firm resources and manager efforts are wasted.

This paper is also related to the extensive literature on the effects of investor attention/recognition in the financial market. Gervais, Kaniel, and Mingelgrin (2001), Chen, Noronha, and Singal (2004), Kaniel, Li, and Starks (2007), Seasholes and Wu (2007), Barber and Odean (2008), and Lehavy and Sloan (2008) find that attention-grabbing events that attract investor attention – for instance, abnormal trading volume, extreme stock returns, earnings announcements, index additions or deletions, and hitting price limits – subsequently lead to higher turnover and stock returns. The common theme underlying the studies in the prior literature and this paper is that (individual) investors are more likely to buy and own stocks that have attracted their attention recently.

This paper also complements the literature on the return predictability of insider trading and new equity issuances. Marin and Olivier (2008) find that insider sales negatively predict stock returns ten months after the sales take place. Loughran and Ritter (1995), Spiess and Affleck-Graves (1995), Hertzel, Lemmon, Linck, and Rees (2002), and Huang and Ritter (2005), meanwhile, show that new equity issuances predict poor future stock returns immediately afterwards. Both findings can be consistent with the mechanism identified in this paper – managers significantly increase advertising spending to drive up stock prices before equity sales, and decrease the spending after sales are completed.

The closest two papers to mine are Grullon, Kanatas, and Weston (2004) and Chemmanur and Yan (2008). Grullon, Kanatas, and Weston (2004) show that advertising expenditures are positively associated with various liquidity measures, and interpret the results as consistent with the model in Merton (1987). Chemmanur and Yan (2008) document a similar hump-shaped pattern in advertising expenditures around new equity offerings, and provide a signalling model for the interpretation of their findings. The main contributions of this paper are twofold: a) to document the effect of advertising on stock returns, and b) to offer evidence of managers' maximizing short-term stock prices by strategically adjusting advertising expenditures. In a way, this paper both extends and links the existing empirical findings in the prior literature.

# 3 Data

## 3.1 Firm Characteristics

I obtain firm advertising expenditures (data45) from the Compustat annual tape for the period 1974 – 2006. I exclude observations before 1973 because very few firms reported advertising expenditures in that period. Data on total assets (data6), equity (data216), annual sales (data12), income (data18), cash (data1), cash flow (data14 + data18), and capex (data128) are also obtained from Compustat. Most accounting variables, e.g., book equity, earnings, and cash flows, are constructed following Daniel and Titman (2006). I require a firm to be at least one year old to be included in the sample, as the first-year data in Compustat are usually more error-prone. Moreover, since the focus of the study is the determinants of advertising, I exclude firms with missing advertising expenditures from the sample.[4] I then merge the Compustat data with the CRSP monthly file to get stock returns, market capitalizations and trading volume.

To mitigate the effect of outliers, I winsorize all growth variables (e.g., annual growth in advertising spending) and ratio variables (e.g., the market-to-book ratio and leverage) at the 1st and the 99th percentiles. Table I presents the summary statistics of the sample. Despite a significant drop in the number of firm-year observations, the subsample with available advertising expenditures is similar to the entire Compustat sample in most aspects, with only a few minor differences. While firms reporting advertising spending have slightly larger sales and market valuations, they report smaller total assets, indicative of lower leverage ratios. On average, the advertising expenditures amount to over $41 million each year in the sample and accounts for about 4.0% of annual sales and 4.8% of total assets. These figures are statistically significant and economically meaningful, suggesting that advertising is an important part of firm operations. The average annual growth rate in advertising spending is 23.7% (i.e., it doubles every 3.2 years).

## 3.2 Other Data

### 3.2.1 Institutional Ownership

Institutional holdings data are obtained from the CDA/Spectrum database. After 1978, all financial institutions with greater than $100 million under management are required to report their holdings

[4] As a robustness check, I also treat missing values as 0 and obtain similar results in the analysis.

to the SEC on a quarterly or semi-annually basis.[5] As per SEC regulation, all holdings in common stocks greater than 10,000 shares or $200,000 must be disclosed. CDA/Spectrum has processed all SEC 13F filings and collected holdings information since 1980.

There are two important dates on each SEC 13F filing – the file date and the report date. The former is the date on which the holdings report is filed with the SEC, while the latter is the date on which the holdings report is actually valid. Although the file date always falls on the last day of a quarter, the report date, or the date to which the holdings correspond, can be weeks or even months before the file date.[6] To address this issue, I assume institutions do not change their positions from the report date to the end of the quarter; in other words, I hold the shares constant until the end of the quarter with split adjustment. Moreover, if an institution misses one or more quarterly reports, I assume it maintains the same holdings for up to the next two quarters.

Finally, for each stock, I sum up the shares held by all institutions at the end of each quarter, and then scale this figure by total shares outstanding to derive the institutional ownership. The final sample consists of stock-quarter observations for the period 1980 – 2006.

### 3.2.2 Insider Trading

Insiders, broadly defined as directors and corporate executives, are required to report all changes in stock holdings in their companies (including positions held by their direct family members) to the SEC in a timely fashion. The Thompson Financial (now Thompson Reuters) insider filing database includes all insider trading activities reported on SEC forms 3, 4, 5, and 144 filed after 1986. To ensure data quality, I exclude all observations with a cleanse code of "A" or "S," indicating a failed cleansing attempt, from the sample. I retrieve three variables from the Thompson Financial database: the date of the transaction, the number of shares transacted, and the price at which the transaction takes place. I further filter out observations whose transaction price is greater than three times or less than one-third of the closing price on the transaction day, as those are likely to be data errors.

To classify insiders based on their roles in their firms, I follow the simple rules suggested by

[5] The required reporting frequency changed a few times during the sample period.

[6] In rare cases, the report date can be after the file date. This happens because CDA/Spectrum sometimes backfills holdings information if an institution does not report its holdings for a particular quarter. To ensure data consistency, I omit all such holdings.

Thompson Financial. The top-level insiders include the chairman of the board, the chief executive officer, the chief operating officer, the general counsel, and the president. The next level 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 offices. For the majority of the paper, I focus on the top-level insiders, who have the ultimate control over advertising expenditures. As a robustness check, I also include the second-tier insiders, and the results are qualitatively the same.

For each firm, I calculate the size of insider purchases/sales in a fiscal year as the cumulative equity value bought/sold by all insiders in the year, scaled by the market capitalization at the end of the prior fiscal year. A year is classified as an event year if the total insider puchases/sales are greater than 0. As a robustness check, I classify a year as an event year only if the insider purchases/sales are above the 10th percentile cutoff, in order to ensure that managers have a large enough incentive to alter investment policies. To scale the cumulative insider trading by a firm's market capitalization is motivated by the empirical finding that manager compensation is increasing in firm size (e.g., Conyon and Murphy (2000); Tervio (2003); Gabaix and Landier (2008)). Alternatively, I can also scale total insider trading by reported compensation, but the data on executive compensation are available only for small number of firms and years.

### 3.2.3 Seasoned Equity Offerings

From Thompson Financial's Securities Data Corporation (SDC), I obtain all domestic seasoned equity offerings for the period 1970 – 2006.[7] Specifically, I retrieve from SDC the date of each offering, the number of shares sold, and the principal amount received. For each firm, I then sum up the number of shares from all issuances in a fiscal year and scale this figure by the total number of shares outstanding at the end of the previous fiscal year to gauge the size of issuances of that year. Since advertising expenditures are only available on a yearly basis, both aggregate insider trading and aggregate stock issuances are computed for each fiscal year.

[7] I do not include initial public offerings in the sample due to the lack of good quality data on advertising expenditures in the pre-IPO years.

# 4 Changes in Advertising Expenditures and Stock Returns

In this section, I examine how changes in advertising expenditures may affect stock returns both in the short-term and in the long-term. The rational paradigm suggests two potential links between advertising and stock returns. First, although the content of an advertisement is uninformative, the act of advertising can serve as an effective signaling device since only firms with high-quality products can afford to advertise; therefore higher advertising expenditures are associated with higher valuations (e.g., Nelson (1974); Grossman and Shapiro (1984); Kihlstrom and Riordan (1984); Milgrom and Roberts (1986); Chemmanur and Yan (2008)). Second, advertising may increase investor recognition of the underlying firm and hence can lead to a lower expected return (or a higher valuation) as more investors bear the same amount of risk (Merton (1987)).[8]

Drawing on a similar insight as Merton (1987) that advertising can potentially attract prospective investors' attention, I argue that advertising can affect stock returns through two additional channels. The first channel is built upon a specific market friction – the short-sales constraint. Due to the general difficulty to short sell securities, investors are faced with a much smaller search domain when deciding what stocks to sell than when deciding what stocks to buy. Consequently, investors' buying decisions are more tilted toward attention-grabbing stocks than their selling decisions. Therefore, an increase in advertising spending can potentially increase the firm value in the short run by generating more buy orders than sell orders; and if the total attention is fixed at a given point in time, the reverse is true for a decrease in advertising spending. Moreover, since individual investors are more attention and resource constrained, and face higher costs of short selling, the asymmetry between buying and selling decisions should be stronger among individual investors.

The second possibility is that investors may draw spurious inferences on a firm's stock market performance from its product market advertising, although advertising usually bears little timely information and is often exaggerated. Specifically, upon seeing the spectacular features of a product in an advertisement, some investors may jump to the conclusion that the firm has great *unexpected* growth potentials, without asking whether the information has already been incorporated in the

[8] A third possibility is that firms may increase advertising (or any type of investment) when the expected future stock returns (or the cost of capital) are low. As shown later, this reverse-causality argument is inconsistent with the data.

stock price and whether the advertisement reflects, in an *unbiased* manner, all features of the product. The bias stems basically from investors' inability to differentiate stale from timely information, and exaggeration from genuine descriptions. The mechanism described here is different from the signaling mechanism, although both have an element of learning. The key in the signalling model is that investors infer good quality from the act of increasing advertising spending, while the behavioral story is about investors' erroneous reactions to the *content* of advertising.

All four mechanisms outlined above predict that an increase in advertising expenditures is accompanied by a rise in *contemporaneous* stock returns (and vice versa for a decrease). However, unlike the agency and the neoclassic models, which maintain a permanent price effect, both the friction-based and the behavioral hypotheses predict an initial price overshoot, which is subsequently reversed.[9] In the remainder of this section, I distinguish the agency and the neoclassic models from the friction-based and the behavioral views by focusing on the stock returns following changes in advertising expenditures.[10]

### 4.1 Calendar-Time Portfolio Returns

I construct calendar-time portfolios to examine the price impact of (changes in) advertising expenditures.[11] Unlike most prior studies (e.g., Fama and French (1993); Daniel and Titman (1997)), most tests in this paper use the accounting data of a fiscal year immediately upon the fiscal year end. The distinction in methodology is due to the differences in our research questions. On the one hand, prior studies intend to examine how the market responds to the information embedded in accounting data; it is therefore important to avoid the look-ahead bias since firms delay reporting their earnings by as much as six months. This paper, on the other hand, focuses on how changes in the exposure to advertising affect consumers'/investors' investment decisions. For example, if a firm increases its advertising spending in fiscal year 2000 by 20% over that in 1999, this analysis is designed to figure out how this additional 20% in advertising spending affects the firm's stock

[9]The increasing-risk-sharing hypothesis also predicts a reversal. However, the reversal, compared with the initial price run-up, should be mild. For example, in the Gordon permanent growth framework, imagine a firm with an annual expected return of 10% and an annual growth rate of 5%. A decrease in expected return of 1% in the current year will lead to an initial positive return of 25% and a reversal of 1% in each of the subsequent years.

[10]This paper does not intend to distinguish between the friction-based and the behavioral models.

[11]To deal with potential microstructure issues, I exclude stocks that are priced below five dollars a shares or whose market capitalizations are in the bottom NYSE decile. I also require minimum advertising expenditures of 100,000 dollars in a year – this is to reduce the noise in calculating the changes in advertising spending. Using different spending cutoffs (e.g., 50,000 or 200,000 dollars) does not affect the result.

returns in fiscal year 2000 (when consumers/investors are exposed to more advertising by the firm), and the returns in the subsequent years (when the effect of advertising dissipates).

The stock portfolios are rebalanced every month and are held for two years.[12] Since firms' fiscal years end in different months in a calendar year, I use the last available accounting figures in each month. So, for example, if a firm's fiscal year ends in September 2000, its advertising spending reported for the year 2000 will be used in portfolio ranking from October 2000 to September 2001, when the firm's next fiscal year ends. In addition, in order to analyze the contemporaneous price effect of advertising, I also compute the stock returns in the portfolio-formation year.

Also note that I focus on the percentage growth rather than the dollar growth in advertising expenditures in the analysis, because the marginal effect of advertising on consumer/investor attention is likely to decrease rapidly as the total advertising expenditures go up. For example, a $1 billion increase in advertising spending by General Motors may have a negligible effect on investor awareness, as GM is already a well-known national company; however, a $1 millon increase in advertising spending by a small software company may go a long way to reach out to potential investors.

Table II presents the equal-weighted returns to the calendar-time portfolios. In Panel A, I sort all stocks into deciles based on $\Delta ads$ at the end of each month, where $\Delta ads = log(ads_t) - log(ads_{t-1})$ and $ads_t$ is the advertising expenditures in fiscal year $t$.[13] Consistent with all four views, the difference between four-factor alpha of the top and bottom deciles sorted by changes in advertising expenditures is 12.8% (t=4.83) in the formation year, implying a positive relationship between $\Delta ads$ and contemporaneous stock returns. The alpha spreads in the subsequent years are significantly negative, -9.2% (t=-3.73) and -6.6% (t=-2.04) in years one and two, respectively. In other words, the total positive spread earned by the long-short portfolio in the formation year is completely reversed in the subsequent two years.[14] The quick and complete reversal pattern observed in the data speaks directly to the reverse causality critique (i.e., advertising expenditures chase contemporaneous stock returns); it is also inconsistent with the agency and the neoclassic models. In sum, the stock return

[12]To deal with overlapping portfolios in each holding month, I follow Jegadeesh and Titman (1993) to take the equal-weighted average return across portfolios formed in different months.

[13]In untabulated results, portfolios sorted by $\Delta \frac{ads_t}{assets_{t-1}} = log(\frac{ads_t}{assets_{t-1}}) - log(\frac{ads_{t-1}}{assets_{t-2}})$ generate very similar return spreads.

[14]A value-weighted fully-tradable strategy (in which portfolios are formed six months after fiscal year ends) yields a four-factor alpha spread of 0.49% per month (significant at the 5% level) in the following year.

pattern in the three-year period documented above supports the predictions of the friction-based and the behavioral views.

Panels B-E conduct further robustness checks. In all these tests, portfolios are formed six months after fiscal year ends to comply with the prior literature, and are held for one year. Panel B employs two alternative definitions of the sorting variable – industry-adjusted advertising expenditures and advertising expenditures scaled by total sales. The results are qualitatively the same as in Panel A, suggesting that the return pattern is not driven by industry differences or by changes in sales.

Panel C separates firms into two groups. The first group includes firms producing consumer goods (e.g., personal electronics) and the second group producing non-consumer goods (e.g., raw materials).[15] I then conduct the same calendar-time portfolio analysis on both groups. Since advertising of consumer goods (e.g., Apple iPod) is more likely to draw attention from consumers/investors than advertising of non-consumer goods (e.g., US Steel), we expect the return effect induced by advertising to be significantly stronger among the former group. The results are consistent with this prediction. the spread in four-factor alpha among firms producing consumer goods is -11.64% in the subsequent year, while that among firms producing non-consumer goods is -6.36%. The difference between the two groups, -5.28%, is statistically significant at the 1% level.

Panel D reports a similar exercise. At the end of each fiscal year, firms are sorted into two groups based on institutional ownership.[16] Since individual investors are more likely to be attention constrained and therefore affected by advertising, the return effect induced by advertising should be more pronounced among stocks that are more likely to be individual investors' preferred habitat.[17] The prediction is again corroborated by the data. The return spread in the subsample of stocks with greater individual investor ownership is significantly stronger than the sample of stocks that are held more by institutional investors.

Finally, Panel E checks the robustness of the return effect in two subperiods. I choose year 1995 as the cutoff year, because a new statement of position, SOP 93-7 (Reporting on Advertising Costs), became effective in 1994. The SOP was issued by the Accounting Standards Executive Committee, and changed the practices used by companies to expense the cost of advertising. The

[15]Consumer and non-consumer industries are classified based on the five-industry definition provided by Kenneth French.

[16]It is known that institutional ownership is highly correlated with firm size. To remove the size effect, I use residual institutional ownership that is orthogonal to firm size in the sorting procedure.

[17]The preferred habitat view is introduced in Barberis, Shleifer, and Wurgler (2005).

results in the two subsamples are qualitatively the same, and are both statistically significant. To sum up, Table II shows a robust hump-shaped return pattern associated with firm advertising; overall, the return effect is more consistent with the friction-based and the behavioral views than the agency and neo-classic models.

## 4.2 Regression Approach

The calendar-time portfolio approach can be boiled down to a univariate regression analysis. To address the confounding effects of other variables that are known to predict stock returns, I conduct a multivariate regression analysis.

### 4.2.1 Determinants of $\Delta Advertising$

I first examine what firm characteristics are related to changes in advertising expenditures. Growth in assets, sales, and investment are expected to be positively associated with advertising expenditures. The firm age may also be important, as advertising expenditures are likely to grow faster in the beginning of a firm's life circle and slow down as the firm matures.

Table III reports the following regression analysis of $\Delta ads$:

$$\begin{aligned}\Delta ads_{i,t} =& \beta_0 + \beta_1\ \Delta ads_{i,t-1} + \beta_2\ \Delta assets_{i,t-1} + \beta_3\ \Delta sales_{i,t-1} + \beta_4\ \Delta capex_{i,t-1} + \\ & \beta_5\ log(me_{i,t-1}) + \beta_6\ mb_{i,t-1} + \beta_7\ ret_{i,t-1} + \beta_8\ log(age_{i,t-1}) + \\ & \beta_9\ \Delta assets_{i,t} + \beta_{10}\ \Delta sales_{i,t} + \beta_{11}\ \Delta capex_{i,t},\end{aligned} \tag{1}$$

where $\Delta ads_{i,t} = log(ads_{i,t}) - log(ads_{i,t-1})$; $\Delta assets_{i,t}$, $\Delta sales_{i,t}$, and $\Delta capex_{i,t}$ are defined similarly; $ret_{i,t}$ is the cumulative return in fiscal year $t$; $me_{i,t}$, $mb_{i,t}$, and $age_{i,t}$ are the total market capitalization, the market-to-book ratio, and the firm age measured at the end of the fiscal year $t$, respectively. The coefficients are estimated using both the Fama-MacBeth approach and a pooled OLS regression with year fixed effects.

As predicted, firms that experience larger growth in assets, sales, and investment, or have better stock market performance in the previous year significantly increase their advertising expenditures in the subsequent year, perhaps due to some general improvement in its operating environment. Moreover, firm age is negatively related to the growth in advertising spending, consistent with the

firm life-cycle view. There is also a significant negative autocorrelation in $\Delta ads$ (although small in magnitude); a 1% increase in advertising spending in the prior year predicts a 0.08% decrease in the next year. One possibility is that firm advertising expenditures move in a cycle; for example, a firm increases its spending in advertising during a new product launch or a major strategic shift and scales back its spending subsequently.

#### 4.2.2 Fama-MacBeth Return Regression

I then conduct the following stock-return regression:

$$\begin{aligned} ret_{i,s} =& \beta_0 + \beta_1\ \Delta ads_{i,t-1} + \beta_2\ \Delta ads_{i,t-2} + \beta_3\ \Delta ads_{i,t} + \beta_4\ \Delta assets_{i,t-1} + \beta_5\ \Delta sales_{i,t-1} + \\ & \beta_6\ \Delta capex_{i,t-1} + \beta_7\ log(me_{i,t-1}) + \beta_8\ mb_{i,t-1} + \beta_9\ ret_{i,t-1} + \beta_{10}\ ret_{i,(t-4:t-2)} + \\ & \beta_{11}\ \tau_{i,(t-4:t-1)} + \beta_{12}\ log(age_{i,t-1}) + \beta_{13}\ turnover_{i,t-1} + \beta_{14}\ accruals_{i,t-1}, \end{aligned} \tag{2}$$

where $ret_{i,s}$ is the return in month $s$ of year $t$; $ret_{i,t-1}$ and $ret_{i,(t-4:t-2)}$ are the cumulative stock returns in year $t$-1 and years $t$-4 to $t$-2, respectively; and $turnover_{i,t-1}$ is the average monthly exchange-adjusted share turnover in fiscal year $t$-1. $\tau_{i,(t-4:t-1)}$ is the aggregate equity issuance in years $t$-4 to $t$-1, defined in Daniel and Titman (2006). $accruals_{i,t-1}$ is the discretionary accruals in year $t$-1, introduced in Sloan (1996).[18] Similar to the calendar-time portfolio approach, I use the last available accounting figures in each month and conduct monthly regressions in the spirit of Fama and MacBeth (1973). I also control for the average share turnover in the same year as $\Delta ads$ is measured in the regression, to address the possibility that advertising affects stock returns because it affects the liquidity of the stock.[19]

The results are presented in table IV. As shown in Columns [1]–[4], after controlling for known predictors of stock returns (e.g., the market-to-book ratio, past stock returns, past turnover, and etc.), we still observe significant *negative* return predictability of $\Delta ads$. Specifically, doubling advertising expenditures in a year, *ceteris paribus*, leads to a lower stock return of 0.24% per month in the subsequent year, both statistically and economically significant.

To test the possibility that the negative return predictability of $\Delta ads_{i,t-1}$ is completely driven by

[18] $accruals_t = \frac{(\Delta Data4_t - \Delta Data1_t) - (\Delta Data5_t - \Delta Data34_t - \Delta Data71_t) - Data14_t}{Data6_{t-1}}$.

[19] Grullon, Kanatas, and Weston (2004) find that larger advertising expenditures are associated with greater stock liquidity.

the negative autocorrelation in $\Delta ads$, I include $\Delta ads_{i,t}$ and $\Delta ads_{i,t-2}$ in the regression specifications and report the results in Columns [5]–[7]. The coefficients of both $\Delta ads_{i,t-1}$ and $\Delta ads_{i,t-2}$ are significantly negative, confirming the findings from the calendar-time portfolio analysis that the return reversal lasts for about two years.

In sum, these results indicate that the negative return predictability of $\Delta ads$ is unlikely to be caused by common risk factors, previously known return anomalies, or the negative autocorrelation in the variable; rather it is consistent with models based on investor inattention and biased responses to advertising.

## 4.3 Individual Investor Holding and Trading Decisions

Given the significant return effect of advertising, an immediate question is which group of investors are more likely to be affected by advertising and hence are responsible for this return pattern. Both the market-friction-based and the behavioral views predict that it is the individual investors. Since individual investors have less access to resources, are more constrained from short selling, and are less financially sophisticated, they are more susceptible to the attention-grabbing effect of advertising and are also more likely to mistake stale and biased information for useful stock-picking signals. This section directly tests this prediction by analyzing the holding and trading decisions of the two groups of investors in response to (changes in) firm advertising policies.

### 4.3.1 Percentage of Institutional Ownership

I first examine how (individual) investors' holding decisions are related to advertising expenditures. If individual investors are more vulnerable to the influence of advertising, we expect firms with larger advertising expenditures to be held more by individual investors; or in other words, to have smaller institutional ownership. Following Gompers and Metrick (2001), I include an array of firm characteristics that are related to institutional holdings in the analysis, such as firm size, the market-to-book ratio, past returns, firm age, turnover, and the stock return volatility:

$$\begin{aligned} \%instown_{i,t} =& \beta_0 + \beta_1\ log(ads_{i,t}) + \beta_2\ log(assets_{i,t}) + \beta_3\ log(sales_{i,t}) + \beta_4\ log(me_{i,t}) + \\ & \beta_5\ mb_{i,t} + \beta_6\ ret_{i,t} + \beta_7\ log(age_{i,t}) + \beta_8\ turnover_{i,t} + \beta_9\ volatility_{i,t}, \end{aligned} \tag{3}$$

where $\%instown_{i,t}$ is the total shares held by institutional investors divided by total shares outstanding at the end of year $t$. For firms whose fiscal years do not end at the end of a quarter, I use the institutional ownership from the closest quarter after the end of the fiscal year. $volatility_{i,t}$ is the monthly return volatility in year $t$. Since some unidentified firm characteristics may be related to both advertising expenditures and institutional ownership (e.g., firms producing consumer products generally spend more on advertising and meanwhile attract more individual investors), I include firm-fixed effects in the regression specification, and only focus on the *within-firm* variations in advertising expenditures. Moreover, I also include year dummies in the regression to absorb market-wide fluctuations in advertising expenditures.

Table V presents the regression results. Consistent with Gompers and Metrick (2001), I find that institutional investors have a strong preference for larger (measured using total assets, sales, or market values), more mature, more liquid, and less volatile stocks. They also exhibit some preference for momentum and value stocks. Interestingly, although advertising is positively associated with firm size, it is significantly and negatively related to institutional ownership.[20] All else equal, a one-standard-deviation increase in the logarithm of advertising spending is associated with a 1.4% drop in institutional ownership, or equivalently a 1.4% increase in individual investor ownership. In Columns [4]–[7], I conduct the same regression analysis with advertising expenditures scaled by lagged assets and sales. Columns [4] and [5] use $log(\frac{ads_t}{sales_{t-1}})$, while Columns [6] and [7] use the variable scaled by lagged assets. The results are by and large unchanged. In sum, the results presented in this table suggest that, compared to institutional investors, individual investors have a stronger preference for stocks with larger advertising expenditures. This is consistent with our hypothesis that attention is the driving force for the return pattern.

#### 4.3.2 Small-Trade Imbalances

As a robustness check, I also analyze the trading decisions of individual investors. Following the prior literature, I classify trades smaller than $5,000 as the ones submitted by individual investors.[21] However, this simple rule to differentiate individual investor trades from institutional trades has become much less effective since 2001; after the adoption of decimalization at the end of 2000,

[20] This is the case even in a univariate regression.

[21] Trade data are collected from ISSM and TAQ. For more details on the construction of small trades, see Barber, Odean, and Zhu (2007).

institutions started to opt for algorithmic trading (i.e., breaking up large orders into small pieces). As a result, I limit my analysis to the sample before 2001:

$$imbal_{i,s} = \beta_0 + \beta_1\ \Delta ads_{i,t} + \beta_2\ \Delta ads_{i,t-1} + \beta_3\ \Delta assets_{i,t-1} + \beta_4\ \Delta sales_{i,t-1} + \beta_5\ log(me_{i,t-1}) + \beta_6\ mb_{i,t-1} + \beta_7\ ret_{i,t-1} + \beta_8\ ret_{i,t}, \quad (4)$$

where $imbal_{i,s} = \frac{buyOrder_{i,s} - sellOrder_{i,s}}{buyOrder_{i,s} + sellOrder_{i,s}}$ is the small-trade imbalance in month $s$ of year $t$. It captures the disparity between buy orders and sell orders (likely) submitted by individual investors. I employ two measures of $imbal_{i,s}$. The first is constructed based on the number of buy and sell orders in each month, and the second based on the dollar value. Similar to the analysis of monthly returns, I use the last available accounting figures in each month and conduct the regression in the spirit of Fama and MacBeth (1973).

The regression results, shown in Table VI, suggest that individual investors are the net buyers in firms with increasing advertising expenditures. Specifically, doubling advertising expenditures in a year, *ceteris paribus*, increases the small-trade imbalance (i.e., buy orders minus sell orders) by about 2.7% in each month in the same year. Interestingly, such an effect does not spill over to the subsequent year. $\Delta ads_{i,t-1}$ is insignificant in predicting small-trade imbalances in year $t$ in all regression specifications. This is consistent with the idea that individual investors buy a firm's stock at the time they see its product market advertising. I also control for the stock return in year $t$ to address the possibility that both advertising and individual investor trading responds to contemporary stock returns. The results do not change.

To sum up, the evidence presented in this section implies that individual investors are more likely to be responsible for the return pattern induced by (changes in) advertising. This is consistent with the prediction that these investors are more likely to be affected by attention-grabbing events, such as advertising.

## 5 Advertising Expenditures Around Equity Sales

Baker, Ruback, and Wurgler (2007) argue that, in the presence of unsophisticated investors and limits to arbitrage, a fully rational manager strike a balance between two conflicting goals. On

the one hand, the manager maximizes the long-term fundamental value of the firm (i.e., to select investment projects with positive net present values). On the other hand, the manager also maximizes the current stock price in order, for instance, to ward off potential takeover threats and/or to maximize his own compensation. Although the two goals are exactly aligned in an efficient market, they can lead to different manager behavior once we relax the assumption of market efficiency. In particular, if firm policies can affect investor behavior and cause stock prices to temporarily deviate from fundamental values, firm managers may choose investment and operation policies that appeal to investors in the short run.

The prior literature has identified a number of firm policies that are partially motivated by the maximization of short term stock prices – for example, accrual-based earnings, the dividend policy, the number of shares outstanding, and etc. In this section, I propose and test an additional channel through which managers may influence short-term stock prices – firm advertising policies.

The preceding sections document a significant return pattern associated with (changes in) advertising: firms that increase their advertising expenditures experience a temporary rise in their stock prices, which is then reversed subsequently. If firm managers are aware of this return pattern, they may take advantage of investors' limited attention by strategically adjusting firm advertising expenditures for the benefits of themselves and the current shareholders.[22]

To detect such manipulative/strategic actions by firm managers, I exploit the variations in the benefit of doing so; specifically, managers are more likely to exploit the temporary price effect of advertising when the potential benefits are larger. Therefore, the strategic component in advertising expenditures should be the most pronounced around equity sales, precisely when a temporary price increase can lead to the largest gains to managers and the current shareholders. In particular, we should observe a sharp increase in advertising expenditures shortly before equity sales, and a sharp decrease in advertising expenditures immediately after the sales are complete. In the remainder of this section, I study two types of equity sales – insider sales and seasoned equity offerings.

Although equity purchases (e.g., insider purchases and share repurchase programs) seem to be the other side of the same coin, there is a substantial difference between equity sales and purchases – the two are likely motivated by different reasons. Take insider transactions for example. Insiders'

[22]It is worth noting that advertising can also lead to higher stock liquidity (see Grullon, Kanatas, and Weston (2004)), which is also beneficial to managers and the current investors.

selling decisions are usually motivated by the need for diversification, hedging, and consumption, all of which can be forecasted reasonably well by managers themselves. This leaves managers with plenty of time to make certain "preparations," such as to increase firm advertising expenditures to pump up the short-term stock prices. Insider purchases, on the other hand, are likely motivated by private information.[23] Given the timely nature of information, rather than wait for advertising to take effect, managers should execute their trades as soon as possible. This important distinction between equity purchases and sales offers us an interesting test for our hypothesis: we should see a stronger strategic component in advertising around equity sales than around purchases.

### 5.1 Advertising Expenditures Around Insider Sales

To examine the pattern in advertising expenditures around insider sales, for each firm, I calculate insider sales as the total equity value sold by all the top-level insiders in a fiscal year, divided by the market capitalization at the end of the previous fiscal year. The choice of market-cap in the denominator is motivated by recent empirical findings that manager compensation is increasing in firm size (e.g., Conyon and Murphy (2000); Tervio (2003); Gabaix and Landier (2008)); the ratio therefore captures managers' incentives to influence short-term stock prices.[24] I then conduct the following regression analysis:

$$\begin{aligned} log(ads_{i,t}) =& \beta_0 + \beta_1\ preEvent_{i,t} + \beta_2\ Event_{i,t} + \beta_3\ postEvent_{i,t} + \beta_4\ preEvent_{i,t} * amnt_{i,t+1} + \\ & \beta_5\ Event_{i,t} * amnt_{i,t} + \beta_6\ postEvent_{i,t} * amnt_{i,t-1} + \beta_7\ log(assets_{i,t-1}) + \\ & \beta_8\ log(sales_{i,t-1}) + \beta_9\ log(me_{i,t-1}) + \beta_{10}\ mb_{i,t-1} + \beta_{11}\ ret_{i,t-1} + \\ & \beta_{12}\ log(age_{i,t-1}) + \beta_{13}\ turn_{i,t-1} + \beta_{14}\ vola_{i,t-1} + \beta_{15}\ kz_{i,t-1}, \end{aligned} \tag{5}$$

where $ads_{i,t}$ is the advertising expenditures by firm $i$ in year $t$. $amnt_{i,t}$ is the amount of aggregate insider sales in firm $i$ in year $t$ divided by the market-cap at the end of $t$-1. I define year $t$ as an event year if $amnt_{i,t}$ is positive. $Event_{i,t}$ is an indicator variable, equal to one if year $t$ is an event year, and zero otherwise. For all years in which $Event_{i,t}$ is zero, $preEvent_{i,t}$ is set to one if

[23] For example, Lakonishok and Lee (2001), Jeng, Metrick, and Zeckhauser (2003), Jenter (2005) find that insider sales do not predict negative stock returns in the short run, while insider purchases are immediately followed by positive stock returns.

[24] I also use total sales in the previous fiscal year in the denominator, and the results are similar.

year $t$+1 is an event year, and similarly, $postEvent_{i,t}$ is set to one if year $t$-1 is an event year. If both $preEvent_{i,t}$ and $postEvent_{i,t}$ are one in a year, I set both to zero, as the effect on advertising spending is unclear in this case. The coefficients of these binary variables indicate whether the average advertising expenditures in the year before, the year during, and the year after insider sales are significantly different from the expenditures in an average non-event year (i.e., when all three binary variables are zero). In addition, I include the interaction terms of the three indicator variables with $amnt_{i,t}$ to analyze how the incentive to influence short-term stock prices varies in relation to the magnitude of sales.

Two confounding effects are explicitly controlled for in the regression. First, since both insider sales and advertising expenditures have been shown to be positively associated with past stock returns, I include both the prior-year stock return and the market-to-book ratio in the regression to capture the effect of past stock performance. Moreover, since financially constrained firms are less likely to spend on advertising, I include the Kaplan and Zingales (1997) index in the regression.[25] This is to address the concern that financial constraints may lead to both lower advertising expenditures and smaller insider sales.

Moreover, to deal with unobserved firm characteristics that may influence a firm's advertising expenditures (e.g., some industries are more advertising intensive (auto vs. steel); some geographic locations are more costly to advertise (metropolitan areas vs. rural areas)), I include firm dummies in the regression – i.e., to focus only on the within firm variations. I also control for the year-fixed effects to remove market-wide fluctuations in advertising expenditures. Moreover, to address the industry effect, I use advertising expenditures that are adjusted by the average industry expenditures in each year as the dependent variable; and the results are qualitatively the same (omitted for brevity).

The first two columns in Table VII present the regression results with $log(ads)$ as the dependent variable. After controlling for all the confounding effects described above, the average advertising expenditures in the year before, and the year during insider sales are 2.9% (t=2.07) and 5.0% (t=3.12) higher than those in a non-event year, equivalent to additional spending in advertising by \$1.2 million and \$2 million, respectively. Interestingly, in the year immediately after insider sales,

[25] Following Kaplan and Zingales (1997) and Baker, Stein, and Wurgler (2003), I define $kz_{i,t} = -1.002 * \frac{cashflow_{i,t}}{assets_{i,t-1}} - 39.368 * \frac{dividend_{i,t}}{assets_{i,t-1}} - 1.315 * \frac{cash_{i,t}}{assets_{i,t-1}} + 3.139 * leverage_{i,t}$.

advertising expenditures are 4.6% (t=-2.50) *lower* than the average expenditures in a non-event year. One interpretation is that managers are trying to make up for the wasted firm resources due to the excessive advertising in the previous two years. Adding the interaction terms of the indicator variables with $amnt_{i,t}$ to the regression reduces the coefficient of $Event_{i,t}$, and renders $preEvent_{i,t}$ and $postEvent_{i,t}$ insignificant. This suggests that it is not *whether* insiders sell but *how much* insiders sell that determines the change in advertising expenditures. More specifically, a 1% increase in the aggregate insider sales leads to a 1.1% (t=2.51) increase and a 0.83% (t=-2.25) decrease in advertising expenditures in the pre- and the post-event years; both are statistically significant.

Columns [3]–[4] report the results for the same analysis with $log(\frac{ads_{i,t}}{assetsi,t-1})$ as the dependent variable. This is to deal with the possibility that some firms simply set their advertising expenditures as a fixed fraction of their total assets or total sales; in other words, the ratio of advertising expenditures to total assets captures the discretionary decisions made by managers. The results are by and large unchanged. The average advertising expenditures in the year before, the year during, and the year after insider sales are 3.1% (t=2.02) higher, 5.6% (t=4.26) higher, and 3% (t=-1.90) lower than those in a non-event year, respectively. Moreover, the interaction terms of the indicator variables with $amnt_{i,t}$ suggest that a 1% increase in the aggregate insider sales leads to a 1.2% (t=2.58) increase in advertising expenditures in the pre-event year.

To offer some further evidence for the dynamics of advertising expenditures around insider sales, I perform another pooled regression based on annual changes in advertising expenditures with the year-fixed effects:

$$\begin{aligned}\Delta ads_{i,t} =& \beta_0 + \beta_1\ preEvent_{i,t} + \beta_2\ Event_{i,t} + \beta_3\ postEvent_{i,t} + \beta_4\ preEvent_{i,t} * amnt_{i,t+1} + \\ & \beta_5\ Event_{i,t} * amnt_{i,t} + \beta_6\ postEvent_{i,t} * amnt_{i,t-1} + \beta_7\ \Delta ads_{i,t-1} + \\ & \beta_8\ \Delta assets_{i,t-1} + \beta_9\ \Delta sales_{i,t-1} + \beta_{10}\ log(me_{i,t-1}) + \beta_{11}\ mb_{i,t-1} + \\ & \beta_{12}\ ret_{i,t-1} + \beta_{13}\ log(age_{i,t-1}).\end{aligned} \tag{6}$$

I impose an additional screening criterion in this regression: if an event year is immediately preceded by another event year, I drop the second observation from the sample, as it is unclear whether managers will keep increasing advertising expenditures in the second event year. The coefficients

on the three event dummies then capture whether the annual *changes* in advertising expenditures in the pre-event, event, and post-event years are significantly different from those in non-event years (i.e., when all three dummies are equal to zero).

The results, shown in the last two columns of Table VII, suggest that the average annual change in advertising expenditures is 3.7% (t=2.54) higher in the year before, 3.6% (t=3.38) higher in the year during, but 6.1% (t=-3.60) lower in the year immediately after insider sales than in an average non-event year. In addition, the interaction terms between the indicator variables and $amnt_{i,t}$ suggest that a 1% increase in the aggregate insider sales leads to a 0.46% (t=1.78) higher annual growth rate in advertising expenditures in the year before insider sales and a 1.2% (t=-2.61) lower growth rate in the year after.

In sum, all the results shown above are consistent with the hypothesis that managers significantly increase firm advertising expenditures in the year preceding and during insider sales and significantly decrease advertising expenditures in the year following insider sales. The significant drop in advertising expenditures in the post-sales year helps rule out a number of alternative explanations (given that the unconditional AR(1) coefficient of $\Delta ads$ is only -0.08); for example, the omitted variable issue – both advertising expenditures and insider sales are driven by some unobserved effects.

Moreover, the dynamic pattern of advertising expenditures around insider sales can also potentially explain the stock return pattern around insider sales documented in the prior literature. Specifically, insider sales follow good past stock returns, and predict negative returns ten months down the road (e.g., Marin and Olivier (2008)). That the return reversal does not appear immediately following insider sales may be due to delayed investor reactions to changes in advertising.

### 5.2 Advertising Expenditures Around SEOs

I also analyze how advertising expenditures vary around seasoned equity offerings (SEO). Although directors and managers are often minority shareholders in their firms, they are still motivated to maximize the proceeds from SEOs. First of all, directors and managers have the fiduciary duty to act in the best interest of their existing shareholders. Moreover, a higher issuance price means a smaller dilution of control for the same capital raised, or more capital to spend for the same stake sold. If mangers strategically adjust advertising expenditures around insider sales, we expect a

similar pattern around equity offerings.

Table VIII reports the coefficients for the same regression as Table VII, with a different definition of events. For each firm, I compute $amnt_{i,t}$ as the aggregate equity issuance in fiscal year $t$, divided by the total shares outstanding at the end of the fiscal year $t$-1 (adjusted for splits). $Event_{i,t}$ is an indicator variable, equal to one if the aggregate issuance is positive, and zero otherwise. $preEvent_{i,t}$ ($postEvent_{i,t}$) is set to one if $Event_{i,t}$ is zero and the aggregate equity issuance in year $t$+1 (year $t$-1) is positive. The definitions of other variables are directly borrowed from Table VII.

Consistent with our prediction, the average advertising expenditures in the year before, and in the year during a seasoned equity offering are 5.7% (t=2.07) and 7.8% (t=3.62) higher than the average expenditures in a non-event year, respectively. These figures roughly translate to additional expenditures of $2.4 million and $3.2 million in advertising in a year. The average advertising expenditures in the year following a seasoned equity offering are not statistically different from the expenditures in a non-event year, suggesting that the increase in advertising expenditures in the previous two years is only temporary. Moreover, adding the interaction terms of the indicator variables with the magnitude of an equity issuance to the regression renders all three indicator variables insignificant. This is consistent with the intuition that the size of an issuance is more important than the mere occurrence of an issuance in determining managers' incentives to pump up short-term stock prices. Meanwhile, the coefficients of the interaction terms suggest that a 1% increase in the magnitude of an equity issuance leads to a 0.25% (t=2.38) increase and a 0.36% (t=4.11) increase in advertising expenditures in the year before and the year of the issuance, respectively.

In Columns [3]–[4], I replace $log(ads_{i,t})$ with $log(\frac{ads_{i,t}}{assetsi,t-1})$ as the dependent variable to address the concern that some firms may simply follow a fixed advertising-to-assets ratio. The results are by and large unchanged. the average advertising expenditures in the year before, and in the year during a seasoned equity offering are 7.1% (t=2.52) and 9.8% (t=4.41) higher than the average expenditures in a non-event year, respectively. In addition, adding the interaction terms of the indicator variables with the magnitude of an equity issuance to the regression renders the three indicator variables insignificant.

Finally, I also test the dynamics of *growth* in advertising expenditures around seasoned equity offerings (Columns [5] and [6]). The average growth in advertising expenditures is 11.4% (t=5.71)

higher in the year before, 6.5% (t=3.94) higher in the year during, but 4.8% (t=-2.98) lower in the year following an SEO than in a non-event year. The coefficients on the interaction terms between the indicator variables and $amnt_{i,t}$ imply that a 1% increase in the size of an SEO leads to a 0.1% (t=2.11) higher growth rate in advertising expenditures in the year before the SEO and a 0.3% (t=-4.91) lower growth rate in the year after.

In sum, this section documents a significant increase in advertising expenditures before seasoned equity offerings and a substantial decrease immediately after the offerings are complete. This is consistent with the idea that managers act in the interest of the existing shareholders, yet at the expense of prospective shareholders.

## 5.3 An Alternative Hypothesis

One important alternative explanation of the findings in this paper is that, rather than strategically adjusting firm advertising expenditures around *predetermined* equity sales, managers are opportunistically selling their holdings when the company stocks are overpriced. For example, a new product launch is often accompanied by a large increase in advertising spending, and thereby inflate stock prices; knowing that the stocks are now overpriced, managers sell their shares. Since the advertising spending usually falls sharply after the product launch is complete, such opportunistic selling by managers can can lead to a similar hump-shaped pattern in advertising expenditures around equity sales. As shown in the following tests, this reverse-causality argument (i.e., abnormal advertising *causes* equity sales) does not seem to be consistent with the evidence.

### 5.3.1 An Alternative Definition of Insiders

If the reverse-causality argument is correct – i.e., insiders sell because the stock is already overpriced, we expect lower-ranking managers and officers, who have similar access to company information as the CEO, the COO, and the chairman of the board, to behave similarly. On the other hand, if the strategic advertising view is correct, we expect a weaker or insignificant pattern in advertising expenditures around share sales by lower-ranking insider, as these people are not directly involved in determining firm investment and operation policies. I conduct a similar analysis as in Table

VII using the trading records of second-tier insiders.[26] The results, shown in Table IX, are more consistent with the strategic advertising view. There is only a marginally significant pattern in advertising expenditures around the sales conducted by lower-ranking officers.

### 5.3.2 Advertising Expenditures Around Insider Purchases

While insiders' selling decisions are likely to be driven by diversification and consumption needs, their buying decisions are more likely to be information-motivated. Theoretically, since a manager's human capital and financial wealth are already concentrated in the firm, it makes little economic sense to increase his equity holdings in the firm unless the manager has received some favorable private signals. Empirically, Lakonishok and Lee (2001) and Jeng, Metrick, and Zeckhauser (2003) find that insider purchases are immediately followed by positive stock returns, confirming that insider purchases are indeed informed. Since it usually takes weeks to implement adjustments to firms' advertising policies and even longer for advertising to reach its targeted viewers, managers sitting on private signals may not want to wait and risk losing their information advantages. As a result, we expect a weaker pattern in advertising expenditures around insider purchases than around insider sales. The results presented in Table X are consistent with this prediction. The data do not exhibit any visible pattern in advertising expenditures around insider purchases.[27]

This finding is again inconsistent with the opportunistic trading view. If managers are to take advantage of the temporary overpricing resulting from an increase in advertising by selling their shares, they should also take advantage of the temporary underpricing resulting from a decrease in advertising by purchasing additional shares. That we do not see a symmetric response from managers suggests that the strategic trading view is at least not a complete description of the underlying mechanism.

### 5.3.3 The Effect of Corporate Governance

If corporate governance can help discipline managers, and better align their interests with the interests of the shareholders, we should see a stronger hump-shaped pattern in advertising expenditures

[26] Following the definition used by the Thompson Financial insider filing database, I include in the sample the chief financial officer, the chief investment officer, the chief technology officer, the treasury, the secretary, and all directors on the company board (except the chairman).

[27] There is no visible pattern in advertising expenditures around share repurchases as well. The results are omitted for brevity.

around insider sales among firms with weaker corporate governance. To test this prediction, I construct a measure of dictatorship from the Governance Index proposed in Gompers, Ishii, and Metrick (2003). *dictator* is a binary variable, equal to one if the firm has a Governance Index greater than or equal to fourteen and zero otherwise.[28] I then include the interaction terms of the event dummies with *dictator* in the regression analysis.

The results, shown in Table XI, indicate the following. First, among firms with relatively strong corporate governance (i.e., $dictator = 0$), the advertising expenditures in the year of insider sales are indistinguishable from a non-event year; in contrast, among firms with relatively weak corporate governance (i.e., $dictator = 1$), the amount spent in advertising goes up by more than 40% in the year of insider sales. The substantial difference in manager behavior between the two groups of firms highlights the conflict of interest between the agent and the principal. Second, a similar pattern is absent in the SEO sample. This is because current shareholders also benefit from higher stock prices in new equity offerings, and hence have no incentive to stop their managers from temporarily pumping up stock prices. In sum, the results support the hypothesis that managers are strategically using advertising to influence short-term stock prices to the benefit of the existing shareholders and/or themselves, and are inconsistent with the alternative view that managers sell their shares because advertising has already caused overpricing in their company stocks.

#### 5.3.4 Pure Players and Conglomerates

In table XII, I classify firms into two groups: those that operate within one industry (pure players) and those that operate in multiple industries (conglomerates).[29] The idea is that top-level managers, such as the CEO and the COO, have much stronger direct control over detailed firm operations in single-segment firms; within multi-segment firms, detail operations, such as advertising, are likely delegated to divisional managers. As a result, the strategic advertising view predicts a more pronounced pattern in advertising expenditures among single-segment firms, while the opportunistic selling view makes no such prediction. The regression results support the strategic advertising view. The pattern in advertising expenditures around equity sales is either insignificant or marginally significant among conglomerates; while the difference in regression coefficients between pure players

[28] I obtain similar results with other cutoff values (e.g., 10, 12).

[29] Industries are defined based on two-digit SIC codes.

and conglomerates are statistically significant. Taken together, the evidence presented in this section is more consistent with the idea that managers are strategically using firm advertising to maximize the proceeds from equity sales, and is less consistent with the reverse-causality view that abnormal advertising leads to equity sales.

# 6 Conclusion

There is accumulating evidence that managers maximize short-term stock prices. This paper contributes to this growing body of literature by suggesting an additional channel through which managers can achieve this goal. First, this paper documents that investors respond excessively to changes in advertising expenditures, either due to the short-sales constraint or some behavioral biases that lead investors to trade on stale and biased information. Second, aware of this return pattern, managers strategically adjust firm advertising expenditures to maximize short-term stock prices when the potential benefits are the largest; in particular, they sharply increase advertising expenditures shortly before insider sales and new equity issuances, and decrease the expenditures immediately after the sales are complete.

While the existing literature on managers' short-termism focuses on firms' financing policies, such as earnings reporting, the dividend policy, and the number of shares outstanding, this paper shows empirically that managers also use firm *operation* policies – e.g., advertising expenditures – to influence investor behavior and thereby stock prices in the short run. More broadly, the findings of this paper imply that other investment and operation decisions may also be motivated by the maximization of short-term stock prices rather than of long-term firm values, a potentially interesting direction for future research.

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## Table I: Summary Statistics (1974 - 2006)

This table reports the summary statistics of all firms in my sample from 1974 to 2006. Data on *advertising expenditures* (data45), *total assets* (data6), *equity* (data216), *annual sales* (data12), *income* (data18), *cash* (data1), and *cash flow* (data14 + data18) are obtained from Compustat annual files. I then merge the Compustat sample with CRSP monthly files to obtain *market capitalization* , *stock returns*, *volatility*, and *turnover*. To reduce the effect of outliers, I winsorize all growth variables and ratio variables at the 1st and the 99th percentile. I also require firms to be at least two years old to be included in the sample. Panel A reports the summary statistics of all firm-year observations with available advertising expenditures; Panel B reports the summary statistics of the entire Compustat sample.

*Panel A: Firms with Available Advertising Spending in Compustat*

| Firm Characteristics | Mean | Stdev | 5th % | Medium | 95th % | No Obs |
|---|---|---|---|---|---|---|
| Total Assets (Million $) | 2000.91 | 21823.68 | 3.74 | 81.39 | 5293.42 | 54004 |
| Sales (Million $) | 1479.27 | 7760.48 | 2.76 | 94.21 | 5506.91 | 54004 |
| Net Earnings (Million $) | 67.01 | 626.51 | -22.45 | 2.22 | 285.81 | 54004 |
| Firm Age | 23.33 | 10.83 | 8 | 22 | 43 | 54004 |
| Market Capitalization (Million $) | 1281.92 | 9124.23 | 2.59 | 53.85 | 3720.77 | 54004 |
| Market to Book | 2.52 | 3.36 | 0.27 | 1.43 | 8.48 | 54004 |
| Annual Return | 15.28% | 62.15% | -61.09% | 2.89% | 132.26% | 54004 |
| Annual Volatility | 14.71% | 8.65% | 5.24% | 12.61% | 31.97% | 54004 |
| Annual Turnover | 89.85% | 110.37% | 7.24% | 50.11% | 322.98% | 54004 |
| Advertising Expenses (Million $) | 41.35 | 208.02 | 0.02 | 1.66 | 158.35 | 54004 |
| Percentage Growth in Ads | 23.71% | 81.03% | -55.17% | 9.40% | 137.65% | 54004 |
| Ads as a Percentage of Sales | 3.97% | 6.27% | 0.14% | 2.02% | 14.45% | 54004 |
| Ads as a Percentage of Assets | 4.77% | 7.27% | 0.11% | 2.36% | 17.46% | 54004 |

*Panel B: All Firms in Compustat*

| Firm Characteristics | Mean | Stdev | 5th % | Medium | 95th % | No Obs |
|---|---|---|---|---|---|---|
| Total Assets (Million $) | 2867.08 | 30876.61 | 4.60 | 132.89 | 8846.92 | 173592 |
| Sales (Million $) | 1334.14 | 6779.39 | 1.98 | 103.89 | 5104.33 | 173592 |
| Net Earnings (Million $) | 70.58 | 600.21 | -24.68 | 3.33 | 294.11 | 173592 |
| Firm Age | 23.62 | 11.47 | 8 | 23 | 46 | 173592 |
| Market Capitalization (Million $) | 1067.93 | 7550.47 | 3.26 | 73.59 | 3369.60 | 173592 |
| Market to Book | 2.37 | 3.23 | 0.27 | 1.36 | 7.81 | 173592 |
| Annual Return | 15.88% | 59.30% | -58.33% | 5.46% | 124.19% | 173592 |
| Annual Volatility | 13.67% | 8.64% | 4.35% | 11.50% | 30.82% | 173592 |
| Annual Turnover | 83.14% | 102.77% | 6.72% | 47.14% | 294.38% | 173592 |

## Table II: Calendar-Time Portfolio Returns (1974-2006)

Panel A reports the calendar time portfolio returns sorted by *delta_ads*, which is computed as log(*advertising(t)* /*advertising(t-1)* ). Since firm fiscal years end at different points in a calendar year, the last reported accounting figures are used in each month. The portfolios are rebalanced every month and held for two years. Year 0 is the formation period (i.e., during which the accounting numbers are computed). In Panels B-E, portfolios are formed six months after fiscal year ends. Panel B reports the portfolio returns sorted by industry adjusted delta_ads and delta_ads_lsales, which is equal to log(advertising(t)/sales(t-1))-log(advertising(t-1)/sales(t-2)). Panel C-E report portfolio returns that are based on conditional sorts. Consumer industries are classified base on the Fama-French five-industry definition. *res_inst_own* is the percentage of shares outstanding held by institutional investors orthogonalized with regard to firm size at the end of the fiscal year. To deal with overlapping portfolios in each holding month, I follow Jegadeesh and Titman (1993) to take the equal-weighted average return across portfolios formed in different months. Three different returns are reported: the CAPM alpha, the Fama-French three-factor alpha, and the Carhart four-factor alpha. T-statistics, shown in parentheses, are computed based on White's standard errors. Estimates significant at the 5% level are in bold font.

*Panel A: Sort by delta_ads*

| | Year 0 (formation year) | | | year 1 | | | year 2 | | |
|---|---|---|---|---|---|---|---|---|---|
| Decile | alpha_1f | alpha_3f | alpha_4f | alpha_1f | alpha_3f | alpha_4f | alpha_1f | alpha_3f | alpha_4f |
| 1 | -1.06% | -1.03% | -0.61% | 0.21% | 0.17% | 0.62% | 0.53% | 0.41% | 0.69% |
| | (-4.40) | (-5.28) | (-3.61) | (1.44) | (1.29) | (2.68) | (2.32) | (2.02) | (3.50) |
| 2 | -0.46% | -0.55% | -0.24% | 0.19% | 0.11% | 0.41% | 0.38% | 0.23% | 0.47% |
| | (-2.71) | (-3.75) | (-1.97) | (1.02) | (0.73) | (2.26) | (2.13) | (1.41) | (2.73) |
| 3 | -0.15% | -0.32% | -0.07% | 0.32% | 0.14% | 0.39% | 0.40% | 0.26% | 0.40% |
| | (-1.05) | (-2.38) | (-0.67) | (2.33) | (1.34) | (1.85) | (2.20) | (2.05) | (2.94) |
| 4 | 0.10% | -0.14% | 0.05% | 0.35% | 0.16% | 0.21% | 0.43% | 0.17% | 0.33% |
| | (0.67) | (-1.08) | (0.45) | (2.47) | (1.52) | (1.65) | (3.07) | (1.41) | (2.80) |
| 5 | 0.14% | -0.05% | 0.10% | 0.37% | 0.21% | 0.37% | 0.26% | 0.13% | 0.24% |
| | (0.96) | (-0.39) | (0.80) | (2.67) | (1.85) | (3.45) | (1.63) | (0.75) | (1.80) |
| 6 | 0.02% | -0.16% | -0.02% | 0.28% | 0.16% | 0.26% | 0.22% | 0.08% | 0.22% |
| | (0.11) | (-0.94) | (-0.12) | (1.72) | (1.20) | (1.81) | (1.52) | (0.86) | (1.93) |
| 7 | 0.17% | 0.02% | 0.17% | 0.16% | 0.01% | 0.21% | 0.24% | 0.05% | 0.27% |
| | (1.07) | (0.15) | (1.33) | (1.08) | (0.11) | (1.65) | (1.55) | (0.36) | (1.88) |
| 8 | 0.30% | 0.25% | 0.31% | -0.08% | -0.18% | 0.05% | 0.17% | -0.01% | 0.28% |
| | (1.63) | (1.83) | (2.34) | (-0.46) | (-1.19) | (0.36) | (0.89) | (-0.08) | (2.14) |
| 9 | 0.23% | 0.22% | 0.33% | -0.37% | -0.27% | 0.16% | 0.02% | -0.04% | 0.37% |
| | (1.30) | (1.17) | (1.91) | (-1.62) | (-1.22) | (0.56) | (0.10) | (-0.18) | (2.15) |
| 10 | 0.19% | 0.36% | 0.46% | -0.83% | -0.63% | -0.14% | -0.45% | -0.36% | 0.15% |
| | (1.05) | (1.82) | (2.32) | (-3.23) | (-2.67) | (-0.56) | (-1.69) | (-1.46) | (0.55) |
| 10 - 1 | **1.24%** | **1.38%** | **1.07%** | **-1.03%** | **-0.79%** | **-0.77%** | **-0.98%** | **-0.78%** | **-0.55%** |
| | (4.70) | (6.23) | (4.83) | (-5.14) | (-3.99) | (-3.73) | (-4.57) | (-3.06) | (-2.04) |

## Table II (Continued)

| *Panel B: Other Definitions of Advertising Expenditures* | | | | | | |
|---|---|---|---|---|---|---|
| | industry-adjusted delta_ads | | | delta_ads_lsales | | |
| Decile | alpha_1f | alpha_3f | alpha_4f | alpha_1f | alpha_3f | alpha_4f |
| 1 | 0.21% | 0.20% | 0.67% | 0.46% | 0.45% | 0.94% |
| | (0.90) | (0.91) | (3.14) | (1.74) | (2.00) | (3.88) |
| 10 | -0.73% | -0.71% | -0.17% | -0.24% | -0.29% | 0.11% |
| | (-2.98) | (-3.19) | (-0.77) | (-1.13) | (-1.57) | (0.54) |
| 10 - 1 | **-0.95%** | **-0.92%** | **-0.84%** | **-0.70%** | **-0.74%** | **-0.84%** |
| | (-5.20) | (-4.44) | (-4.06) | (-3.51) | (-3.52) | (-3.24) |

| *Panel C: Consumer Industries* | | | | | | |
|---|---|---|---|---|---|---|
| | consumer | | | non-consumer | | |
| Decile | alpha_1f | alpha_3f | alpha_4f | alpha_1f | alpha_3f | alpha_4f |
| 1 | 0.40% | 0.15% | 0.53% | -0.08% | -0.03% | 0.48% |
| | (1.71) | (0.65) | (1.75) | (-0.31) | (-0.14) | (2.03) |
| 10 | -0.60% | -0.86% | -0.44% | -0.94% | -0.64% | -0.05% |
| | (-2.31) | (-3.56) | (-1.66) | (-3.12) | (-2.32) | (-0.17) |
| 10 - 1 | **-1.01%** | **-1.01%** | **-0.97%** | **-0.87%** | **-0.61%** | **-0.53%** |
| | (-4.49) | (-4.23) | (-4.03) | (-3.66) | (-2.45) | (-2.28) |

| *Panel D: Institutional Owernship* | | | | | | |
|---|---|---|---|---|---|---|
| | low res_inst_own | | | high res_inst_own | | |
| Decile | alpha_1f | alpha_3f | alpha_4f | alpha_1f | alpha_3f | alpha_4f |
| 1 | 0.35% | 0.30% | 0.83% | 0.31% | 0.09% | 0.44% |
| | (1.24) | (0.99) | (2.69) | (1.34) | (0.46) | (2.19) |
| 10 | -0.87% | -0.69% | -0.11% | -0.51% | -0.51% | -0.13% |
| | (-2.62) | (-2.12) | (-0.32) | (-2.01) | (-2.27) | (-0.60) |
| 10 - 1 | **-1.22%** | **-1.00%** | **-0.94%** | **-0.82%** | **-0.61%** | **-0.56%** |
| | (-4.17) | (-3.52) | (-3.36) | (-2.97) | (-2.39) | (-2.12) |

| *Panel E: Subperiods* | | | | | | |
|---|---|---|---|---|---|---|
| | pre-1995 | | | post-1996 | | |
| Decile | alpha_1f | alpha_3f | alpha_4f | alpha_1f | alpha_3f | alpha_4f |
| 1 | -0.07% | -0.12% | 0.11% | 0.98% | 0.69% | 1.22% |
| | (-0.29) | (-0.69) | (0.72) | (2.13) | (1.64) | (3.09) |
| 10 | -0.99% | -0.78% | -0.54% | -0.33% | -0.37% | 0.38% |
| | (-3.78) | (-4.35) | (-3.17) | (-0.62) | (-0.74) | (0.88) |
| 10 - 1 | **-0.91%** | **-0.66%** | **-0.64%** | **-1.32%** | **-1.06%** | **-0.84%** |
| | (-4.84) | (-3.53) | (-3.13) | (-4.16) | (-3.48) | (-2.74) |

## Table III: Determinants of the Change in Advertising Spending (1974-2006)

The dependent variable in the regression is *delta_ads,* defined as log(*advertising(t)* /*advertising(t-1)* ); *delta_assets, delta_sales,* and *delta_capex* are defined similarly. *ret12* is the cumulative return in a fiscal year; *advertising, log_mktcap, mb,* and *log_age* are the advertising spending, the logarithm of market capitalization, the market-to-book ratio, and the logarithm of the firm age reported at the end of a fiscal year, respectively. The coefficients are estimated both with the Fama-MacBeth approach (columns [1]-[3]) and with a pooled OLS regression (columns [4]-[6]). Standard errors for Fama-MacBeth estimates are computed with the Newey-West correction of four lags. In pooled OLS, year fixed effects are included in all regression specifications and the standard errors are clustered at the firm level. T-statistics are shown in parentheses. Coefficient estimates significant at the 5% level are in bold font.

| *Dependent Variable = delta_ads(t)* | | | | | | |
|---|---|---|---|---|---|---|
| | Fama-MacBeth | | | Pooled OLS | | |
| | [1] | [2] | [3] | [4] | [5] | [6] |
| delta_ads(t-1) | **-0.084** | **-0.082** | **-0.084** | **-0.078** | **-0.076** | **-0.079** |
| | (-8.37) | (-8.55) | (-9.09) | (-6.29) | (-6.15) | (-6.61) |
| delta_assets(t-1) | **0.286** | **0.253** | **0.119** | **0.278** | **0.245** | **0.121** |
| | (18.02) | (17.96) | (10.99) | (14.84) | (13.17) | (6.84) |
| delta_sales(t-1) | **0.184** | **0.132** | **0.050** | **0.144** | **0.104** | 0.010 |
| | (10.32) | (7.87) | (2.73) | (6.06) | (4.40) | (0.43) |
| delta_capex(t-1) | 0.010 | 0.008 | **0.017** | 0.008 | 0.009 | **0.016** |
| | (1.59) | (1.48) | (4.34) | (1.61) | (1.83) | (3.35) |
| log_mktcap(t-1) | | 0.003 | 0.002 | | **-0.004** | **-0.002** |
| | | (1.38) | (1.27) | | (-3.05) | (-2.03) |
| mb(t-1) | | **0.005** | -0.002 | | 0.002 | **-0.004** |
| | | (2.70) | (-1.24) | | (1.76) | (-3.45) |
| ret12(t-1) | | **0.075** | **0.030** | | **0.085** | **0.038** |
| | | (12.60) | (7.24) | | (15.88) | (7.54) |
| log_age(t-1) | | **-0.043** | **-0.017** | | **-0.035** | -0.009 |
| | | (-4.82) | (-2.64) | | (-6.19) | (-1.84) |
| delta_assets(t) | | | **0.115** | | | **0.175** |
| | | | (4.42) | | | (8.81) |
| delta_sales(t) | | | **0.548** | | | **0.507** |
| | | | (15.02) | | | (19.64) |
| delta_capex(t) | | | **0.043** | | | **0.045** |
| | | | (7.50) | | | (8.83) |
| Adj-$R^2$ | 9.81% | 12.03% | 25.12% | 7.29% | 9.54% | 22.21% |
| No Obs | 23733 | 23733 | 23733 | 23733 | 23733 | 23733 |

## Table IV: Stock Return Regression (1974-2006)

The dependent variable in the regression is the return in each month *s* of fiscal year *t*. Among the independent variables, *delta_ads* is computed as log(*advertising(t)*/*advertising(t-1)*); *delta_assets*, *delta_sales*, and *delta_capex* are defined similarly; *ret12* and *ret36* are the cumulative stock returns; *turnover* is the average monthly share turnover in a year; *log_mktcap*, *mb*, and *log_age* are the logarithm of market capitalization, the market-to-book ratio, and the logarithm of the firm age reported at the end of a fiscal year, respectively; *equity_issuances* is defined in Daniel and Titman (2006); *accruals* is defined in Sloan (1996). The coefficients are estimated with the Fama-MacBeth approach. T-statistics, shown in parentheses, are based on White's standard errors. Coefficient estimates significant at the 5% level are in bold font.

| *Dependent Variable = ret(s)* | | | | | | |
|---|---|---|---|---|---|---|
| (X 100) | [1] | [2] | [3] | [4] | [5] | [6] |
| delta_ads(t-1) | **-0.512** | **-0.382** | **-0.274** | **-0.586** | **-0.362** | **-0.271** |
| | (-3.13) | (-3.08) | (-2.32) | (-3.91) | (-3.05) | (-2.22) |
| delta_ads(t-2) | | | | **-0.340** | **-0.256** | -0.192 |
| | | | | (-2.22) | (-2.06) | (-1.78) |
| delta_ads(t) | | | | **0.758** | **0.890** | **0.756** |
| | | | | (4.32) | (5.49) | (5.08) |
| delta_assets(t-1) | | **-0.748** | **-0.558** | | **-1.012** | **-0.796** |
| | | (-3.19) | (-2.90) | | (-4.56) | (-4.08) |
| delta_sales(t-1) | | 0.310 | **0.693** | | 0.241 | **0.641** |
| | | (0.94) | (2.63) | | (0.76) | (2.43) |
| delta_capex (t-1) | | **-0.160** | -0.107 | | **-0.185** | -0.110 |
| | | (-2.41) | (-1.57) | | (-2.87) | (-1.63) |
| log_mktcap(t-1) | | | -0.017 | | | -0.024 |
| | | | (-0.34) | | | (-0.49) |
| mb(t-1) | | | -0.025 | | | -0.020 |
| | | | (-0.78) | | | (-0.59) |
| ret12(t-1) | | | **0.344** | | | 0.264 |
| | | | (2.22) | | | (1.69) |
| ret36(t-4, t-2) | | | -0.022 | | | -0.030 |
| | | | (-0.84) | | | (-1.11) |
| equity_issuance(t-4, t-1) | | | **-0.278** | | | **-0.251** |
| | | | (-2.41) | | | (-2.10) |
| turnover(t-1) | | | -0.043 | | | -0.043 |
| | | | (-0.42) | | | (-0.43) |
| accruals_lassets (t-1) | | | **-3.268** | | | **-3.197** |
| | | | (-6.14) | | | (-6.01) |
| log_age(t-1) | | | -0.144 | | | -0.129 |
| | | | (-1.35) | | | (-1.26) |
| Adj-$R^2$ | 0.51% | 2.07% | 8.00% | 1.74% | 3.08% | 8.85% |
| No Obs | 191566 | 191566 | 191566 | 191566 | 191566 | 191566 |

## Table V: Institutional Investor Holdings (1980-2006)

The dependent variable of the regressions is *% held by institutions,* which is defined as the total shares held by institutional investors scaled by shares outstanding at the end of a fiscal year. *ret12* is the cumulative return, *turnover* is the average monthly turnover, and *volatility* is the monthly volatility in a fiscal year; *log_ads, log_assets, log_sales, log_mktcap* , *mb,* and *log_age* are the logarithm of the advertising spending, the logarithm of the total asset, the logarithm of the annual sales and the logarithm of the market capitalization, the market-to-book ratio, and the logarithm of the firm age reported at the end of a fiscal year, respectively. *log_ads_lsales* is defined as log(*advertising(t)* /*sales(t-1)* )-log(*advertising(t-1)* /*sales(t-2)* ), and similarly for *log_ads_lassets.* Both year fixed effects and firm fixed effects are included in all regression specifications. T-statistics, shown in parentheses, are based on standard errors clustered at the firm level. Coefficient estimates significant at the 5% level are in bold font.

| *Dependent Variable = % Held by Institutions(t)* | | | | | | | |
|---|---|---|---|---|---|---|---|
| | [1] | [2] | [3] | [4] | [5] | [6] | [7] |
| log_ads(t) | **-0.015** | **-0.014** | **-0.013** | | | | |
| | (-3.79) | (-3.41) | (-3.54) | | | | |
| log_ads_lassets(t) | | | | | | **-0.009** | **-0.011** |
| | | | | | | (-2.65) | (-3.37) |
| log_ads_lsales(t) | | | | **-0.013** | **-0.011** | | |
| | | | | (-3.74) | (-3.44) | | |
| log_assests(t) | **0.080** | **0.050** | **0.018** | **0.077** | **0.016** | **0.071** | **0.018** |
| | (11.40) | (5.97) | (2.24) | (11.22) | (2.03) | (10.27) | (2.18) |
| log_sales(t) | **0.051** | **0.039** | 0.011 | **0.039** | 0.000 | **0.045** | 0.006 |
| | (7.02) | (5.41) | (1.56) | (5.49) | (0.05) | (6.45) | (0.97) |
| log_mktcap(t) | | **0.046** | **0.042** | | **0.042** | | **0.042** |
| | | (8.29) | (7.83) | | (7.88) | | (7.91) |
| mb(t) | | -0.002 | **-0.002** | | **-0.002** | | **-0.002** |
| | | (-1.81) | (-2.48) | | (-2.46) | | (-2.51) |
| ret12(t) | | **0.016** | **0.016** | | **0.017** | | **0.018** |
| | | (5.33) | (5.73) | | (6.04) | | (6.15) |
| log_age(t) | | | **0.238** | | **0.233** | | **0.233** |
| | | | (14.71) | | (14.23) | | (14.25) |
| turnover(t) | | | **0.038** | | **0.038** | | **0.038** |
| | | | (13.06) | | (13.11) | | (13.22) |
| volatility(t) | | | **-0.375** | | **-0.377** | | **-0.379** |
| | | | (-13.70) | | (-13.78) | | (-13.83) |
| Adj-$R^2$ | 31.85% | 35.44% | 41.92% | 31.82% | 41.90% | 31.74% | 41.90% |
| No Obs | 21060 | 21060 | 21060 | 21060 | 21060 | 21060 | 21060 |

## Table VI: Individual Investor Trading (1983-2000)

The dependent variable in the regression is the small-trade imbalance in each month *s* of fiscal year *t*. In columns [1]-[4], the imbalance in small trades is defined as the number of buy orders minus the number of sell orders, divided by the sum of the two; in columns [5]-[8], the small-trade order imbalance is measured using the dollar volume rather than the number of trades. Small trades are defined as those below $5,000. *delta_ads* is computed as log(*advertising(t)*/*advertising(t-1)*); *delta_sales* and *delta_assets* are defined similarly. *ret12* is the cumulative return in a fiscal year; *log_mktcap* and *mb* are the logarithm of market capitalization, and the market-to-book ratio reported at the end of a fiscal year, respectively. The coefficients are estimated with the Fama-MacBeth approach. T-statistics, shown in parentheses, are based on standard errors with the Newey-West correction of 12 lags. Coefficient estimates significant at the 5% level are in bold font.

| *Dependent Variable = Small Trade Imbalance(s)* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Number of Trades | | | | Dollar Value of Trades | | | |
| | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] |
| delta_ads(t) | **0.139** | **0.061** | **0.040** | **0.039** | **0.126** | **0.054** | **0.034** | **0.034** |
| | (7.36) | (4.97) | (3.82) | (3.92) | (7.08) | (4.57) | (3.42) | (3.50) |
| delta_ads(t-1) | | 0.039 | 0.020 | 0.021 | | 0.039 | 0.020 | 0.020 |
| | | (1.81) | (1.01) | (1.03) | | (1.89) | (1.06) | (1.07) |
| delta_assets(t-1) | | **0.224** | **0.193** | **0.196** | | **0.204** | **0.174** | **0.177** |
| | | (5.75) | (6.26) | (6.27) | | (5.61) | (6.07) | (6.03) |
| delta_sales(t-1) | | **0.212** | **0.154** | **0.153** | | **0.198** | **0.144** | **0.144** |
| | | (6.09) | (5.20) | (5.09) | | (6.13) | (5.25) | (5.13) |
| log_mktcap(t-1) | | | **0.019** | **0.020** | | | **0.015** | **0.016** |
| | | | (2.79) | (2.87) | | | (2.18) | (2.27) |
| mb(t-1) | | | **0.015** | **0.016** | | | **0.015** | **0.015** |
| | | | (4.06) | (4.09) | | | (3.94) | (3.96) |
| ret12(t-1) | | | **0.080** | **0.079** | | | **0.073** | **0.072** |
| | | | (6.97) | (6.78) | | | (6.61) | (6.42) |
| ret12(t) | | | | 0.007 | | | | 0.002 |
| | | | | (0.60) | | | | (0.17) |
| Adj-$R^2$ | 0.66% | 2.38% | 5.38% | 5.81% | 0.57% | 2.54% | 4.87% | 5.27% |
| No Obs | 103856 | 103856 | 103856 | 103856 | 103856 | 103856 | 103856 | 103856 |

# Table VII: Advertising Spending Around Insider Sales (1986-2006)

Columns [1]-[6] report regression results based on the level of advertising spending. The dependent variable in columns [1]-[3] is the logarithm of advertising spending in year *t*; the dependent variable in columns [4]-[6] is log(*advertising(t)*/*assets(t-1)*). These regressions include both year fixed effects and firm fixed effects. Columns [7]-[8] report regression results based on log(*advertising(t)*/*advertising(t-1)*), and only year fixed effects are included. *ret12* is the cumulative return, *turnover* is the average monthly turnover and *volatility(t)* is the monthly volatility in a fiscal year; *log_assets*, *log_sales*, *log_mktcap*, *mb*, *log_age*, and *kz* are the logarithm of the total assets, the logarithm of the annual sales, the logarithm of the market capitalization, the market-to-book ratio, the logarithm of the firm age, and the Kaplan-Zingales index at the end of a fiscal year, respectively. An event year is defined as one in which the aggregate insider sale is positive. *pre_event(t)*, *event(t)*, and *post_event(t)* are equal to 1 if year *t*+1, *t*, and *t*-1 is an event year, respectively, and 0 otherwise. Insiders are defined as the top-level directors and officers. *amt(t)* is the total equity value sold in year *t* scaled by the market capital at the end of year *t*-1. T-statistics, shown in parentheses, are based on standard errors clustered at the firm level. Coefficient estimates significant at the 5% level are in bold font.

| | *Insider Sales* | | | | | |
|---|---|---|---|---|---|---|
| | Level of Advertising Spending | | | | Change | |
| | log_ads(t) | | log_ads_lassets(t) | | delta_ads(t) | |
| | [1] | [2] | [3] | [4] | [5] | [6] |
| pre_event(t) | **0.029** | 0.017 | **0.031** | 0.018 | **0.037** | **0.031** |
| | (2.07) | (0.89) | (2.02) | (0.91) | (2.54) | (2.04) |
| event(t) | **0.050** | **0.045** | **0.056** | **0.051** | **0.036** | **0.035** |
| | (3.12) | (2.55) | (4.26) | (3.65) | (3.38) | (3.02) |
| post_event(t) | **-0.046** | -0.034 | -0.030 | -0.024 | **-0.061** | **-0.043** |
| | (-2.50) | (-1.64) | (-1.90) | (-1.14) | (-3.60) | (-2.36) |
| pre_event(t) * amt | | **1.098** | | **1.176** | | 0.461 |
| | | (2.51) | | (2.58) | | (1.78) |
| event(t) * amt | | 0.484 | | 0.456 | | 0.132 |
| | | (1.08) | | (0.99) | | (0.30) |
| post_event(t) * amt | | **-0.828** | | -0.390 | | **-1.170** |
| | | (-2.25) | | (-0.57) | | (-2.61) |
| log_sales(t-1) | **0.209** | **0.209** | | | | |
| | (17.99) | (18.01) | | | | |
| log_assets(t-1) | **0.487** | **0.487** | | | | |
| | (32.01) | (31.99) | | | | |
| delta_ads(t-1) | | | | | **-0.116** | **-0.116** |
| | | | | | (-9.05) | (-9.04) |
| delta_sales(t-1) | | | | | **0.376** | **0.376** |
| | | | | | (18.86) | (18.87) |
| delta_assets(t-1) | | | | | **0.065** | **0.065** |
| | | | | | (2.60) | (2.61) |
| log_mktcap(t-1) | **0.107** | **0.107** | **-0.063** | **-0.062** | **0.017** | **0.017** |
| | (11.69) | (11.71) | (-9.23) | (-9.20) | (10.47) | (10.40) |
| mb(t-1) | **0.014** | **0.014** | **0.037** | **0.037** | **-0.006** | **-0.006** |
| | (7.61) | (7.52) | (20.65) | (20.56) | (-3.88) | (-3.90) |
| ret12(t-1) | 0.007 | 0.006 | **0.061** | **0.060** | **0.131** | **0.131** |
| | (0.94) | (0.88) | (8.52) | (8.46) | (16.34) | (16.32) |
| log_age(t-1) | 0.041 | 0.042 | **-0.130** | **-0.128** | **-0.017** | **-0.017** |
| | (0.81) | (0.83) | (-2.57) | (-2.54) | (-2.07) | (-2.13) |
| volatility(t-1) | -0.103 | -0.102 | -0.119 | -0.118 | | |
| | (-1.56) | (-1.54) | (-1.75) | (-1.74) | | |
| turnover(t-1) | **0.037** | **0.037** | **0.018** | **0.019** | | |
| | (6.51) | (6.61) | (3.23) | (3.30) | | |
| kz(t-1) | **-0.017** | **-0.017** | **-0.040** | **-0.040** | | |
| | (-3.71) | (-3.65) | (-8.97) | (-8.91) | | |
| No Obs | 28554 | 28554 | 28554 | 28554 | 21662 | 21662 |

# Table VIII: Advertising Spending Around SEOs (1974-2006)

Columns [1]-[6] report regression results based on the level of advertising spending. The dependent variable in columns [1]-[3] is the logarithm of advertising spending in year t; the dependent variable in columns [4]-[6] is log(advertising(t)/assets(t-1)). These regressions include both year fixed effects and firm fixed effects. Columns [7]-[8] report regression results based on log(advertising(t)/advertising(t-1)), and only year fixed effects are included. *ret12* is the cumulative return, *turnover* is the average monthly turnover and *volatility* is the monthly volatility in a fiscal year; *log_assets*, *log_sales*, *log_mktcap*, *mb*, *log_age*, and *kz* are the logarithm of the total assets, the logarithm of the annual sales, the logarithm of the market capitalization, the market-to-book ratio, the logarithm of the firm age, and the Kaplan-Zingales index at the end of fiscal year t, respectively. An event year is defined as one in which the aggregate equity issuance is positive. *pre_event(t)*, *event(t)*, and *post_event(t)* are equal to 1 if year $t+1$, $t$, and $t-1$ is an event year, respectively, and 0 otherwise. *amt(t)* is the total shares issued in year $t$ scaled by the shares outstanding at the end of year $t-1$. T-statistics, shown in parentheses, are based on standard errors clustered at the firm level. Coefficient estimates significant at the 5% level are in bold font.

| | *SEOs* | | | | | |
|---|---|---|---|---|---|---|
| | Level of Advertising Spending | | | | Change | |
| | log_ads(t) | | log_ads_lassets(t) | | delta_ads(t) | |
| | [1] | [2] | [3] | [4] | [5] | [6] |
| pre_event(t) | **0.057** | 0.001 | **0.071** | 0.037 | **0.114** | **0.094** |
| | (2.07) | (0.03) | (2.52) | (0.95) | (5.71) | (3.53) |
| event(t) | **0.078** | -0.002 | **0.098** | 0.036 | **0.065** | **0.057** |
| | (3.62) | (-0.06) | (4.41) | (1.20) | (3.94) | (2.61) |
| post_event(t) | 0.009 | -0.034 | -0.001 | -0.019 | **-0.048** | 0.049 |
| | (0.46) | (-1.36) | (-0.08) | (-0.75) | (-2.98) | (1.32) |
| pre_event(t) * amt | | **0.253** | | **0.156** | | **0.095** |
| | | (2.38) | | (2.24) | | (2.11) |
| event(t) * amt | | **0.358** | | **0.281** | | 0.039 |
| | | (4.11) | | (3.15) | | (0.56) |
| post_event(t) * amt | | 0.147 | | 0.064 | | **-0.294** |
| | | (1.29) | | (1.14) | | (-4.91) |
| log_sales(t-1) | **0.259** | **0.260** | | | | |
| | (26.47) | (26.57) | | | | |
| log_assets(t-1) | **0.477** | **0.474** | | | | |
| | (38.09) | (37.88) | | | | |
| delta_ads(t-1) | | | | | **-0.118** | **-0.117** |
| | | | | | (-11.61) | (-11.54) |
| delta_sales(t-1) | | | | | **0.370** | **0.373** |
| | | | | | (22.68) | (22.80) |
| delta_assets(t-1) | | | | | **0.094** | **0.094** |
| | | | | | (4.76) | (4.76) |
| log_mktcap(t-1) | **0.100** | **0.101** | **-0.056** | **-0.056** | **0.017** | **0.016** |
| | (13.54) | (13.61) | (-10.28) | (-10.32) | (13.68) | (13.30) |
| mb(t-1) | **0.013** | **0.013** | **0.035** | **0.035** | **-0.004** | **-0.005** |
| | (7.72) | (7.59) | (22.24) | (22.17) | (-3.21) | (-3.39) |
| ret12(t-1) | **0.019** | **0.020** | **0.068** | **0.068** | **0.116** | **0.114** |
| | (3.17) | (3.25) | (11.23) | (11.26) | (20.86) | (20.43) |
| log_age(t-1) | -0.080 | -0.072 | **-0.197** | **-0.193** | **-0.018** | **-0.018** |
| | (-1.91) | (-1.73) | (-4.72) | (-4.62) | (-3.10) | (-3.12) |
| volatility(t-1) | -0.087 | -0.083 | -0.111 | -0.108 | | |
| | (-1.52) | (-1.45) | (-1.89) | (-1.85) | | |
| turnover(t-1) | **0.032** | **0.031** | **0.014** | **0.013** | | |
| | (6.13) | (5.91) | (2.65) | (2.53) | | |
| kz(t-1) | **-0.018** | **-0.018** | **-0.046** | **-0.046** | | |
| | (-4.62) | (-4.51) | (-12.25) | (-12.20) | | |
| No Obs | 39565 | 39565 | 39565 | 39565 | 39500 | 39500 |

# Table IX: An Alternative Definition of Insiders (1986-2006)

Columns [1]-[6] report regression results based on the level of advertising spending. The dependent variable in columns [1]-[3] is the logarithm of advertising spending in year *t*; the dependent variable in columns [4]-[6] is log(*advertising(t)*/*assets(t-1)*). These regressions include both year fixed effects and firm fixed effects. Columns [7]-[8] report regression results based on log(*advertising(t)*/*advertising(t-1)*), and only year fixed effects are included. *ret12* is the cumulative return, *turnover* is the average monthly turnover and *volatility* is the monthly volatility in a fiscal year; *log_assets, log_sales, log_mktcap, mb, log_age, and kz* are the logarithm of the total assets, the logarithm of the annual sales, the logarithm of the market capitalization, the market-to-book ratio, the logarithm of the firm age, and the Kaplan-Zingales index at the end of a fiscal year, respectively. An event year is defined as one in which the aggregate insider sale is positive. *pre_event(t), event(t),* and *post_event(t)* are equal to 1 if year *t*+1, *t,* or *t*-1 is an event year, respectively, and 0 otherwise. Insiders are defined as the **second-tier** directors and officers. *amt(t)* is the total equity value sold in year *t* scaled by the market capital at the end of year *t*-1. T-statistics, shown in parentheses, are based on standard errors clustered at the firm level. Coefficient estimates significant at the 5% level are in bold font.

| *Insider Sales (Levels 2)* | | | | | | |
|---|---|---|---|---|---|---|
| | Level of Advertising Spending | | | | Change | |
| | log_ads(t) | | log_ads_lassets(t) | | delta_ads(t) | |
| | [1] | [2] | [3] | [4] | [5] | [6] |
| pre_event(t) | 0.011 | 0.010 | 0.015 | 0.015 | **0.042** | **0.035** |
| | (0.62) | (0.54) | (0.80) | (0.79) | (2.90) | (2.29) |
| event(t) | **0.028** | 0.023 | **0.033** | **0.029** | 0.014 | 0.015 |
| | (2.32) | (1.87) | (2.46) | (2.07) | (1.34) | (1.37) |
| post_event(t) | -0.035 | -0.030 | -0.021 | -0.019 | -0.031 | -0.022 |
| | (-1.80) | (-1.43) | (-1.04) | (-0.86) | (-1.78) | (-1.19) |
| pre_event(t) * amt | | 0.123 | | -0.030 | | 0.650 |
| | | (0.23) | | (-0.05) | | (1.35) |
| event(t) * amt | | 0.356 | | 0.380 | | -0.061 |
| | | (1.12) | | (1.02) | | (-0.20) |
| post_event(t) * amt | | -0.335 | | -0.122 | | -0.654 |
| | | (-0.61) | | (-0.22) | | (-1.17) |
| log_sales(t-1) | **0.208** | **0.209** | | | | |
| | (17.95) | (17.98) | | | | |
| log_assets(t-1) | **0.488** | **0.487** | | | | |
| | (32.05) | (32.03) | | | | |
| delta_ads(t-1) | | | | | **-0.131** | **-0.131** |
| | | | | | (-9.37) | (-9.37) |
| delta_sales(t-1) | | | | | **0.385** | **0.385** |
| | | | | | (17.58) | (17.56) |
| delta_assets(t-1) | | | | | **0.087** | **0.087** |
| | | | | | (3.20) | (3.20) |
| log_mktcap(t-1) | **0.106** | **0.106** | **-0.063** | **-0.063** | **0.018** | **0.018** |
| | (11.63) | (11.64) | (-9.29) | (-9.29) | (9.97) | (9.96) |
| mb(t-1) | **0.015** | **0.014** | **0.037** | **0.037** | **-0.008** | **-0.008** |
| | (7.71) | (7.55) | (20.77) | (20.61) | (-4.20) | (-4.17) |
| ret12(t-1) | 0.008 | 0.007 | **0.062** | **0.061** | **0.140** | **0.140** |
| | (1.07) | (0.95) | (8.65) | (8.54) | (15.44) | (15.40) |
| log_age(t-1) | 0.043 | 0.044 | **-0.127** | **-0.126** | **-0.020** | **-0.021** |
| | (0.85) | (0.87) | (-2.51) | (-2.49) | (-2.23) | (-2.25) |
| volatility(t-1) | -0.106 | -0.107 | -0.122 | -0.122 | | |
| | (-1.60) | (-1.62) | (-1.79) | (-1.81) | | |
| turnover(t-1) | **0.035** | **0.036** | **0.017** | **0.018** | | |
| | (6.30) | (6.37) | (3.05) | (3.10) | | |
| kz(t-1) | **-0.017** | **-0.016** | **-0.040** | **-0.040** | | |
| | (-3.68) | (-3.58) | (-8.95) | (-8.86) | | |
| No Obs | 28554 | 28554 | 28554 | 28554 | 17708 | 17708 |

# Table X: Advertising Spending Around Insider Purchases (1986-2006)

Columns [1]-[6] report regression results based on the level of advertising spending. The dependent variable in columns [1]-[3] is the logarithm of advertising spending in year *t*; the dependent variable in columns [4]-[6] is log(*advertising(t)*/*assets(t-1)*). These regressions include both year fixed effects and firm fixed effects. Columns [7]-[8] report regression results based on log(*advertising(t)*/*advertising(t-1)*), and only year fixed effects are included. *ret12* is the cumulative return, *turnover* is the average monthly turnover and *volatility* is the monthly volatility in a fiscal year; *log_assets, log_sales, log_mktcap, mb, log_age, and kz* are the logarithm of the total assets, the logarithm of the annual sales, the logarithm of the market capitalization, the market-to-book ratio, the logarithm of the firm age, and the Kaplan-Zingales index at the end of a fiscal year, respectively. An event year is defined as one in which the aggregate insider purchase is positive. *pre_event(t), event(t),* and *post_event(t)* are equal to 1 if year *t*+1, *t,* or *t*-1 is an event year, respectively, and 0 otherwise. Insiders are defined as the top-level directors and officers. *amt(t)* is the total equity value bought in year *t* scaled by the market capital at the end of year *t*-1. T-statistics, shown in parentheses, are based on standard errors clustered at the firm level. Coefficient estimates significant at the 5% level are in bold font.

| *Insider Purchases* | | | | | | |
|---|---|---|---|---|---|---|
| | Level of Advertising Spending | | | | Change | |
| | log_ads(t) | | log_ads_lassets(t) | | delta_ads(t) | |
| | [1] | [2] | [3] | [4] | [5] | [6] |
| pre_event(t) | 0.010 | 0.018 | -0.005 | 0.002 | 0.022 | 0.025 |
| | (0.53) | (0.93) | (-0.29) | (0.12) | (1.44) | (1.57) |
| event(t) | 0.024 | **0.029** | 0.008 | 0.012 | 0.005 | 0.009 |
| | (1.47) | (1.97) | (0.56) | (0.84) | (0.36) | (0.64) |
| post_event(t) | 0.028 | 0.024 | 0.020 | 0.015 | 0.019 | 0.020 |
| | (1.57) | (1.30) | (1.08) | (0.79) | (1.18) | (1.23) |
| pre_event(t) * amt | | -1.547 | | -1.465 | | -0.540 |
| | | (-1.53) | | (-1.42) | | (-0.57) |
| event(t) * amt | | -0.993 | | -0.867 | | -0.822 |
| | | (-1.54) | | (-1.31) | | (-0.87) |
| post_event(t) * amt | | 0.643 | | 0.812 | | -0.305 |
| | | (0.66) | | (0.81) | | (-0.31) |
| log_sales(t-1) | **0.209** | **0.209** | | | | |
| | (17.97) | (17.99) | | | | |
| log_assets(t-1) | **0.485** | **0.485** | | | | |
| | (31.86) | (31.86) | | | | |
| delta_ads(t-1) | | | | | **-0.113** | **-0.113** |
| | | | | | (-8.93) | (-8.93) |
| delta_sales(t-1) | | | | | **0.363** | **0.363** |
| | | | | | (18.83) | (18.83) |
| delta_assets(t-1) | | | | | **0.070** | **0.070** |
| | | | | | (2.84) | (2.83) |
| log_mktcap(t-1) | **0.108** | **0.108** | **-0.061** | **-0.062** | **0.019** | **0.018** |
| | (11.90) | (11.85) | (-9.08) | (-9.12) | (11.19) | (11.05) |
| mb(t-1) | **0.015** | **0.015** | **0.037** | **0.037** | **-0.005** | **-0.005** |
| | (7.80) | (7.82) | (20.94) | (20.96) | (-3.49) | (-3.48) |
| ret12(t-1) | 0.010 | 0.009 | **0.064** | **0.064** | **0.127** | **0.127** |
| | (1.32) | (1.31) | (9.03) | (9.02) | (17.26) | (17.24) |
| log_age(t-1) | 0.040 | 0.040 | **-0.134** | **-0.133** | **-0.023** | **-0.022** |
| | (0.79) | (0.79) | (-2.64) | (-2.64) | (-2.92) | (-2.90) |
| volatility(t-1) | -0.117 | -0.116 | -0.132 | -0.132 | | |
| | (-1.77) | (-1.75) | (-1.95) | (-1.94) | | |
| turnover(t-1) | **0.035** | **0.035** | **0.017** | **0.017** | | |
| | (6.25) | (6.24) | (3.01) | (3.01) | | |
| kz(t-1) | **-0.017** | **-0.017** | **-0.041** | **-0.041** | | |
| | (-3.76) | (-3.78) | (-9.07) | (-9.07) | | |
| No Obs | 28554 | 28554 | 28554 | 28554 | 23441 | 23441 |

# Table XI: The Effect of Corporate Governance (1990-2006)

The dependent variable in this table is the logarithm of advertising spending in year *t*. Both regression specifications include year fixed effects. *ret12* is the cumulative return, *turnover* is the average monthly turnover, and *volatility* is the monthly volatility in a fiscal year; *log_assets, log_sales, log_mktcap, mb, log_age,* and *kz* are the logarithm of the total assets, the logarithm of the annual sales, the logarithm of the market capitalization, the market-to-book ratio, the logarithm of the firm age, and the Kaplan-Zingales index at the end of a fiscal year, respectively. An event year is defined as one in which the aggregate insider sale is positive. *pre_event(t), event(t),* and *post_event(t)* are equal to 1 if year *t* +1, *t*, and *t* -1 is an event year, respectively, and 0 otherwise. Insiders are defined as the top-level directors and officers. *dictator* is an indicator variable, equal to 1 if the governance index is equal to or greater than 14, and 0 otherwise (the governance index is derived in Gompers, Ishii and Metrick (QJE 2003)). T-statistics, shown in parentheses, are based on standard errors clustered at the firm level. Coefficient estimates significant at the 5% level are in bold font.

| | *Insider Sales* | | *SEO* | |
|---|---|---|---|---|
| | *log_ads* | *log_ads_lassets* | *log_ads* | *log_ads_lassets* |
| pre_event(t) | 0.027 | 0.045 | 0.032 | 0.031 |
| | (1.39) | (1.61) | (0.65) | (0.62) |
| event(t) | 0.035 | 0.048 | 0.057 | 0.044 |
| | (1.30) | (1.79) | (1.66) | (1.55) |
| post_event(t) | -0.045 | -0.077 | -0.006 | -0.016 |
| | (-1.67) | (-1.95) | (-0.15) | (-0.38) |
| dictator (t-1) | -0.172 | -0.081 | -0.052 | -0.025 |
| | (-1.28) | (-0.58) | (-0.95) | (-0.44) |
| pre_event(t) * dictator | 0.017 | 0.206 | -0.149 | -0.238 |
| | (0.07) | (0.75) | (-0.44) | (-0.67) |
| event(t) * dictator | **0.392** | **0.463** | -0.191 | -0.172 |
| | (2.15) | (2.35) | (-0.94) | (-0.82) |
| post_event(t) * dictator | -0.011 | 0.103 | 0.075 | 0.098 |
| | (-0.03) | (0.28) | (0.39) | (0.49) |
| log_sales(t-1) | **0.895** | | **0.506** | |
| | (11.72) | | (14.79) | |
| log_assets(t-1) | 0.128 | | **0.250** | |
| | (1.78) | | (4.17) | |
| log_mktcap(t-1) | 0.027 | **-0.056** | 0.034 | **-0.134** |
| | (0.52) | (-2.31) | (1.72) | (-3.33) |
| mb(t-1) | **0.034** | **0.049** | **0.010** | **0.035** |
| | (3.33) | (5.12) | (2.85) | (4.73) |
| ret12(t-1) | 0.006 | 0.044 | **0.056** | **0.098** |
| | (0.19) | (1.29) | (3.90) | (2.02) |
| log_age(t-1) | -0.108 | 0.077 | 0.223 | 0.164 |
| | (-1.22) | (0.83) | (1.93) | (1.38) |
| volatility(t-1) | **-1.331** | **-2.507** | -0.213 | **-0.421** |
| | (-2.54) | (-4.69) | (-1.35) | (-2.56) |
| turnover(t-1) | -0.034 | -0.040 | **0.062** | **0.064** |
| | (-1.17) | (-1.24) | (5.75) | (5.69) |
| kz(t-1) | **-0.102** | **-0.143** | **-0.039** | **-0.081** |
| | (-3.60) | (-5.42) | (-3.99) | (-5.22) |
| No Obs | 6554 | 6554 | 6554 | 6554 |

## Table XII: Pure Players vs. Congolmerates (1978-2006)

The dependent variable in this table is the logarithm of advertising spending in year *t*. Both regression specifications include year and firm fixed effects. *ret12* is the cumulative return, *turnover* is the average monthly turnover, and *volatility* is the monthly volatility in a fiscal year; *log_assets*, *log_sales*, *log_mktcap*, *mb*, *log_age*, and *kz* are the logarithm of the total assets, the logarithm of the annual sales, the logarithm of the market capitalization, the market-to-book ratio, the logarithm of the firm age, and the Kaplan-Zingales index at the end of a fiscal year, respectively. An event year is defined as one in which the aggregate insider sale is positive. *pre_event(t)*, *event(t)*, and *post_event(t)* are equal to 1 if year *t*+1, *t*, and *t*-1 is an event year, respectively, and 0 otherwise. Insiders are defined as the top-level directors and officers. *pplay* is an indicator variable, equal to 1 if the firm only operates in one industry (2-digit SIC code) and 0 otherwise. T-statistics, shown in parentheses, are based on standard errors clustered at the firm level. Coefficient estimates significant at the 5% level are in bold font.

| | *Insider Sales* | | *SEO* | |
|---|---|---|---|---|
| | *log_ads* | *log_ads_lassets* | *log_ads* | *log_ads_lassets* |
| pre_event(t) | 0.009 | 0.018 | 0.036 | 0.027 |
| | (0.25) | (0.48) | (1.86) | (1.62) |
| event(t) | 0.019 | 0.025 | **0.043** | **0.042** |
| | (0.88) | (1.03) | (2.17) | (2.11) |
| post_event(t) | -0.037 | -0.017 | 0.018 | 0.026 |
| | (-1.95) | (-1.42) | (0.40) | (0.67) |
| pplay(t-1) | **-0.073** | **-0.053** | 0.020 | 0.030 |
| | (-3.94) | (-2.77) | (1.43) | (1.69) |
| pre_event(t) * pplay | 0.026 | 0.017 | 0.010 | 0.027 |
| | (1.63) | (1.20) | (1.00) | (1.53) |
| event(t) * pplay | **0.047** | **0.038** | **0.040** | **0.073** |
| | (2.40) | (2.39) | (2.55) | (3.59) |
| post_event(t) * pplay | -0.006 | -0.011 | -0.039 | **-0.051** |
| | (-0.54) | (-1.04) | (-1.91) | (-2.15) |
| log_sales(t-1) | **0.223** | | **0.369** | |
| | (17.63) | | (29.71) | |
| log_assets(t-1) | **0.470** | | **0.373** | |
| | (29.99) | | (25.74) | |
| log_mktcap(t-1) | **0.104** | **-0.070** | **0.101** | **-0.062** |
| | (11.29) | (-10.22) | (12.30) | (-10.38) |
| mb(t-1) | **0.015** | **0.037** | **0.009** | **0.033** |
| | (7.82) | (20.55) | (4.89) | (18.78) |
| ret12(t-1) | 0.003 | **0.059** | **0.017** | **0.065** |
| | (0.46) | (8.22) | (2.55) | (9.97) |
| log_age(t-1) | 0.042 | **-0.121** | -0.022 | **-0.122** |
| | (0.83) | (-2.41) | (-0.45) | (-2.51) |
| volatility(t-1) | -0.128 | **-0.165** | -0.109 | **-0.120** |
| | (-1.90) | (-2.40) | (-1.71) | (-1.83) |
| turnover(t-1) | **0.036** | **0.020** | **0.027** | **0.011** |
| | (6.41) | (3.43) | (4.95) | (1.88) |
| kz(t-1) | **-0.019** | **-0.044** | **-0.022** | **-0.046** |
| | (-4.05) | (-9.76) | (-5.52) | (-9.42) |
| No Obs | 27657 | 27657 | 32663 | 32663 |