On a Spending Spree:
The Real Effects of Heuristics in Managerial Budgets*

Paul H. Décaire
Arizona State University

Denis Sosyura
Arizona State University

Abstract

Using micro data on managerial expenditures, we uncover heuristics in capital budgets, such as nominal rigidity, anchoring, and sharp reset deadlines. Such heuristics engender managerial opportunism. Managers with a budget surplus increase investment before budget deadlines, and such projects underperform. Managers who reach a budget constraint early in the fiscal cycle halt spending until their budget is reset, irrespective of investment options. These effects are stronger at firms with more hierarchical layers and a greater subordinates-to-executives ratio. Such firms become targets of private equity funds. After the buyout by strong principals, firms remove budgetary heuristics and switch to continuous capital allocations. Overall, simplifying budgeting rules engender strategic managerial behavior.

JEL Codes: D22, G30, G31, G34, G41

Keywords: capital budgeting, governance, fallacy, managerial heuristics

---

According to academic theory, the main job of top management is to allocate a firm's capital to the best investment opportunities. In practice, a typical firm faces thousands of resource allocation options every day, and the majority of day-to-day operating decisions are delegated to agents outside the executive suite. Since it is impractical to review each of these decisions, the dominant practice in the modern firm is to endow midlevel managers with pre-determined spending budgets under some simplifying rules and heuristics. Much like academic research budgets, managerial spending budgets are persistent in nominal terms over time, and often carry special provisions such as a mandatory review of any overage expenses or a recapture of the remaining funds at the fiscal year-end.

The benefit of such annual budgets is that they endow agents with control rights, impose a clear budget constraint, and reduce monitoring costs associated with the approval of day-to-day expenses. However, the limitation of such a simplifying framework is that it hardly incorporates the complex dynamics of a firm's investment opportunities, which should be the ultimate focus of capital allocation decisions. For example, investment opportunities vary greatly over time, and arise independently of the remaining budget balances and fiscal year deadlines.

Our main finding is that the divergence between the heuristic rules in capital budgeting and real-world investment opportunities reduces investment efficiency and generates investment frictions. Such frictions manifest in spending sprees around fiscal year-end deadlines and lead managers to forego some attractive investments that unexpectedly arrive late in the budget cycle when the manager is close to the private budget constraint. Managerial budgeting frictions are more pronounced in complex firms where spending is more difficult to monitor, such as firms with a greater number of hierarchical layers, more product divisions, and a higher subordinates-to-executives ratio.

To offer a granular analyses of managerial spending behavior under budget constraints, we study one of the largest types of corporate budgets—namely, advertising expenditures. Our analyses exploit daily transaction-level data on the allocation of nearly $608.5 billion by 539 public and private firms in 2010–2019. To assess the outcomes of advertising projects, we match project to transaction-level scanner data on product sales, which detail the selling price, quantity, and location of the sale. Reported weekly, the sales

1

data cover 100 billion transactions for 4.5 million products and account for the majority of physical sales in grocery stores and drug stores (53% and 55%, respectively).

While our empirical setting provides a glance at high-frequency managerial decisions throughout the budgetary cycle, it also illuminates an economically important resource allocation for the firm. The annual advertising expenditures for the mean firm in our sample are comparable to the annual expenditures on capital investment (85% of CapEx) and exceed the spending on research and development (155% of R&D), consistent with theory models that highlight advertising expenditures as a key driver of a firm's competitive advantage, along with CapEx and R&D (Telser 1964; Comanor 1967; Spence 1980).

Survey evidence indicates that an analysis of advertising expenditures is a suitable laboratory for testing the role of managerial heuristics in capital budgeting. According to a recent survey of CFOs, advertising budgets are largely fixed within the year, follow fiscal year deadlines, and remain sticky in nominal terms, with the majority of executives (62%) reporting minimal year-over-year budget adjustments (Agrawal et al. 2020). In contrast, only 10% of executives report revising their budgets during the year to respond to changing market conditions.

Our evidence confirms the reliance on heuristics in advertising budgets. We uncover several empirical patterns in advertising expenditures symptomatic of managerial heuristics. First, expenditures show strong nominal rigidity over time, with an average growth rate of 1.06, and the R-squared of 91%. Second, budgets follow rigid fiscal year deadlines, and budget cycles shift when a firm changes its fiscal year-end. We study the impact of such budgetary rigidities on investment spending and the efficiency of capital allocation.

Our first results show that managers raise their spending sharply during the final four weeks before the budget reset deadline. As a result, the average expenditures in the final budgetary month spike by 44%, but only if the manager is running a budget surplus relative to the previous year's realized expenditures. Survey evidence suggests that managers elect to retain control over their surplus instead of returning it to the firm at the risk of getting a lower budget next year (Moorman 2021). Consistent with this explanation, we find that managers who finish the year with an unspent surplus tend to receive lower capital allocations in the following year. This pattern creates an incentive for aggressive pre-deadline spending to finish the

year with little to no excess funds. The average manager expends 88% of the surplus available four weeks before the yearend, and most of this spending is concentrated immediately prior to the budget reset deadline.

In contrast, when a manager reaches their budget constraint early in the fiscal year (usually due to unexpected market developments or competitive threats), expenditures drop sharply for the rest of the budgetary cycle, with an average decline of 46% in the pre-deadline month. This decline persists irrespectively of investment opportunities and leads to underinvestment relative to industry peers until the manger's budget reset date. Investment recovers sharply at the onset of a new budget cycle.

We test several alternative explanations for managerial spending patterns around budget deadlines. We find that our results are not driven by a December effect and persist in a subsample of firms whose fiscal year ends in other months of the year (41% of firms). Our findings are also distinct from tax management incentives and hold for firms that generate negative pre-tax earnings and pay no taxes. Our results are also robust to accounting for end-of-year sales targets and hold for firms with no promotional incentives. Finally, in contrast to the earnings management explanation, our findings persist for firms that face little incentives for earnings manipulation—those whose quarterly earnings are far above or far below the consensus forecast at the end of their fiscal year.

Next, we study the effect of pre-deadline spending on project outcomes. The spike in the spending of excess funds before deadlines is associated with a decline in investment efficiency, as measured by the impact on sales, market penetration, and customer reach. Advertisement projects funded from budgets with excess funds in the last month of the budgetary cycle generate less revenue, achieve lower market penetration, and cost more to reach the same number of viewers (measured by Nielsen) than other projects of the same manager in the same year but after the budget reset deadline.

The underperformance of close-to-deadline projects is robust to controlling for unobservable factors affecting a given firm and product category in each year via various combinations of high-dimensional fixed effects. For example, the results persist in specifications with firm*year*product category fixed effects that account for a firm's capital availability and investment opportunities, as well as temporal shifts in product demand. The results are also robust to controlling for intra-year seasonality in product sales, advertisement prices, and advertisement efficiency, using product category*month*market fixed effects. For example, these specifications compare the performance of ad projects for shampoo in

June 2018 between firms whose fiscal year ends in June against the performance of other ad projects for shampoo in June 2018 but for firms whose fiscal year ends in September.

We identify two drivers of the variation in project performance: (i) the project's temporal proximity to the budget reset deadline and (ii) the manager's budget surplus remaining before the reset deadline. The underperformance of close-to-deadline projects disappears for projects funded from budgets running at an overage (relative to the prior year) and reemerges for budgets running at a surplus. When a firm changes its budget deadlines (fiscal yearend), say from June to December, the underperformance of projects funded in June disappears and reemerges in December. To address the notion that firms strategically change their fiscal yearend to accommodate a new product or seasonal shift, we replicate these findings for products that account for less than 1% of the firm's sales and are unlikely to drive a change in the fiscal year.

Next, we provide evidence on the mechanisms underlying the underperformance of close-to-deadline projects. Our evidence suggests that the higher intensity of spending before the budget deadlines is associated with the stepping down in project quality and, hence, weaker performance. Consistent with this explanation, the most attractive investment opportunities for advertising expenditures (such as primetime TV slots) are pre-booked 6-12 months in advance. Thus, managers with a budget surplus before the reset deadline face three options. They can spend the remaining funds on less attractive projects (effectively, leftover ads), return the unused funds to the firm, or signal a lack of investment opportunities at the risk of receiving a smaller budget next year. We find that managers elect to retain control over the remaining funds and increase spending without a corresponding increase in investment opportunities.

We present micro evidence in support of the hypothesis that the underperformance of close-to-deadline projects is linked to excessive spending relative to available investment options, consistent with theory models of investment under limited options (Baldwin 1982; Bernanke 1983; Weeds 2003; Kogan and Papanikolaou 2013). To test this prediction, we exploit a unique institutional feature of the TV advertising market that generates intra-year variation in investment opportunities for select markets. In the US, primetime TV ads for the year are made available for booking during a fixed period between mid-May and the end of June (Shapiro et al. 2021). Thus, managers left with budget surpluses scheduled to expire during this booking period get access to attractive investment options before their budgets expire. For this subsample of managers with access to attractive investments, the performance of close-to-deadline projects

4

is no worse, and sometimes better, than that of the same managers' projects earlier in the budget cycle, and year-end expenditures surge are absent.

Finally, we study how the spike in the pre-deadline spending is associated with internal governance. To assess internal controls, we collect data on each firm's organizational structure, hierarchy, and managerial subordination from Lexis Nexis Corporate Affiliations. The pre-deadline spike in managerial spending is more pronounced at complex firms with more reporting units and a greater number of hierarchical layers between operating units and the CEO. Similarly, such effect is stronger at firms with laxer internal monitoring—those whose CEOs have weaker business training and financial expertise.

Firms with budgetary heuristics are more likely to become targets of private equity funds. After a buyout by private equity or other activist investors, such firms remove budgetary heuristics and switch to a pay-as-you-go approach to capital budgeting without fixed allocations. An advantage of this approach is that it accommodates the dynamic nature of investment opportunities. However, this advantage come at the cost of more frequent project reviews and managerial involvement.

Using internal reviews by corporate insiders, we find that a departure from fixed capital budgets to flexible spending schemes generates a dissatisfaction of mid-level managers. This effect manifests in lower internal scores of job satisfaction. Using employee-level data, we show that this effect is limited to managerial staff and does not arise for rank-and-file workers who typically have no spending budgets. Overall, a firm's choice between fixed annual budgets and flexible spending practices likely involves a tradeoff between efficiency improvements and higher managerial burden and internal lobbying.

The central contribution of this paper is to provide granular project-level evidence on the real effects of heuristics in managerial budgets. In contrast to traditional models of capital budgeting as a continuous allocation of resources to stochastically arriving investment opportunities, corporate budgets exhibit nominal rigidity in capital spending, fiscal year horizons, and sharp expiration deadlines. While such institutional rules facilitate delegation in capital spending, they give rise to managerial opportunism and introduce frictions. Our findings add to three research strands: (i) managerial heuristics, (ii) intra-year corporate spending cycles, and (iii) the practice of capital budgeting.

Our paper adds to the literature on managerial heuristics in financial decisions. Prior work shows that managers rely on various shortcuts and fallacies in their decisions, often to the detriment of firm value. For example, managers apply the same discount rate to projects with different risk (Kruger et al. 2015), anchor the cost of capital on prior deals (Dougal et al. 2015), incorporate sunk costs in project evaluation (Guenzel 2021), rely excessively on the CAPM in estimating the discount rate (Dessaint et al. 2021), and improperly account for idiosyncratic risk (Decaire 2021). We add to this research by revealing managerial heuristics in capital budgets and offering micro evidence on their economic consequences.

We also expand the literature on intra-year patterns in corporate investment. So far, this literature has mostly focused on the role of tax incentives and earnings management. Kinney et al. (1993) and Xu and Zwick (2022) show that firms are more likely to place equipment in service in the fourth quarter of the fiscal year to maximize tax benefits from depreciation. Research in accounting finds that firms manipulate year-end earnings by strategically timing income recognition from asset sales (Bartov 1993), delaying R&D and maintenance investments (Dechow and Skinner 2000), managing expenses (Cohen, Mashruwala, and Zach 2010), and overproducing to reduce the reported cost of goods sold (Roychowdhury 2006). As discussed, our findings are distinct from the tax management and earnings manipulation channels and hold in settings where these channels are muted. In complement to this work, we highlight a less explored mechanism—managerial spending budgets. Our study is among the first in this literature to offer high-frequency project-level evidence and evaluate real outcomes on product prices, sale quantities, and contribution margins. In its focus on projects, our paper is closest to Liebman and Mahoney (2017), who find that the U.S. government accelerates spending on procurement contracts in the final week of the year.

Finally, we add to the literature on the practice of capital budgeting. While capital budgeting is one of the most fundamental corporate decisions, field evidence on firms' budgeting practices has been scarce because project investments and their outcomes are typically unobservable, and even aggregate financial data are available at only quarterly levels, obfuscating the analysis of managerial behaviors. Yet, survey evidence suggests that managers employ various shortcuts and rules of thumb in capital budgeting decisions (Graham and Harvey 2005), and the overwhelming majority (78%) of executives are willing to sacrifice value to accommodate various financial incentives (Graham, Harvey, and Rajgopal 2005). Graham Harvey, and Puri (2015) show that across all of the financial policies in their survey, top executives are most likely

to delegate capital spending to their subordinates and, in doing so, 42% admit to relying on a "gut feel" as an important factor in the allocation decisions. Our paper studies the foundation of such delegation decisions via annual budgets and traces the effects of budgeting rules on project outcomes.

1. Institutional Details

1.1. Economic Significance

Research identifies advertising as one of the three main pillars, along with capital expenditures and R&D, that underpin a firm's competitive position and support its business strategy (Telser 1960; Comanor 1967; Spence 1980). Panel A in Figure 1 shows that the average U.S. firm spends $0.60-0.85 in advertising for each dollar of CapEx. This measure has been increasing over time, consistent with a growing importance of advertising in the allocation of corporate resources. Panel B shows that advertising expenditures are comparable in magnitude to R&D, with the average firm spending $0.80-$1.55 on advertising for each dollar of R&D.

The advertising industry has an important intra-year cycle characterized by two broad seasons in the market for TV ads. The upfront ads run between mid-May and late June (Geving 2018), and about 70% of the annual TV advertising dollars are allocated at that time (Shapiro et al. 2021). This period provides advertisers with early access to the upcoming year's most valuable primetime slots. During the remaining period, from July through December, advertisers allocate the "remnant" slots, which air in the month of purchase, mostly during lower-visibility hours outside of primetime.

1.2. Rigidity and Anchoring in Annual Budgets

Survey evidence highlights two characteristics in budget allocations: (1) intra-year rigidity and (2) year-to-year anchoring (Agrawal 2020). The first attribute—intra-year rigidity—indicates that budgets are allocated at the start of the fiscal year, remain fixed for its duration, and get refilled after the yearend. For example, 90% of executives report that their budgets during the fiscal year have no systematic adjustments to dynamic corporate objectives. The second attribute—year-to-year anchoring—indicates that budgets are sticky over time. The majority of executives (62%) note that they use the previous year's budget as a reference point for the next year's budget and perform little to re-evaluation. Moorman (2021) finds that 41% of executives

set the next year's budget based on the prior year's budget, and another 21% calculate the next year's budget as a proportion of expected revenues, also based on prior year's revenues. This lack of adaptive evaluation induces temporal persistence in budget allocations.

Figure 2 illustrates this temporal persistence in advertising expenditures. The figure plots the relationship between the previous year's budget (x-axis) and the next year's budget (y-axis). The scatterplot of realized advertising expenditures aligns closely along a 45-degree line, indicating nominal rigidity. Table 1 in the Internet Appendix (hence Table IA.1) confirms this pattern in a regression setting shows. The year-over-year growth rate coefficient is 1.06, and the R-squared is 0.91 (column 2).

1.3. Fiscal Year as a Budgetary Cycle

A firm's advertising budget follows its fiscal year. Panel A in Figure 3 shows the distribution of the fiscal yearend dates for the firms in our sample. A slight majority of firms (59%) have a fiscal year that coincides with the calendar year. For the remaining firms, the fiscal yearend falls on other months, with a slightly higher frequency at the end of calendar quarters (March, June, and September).

A firm's choice of the fiscal yearend often takes into account the seasonality in its product sales. However, most firms in our sample produce a variety of products with different seasonal patterns. The average (median) firm in our sample is active in 9.83 (7) product categories. Given the diversity of a typical firm's product mix and other considerations in selecting a budgetary cycle, there is significant variation in the fiscal yearend across firms producing the same products.

Panel B in Figure 3 depicts the number of distinct fiscal yearend months for a given product category, such as shampoo, cereal, or shaving products. The figure shows that 93% of product categories are offered by firms whose fiscal yearends in different calendar months. The average (median) product category is associated with 6.6 (6) yearend months, and average yearend month includes 160 (169) distinct product categories. This granularity allows us to exploit the variation in budgetary deadlines across firms but within the same product category, thus accounting for seasonality in product sales.

2. Data and Summary Statistics

Our main data come from the Nielsen Retail Measurement Service and include (1) Nielsen Ad Intel and (2) scanner data. We obtain both datasets from the Kilts-Nielsen Data Center at the University of Chicago.

These data provide us with detailed characteristics of firms' advertising projects and granular measures of project performance broken down by product category and local market.

2.1. Advertising Projects

The Nielsen Ad Intel dataset provides project-level data on firms' advertising expenditures across the full spectrum of advertising mediums, including TV, radio, print, outdoor, coupons, cinema, and digital ads. The unit of observation is an advertising project, such as a TV commercial, a magazine advertisement, or a targeted ad campaign. For each observation, we obtain (1) project characteristics (such as the advertising firm, advertised product, advertising medium, creative description, and airing time for TV and radio ads), (2) project costs, and (3) project outcomes (such as viewership and customer reach, ad impressions, and the maximum target universe).

Our sample contains 6.1 million projects that collectively amount to $608.5 billion in spending. Panel A in Table 1 describes project characteristics. The mean project targets customers in nine Designated Market Areas (DMAs)[1], with campaigns lasting for 41.0 days. The most frequent project categories include TV (2,306.6 projects per firm-year), coupons (102.1), and web campaigns (81.2). We note that some firms in our sample do not actively advertise for some years, and some ad campaigns involve more than one advertising medium. Since the frequency of project reporting (daily, weekly, and monthly) in Ad Intel varies across the advertising mediums, we aggregate project data at the monthly frequency to achieve consistency in measurement.

2.2. Product Sales

To measure the impact of advertising projects on product sales in targeted markets, we augment the advertising data with transaction-level scanner data from the Nielsen Retail Measurement Service. These data come from point of sales electronic systems in retail stores and compile all of a store's transactions for the covered period, including details on product quantities, prices, and sale time stamps.

---

[1] National markets are distinctly defined in AdIntel, and some advertising mediums do not directly provide the regional coverage of specific ads.

The scanner data include over 100 billion transactions for 4.5 million products and collectively exceed $2 trillion in sales. These transactions account for 53% of all sales in grocery stores, 55% of sales in drug stores, and 32% in mass markets. While the scanner data cover only sales in physical retail stores, such sales account for the overwhelming majority (90-96%) of consumer spending in the U.S. during our sample period of 2010-2019 (Federal Reserve Bank of St. Louis).

To link each product to its manufacturing firm, we use the Universal Product Code (UPC), a unique product identifier embedded in the barcode and scanned at the point of sale. Specifically, we match the UPC to the Global Trade Item Number (GTIN) database, which links firms to their products via a system of barcodes. This database is maintained by GS1 (Global Standards 1), an international standards organization that administers the global system of barcodes.

Next, we merge data on advertising projects with the scanner dataset by linking the product categories in the Ad Intel dataset with the related category in retail scanner data and confirming the firm identity in both datasets. When an advertised product is too broad to establish a unique and unambiguous match to the scanner data, we exclude such observations.

2.3. Firms

Our sample includes 539 firms, of which 527 are publicly traded, 113 are privately held for at least a portion of the sample period (2010-2019). For each firm and every sample year, we collect the date of the firm's fiscal yearend.

For public firms in the sample, we collect the fiscal yearend date from Compustat and Global Compustat, using the variable "datadate". For private firms, we construct a panel dataset of fiscal year dates from Lexis Nexis or by extrapolating dates reported in Compustat once they turn public. While this allows us to replicate and expand our findings with private firms, we restrict our main analysis to public firms to ensure precise measurement of yearend dates. Across all firms in our sample, 4.7% change their fiscal year dates during our sample period. Those switchers move their yearend dates by 6.9 months when making the change, on average.

For all public and private firms, we manually collect a firm's organizational structure from the Lexis Nexis Corporate Affiliations database. These data provide insights into the internal hierarchy of the firm,

including the subordination of its business units, the number of hierarchical layers between managers, and the managers-to-subordinates ratio at an annual frequency. These data offer several benefits over the traditional measures of firm organizational structures from Compustat segment data. Compustat segment data are often disconnected from firms' true operations (Price Water House Coopers, 2008), and firms have been known to game accounting rules by adjusting their organization structure to avoid reporting revenue metrics for sensitive divisions (Georgiev 2017). In contrast, Lexis Nexis uses in-house specialists to collect corporate organization structures via periodic reviews.

Panel B in Table 1 presents summary statistics for our sample firms. The average firm advertises 9.8 product categories, spends $104.4 million per year on advertising, and initiates 1,931 ad projects per year. The average firm has 3.1 hierarchical layers and each headquarters' direct report operates 1.6 business units. The additional breakdown of these statistics between public and private firms shows that public firms organize advertising campaigns for more products and initiate more projects.

Panel B provides additional financial statistics for publicly traded firms. The average public firm owns assets with a book value of $29.4 billion, commands market equity of 32.7 billion, invests $1.7 billion (3.9% of total assets) in capital expenditures, spends $1.1 billion (5.7%) on R&D, and spends $0.5 billion (4.5%) on advertising, among the firms reporting these accounts in their financial statements. These data confirm that advertising expenditures are economically important in resource allocation, and their amount is comparable to CapEx and R&D spending for the sample firms.

3. Main Results

3.1. Descriptive Evidence: Managerial Budgets and Intra-year Spending

We begin our analysis with studying how managerial spending evolves during the budgetary cycle and how it varies with the remaining budget for the fiscal year. Since we do not observe firms' internal budgetary projections, we approximate the current year's advertising budget by the previous year's realized advertising expenditures. This proxy builds on the evidence of nominal rigidity and year-to-year anchoring in annual budgets in survey evidence (Moorman 2021) and in our data (Table IA.1).

Figure 4 studies how managerial budget constraints affect intra-year spending. The figure depicts monthly spending on advertising projects in event time relative to a firm's fiscal year, where month zero

denotes the start of the year. Panels A-D show how the intra-year spending evolves if the manager depletes the current year's budget (proxied as above) by month 12, 11, 10, or 9, respectively. The vertical bars correspond to the 95% confidence intervals based on the standard errors clustered by firm.

The results across all panels in Figure 4 yield a consistent pattern. Managers who reach a budget constraint early in the fiscal cycle cut their spending until their budget is refilled at the start of the next year. These spending cuts account for up to 60% of the average monthly spending. After a manager reaches a budget constraint, the decline in spending persists for all of the remaining months of the fiscal year and accelerates towards the fiscal yearend. After the budget is refilled in month 0, the spending rebounds to its average monthly levels.

Table IA.2 provides suggestive evidence on why some managers might deplete their budgets early. This table shows that early budget depletions are positively related to competitive actions of the firm's rivals, such as a new product launch, that likely necessitate unplanned advertising expenditures. Panel A in Table IA.2 shows that the likelihood of budget depletion is strongly positively related to the launch of a new rival product in the firm's product category. Panel B in Table IA.2 shows that the speed at which firms run into budget deficit during the fiscal year is strongly positively related to the intensity of the new rival product advertising campains.

Figure 5 focuses on intra-year spending in the presence of budget surpluses, using a similar event-time framework as in Figure 4. Panel A focuses on fiscal years when a manager is running a budget surplus.[2] For ease of comparison, Panel A in Figure 5 restricts the analysis to the same set of advertising managers as in Figure 4 who deplete their budgets at least once during another year in the sample period. Panel A shows that the spending behavior of the same managers reverses sharply if they are running an intra-year budget surplus. Managers running below the last year's budget raise their spending during the final month of the fiscal year before the budget reset deadline. We estimate that the spike in spending during the final

---

[2] We approximate the remaining budgetary balance (surplus or deficit), using the previous year's realized expenditures. For example, we calculate the remaining budgetary balance before month 12 as follows:

Remaining budget by month 12 = 1 - $\dfrac{\text{Expenditure during } \textbf{first } 11 \text{ months}}{\textbf{Previous anchor point}}$

month of the year accounts for 88% of the estimated surplus, suggesting that managers spend nearly all of the remaining funds before the end of the fiscal year.

Panel B shows that the pre-deadline spike in spending in the presence of a budgetary surplus is not specific to the month of December or the end of a calendar year. This panel replicates the results for firms whose fiscal year ends in months other than December and shows a similar pattern.

Panel C shows the unconditional monthly spending on advertising projects for the full sample of firm-years. The figure shows that, on average, managers raise their spending sharply during the final month before the budget reset deadline. As a result, the average expenditures in the final budgetary month increase by 44%. The monthly spending reverts to normal levels immediately after the onset of the new fiscal year.

Survey evidence suggests managers tend to spend their budget surpluses because an unspent budget increases the likelihood of a downward budget revision for the following year. Table IA.3 verifies this prediction in our sample. This table studies how the allocation of the next year's advertising expenditures depends on the unspent budget balance remaining at the yearend, while controlling for the firm's sales growth and time-persistent firm heterogeneity in budgetary policies (firm fixed effects). The results show that the next year's realized budget spending is strongly negatively related to the approximate budget surplus at the end of the fiscal year, consistent with survey evidence.

In summary, project spending varies strongly with a manager's budget constraints and fiscal year deadlines. Managers running a budget surplus spend nearly all of it in the final month of the fiscal year, leading to a sharp increase in spending before budget deadlines. Managers who finish the year with unspent budget balances get smaller expenditures for the next fiscal year. Managers running a deficit halt their spending until the budget refill date and revert to normal spending at the onset of a new fiscal cycle.

3.2. Budgetary Cycles and Intra-Year Spending

This section offers formal evidence on intra-year variation in project spending and its relationship with managerial budget constraints and fiscal year deadlines.

Panel A in Table 2 studies unconditional variation in pre-deadline spending during the final month of the fiscal year. The dependent variable is the proportion of a firm's annual advertisement project

spending in a given fiscal month and measured in percentage points. The variable of interest is an indicator *Last month*, which equals 1 for project spending during the final month of the fiscal year, and 0 otherwise.

Column 1 shows the baseline specification without fixed effects. Columns 2-4 sequentially augment the specifications with month, year, firm and firm∗year fixed effects. In column 2, the month fixed effect absorbs seasonal patterns that affect overall retail spending (such as Christmas holidays or Easter). In column 3, firm fixed effects absorb firm-level advertising drivers that remain constant during our sample period, such as the firm's location, industry, and complexity. Column 4 replaces the firm and year fixed effects with firm∗fiscal year fixed effects, which account for the dynamic determinants of a firm's capital budgeting strategy in a given year, such as the variation in the firm's financial condition and budgetary rules. Column 5 includes product category fixed effects, effectively controlling for time-persistent product attributes, such as differences in competition and regulation, as well as the impact of advertising on sales for each product group. Column 6 replaces the previous fixed effects with product category∗month and product category∗fiscal year∗firm fixed effects. The inclusion of product category∗month fixed effects mutes the role of product-specific seasonal patterns (i.e., Halloween for candy and Christmas for toys), while the product category∗fiscal year∗firm fixed effects account for firm-specific product-level decisions during the fiscal year.

The results in Panel A show that managers sharply increase project spending during the final month of the fiscal year, as shown by the positive and statistically significant coefficient on the term *Last Month*. This effect is robust to absorbing various sources of heterogeneity and retains most of its economic magnitude as the empirical model is saturated with high-dimensional fixed effects. In the most restrictive specification in column 6, the point estimate on the indicator *Last Month* (coefficient = 2.81, *t*-statistic = 13.12) indicates that managerial spending during the last month of the fiscal year is about 34% greater than the average monthly spending in other months.

Panel B tests how the spike in the end-of-year spending varies with managerial budget constraints and the remaining budget allowance. This panel introduces an indicator, *Budget Depleted*, which equals 1 if the manager's spending for the current year has reached or exceeded the annual budget proxy. The main

variable of interest is the interaction term *Last month * Budget Depleted*, which captures the effect of budget depletion on yearend spending.

The results in Panel B yield two conclusions. First, the increase in yearend spending operates only for managers who have remaining budgetary funds, as proxied by last year's spending. Second, managers who deplete their budgets tend to reduce, rather than increase, their spending in the final month of the year, as shown by the negative and significant coefficient on the interaction term *Last month * Budget Depleted* across all columns. According to the most restrictive specification in column 6, a manager who reaches a private budget constraint in a given year cuts project expenditures by 3.50 percentage points[3] in the final month of the year relative to their normal end-of-year spending on the same product and at the same firm.

In summary, managerial spending rises during the last month of the fiscal year, but only for managers running a budget surplus. In contrast, project spending declines during the last month of the year for managers who reach their budget constraints. These results are robust to controlling for product-level seasonality in demand, firm-level budgetary policies, and the dynamics of capital availability at the firm.

3.3. Cross-Sectional Evidence

Variation across Firms

Table 3 studies how the pre-deadline spending of budget surpluses is associated with corporate governance, organizational complexity, and managerial expertise. The dependent variable is the proportion of a firm's annual advertising spending in a given fiscal month and measured in percentage points. To focus on the spending of budget surpluses, the sample is limited to observations where a manager is running a budget surplus by the start of the final month of the fiscal year, approximated as before. The main variable of interest is the interaction effect between the year-end spending (indicator *Last month*) and various governance and organizational characteristics. As before, we present specifications that account for product-level seasonality in advertising expenditures and customer demand by including Product category * month fixed effects. In select specifications, we also include Product Category * Fiscal Year * Firm fixed effects to absorb the baseline effect of time-varying firm and product characteristics.

---

[3] This magnitude combines all three regression coefficients from Panel B column 6 (3.5 = 5.68-6.29-2.89).

Panel A shows that the pre-deadline spending of budget surpluses is attenuated in the presence of blockholders, defined as shareholders with an ownership stake of at least 5%. This effect, captured by the negative and significant coefficients on the interaction term *Last Month * Blockholders*, persists across all columns, whether we focus on the number of blockholders (columns 1-2) or their combined ownership (columns 3-4).

Panel B finds that the pre-deadline spending of budget surpluses is magnified for cash-rich firms and attenuated in the presence of tighter financial constraints, consistent with the predictions of the free cash flow hypothesis in Jensen (1986 and 1989). In these specifications, financial constraints are measured by the Hadlock and Pierce (2010) index.

Panel C provides evidence that pre-deadline surplus spending is more common among firms with complex structures and a greater number of hierarchical layers. These results suggest that pre-deadline spending is more acute in opaque organizations where monitoring is likely more costly.

Panel D shows that surplus spending is curbed in the presence of CEOs with greater financial expertise, defined as graduate training in business and prior experience as a Chief Financial Officer (CFO). These results are robust to the inclusion of Product Category*Fiscal Year*Firm fixed effects, suggesting that the same firm is less likely to have pre-deadline spending sprees in the advertisement projects for the same products when it is run by a CEO with financial expertise.

Variation across Project Types

Figure 6 shows how managers allocate their advertising projects across advertising mediums during the final month of the fiscal year and the surrounding months. We focus on the main advertising channels: TV, radio, print, online, and other (such as outdoor). We find that project allocations during the final month of the year appear to follow a largely similar pattern, with a slight increase in the share of other, less traditional mediums, and a slight decline in the share of projects in online advertising. In unreported results, we verify this pattern in a regression setting.

In summary, the pre-deadline surplus spending increases expenditures across all major project groups by advertising medium, with no significant changes in the project mix. The spending sprees are more prevalent in complex organizations with more hierarchical layers and substantial cash reserves. This

behavior is attenuated in the presence of stronger monitors (blockholders) and financially savvy management.

3.4 Robustness and Alternative Channels

This section considers several alternative mechanisms that could explain a yearend increase in project spending. While such mechanisms are likely operative in our setting, we provide evidence that the effects of budget heuristics on managerial spending need not rely on such mechanisms. These analyses appear in Table 4, which replicates our baseline specification in Table 2 for various subsamples that target each of the alternative explanations.

Earnings management

Fiscal yearend marks an important benchmark for corporate earnings, and firms could alter their advertising spending in an effort to meet the annual earnings targets. To shut down the earnings management channel, Panel A shows that our main results remain robust in a sample of privately-held firms, a group largely unencumbered by analyst forecasts and free from the stock market pressure for earnings targets. Panels B and C replicate our main results for a subsample of public firms that are far away from their earnings targets, following the thresholds established in prior work (Almeida, Fos, and Kronlund 2015). In this subsample, the realized earnings are too far above or below the forecast, effectively muting the earnings management incentives. Panels B and C show that our results hold in a sample of observations where firms beat or miss their annual earnings forecasts by more than 10% or by more than 10 cents per share, respectively.

Tax management

Prior research shows that firms are more likely to place fixed assets in service in the fourth quarter of the fiscal year to maximize tax benefits from depreciation (Kinney et al. 1993 and Xu and Zwick 2022). This pattern results in an increase in CapEx spending. In contrast to investment in fixed assets, most advertising expenditures are expensed rather than capitalized, with the exception of direct response advertising costs and business startup advertising expenses. To minimize the effect of tax management incentives, we focus on a subsample of firms that do not pay taxes and have not paid them for at least three trailing years due to negative earnings. Panel D shows that our results remain statistically significant at 1% and comparable in

17

economic magnitude across all specifications for firms with negative earnings and minimal tax management incentives.

Sales incentives

Sales and marketing executives often have annual sales targets and face additional financial incentives to achieve these sales targets by the end of the fiscal year. Previous work shows that nonlinear payoffs from sales targets may lead marketing managers to offer steep price discounts and other promotions to accelerate the timing of customer purchases (Oyer 1998). This pattern would be consistent with a yearend increase in sales, but is unlikely to explain the decline in project expenditures for managers who have depleted their annual budgets.

Following Oyer's intuition about measuring sales incentives with the intensity of price discounts, we construct a product-level measure of price discounts in the final month of the fiscal year. Specifically, using transaction-level data at the product level, we measure the average sale price for a given product of the focal firm in the final month of the year relative to its average price in other months. Table IA.4 shows that prices do not exhibit significant seasonal patterns throughout the fiscal year. The discrepancy with Oyer (1998) evidence could, at least in part, be attributed to using different data sources. We use product level data, whereas Oyer (1998) relies on accounting data from Compustat. We then construct a measure of sales incentives based on whether a product receives promotional pricing during the final month of the year.

Since the Nielsen scanner data includes the final price paid for the item, it captures the effect of any promotions, discounts, or coupons applied to the product. We argue that the revealed sales incentives are weaker for products that show no change in pricing in the final month of the fiscal year. Panel E in Table 4 shows that our results hold robustly for products that show no changes in sales incentives based on product pricing.

Seasonality and the Timing of the fiscal yearend

Retail sales have important seasonal patterns that could affect advertising expenditures. First, the fiscal year of the majority of firms coincides with the calendar year, and the last month of the calendar year is one of the most active periods for holiday shopping. Our main analyses control for product-specific seasonality in

sales by using product category * month fixed effects. In Panel F of Table 4, we find similar results after we remove all firms with the fiscal yearend in December and decouple the end of the fiscal year from the period of holiday shopping.

Second, firms that select their fiscal year to differ from the calendar year often take into account their business seasonality in establishing the yearend deadline. Since the average firm advertises for 9.8 product categories, the choice of the fiscal year, typically guided by the seasonality in the main products, is then imposed on all of the firm's products. To the extent that the firm's choice of the fiscal year is guided by its core business, the fiscal year deadlines are largely exogenous for the firm's noncore products. Panels G and H show that our results hold for the subsample of a firm's noncore products that account for less than 1% of sales and advertising budgets, respectively.

Finally, we provide additional evidence that the spike in yearend spending is linked to the specific end of the fiscal year deadlines rather than other temporal factors or latent firm characteristics. Panel A of Table IA.5 focuses on a subsample of firms that change their fiscal year. After the fiscal year deadlines are shifted in time, the increase in project spending disappears before the previous end-of-year deadlines and reemerges in the month immediately preceding the new deadlines.

Using the firms that change the end of their fiscal year, Panel B of Table IA.5 augments the set of fixed effects in the analysis to include product category*year*firm fixed effects. This allows us to precisely account for the seasonality associated with each firm's product category. The results show that the increase in spending in the final month of the fiscal year is not related to firms' product category specific seasonal patterns.

In summary, the pre-deadline increase in managerial spending of budgetary surpluses cannot be explained by earnings management incentives as it holds for private firms that do not report quarterly earnings. This pattern is also unlikely to be explained by tax management strategies as it holds for firms that do not pay taxes. Finally, the results are not driven by sales incentives as they persist for products that offer no price incentives to stimulate sales. The effects are specific to budgetary deadlines, as a change in the fiscal year leads to a temporal shift in the pre-deadline spending.

4. Project Outcomes

This section evaluates the performance of pre-deadline projects and their impact on project sales in targeted markets. We then investigate the economic mechanisms that could explain the project outcomes.

4.1. Project Performance

Table 5 studies the performance of advertising projects, using two standard metrics commonly used in economics for evaluating their efficacy (e.g., Shapiro et al., 2021). Columns 1-3 study the number of viewers reached per dollar of project spending. Columns 4-6 focus on the market penetration achieved per dollar spent. Higher values of both metrics correspond to a higher return on the project's investment in terms of its customer impact. The unit of observation is an advertising project, and project performance data is from Nielsen Ad Intel.

The results in Table 5 show that projects initiated during the last month of the fiscal year achieve weaker outcomes. This effect is captured by the negative and statistically significant coefficient on the interaction term of project spending and the indicator *Last month*, which captures the differential performance effects of projects initiated during the final month of the fiscal year. According to the point estimates in the most restrictive specifications (columns 3 and 6), a project initiated during the final month of the fiscal year generates 21% less viewership and 8% less market penetration per dollar invested, as compared to other projects in the same product category implemented by the same firm in the same year.[4]

Table 6 examines the effect of advertisement projects on the sales of targeted products. This analysis complements consumer analytics metrics with executed purchase transactions and captures the monetary impact of project spending. Panel A estimates the marginal effect of project spending on unit sales of the advertised product in the targeted markets. This specification controls for product prices and estimates a project's ad-to-quantity elasticity, as in Shapiro et al. (2021). Panel B examines the marginal effect of project spending on dollar sales of the advertised product and estimates a project's ad-to-sales

---

[4] These relative estimates are derived by dividing the coefficients on the interaction term that capture the marginal effects of project spending in the final month of the year by the baseline effect of project spending during the rest of the year.

elasticity. To accommodate a project's impact on consumer decisions over different time horizons, we estimate the marginal effect on sales in the month of the advertisement (column 1) and in each of the following three months (columns 2-4). To account for a lingering impact of the firm's earlier advertising campaigns for the same product, we control for the firm's ad spending in the trailing eleven months. To capture the spillover effects from the advertisements of other products in the same category, we control for ad spending in the same category by the firm's peers over the trailing eleven months.

The results in Table 6 yield two conclusions. First, advertising spending is associated with higher sales of the advertised product in targeted markets. This effect is stronger in the month of advertising and remains positive for the next few months with declining economic magnitudes. Second, advertising projects initiated in the last month of the fiscal year generate a significantly weaker sales response, whether measured by units sold (Panel A) or dollar revenues (Panel B). According to column 2 in Panel B, end-of-year projects generate 25% less sales revenue per dollar of project spending[5]. This differential is greater in the month of the advertisement and remains directionally negative in the following months.

In summary, end-of-year spending sprees are associated with weaker outcomes. Advertising projects in the final month of the fiscal year underperform other projects in the same product category implemented by the same manager earlier in the fiscal year. This conclusion holds for a variety of outcome measures, including customer reach, market penetration, and unit sales.

4.2. Economic Mechanism

We hypothesize that the decline in project outcomes is related to a mismatch between budget heuristics and investment opportunities. For example, budget considerations that may lead managers to spend their surplus before the end of year need not coincide with a corresponding rise in investment opportunities. In this case, an increase in project spending driven by budgetary pressures will lead to the stepping down in project quality, resulting in weaker outcomes. Alternatively, managers who deplete their budgets before the refill deadlines tend to cut spending, and such spending cuts may forego valuable investment options.

---

[5] This estimate is derived by dividing the coefficient on the interaction term that captures the effect of end-of-year spending (coefficient = -0.01) by the baseline effect of project spending for the rest of the year (coefficient = 0.04).

Panel A in Table 7 tests the hypothesized mechanism by exploiting temporal variation in investment opportunities in the market for TV advertising, where attractive primetime slots are released for sale between mid-May and late June in select media markets. Panel A studies end-of-year spending patterns at firms whose fiscal yearend deadlines occur during the period when primetime slots become available for booking in their media market. This panel introduces an indicator *Upfront season*, which equals 1 for firms whose fiscal yearend coincides with the release of primetime slots in the respective market, and 0 otherwise. This institutional feature allows managers to carry forward their spending by prepaying future primetime slots rather than spending their surplus only in the current month and proximate weeks of the year.

The results in Panel A show that the relaxation of budget spending deadlines (accommodated by the prepayment of future primetime slots) eliminates most of the spike in the immediate expenditures for projects run in the final month of the year. This effect is captured by the negative and significant interaction term *Last month * Upfront season*. The negative point estimates on the interaction term nearly offset the unconditional increase in spending on projects slated for the last month of the year, captured by the indicator *Last month*.

Panel B in Table 7 tests the hypothesis that budget constraints lead managers to forego investment opportunities and restrict their responses to competitive developments. As before, the dependent variable is the monthly spending on advertising projects. This table shows two patterns. First, a firm's project spending is strongly responsive to the spending of its peers in the same product category, as shown by the positive and significant coefficient on the term *Peer spending*. Second, early budget depletion restricts managers' ability to respond to the actions of their peers, as shown by the negative interaction term *Peer spending * Depleted budget*. The negative point estimates on the interaction term nearly offset the baseline response to peers' actions, suggesting that budget depletions mute the firm's responsiveness to its rivals. These results also suggest that when budget constraints become binding, managers are likely to forego project opportunities that their peers consider valuable.

In summary, budget heuristics introduce constraints that diverge from investment opportunities. This divergence is associated with weaker project outcomes. When spending deadlines are relaxed with the opportunity to carry forward unspent balances, the immediate overspending disappears. When budget

constraints become binding, managers stop responding to the investments of their peers and likely forego valuable projects.

5. Governance and Budgeting Alternatives

This section investigates how a firm's resource allocation would change in the absence of fixed budgets. We discuss the tradeoffs from removing fiscal year budget allowances and identify governance actions that lead to such policy shifts.

5.1. Zero Based Budgeting

The allocation of corporate resources inside the firm need not rely on fixed budgets or follow the fiscal year. In fact, standard corporate theory models the allocation of resources inside the firm as a continuous, rather than intermittent process, in which firms direct resources to arising opportunities without sharp spending deadlines, budgetary cycles, or predetermined allowances. A pay-as-you go approach to capital budgeting is feasible in practice and has been growing in popularity over the recent decade. Such a flexible allocation policy with no fixed budgets is commonly labeled zero-based budgeting (ZBB).

Zero-based budgeting is a method of resource allocation that starts with a 'zero base' and allocates funds in response to arising project opportunities without a guaranteed spending amount or a nominal link to prior year's expenditures. Zero-based budgeting requires project managers to justify each project and build their expenditures from scratch rather than using the prior year's budget as a starting point.

An advantage of ZBB is that it accommodates the dynamic nature of investment opportunities, avoids intermittent deficits or surpluses that fuel managerial opportunism, and removes most of the budgetary heuristics, such as anchoring, nominal rigidity, and sharp deadlines. These advantages come at the cost of more frequent project reviews and managerial involvement. Since ZBB requires a justification for each project, it may also curb experimentation and impose internal influence costs. Such costs arise when managers engage in unproductive lobbying for project approvals instead of receiving a standard, consistent budget allocation at the start of each year.

We identify firms that a shift from traditional fiscal-year budgeting to ZBB by searching for the mentioning of this policy and its variations in the transcripts of earnings calls, proxy statements, and annual reports for the firms in our sample. We manually confirm each match by reading the management's

discussion of the switch to ZBB and establishing the timing of the policy change. We also obtain management's stated rationale for the policy switch.

We find that ZBB received a wide adoption after the private equity firm 3G Capital, in cooperation with Warren Buffet and Berkshire Hathaway, acquired Kraft Foods in March 2015 and subsequently merged it with Heinz to form one of the largest food conglomerates. 3G Capital switched Kraft-Heinz budgeting policy from the traditional fiscal year budgeting to ZBB. The result of the policy switch was a significant reduction in costs, improvement in margins, and increased efficiency in capital allocations.

The rapid efficiency improvements at Kraft-Heinz triggered the adoption of ZBB by its peer firms and then by the peers of their peers, resulting a wave of ZBB adoptions in 2016-2019. Figure 7 illustrates this pattern. The data show a sharp increase in ZBB adoptions across firms after 3G Capital's widely publicized implementation of this policy at Kraft Foods.

We find that 35% of publicly traded firms in our sample switch from traditional budgeting to ZBB by the end of 2019. The most common rationale stated for the policy adoption is the intent to cut costs and improve investment efficiency. In the discussion of ZBB, many CEOs also mention the adoption of ZBB by Kraft-Heitz, their peers, or other firms where 3G Capital implemented this policy. Consistent with managerial disclosures, Table IA.6 shows that a switch to ZBB is positively related to the adoption of this policy by the firm's peers and the Kraft-Heinz deal. A firm's peers are defined as the ten closest industry peers in a given year, according to the Hoberg-Phillips index.

Table 8 studies how a firm's capital allocation during the fiscal year changes with the adoption of ZBB. This table re-estimates our baseline analysis of intra-year capital allocation after introducing the indicator *ZBB*, which takes on the value of 1 for firm-years following the adoption of zero-based budgeting, and 0 otherwise.

Panel A in Table 8 shows that the adoption of ZBB eliminates the end-of-year spike in spending. In particular, the unconditional spike in spending during the last month of the year, captured by the term *Last month*, is fully outweighed by the negative and significant interaction term *Last month * ZBB*. Columns 4-6 show that this conclusion holds in specifications with firm * year fixed effects, which compare the

24

spending policy of the same firm around the adoption of ZBB, as well as account for time-varying determinants of ZBB adoption.

The results in Panel A provide additional insights into the mechanism underlying the unconditional increase in pre-deadline spending under traditional annual budgeting. The disappearance of the yearend effect with adoption of ZBB indicates that the baseline effect of pre-deadline spending is driven by budgetary considerations rather than alternative mechanisms, such as tax management or earnings management, which remain unchanged after the ZBB adoption.

Panel B in Table 8 shows that the adoption of ZBB does not restrict a firm's responsiveness to competitive developments. The results show that after the adoption of ZBB, a firm remains equally agile in its sensitivity of its spending to the spending of its peers, a proxy for competitive developments and market opportunities. Overall, the combined evidence in Panels A and B suggests that the additional procedures for project approval under ZBB eliminate pre-deadline spending sprees but do not restrict a firm's responsiveness to the competition.

Table 9 studies the effect of ZBB adoption on the performance of yearend projects, following the same specification as in the main analyses of project outcomes. This table estimates the marginal effect of project spending on unit sales (Panel A) and dollar sales (Panel B) of the advertised product in the targeted markets. The results show that after the adoption of ZBB, the underperformance of yearend projects disappears, consistent with eliminating spending sprees that lead to the stepping down in project quality.

The results in Table 9 also suggest that the underperformance of yearend projects before the adoption of ZBB is linked to budgetary motives rather than alternative channels. The results in this table confirm that the unconditional underperformance of yearend projects under standard budgeting policies cannot be explained by product-specific or industry-wide seasonality ad pricing or their impact on sales, since patterns are unaffected by a given firm's changes in budgeting policies.

In summary, the adoption of zero-based budgeting largely eliminates the yearend spike in project spending and closes the performance gap of pre-deadline projects. The reversal of these yearend patterns suggests that they are linked to budgetary motives rather than alternative channels that remain unchanged with ZBB adoption.

5.2. Governance

If the traditional annual budgeting embeds frictions in resource allocation, why do many firms continue to follow this practice rather than embracing a more flexible approach unencumbered by persistent heuristics, fixed spending allowances, and rigid deadlines?

Field evidence from consulting firms suggests that a shift away from the standard budgeting practices meets with strong resistance from managerial staff who stand to lose their control rights over annual spending allowances. McKinsey & Company's summary report on the budgeting practices at over 1,500 firms concludes that a shift away from fixed annual budgets to ZBB generates cost savings of 10-25% and generates higher long-run returns. However, a key challenge in implementing such a policy is to "unlock that tight grip that managers have over their budgets" (McKinsey & Co. 2018). Similarly, Bain & Company's Management Tools Survey suggests strong internal resistance to ZBB by the middle management. In this survey, ZBB gets the lowest scores in manager satisfaction among the 25 tools studied (Bain & Co., 2017).

Table 10 studies how a firm's insiders evaluate a shift from standard budgeting practices to ZBB. The dependent variable is one of the measures of an insider's internal assessment of their firm, such as the overall firm rating, the approval rate of its senior leadership and firm culture, and the likelihood to recommend the firm to a friend. The data comprise over 564,199 insider reviews for the sample firms compiled by Glassdoor, Inc, and the unit of observation is one review. The data provider offers additional services to employees, such as salary benchmarking, and, in return, requires an employee to provide an anonymous company review, salary disclosure, or interview discussion. This business model, which requires a submission of a review and personal authentication, produces a large volume of evaluations, while limiting the impact of outliers and the scope for manipulation. To draw a distinction between managers and rank-and-file workers, we introduce an indicator *Manager*, which is equal 1 for reviews by employees whose job title (embedded in the review) includes the words "manager", "director", "executive", or "senior." The omitted category corresponds to rank-and-file workers.

The results in Table 10 show that rank-and-file employees, such as production workers, clerical staff, and support roles, seem unaffected by the departure from fixed annual budgets. The coefficient on the term *ZBB* for this omitted category (which accounts for 82% of reviews) is statistically insignificant, has near-zero point estimates, and flips signs across specifications. However, a firm's managerial staff report a steep drop in their assessment of the firm, its culture, and senior management. For example, according to columns 1 and 3, a firm's adoption of ZBB is associated with a 3.3 percent decline in the managers' overall rating of the firm (*t*-statistic = 2.40) and a 4.0%[6] decline in their approval of the firm's culture (*t*-statistic = 3.34). These results suggest that some of the managers are reluctant to forfeit control over spending or absorb the private influence costs.

A shift in firm policies that faces some internal resistance often requires the involvement of strong principals with powerful incentives. Table 11 tests this hypothesis by studying the resource allocation of companies acquired by private equity firms. Panel A shows that firms with greater yearend spending are more likely to become a target of a private equity buyout, consistent with more potential for efficiency improvements.

Panel B compares the spending patterns at private equity-backed firms and publicly traded firms that operate in the same product categories but have no private equity involvement. The results show that the involvement of private equity principals eliminates end-of-year spending sprees. Columns 4-6 show that this conclusion holds when we compare project spending at the same firms before and after the private equity buyout. The addition of firm * year fixed effects in the right-hand side columns also helps account for selection of private equity targets.

Panel C compares the spending patterns at private equity-backed firms and other private firms. We find no evidence of yearend spending sprees in the presence of strong principals. Since our comparison group includes only private firms, the results in this panel suggest that the disappearance of the yearend spending sprees is not simply a "going-private" effect. Finally, Panel D shows that while the involvement

---

[6] We obtain those magnitude by dividing the regression coefficient by their respective sample average of 3.31 for the overall rating and 3.28 for the approval of corporate culture.

of private equity investors appears to temper yearend spending, such spending curbs do not restrict the firm's responsiveness to the spending campaigns of its peers.

In summary, a departure from fixed capital budgets to more flexible spending schemes generates dissatisfaction of corporate insiders. This effect is limited to managerial staff and does not arise for rank-and-file workers who typically have no spending budgets. A firm's choice between fixed annual budgets and flexible spending practices likely involves a tradeoff between efficiency improvements and higher managerial burden and internal lobbying.

4. Conclusion

This paper provides project-level evidence on managerial heuristics in capital budgeting and their effects on project outcomes and investment efficiency. Our findings make a step towards a better understanding of the benefits and pitfalls of delegating capital budgets as a common approach to resource allocation in the modern firm.

While most prior research has focused on chief executives and financial officers, our evidence indicates that managerial incentives at lower levels of a firm's hierarchy play an important role in a firm's resource allocation. Further analysis of this managerial group can provide new insights into firms' financial decisions and improve our understanding of the inner workings of a firm.

References

Aghion, P., Tirole, J., 1997. Formal and Real Authority in Organizations*, Journal of Political Economy* 105

Agrawal, A., Birshan, M., Grube, C., Maloney, M., Seth, I., 2020. Memo to the CFO: A New Approach to 2021 Budgeting Starts Now. *McKinsey Global Publishing*.

Bartov, E., 1993. The timing of asset sales and earnings manipulation*, Accounting Review* 840–855.

Bernanke, B. S., 1983. Irreversibility, Uncertainty, and Cyclical Investment. *Quarterly Journal of Economics* 98, 85-106.

Bloom, N., Sadun, R., Van Reenen, J., 2010. Does Product Market Competition Lead Firms to Decentralize? *American Economic Review* 100

Bloom, N., Sadun, R., Van Reenen, J., 2012. The organization of firms across countries, *The Quarterly Journal of Economics* 127, 1663–1705

Bolton, P., Dewatripont, M., 1994. The Firm as a Communication Network. *Quarterly Journal of Economics* 109, 809–839

Cohen, D., Mashruwala R., Zach. T., 2010. The use of advertising activities to meet earnings benchmarks: evidence from monthly data. *Review of Accounting Studies* 15, 808–832.

Comanor, W. S., 1967. Market Structure, Product Differentiation, and Industrial Research. *Quarterly Journal of Economics*, Volume 81, 639–657

Core, J., Holthausen, R., Larcker, D., 1999. Corporate governance, chief executive officer compensation, and firm performance, *Journal of Financial Economics* 51, 371–406.

Decaire, P., 2021. Capital Budgeting and Idiosyncratic Risk. Working paper.

Dechow, P. M., Skinner, D. J., 2000. Earnings Management: Reconciling the Views of Accounting Academics, Practitioners, and Regulators. *Accounting Horizons* 14, 235–250

Dessaint, O., Olivier, J., Otto, C., Thesmar, D., 2021. CAPM-Based Company (Mis)valuations. *Review of Financial Studies* 34, 1–66.

Dougal, C., Engelberg, J., Parsons, C., Van Wesep, E., 2015. Anchoring on Credit Spreads. *Journal of Finance* 70, 1039–1080.

Duchin, R., Sosyura, D., 2013. Divisional Managers and Internal Capital Markets. *Journal of Finance* 68, 387–429.

Gabaix X, Landier A., 2008. Why Has CEO Pay Increased So Much*? Quarterly Journal of Economics* 123, 49-100.

Georgiev, G. S., 2017. Too Big to Disclose: Firm Size and Materiality Blindspots in Securities Regulation, *UCLA Law Review* 64

Geving, B., The Basics of Media-Buying (2018), Tatari Inc. (Website consulted on August 12, 2022). Url link: https://www.tatari.tv/insights/basics-of-media-buying

Glaser, M., Lopez-de-Silanes, F., Sautner. Z., 2013. Opening the Black Box: Internal Capital Markets and Managerial Power. *Journal of Finance* 68, 1577–1631.

Graham, J. R. and Harvey, C. R., 2001. The theory and practice of corporate finance: evidence from the field. *Journal of Financial Economics*

Graham, J. R., Harvey, C. R. and Puri, M. 2015. Capital allocation and delegation of decision-making authority within firms. *Journal of Financial Economics*

Graham, J. R., Harvey, C., Rajgopal, S., 2005. The economic implications of corporate financial reporting, *Journal of Accounting and Economics* 40, 3-73.

Guadalupe, M., Wulf, J., 2010. The Flattening Firm and Product Market Competition: The Effect of Trade Liberalization on Corporate Hierarchies, *American Economic Journal: applied Economics* 2

Guenzel, M., 2021. In Too Deep: The Effect of Sunk Costs on Corporate Investment. Working paper.

Holmstrom, B., Ricart i Costa, J., 1986. Managerial Incentives and Capital Management, *The Quarterly Journal of Economics* 101, 835-860

Harris, M., Raviv, A., 1998. Capital Budgeting and Delegation, *Journal of Financial Economics* 50, 259-289

Jensen, M., 1986. Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *American Economic Review* 76, 323–329.

Jensen, M., Meckling, W., 1976. Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics* 3, 305–360.

Kamerschen, D.R., 1968. The influence of ownership and control on profit rates. *American Economic Review* 58, 432–447.

Kinney, M. R, Trezevant, R. H., 1993. Taxes and the timing of corporate capital expenditures*, The Journal of the American Taxation Association* 15, 40.

Kogan, L., Papanikolaou, D., 2013. Firm Characteristics and Stock Returns: The Role of Investment-Specific Shocks, *The Review of Financial Studies* 26, 2718–2759

Kruger, P., Landier, A., Thesmar, D., 2015. The WACC Fallacy: The Real Effects of Using a Unique Discount Rate. *Journal of Finance* 70, 1253–1285.

Liebman, J. B., Mahoney, N., 2017. Do Expiring Budgets Lead to Wasteful Year-End Spending? Evidence from Federal Procurement, *American Economic Review* 107, 3510-49.

Malenko, A., 2019. Optimal Dynamic Capital Budgeting. *Review of Economic Studies* 86, 1747-1778.

Monsen, R. J., Chiu, J. S., Cooley, D. E., 1968. The Effect of Separation of Ownership and Control on the Performance of the Large Firm, *The Quarterly Journal of Economics* 82, 435-451.

Moorman, C., 2021, Topline Report, *The CMO Survey.*

Price Water House Cooper, A practical guide to segment reporting, 2008.

Roychowdhury, S., 2006. Earnings management through real activities manipulation, *Journal of Accounting and Economics* 42, 335-370.

Telser, L. G., 1964. Advertising and Competition, *Journal of Political Economy* 72.

Shapiro, B. T., Hitsch, G. J., Tuchman, A. E., 2021. TV Advertising Effectiveness and Profitability: Generalizable Results From 288 Brands, *Econometrica* 89, 1855-1879

Schmalz, M., Zhuk, S., 2019. Revealing Downturns. *Review of Financial Studies* 32, 338–373.

Shin, H., Yong, H Kim, 2002, Agency costs and efficiency of business capital investment: evidence from quarterly capital expenditures, *Journal of Corporate Finance* 8, 139–158

Shivdasani, A., Yermack, D., 1999. CEO involvement in the selection of new board members: An empirical analysis, *Journal of Finance* 54, 1829–1853.

Spence, A. M, 1980. Notes on Advertising, Economies of Scale, and Entry Barriers, *The Quarterly Journal of Economics*, 95, 493–507

Weeds, H., 2002. Strategic Delay in a Real Options Model of R&D Competition, *The Review of Economic Studies* 69, 729- 747

Xu, Q., Zwick, E., 2022. Tax Policy and Abnormal Investment Behavior, working paper.

FIGURE 1: The Importance of Advertising Expenditures for US Firms

Panel A and B respectively plots the relative importance of advertising expenditures to firms' capital expenditure and research and development, for both the firms in our sample and all firms included in Compustat. To avoid implementing filters based on firms with no R&D (xrd = 0) or no capital expenditures (capx = 0), we estimate the dollar of advertising per dollar of other expenditure in two steps. First, we measure the average ratio a as: ratio_CAPX = xad/(xad+capx) and then we backout our measure of interest from: ratio_CAPX/(1- ratio_CAPX). We use the same approach for research and development.

FIGURE 1.1: The economic Importance of the Advertising Industry in the US
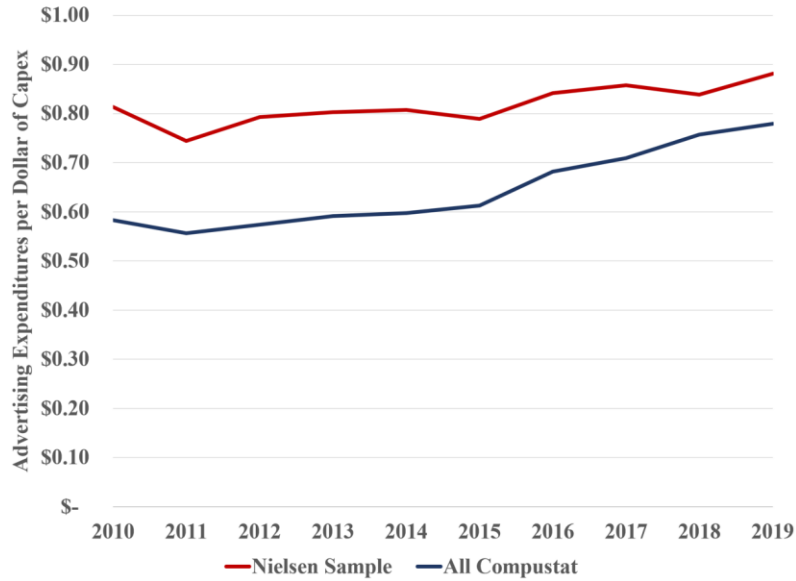
Panel A.: Advertising vs. CAPEX
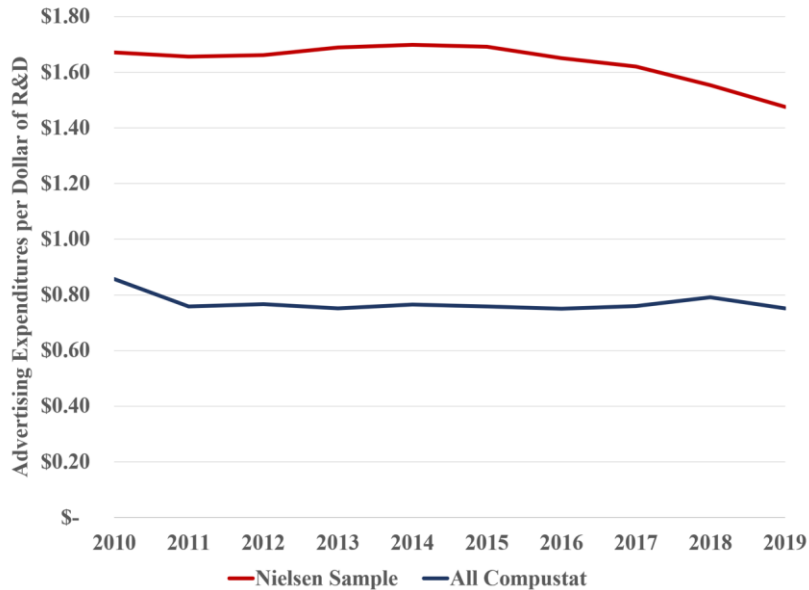
Panel B. Advertising vs. R&D

FIGURE 2: Time Series Budget Dynamic

Figure 2. This figure shows the persistence of year-over-year advertising spendings in our sample. The solid red line indicates the 45-degree line.
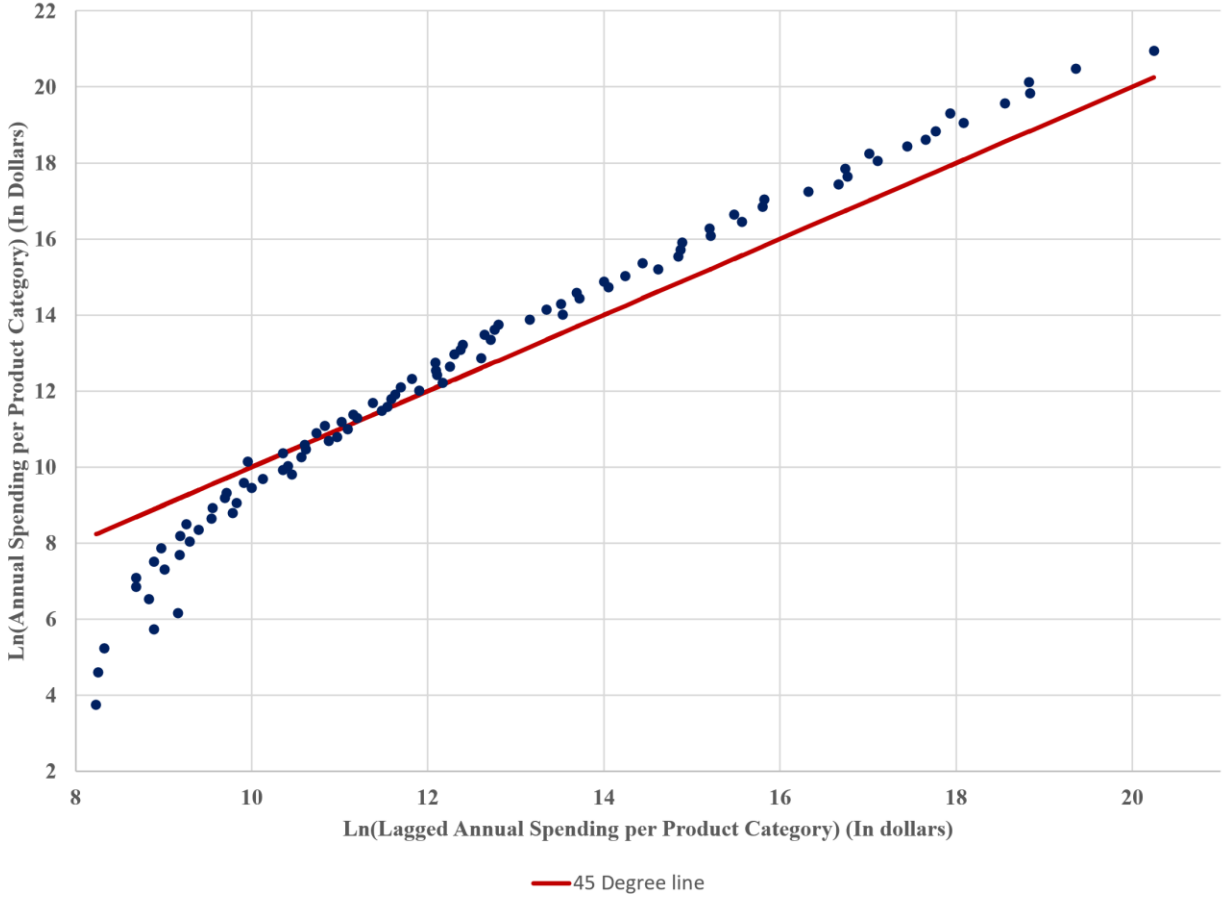
FIGURE 3: Yearend Month and Sample Properties

Panel A shows the number of firm-year observations that have the end-of-year month on a specific month. The number 1 on the x-axis indicates January, and number 12 denotes *December*. Between January and November, we observe 5,831 distinct firm-year observations, while we have 3,454 observations for the month of December alone. Panel B counts the number of end-of-year months for each product category in the sample. For example, a value of 2 indicates that firms engage in that product category with have the last month of their fiscal year on two distinct months in the sample (e.g., June and August).
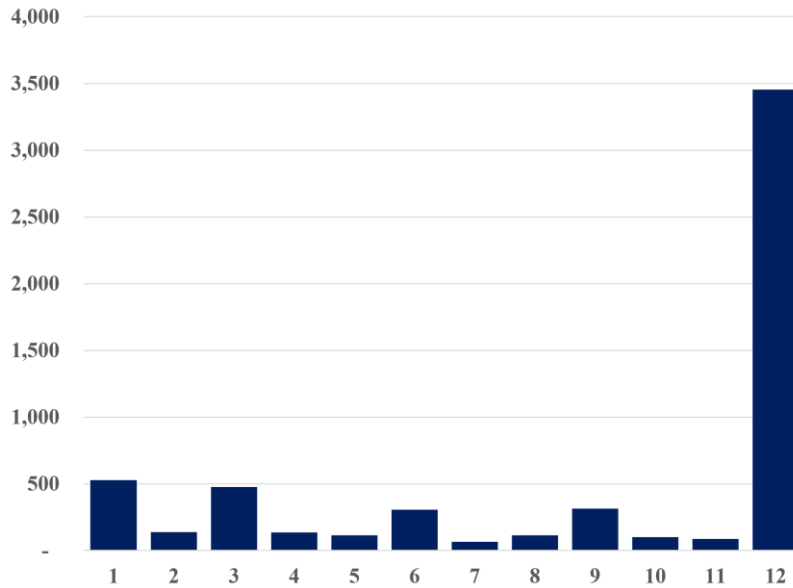
Panel A. Number of Firm-Year Ending on Months of the Calendar Year
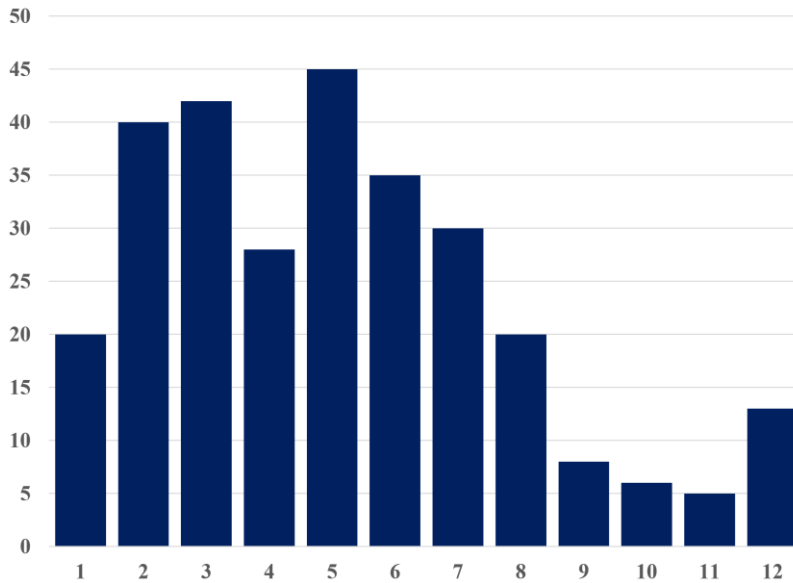
Panel B. Number of End of Year Month Per Product Category

FIGURE 4: Binding "Budgets" and End-of-Year Expenses

Panels A to D respectively plot the effect of busting last year spending level before a given month, on the following months spending levels. The red bands denote the 95th percentile confidence interval for errors clustered at the firm level.

Panel A: By Month 12

Panel B: By Month 11

Panel C: By Month 10

Panel D: By Month 9
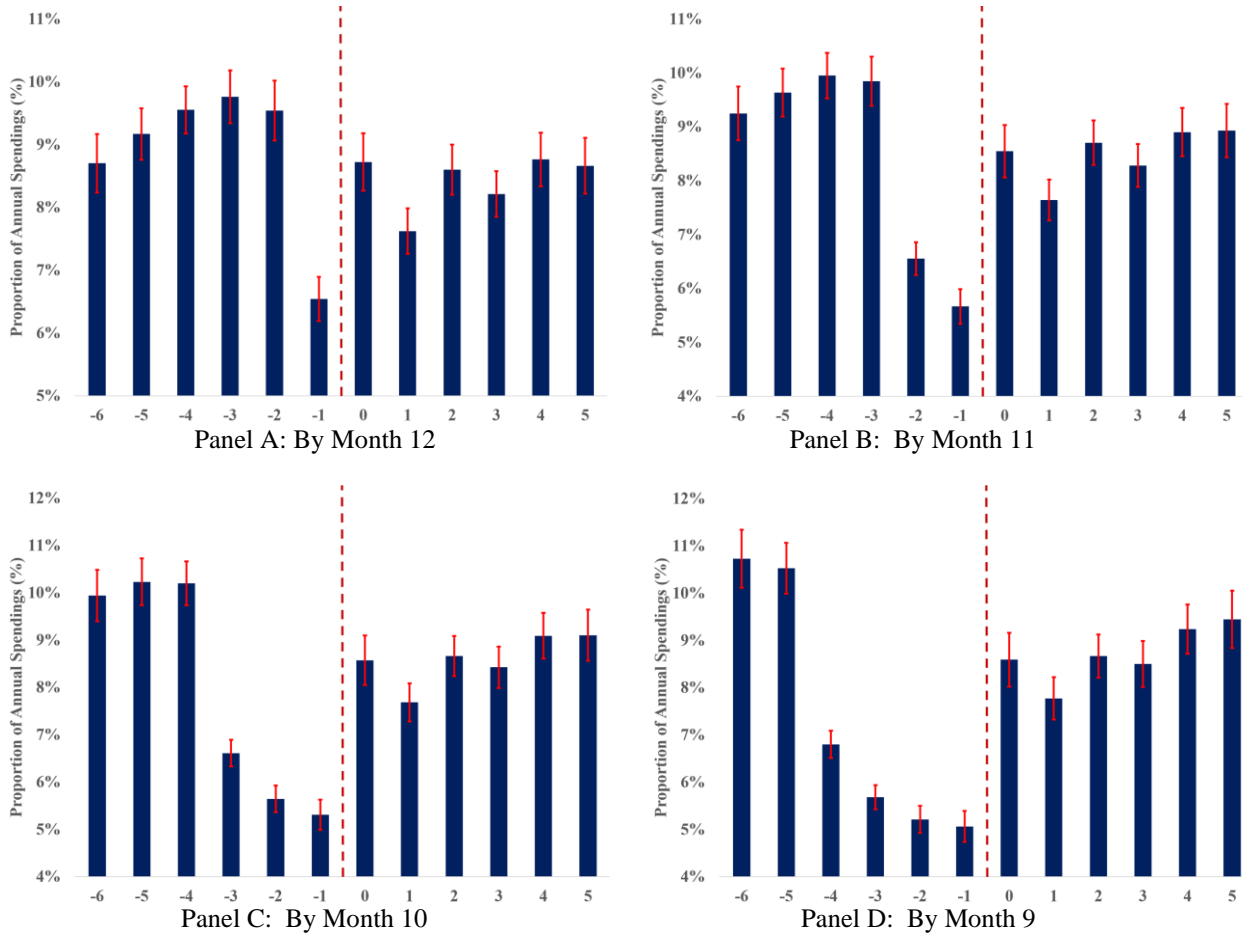
FIGURE 5: Firms' Monthly Spendings Over the Fiscal Year

The data used to produce the figure includes the 527 public firms from Nielsen AdIntel from 2010 to 2019. Panel A plots the monthly proportion of firms' annual spendings done around the end of firms' fiscal year, measured for firms running a budget surplus on the last month from the subset of product category that ran at least one deficit during the sample. The x-axis denotes the months around the end of the fiscal year. A value of 0 denotes the first month of the fiscal year, whereas month number -1 indicates the last month of the fiscal year. The red bands denote the 95th percentile confidences interval for errors clustered at the firm level. Figure 5.2. plots the same pattern for firms that depleted their budget at least once during the sample. Panel B plots the monthly pattern excluding firms that have the end of the fiscal year in December, and Panel C includes all public firms in the sample.
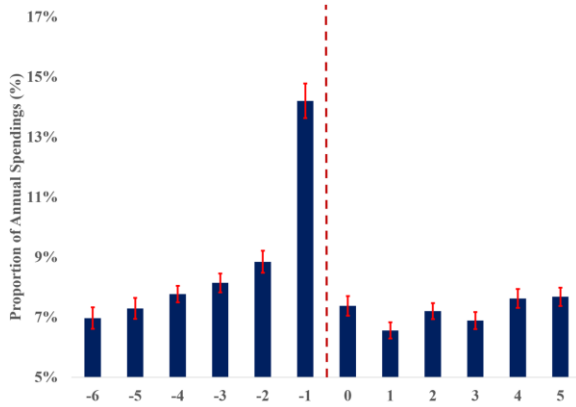
Panel A: Remaining Budget by Month 12 > 1/12
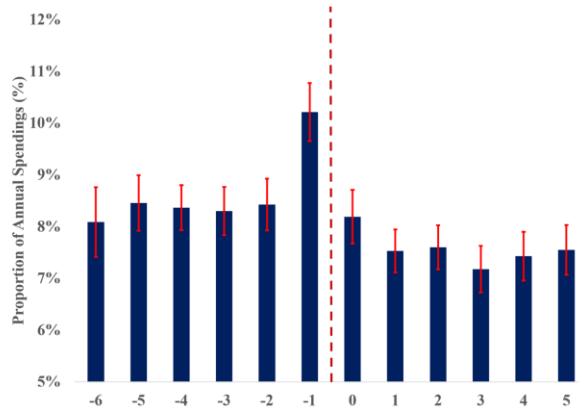
Panel B: No December Effect
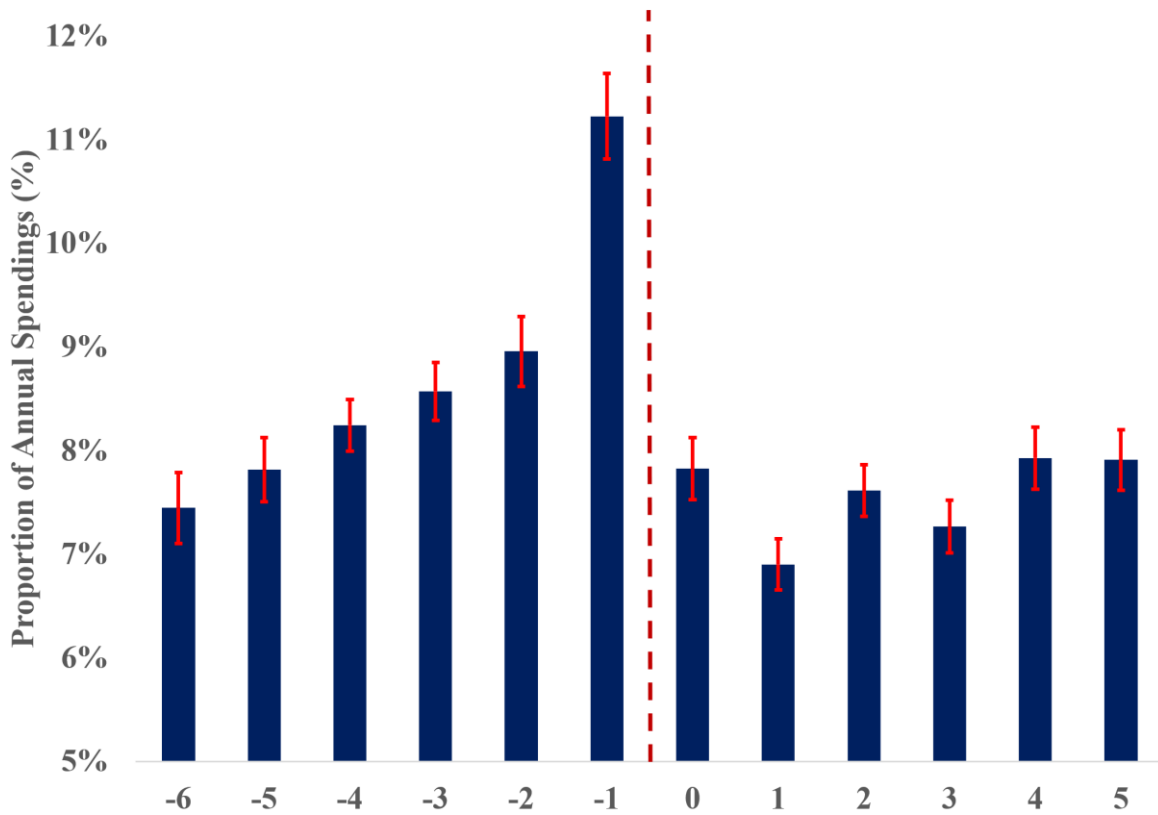
Panel C: Monthly Spendings

FIGURE 6 Advertising Mix over the Fiscal Year

Figure 6.1. plots the share of each advertising medium used by firms over the average fiscal year, showing the relative importance and stability of firms advertising preferences. Figure 6.2. shows the deviation from the annual mean for each advertising medium.
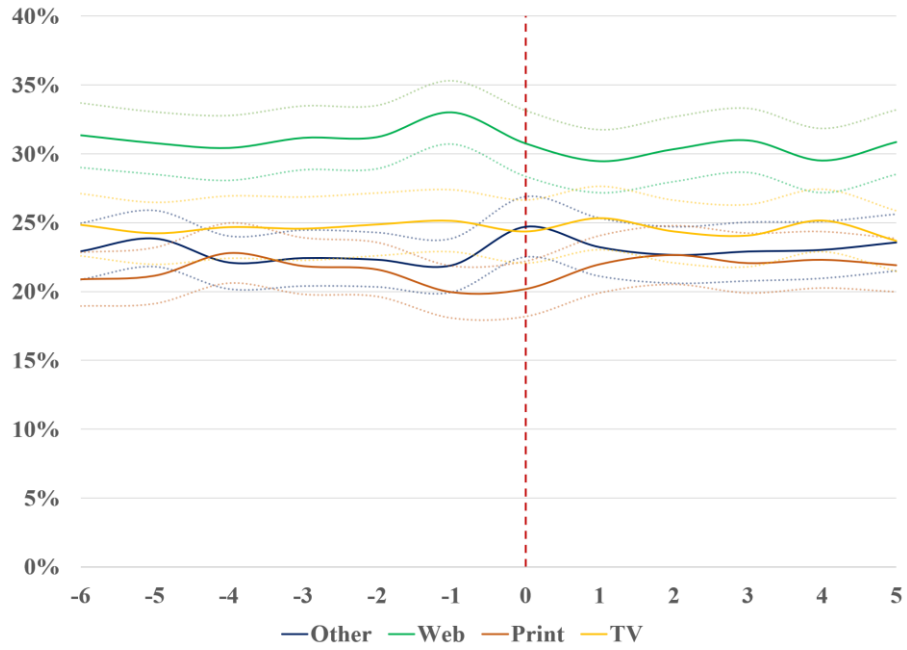
FIGURE 6: Share of Firms' Advertising Portfolio

TABLE 1: Summary Statistics

This table reports summary statistics. The sample consists of 539 firms, and 6,077,101 advertising projects in the United States over 2010-2019. The projects are advertising campaigns that combine multiple ads distributed across the country and over time. Panels A and B describe the sample projects, and firms respectively. Variable definitions appear in Appendix 1.

Panel A: Ads Characteristics

Variable	Mean	25th Pct.	Median	75th Pct.	Std. Dev.	No. Obs.
Ads Runtime (in days)	40.95	3.00	13.00	42.00	128.51	6,077,101
Number of Market Reached	9.34	1.00	2.00	8.00	20.07	6,077,101

Panel B: Firm Characteristics

Variable	Mean	25th Pct.	Median	75th Pct.	Std. Dev.	No. Obs.
All Firms						
No. projects per firm-year	1,931.44	14.00	182.00	1,188.00	5,121.25	5,289
No. projects per firm-year-advertising medium	464.29	3.00	8.00	46.00	2,513.62	22,057
No. of Hierarchical Layers	3.21	1.00	1.26	2.02	12.52	4,321
Flatness (No. Business Unit/ HQ Direct Reports)	1.55	1.15	1.38	1.82	0.51	2,688
No. of Product Categories	9.83	3.00	7.00	13.00	9.84	5,831
Annual Advertising Expenditure ($ Mil)	104.35	0.04	4.35	71.01	273.27	5,831
Private Firms						
No. of Product Categories	7.12	1.00	3.00	10.00	8.40	426
Annual Advertising Expenditure ($ Mil)	46.47	0.00	0.13	17.13	128.63	426
Public Firms						
No. of Product Categories	10.04	3.00	7.00	14.00	9.92	5,405
Annual Advertising Expenditure in Nielsen ($ Mil)	108.92	0.05	5.08	76.96	281.03	5,405
Compustat Variables						
Firm Assets (Total Assets$_t$ $ Bil)	29.37	1.13	4.73	22.74	67.03	4,912
Market Value ($ Bil)	32.70	1.07	5.44	27.16	84.16	4,912
Capex$_t$	1.27	0.03	0.14	0.69	3.74	4,909
Firm-level Investment Rate (Capex$_t$/Total Assets$_t$)	3.94	1.77	3.12	5.15	3.17	4,909
Research and Development ($ Bil)	1.10	0.00	0.06	0.56	2.76	3,451
Firm-level R&D Rate (R&D$_t$/Total Assets$_t$)	5.74	0.14	1.46	4.22	70.57	3,451
Advertizing Expenses ($ Bil)	0.54	0.02	0.10	0.42	1.21	3,422
Firm-level Advertizing Rate (Adv$_t$/Total Assets$_t$)	4.50	1.08	2.46	5.46	6.59	3,422

TABLE 2: Last Month of Fiscal Year Effects

This table studies how deadlines impact firms' resource allocation over the fiscal year by estimating the proportion of firms' annual spending done during the last month of the period using an OLS regression. The dependent variable $Spendings_{i,k,t} = \frac{Monthly\ Spending_{i,k,t}}{Fiscal\ Year\ Spending_{i,k,y}}$ for firm "i" in product category "k" on month "t", and fiscal year "y". The first variable of interest $Last\ Month_{i,t}$ is a binary indicator that equals 1 if it is the last month of the firms' fiscal year, and 0 otherwise. Panel B introduces $Budget\ Depleted_{i,t}$, a binary indicator equal to 1 if the manager is running a budget deficit for the product category, and 0 otherwise. Variable definitions appear in Appendix 1. The t-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%."

Panel A: Yearend Spendings	$Spendings_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	3.37***	2.62***	2.66***	2.65***	2.92***	2.81***
	(14.77)	(11.30)	(11.42)	(11.37)	(13.69)	(13.12)
R^2	0.00	0.01	0.01	0.02	0.04	0.11
F-Statistics	218.07	127.75	130.38	129.32	187.50	172.05
No. Obs.	413,202	413,202	413,202	413,202	413,124	413,124

Panel B: Binding Budgets and Yearend Spendings	$Spendings_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	5.78***	4.98***	5.01***	5.05***	5.30***	5.68***
	(19.15)	(16.93)	(16.99)	(17.17)	(18.93)	(20.12)
(β_2) Last Month$_{i,t}$ * Budget Depleted$_{i,t}$	-5.70***	-5.31***	-5.34***	-5.48***	-5.46***	-6.29***
	(-18.84)	(-18.65)	(-18.85)	(-19.37)	(-18.87)	(-21.34)
(β_3) Budget Depleted$_{i,t}$						
	-1.54***	-1.94***	-1.92***	-1.95***	-1.91***	-2.89***
	(-18.14)	(-23.03)	(-22.44)	(-22.35)	(-22.13)	(-22.20)
R^2	0.01	0.01	0.02	0.03	0.05	0.11
F-Statistics	470.68	422.62	444.28	438.37	467.72	413.54
No. Obs.	413,202	413,202	413,202	413,202	413,124	413,124
Month FE	No	Yes	Yes	Yes	No	No
Fiscal Year FE	No	No	Yes	No	No	No
Firm FE	No	No	Yes	No	No	No
Firm*Fiscal Year FE	No	No	No	Yes	Yes	No
Product Category*Month FE	No	No	No	No	Yes	Yes
Product Category*Fiscal Year*Firm FE	No	No	No	No	No	Yes

This table studies how deadlines impact firms' resource allocation over the fiscal year by estimating the proportion of firms' annual spending done during the last month of the period using an OLS regression. The dependent variable $Spendings_{i,k,t} = \frac{Monthly\ Spending_{i,k,t}}{Fiscal\ Year\ Spending_{i,k,y}}$ for firm "i" in product category "k" on month "t", and fiscal year "y". The first variable of interest $Last\ Month_{i,t}$ is a binary indicator that equals 1 if it is the last month of the firms' fiscal year, and 0 otherwise. Panel A investigated the role of blockholders, using two different metrics: (i) the number of blockholders, and (ii) the share of the firm owned by blockholders. A blockholder is defined as an investor that owns at least 5% of the firm's outstanding shares. The variable $Blockholders_{i,t}$ takes the value of 1 if the measure is above the sample median, and 0 otherwise. Panel B looks at the effect of $financial\ constraints_{i,t}$, using two proxies: (i) the Hadlock and Pierce index, and (ii) the cash on hand, which corresponds to cash/total assets. The variable $financial\ constraints_{i,t}$ takes the value of 1 if the measure is above the sample median, and 0 otherwise. Panel C evaluates the role of firm hierarchical structure by looking at (i) firm flatness, an indicator variable equal to 1 if the firm's number of units per headquarters direct reports is above the sample median, and 0 otherwise, and (ii) hierarchical layers, an indicator variable equal to 1 if the firm's number of hierarchical layers is above the sample median, and 0 otherwise. The variable $Complexity_{i,t}$ takes the value of 1 if the measure is above the sample median, and 0 otherwise. Lastly, Panel D studies the effect of CEO financial acumen using two measures: (i) MBA, an indicator variable equal to 1 if the CEO has an MBA and 0 otherwise, and (ii) experience as CFO, an indicator variable equal to 1 if the CEO occupied a CFO position before becoming the firm CEO. Variable definitions appear in Appendix 1. The t-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.

Panel A: Blockholders	$Spendings_{i,k,t}$			
	No. of Blockholders		Blockholders Ownership (%)	
	(1)	(2)	(3)	(4)
(β_1) Last Month$_{i,t}$	5.70***	5.07***	4.06***	3.44***
	(8.50)	(8.24)	(12.03)	(10.99)
(β_2) Last Month$_{i,t}$ * Blockholders$_{i,t}$	-2.97***	-2.90***	-1.22***	-1.10***
	(-4.04)	(-4.19)	(-2.72)	(-2.66)
(β_3) Blockholders$_{i,t}$	0.15**		0.05	
	(2.42)		(1.19)	
R²	0.00	0.11	0.00	0.11
F-Statistics	66.11	80.49	76.64	89.35
No. Obs.	413,202	413,124	413,202	413,124
Panel B: Financial Constraint	$Spendings_{i,k,t}$			
	HP Index		Cash on Hand	
	(1)	(2)	(3)	(4)
(β_1) Last Month$_{i,t}$	4.18***	3.52***	4.16***	3.54***
	(12.82)	(11.14)	(12.97)	(11.96)
(β_2) Last Month$_{i,t}$ * Fin. Constaint$_{i,t}$	-1.64***	-1.36***	-1.59***	-1.44***
	(-3.61)	(-3.16)	(-3.52)	(-3.31)
(β_3) Fin. Constaint$_{i,t}$	0.12***		0.21***	
	(2.88)		(4.58)	
R²	0.00	0.11	0.00	0.11
F-Statistics	77.62	88.98	79.55	96.32
No. Obs.	413,202	413,124	413,202	413,124
Panel C: Firm Complexity	$Spendings_{i,k,t}$			
	Firm Flatness		Hierarchical Layers	
	(1)	(2)	(1)	(2)
(β_1) Last Month$_{i,t}$	2.80***	2.38***	2.87***	2.50***
	(7.37)	(6.75)	(7.56)	(7.11)
(β_2) Last Month$_{i,t}$ * Complexity$_{i,t}$	1.18**	1.11**	1.08**	0.94**
	(2.45)	(2.46)	(2.23)	(2.09)
(β_3) Complexity$_{i,t}$	(-1.43)		-0.06	
	(-1.43)		(-1.04)	
R²	0.00	0.11	0.00	0.11
F-Statistics	78.95	89.59	78.92	89.01
No. Obs.	368,526	368,448	368,526	368,448
	Continues on the next page			

Panel D: CEO Financial Knowledge	Spendings$_{i,k,t}$			
	MBA		Experience as CFO	
	(1)	(2)	(3)	(4)
(β_1) Last Month$_{i,t}$	4.16***	3.69***	3.77***	3.24***
	(12.57)	(11.57)	(15.66)	(13.20)
(β_2) Last Month$_{i,t}$ * CEO Financial Knowledge$_{i,t}$	-1.19**	-1.32***	-0.46***	-0.41***
	(-2.27)	(-2.64)	(-2.86)	(-2.73)
(β_3) CEO Financial Knowledge$_{i,t}$	0.10**		0.08**	
	(1.99)		(2.37)	
R^2	0.00	0.11	0.00	0.11
F-Statistics	80.52	88.89	83.95	87.68
No. Obs.	373,260	373,194	373,242	373,176
Product Category*Month	No	Yes	No	Yes
Product Category*Fiscal Year*Firm FE	No	Yes	No	Yes

This table studies how deadlines impact firms' resource allocation over the fiscal year by estimating the proportion of firms' annual spending done during the last month of the period using an OLS regression. The dependent variable $\text{Spendings}_{i,k,t} = \frac{Monthly\ Spending_{i,k,t}}{Fiscal\ Year\ Spending_{i,k,y}}$ for firm "i" in product category "k" on month "t", and fiscal year "y". The first variable of interest $Last\ Month_{i,t}$ is a binary indicator that equals 1 if it is the last month of the firms' fiscal year, and 0 otherwise. Panel A investigates the annual pattern using only private non-private equity backed firms. Panels B and C use a subset of the sample where CEOs missed or beat the average EPS target by more than 10% or 10 cents. Panel D uses a subset of the sample that only includes firms with negative earnings before taxes. Panel E uses a subset of the sample in which the average price of the item sold in the last month of the fiscal year is above the previous months' median price. Panel F excludes firms that have the end of their fiscal year in December. Panels G and H restrict the analysis to the product category that accounts for less than 1% of the annual sales, or less than 1% of the annual advertising expenditures. Variable definitions appear in Appendix 1. The t-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.

Panel A: Private Non-PE Backed Firm	$\text{Spendings}_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	1.93**	1.71**	1.75**	1.76**	1.98***	1.87***
	(2.31)	(2.22)	(2.34)	(2.35)	(3.48)	(3.18)
R^2	0.00	0.00	0.02	0.03	0.14	0.20
F-Statistics	5.34	4.95	5.45	5.50	12.09	10.12
No. Obs.	20,448	20,448	20,448	20,448	20,188	20,188

Panel B: Earnings Management (%)	$\text{Spendings}_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	3.38***	2.43***	2.66***	2.63***	2.99***	2.88***
	(7.60)	(5.44)	(5.92)	(5.87)	(7.09)	(6.90)
R^2	0.00	0.01	0.02	0.02	0.06	0.13
F-Statistics	57.71	29.59	35.05	34.49	50.29	47.58
No. Obs.	122,958	122,958	122,958	122,958	122,784	122,784

Panel C: Earnings Management ($)	$\text{Spendings}_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	2.30***	2.41***	2.37***	2.37***	2.73***	2.61***
	(7.37)	(7.34)	(7.15)	(7.17)	(8.55)	(8.15)
R^2	0.00	0.00	0.02	0.03	0.06	0.13
F-Statistics	54.39	53.93	51.10	51.34	73.11	66.37
No. Obs.	173,412	173,412	173,412	173,412	173,292	173,292

Panel D: Taxes Incentives	$\text{Spendings}_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	3.71***	2.49***	2.53***	2.50***	2.67***	2.60***
	(3.73)	(2.97)	(2.97)	(2.95)	(2.96)	(2.89)
R^2	0.00	0.01	0.02	0.03	0.17	0.23
F-Statistics	13.89	8.84	8.84	8.71	8.79	8.37
No. Obs.	15,072	15,072	15,072	15,072	14,614	14,611

Panel E: Product Pricing Incentive	Spendings$_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	2.30***	2.41***	2.37***	2.37***	2.73***	2.61***
	(7.37)	(7.34)	(7.15)	(7.17)	(8.55)	(8.15)
R^2	0.00	0.00	0.02	0.03	0.06	0.13
F-Statistics	54.39	53.93	51.10	51.34	73.11	66.37
No. Obs.	173,412	173,412	173,412	173,412	173,292	173,292
Panel F: No December Effect	Spendings$_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	3.97***	3.02***	3.19***	3.16***	3.58***	3.46***
	(9.01)	(6.98)	(7.33)	(7.28)	(8.73)	(8.49)
R^2	0.00	0.01	0.02	0.03	0.06	0.13
F-Statistics	81.15	48.66	53.67	53.01	76.24	72.02
No. Obs.	147,240	147,240	147,240	147,240	147,114	147,114
Panel G: Smallest Divisions (< 1% sales)	Spendings$_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	3.15***	2.88***	2.86***	2.85***	3.11***	2.95***
	(7.99)	(7.08)	(7.03)	(7.01)	(7.81)	(7.26)
R^2	0.00	0.01	0.02	0.02	0.06	0.13
F-Statistics	57.71	29.59	35.05	34.49	50.29	47.58
No. Obs.	122,958	122,958	122,958	122,958	122,784	122,784
Panel H: Smallest Divisions (<1% Budget)	Spendings$_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	2.55***	2.63***	2.58***	2.54***	2.74***	2.61***
	(9.20)	(8.12)	(7.89)	(7.72)	(8.84)	(8.14)
R^2	0.00	0.00	0.01	0.03	0.05	0.12
F-Statistics	84.68	65.90	62.24	59.57	78.06	66.25
No. Obs.	148,632	148,632	148,632	148,632	148,291	148,290
Month FE	No	Yes	Yes	Yes	No	No
Fiscal Year FE	No	No	Yes	No	No	No
Firm FE	No	No	Yes	No	No	No
Firm*Fiscal Year FE	No	No	No	Yes	Yes	No
Product Category*Month FE	No	No	No	No	Yes	Yes
Product Category*Fiscal Year*Firm FE	No	No	No	No	No	Yes

This table studies the reach of advertising spendings using an OLS regression. *Viewership Total Time* denotes the number of hours of advertising viewed per millions of viewers. The variables *Market Penetration* is the number of monthly viewers divided by the universe estimate of possible viewers, as provided by Nielsen. The first variable of interest ln (Spending Amount$_{i,k,t}$ + 1) is the natural logarithm of month spendings in dollars for TV advertising. The second variation of interest L*ast Month*$_{i,t}$, is defined as a binary indicator that equals 1 if it is the last month of the firms' fiscal year, and 0 otherwise. Variable definitions appear in Appendix 1. The *t*-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.

	Viewership Total Time$_{i,k,t}$			Market Penetration$_{i,k,t}$		
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) ln (Spending Amount$_{i,k,t}$ + 1)	743.61***	642.09***	323.09***	105.65***	99.07***	70.95***
	(5.25)	(5.59)	(6.43)	(14.95)	(15.20)	(19.27)
(β_2) ln (Spending Amount$_{i,k,t}$ + 1) $*$ Last Month$_{i,t}$	-175.31**	-162.94**	-67.51**	-16.27***	-15.31***	-6.39**
	(-2.19)	(-2.28)	(-2.15)	(-3.73)	(-3.92)	(-2.17)
(β_3) Last Month$_{i,t}$	2524.09**	2002.13**	938.66**	230.23***	202.39***	87.68**
	(2.20)	(2.11)	(2.06)	(3.66)	(3.69)	(2.07)
R^2	0.10	0.30	0.70	0.36	0.52	0.85
F-Statistics	11.43	12.95	16.38	79.08	77.17	126.09
No. Obs.	46,339	46,322	45,042	46,339	46,322	45,042
Month FE	No	Yes	No	No	Yes	No
Fiscal Year FE	No	Yes	No	No	Yes	No
Firm FE	No	Yes	No	No	Yes	No
Product Category*Month FE	No	No	Yes	No	No	Yes
Product Category*Fiscal Year*Firm FE	No	No	Yes	No	No	Yes

Table 6: Yearend Spendings and Performance

This table studies the performance of advertising spendings using an OLS regression. The first variable of interest ln (Spending Amount$_{i,k,t}$ + 1) is the natural logarithm of month spendings in dollars for TV advertising. The second variation of interest L*ast Month*$_{i,t}$, is defined as a binary indicator that equals 1 if it is the last month of the firms' fiscal year, and 0 otherwise. Panel A dependent variables are the natural logarithm of quantity sold for firm 'i' in product category 'k' and month of the fiscal year "t", " 't+1", "t+2", and "t+3". The specification also includes controls to account for the previous 11 months of the firm's advertising spending, as well as total advertising expenditures in that product category by the firm's competitors. Lastly, we include the average retail price. Panel B dependent variables are the natural logarithm of total sales for firm 'i' in product category 'k' and month of the fiscal year "t", " 't+1", "t+2", and "t+3". The specification also includes controls to account for the previous 11 months of the firm's advertising spending, as well as total advertising expenditures in that product category by the firm's competitors. Variable definitions appear in Appendix 1. The *t*-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.

Panel A: Ads-to-Quantities Elasticity	ln (Qty$_{i,k,t}$)	ln (Qty$_{i,k,t+1}$)	ln (Qty$_{i,k,t+2}$)	ln (Qty$_{i,k,t+3}$)	
	(1)	(2)	(3)	(4)	(5)
(β_1) ln (*Spending Amount*$_{i,k,t}$ + 1)	0.04***	0.04***	0.02***	0.02***	0.02***
	(9.90)	(9.71)	(9.47)	(8.19)	(8.88)
(β_2) ln (*Spending Amount*$_{i,k,t}$ + 1) $*$ Last Month$_{i,t}$	-0.02**	-0.01*	-0.01	-0.00	-0.00
	(-2.52)	(-1.91)	(-1.32)	(-0.83)	(-0.71)
(β_3) Last Month$_{i,t}$	0.26***	0.13***	0.04	-0.00	-0.00
	(4.47)	(2.70)	(0.98)	(-0.08)	(-0.06)
Controls	$\sum_{m=1}^{11} \gamma_m * \ln (Spending\ Amount_{i,k,t-m} + 1),$ $\sum_{m=1}^{11} \rho_m * \ln (Peer\ Spendings\ Amount_{i,k,t-m} + 1)$ $\delta * Average\ Monthly\ Price_{i,k,t}$				
R^2	0.18	0.68	0.68	0.68	0.68
No. Obs.	67,320	67,263	66,317	66,141	66,045
Panel B: Ads-to-Sales Elasticity	ln (Sales$_{i,k,t}$)	ln (Sales$_{i,k,t+1}$)	ln (Sales$_{i,k,t+2}$)	ln (Sales$_{i,k,t+3}$)	
	(1)	(2)	(3)	(4)	(5)
(β_1) ln (*Spending Amount*$_{i,k,t}$ + 1)	0.05***	0.04***	0.02***	0.02***	0.02***
	(10.74)	(10.13)	(9.64)	(8.78)	(9.21)
(β_2) ln (*Spending Amount*$_{i,k,t}$ + 1) $*$ Last Month$_{i,t}$	-0.01*	-0.01*	-0.01	-0.00	-0.01
	(-1.96)	(-1.75)	(-1.36)	(-0.19)	(-1.07)
(β_3) Last Month$_{i,t}$	0.23***	0.12***	0.04	-0.04	-0.03
	(4.03)	(2.62)	(0.76)	(-1.02)	(-0.66)
Controls	$\sum_{m=1}^{11} \gamma_m * \ln (Spending\ Amount_{i,k,t-m} + 1),$ $\sum_{m=1}^{11} \rho_m * \ln (Peer\ Spendings\ Amount_{i,k,t-m} + 1)$				
R^2	0.18	0.66	0.66	0.66	0.66
No. Obs.	67,320	67,263	67,285	67,302	67,342
Firm*Fiscal Year FE	Yes	Yes	Yes	Yes	Yes
Product Category*Month FE	Yes	Yes	Yes	Yes	Yes

TABLE 7: Opportunities Arrival and Resource Availability Mismatch

This table studies how the nature of firm opportunity set (Panel A), or how budget constraints affect firm ability to respond to rivals advertising campaigns using an OLS regression. In Panel A, the dependent variable is TV Spendings$_{i,k,t}$ = $\frac{TV\ Monthly\ Spending_{i,k,t}}{Fiscal\ Year\ TV\ Spending_{i,k,y}}$ which corresponds to the firm "i" product category "k" on month "t" share of annual budget on year "y"..
The first variable of interest is the L*ast Month*$_{i,t}$, defined as a binary indicator that equals 1 if it is the last month of the firms' fiscal year, and 0 otherwise. The second variable of interest is Upfront Season, an indicator variable if the firm's fiscal year ends in May or June, and 0 otherwise. In Panel B, the dependent variable Spendings$_{i,k,t}$ = $\frac{Monthly\ Spending_{i,k,t}}{Fiscal\ Year\ Spending_{i,k,y}}$ for firm "i" in product category "k" on month "t", and fiscal year "y". The variable Peer Spendings$_{i,k,t}$ corresponds to the share of firm "i" rivals annual advertising spendings for product category "k" on month "t". The variable of interest Depleted Budget$_{i,k,t}$ is a binary indicator that equals 1 if firm "i" has depleted the budget of product category "k" on month "t", and 0 otherwise. Variable definitions appear in Appendix 1. The t-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.

Panel A: Extending Opportunity Set	TV Spendings$_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	3.66***	2.00***	2.06***	2.03***	2.79***	2.73***
	(10.75)	(5.47)	(5.61)	(5.53)	(8.26)	(7.84)
(β_2) Last Month$_{i,t}$ * Upfront Season$_{i,y}$	-3.31***	-1.60**	-1.73**	-1.68**	-2.39***	-2.29***
	(-4.91)	(-2.24)	(-2.42)	(-2.37)	(-3.62)	(-3.52)
(β_3) Upfront Season$_{i,y}$	0.20***	0.05				
	(3.43)	(0.86)				
R^2	0.00	0.01	0.01	0.03	0.08	0.14
F-Statistics	43.81	19.46	15.76	15.33	34.17	30.71
No. Obs.	182,394	182,394	182,394	182,394	182,358	182,358
Panel B: Depleted Budget	Spendings$_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Peer Spendings$_{i,k,t}$	0.12***	0.11***	0.14***	0.14***	0.11***	0.13**
	(4.45)	(4.43)	(3.55)	(3.51)	(2.91)	(2.44)
(β_2) Peer Spendings$_{i,k,t}$ * Depleted Budget$_{i,k,t}$	-0.09***	-0.06**	-0.05*	-0.05*	-0.05**	-0.07**
	(-3.17)	(-2.24)	(-1.75)	(-1.67)	(-2.47)	(-2.21)
(β_3) Depleted Budget$_{i,k,t}$	-1.55***	-2.27***	-2.26***	-2.30***	-2.27***	-3.09***
	(-10.83)	(-16.15)	(-15.43)	(-15.01)	(-18.41)	(-16.77)
R^2	0.00	0.01	0.01	0.02	0.04	0.11
F-Statistics	213.31	229.43	227.96	219.54	248.06	182.15
No. Obs.	408,702	408,702	408,702	408,702	408,624	408,624
Month FE	No	Yes	Yes	Yes	No	No
Fiscal Year FE	No	No	Yes	No	No	No
Firm FE	No	No	Yes	No	No	No
Firm*Fiscal Year FE	No	No	No	Yes	Yes	No
Product Category*Month FE	No	No	No	No	Yes	Yes
Product Category*Fiscal Year*Firm FE	No	No	No	No	No	Yes

Table 8: Zero Base Budgeting and Resource Allocation

This table studies the relation between private equity owners and advertising spending patterns over the fiscal year using an OLS regression. The dependent variable $Spendings_{i,k,t} = \frac{Monthly\ Spending_{i,k,t}}{Fiscal\ Year\ Spending_{i,k,y}}$ for firm "i" in product category "k" on month "t", and fiscal year "y". The first variable of interest $Last\ Month_{i,t}$ is a binary indicator that equals 1 if it is the last month of the firms' fiscal year, and 0 otherwise. Panel A the effect of adopting zero base budgets on spendings patterns over the fiscal year. $ZBB_{i,y}$ is an indicator variable equal to 1 if firm "I" is using a zero-base strategy to budget on year "y", and 0 otherwise. We identify firms using zero-base budget using earnings call discussion when managers directly mention a date of adoption for the practice. Panel B verifies if the use of zero-base budgets affects firms' ability to respond to peers advertising campaigns. Peer $Spendings_{i,t}$ is the average of firm's "i" peers spendings in product category "k" on month "t". Variable definitions appear in Appendix 1. The t-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.

Panel A: Zero-Base Budgets and Excess Spendings	$Spendings_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	3.53***	2.78***	2.80***	2.79***	3.07***	2.96***
	(15.20)	(11.75)	(11.79)	(11.74)	(14.17)	(13.57)
(β_2) Last Month$_{i,t}$* ZBB$_{i,y}$	-2.59***	-2.59***	-2.34***	-2.34***	-2.31***	-2.24***
	(-3.35)	(-3.35)	(-2.81)	(-2.80)	(-3.04)	(-2.93)
(β_3) ZBB$_{i,y}$	0.18**	0.17**	0.12			
	(2.08)	(2.10)	(0.86)			
R^2	0.00	0.01	0.01	0.02	0.04	0.11
F-Statistics	77.38	46.64	47.04	68.94	101.05	92.51
No. Obs.	413,202	413,202	413,202	413,202	413,124	413,124

Panel B: Zero-Base Budgets and Missing Opportunities	$Spendings_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Peer Spendings$_{i,k,t}$	0.12***	0.11***	0.14***	0.14***	0.11***	0.13**
	(4.68)	(4.68)	(3.62)	(3.56)	(2.90)	(2.41)
(β_2) Peer Spendings$_{i,k,t}$* ZBB$_{i,y}$	-0.02	-0.02	-0.03	-0.03	-0.03	-0.04
	(-0.88)	(-1.00)	(-0.92)	(-0.68)	(-0.85)	(-0.78)
(β_3) ZBB$_{i,y}$	-0.00	-0.02	0.03			
	(-0.02)	(-0.12)	(0.14)			
R^2	0.00	0.01	0.01	0.02	0.04	0.11
F-Statistics	26.02	27.21	11.28	15.84	8.21	8.21
No. Obs.	408,702	408,702	408,702	408,702	408,624	408,624
Month FE	No	Yes	Yes	Yes	No	No
Fiscal Year FE	No	No	Yes	No	No	No
Firm FE	No	No	Yes	No	No	No
Firm*Fiscal Year FE	No	No	No	Yes	Yes	No
Product Category*Month FE	No	No	No	No	Yes	Yes
Product Category*Fiscal Year*Firm FE	No	No	No	No	No	Yes

Table 9: Zero-Based Budgets and Performance

This table studies the performance of advertising spendings using an OLS regression using only the subset of firms that adopted zero-base budgets. The first variable of interest $\ln (\text{Spending Amount}_{i,k,t} + 1)$ is the natural logarithm of month spendings in dollars for TV advertising. The second variation of interest L*ast Month*$_{i,t}$, is defined as a binary indicator that equals 1 if it is the last month of the firms' fiscal year, and 0 otherwise. Panel A dependent variables are the natural logarithm of quantity sold for firm 'i' in product category 'k' and month of the fiscal year "t", "'t+1", "t+2", and "t+3". The specification also includes controls to account for the previous 11 months of the firm's advertising spending, as well as total advertising expenditures in that product category by the firm's competitors. Lastly, we include the average retail price. Panel B dependent variables are the natural logarithm of total sales for firm 'i' in product category 'k' and month of the fiscal year "t", "'t+1", "t+2", and "t+3". The specification also includes controls to account for the previous 11 months of the firm's advertising spending, as well as total advertising expenditures in that product category by the firm's competitors. Variable definitions appear in Appendix 1. The *t*-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.

Panel A: Zbb restores efficiency of resource allocation (qty)	$\ln (\text{Quantities}_{i,k,t})$				
	(1)	(2)	(3)	(4)	(5)
(β_1) $\ln (\text{Spending Amount}_{i,k,t} + 1)$	0.04***	0.04***	0.05***	0.05***	0.05***
	(3.63)	(3.62)	(4.49)	(4.54)	(4.08)
(β_2) $\ln (\text{Spending Amount}_{i,k,t} + 1) * \text{Last Month}_{i,t}$	-0.00	-0.01	-0.00	-0.00	0.00
	(-0.32)	(-0.42)	(-0.33)	(-0.29)	(0.10)
(β_3) $\text{Last Month}_{i,t}$	0.12	0.07	0.04	0.04	-0.02
	(0.87)	(0.46)	(0.28)	(0.26)	(-0.18)
Controls	$\sum_{m=1}^{11} \gamma_m * \ln (\text{Spending Amount}_{i,k,t-m} + 1),$ $\sum_{m=1}^{11} \rho_m * \ln (\text{Peer Spendings Amount}_{i,k,t-m} + 1)$ $\delta * \text{Average Monthly Price}_{i,k,t}$				
R^2	0.24	0.24	0.39	0.40	0.62
No. Obs.	8,222	8,222	8,222	8,222	8,139
Panel A: Zbb restores efficiency of resource allocation (sales)	$\ln (\text{Sales}_{i,k,t})$				
	(1)	(2)	(3)	(4)	(5)
(β_1) $\ln (\text{Spending Amount}_{i,k,t} + 1)$	0.04***	0.04***	0.05***	0.05***	0.05***
	(3.66)	(3.63)	(4.34)	(4.38)	(4.19)
(β_2) $\ln (\text{Spending Amount}_{i,k,t} + 1) * \text{Last Month}_{i,t}$	-0.00	-0.00	-0.00	0.00	0.00
	(-0.01)	(-0.11)	(-0.05)	(0.02)	(0.24)
(β_3) $\text{Last Month}_{i,t}$	0.07	0.03	0.01	-0.00	-0.04
	(0.57)	(0.23)	(0.04)	(-0.01)	(-0.33)
Controls	$\sum_{m=1}^{11} \gamma_m * \ln (\text{Spending Amount}_{i,k,t-m} + 1),$ $\sum_{m=1}^{11} \rho_m * \ln (\text{Peer Spendings Amount}_{i,k,t-m} + 1)$				
R^2	0.26	0.26	0.39	0.40	0.62
No. Obs.	8,222	8,222	8,222	8,222	8,139
Month FE	No	Yes	Yes	Yes	No
Fiscal Year FE	No	No	Yes	No	No
Firm FE	No	No	Yes	No	No
Firm*Fiscal Year FE	No	No	No	Yes	Yes
Product Category*Month FE	No	No	No	No	Yes

TABLE 10: Managers Satisfactions and Zero-Base Budgeting

This table investigates how the adoption of zero-base budget affects managers satisfaction using an OLS regression. The unit of observation at the Glassdoor review level "r". The dependent variables correspond to the score given by the employee over four rating categories: (i) overall rating, (ii) approval of senior leadership, (iii) approval of firm culture, and (iv) and a binary variable equal to one if they would recommend the firm as a possible employer to a friend. The is variable of interest Use Zero − Base Budgets$_{i,y}$ is an indicator variable equal to 1 if firm "I" adopted a zero-base budget strategy on year "y", and 0 otherwise. Manager is an indicator variable equal to 1 if the employee making the review has a manager title, and 0 otherwise. Variable definitions appear in Appendix 1. The *t*-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.

	Overall Rating$_r$	Approves Senior Leadership$_r$	Approves Firm Culture $_r$	Would Recommend to a Friend $_r$
	(1)	(2)	(3)	(4)
(β_1) ZBB$_{i,y}$	-0.01	-0.01	-0.05	0.00
	(-0.23)	(-0.27)	(-0.79)	(0.02)
(β_2) ZBB$_{i,y}$ * Manager$_z$	-0.09**	-0.06*	-0.13***	-0.02*
	(-2.40)	(-1.70)	(-3.34)	(-1.73)
(β_3) Manager$_z$	-0.03*	-0.05***	0.00	-0.01**
	(-1.68)	(-3.54)	(0.04)	(-2.15)
R^2	0.09	0.06	0.10	0.08
F-Statistics	4.81	7.67	4.50	4.08
No. Obs.	564,186	497,964	444,158	462,573
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes

This table studies the relation between private equity owners and advertising spending patterns over the fiscal year using an OLS regression. The dependent variable $\text{Spendings}_{i,k,t} = \frac{Monthly\ Spending_{i,k,t}}{Fiscal\ Year\ Spending_{i,k,y}}$ for firm "i" in product category "k" on month "t", and fiscal year "y". The first variable of interest $Last\ Month_{i,t}$ is a binary indicator that equals 1 if it is the last month of the firms' fiscal year, and 0 otherwise. Panel A investigates the possible selection effect, comparing spending patterns between PE-targets before the acquired with non-target firms. $PE\ Target_i$ is an indicator variable equal to 1 if the firm is the target of private equity owner, and 0 otherwise. PE-target firms are excluded from the sample once they are acquired. Panel B compares spending patterns once targets are acquired with non-target public firms. $PE\ backed_{i,t}$ is a binary variable equal to 1 if the firm is PE-backed and 0 otherwise. Panel C compares spending patterns once targets are acquired with non-target private firms. $PE\ backed_{i,t}$ is a binary variable equal to 1 if the firm is PE-backed and 0 otherwise. Panel D investigates how PE-backed firms respond to rivals advertising campaigns. $Peer\ Spendings_{i,t}$ is the average of firm's "i" peers spendings in product category "k" on month "t". Variable definitions appear in Appendix 1. The t-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.

Panel A: Private Equity Selection	$\text{Spendings}_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	3.27***	2.53***	2.57***	2.56***	2.82***	2.71***
	(14.88)	(11.27)	(11.37)	(11.34)	(13.68)	(13.05)
(β_2) Last Month$_{i,t}$ * PE Target$_i$	4.92***	4.95***	4.88***	4.91***	5.08***	5.06***
	(3.00)	(3.15)	(3.05)	(3.02)	(3.06)	(3.07)
(β_3) PE Target$_i$	-0.20	-0.19				
	(-1.43)	(-1.40)				
R^2	0.00	0.01	0.01	0.02	0.04	0.11
F-Statistics	82.32	48.19	72.25	71.88	102.59	94.17
No. Obs.	424,374	424,374	424,374	424,374	424,290	424,290
Panel B: PE Backed VS Public Firms	$\text{Spendings}_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	3.44***	2.68***	2.71***	2.70***	2.97***	2.86***
	(15.12)	(11.52)	(11.62)	(11.58)	(13.85)	(13.27)
(β_2) Last Month$_{i,t}$ * PE backed$_{i,t}$	-3.50**	-3.61**	-3.59**	-3.67**	-3.23***	-3.24***
	(-2.25)	(-2.30)	(-2.29)	(-2.35)	(-2.80)	(-2.84)
(β_3) PE Backed$_{i,t}$	0.28**	0.28**	0.22			
	(2.07)	(2.11)	(1.00)			
R^2	0.00	0.01	0.01	0.02	0.04	0.11
F-Statistics	76.98	45.10	46.56	68.15	97.05	89.35
No. Obs.	413,760	413,760	413,760	413,760	413,682	413,682
Panel C: PE Backed VS Private Firms	$\text{Spendings}_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	3.79***	2.79***	2.80***	2.81***	3.17***	3.05***
	(4.54)	(3.05)	(3.02)	(3.04)	(3.81)	(3.77)
(β_2) Last Month$_{i,t}$ * PE backed$_{i,t}$	-3.84**	-3.92**	-3.91**	-4.01***	-4.91***	-4.99***
	(-2.58)	(-2.58)	(-2.55)	(-2.63)	(-4.19)	(-4.58)
(β_3) PE Backed$_{i,t}$	0.35**	0.35**	0.27			
	(2.41)	(2.52)	(0.91)			
R^2	0.00	0.00	0.02	0.03	0.11	0.17
F-Statistics	8.59	4.39	4.17	6.42	10.37	11.54
No. Obs.	39,510	39,510	39,510	39,510	39,312	39,312

Panel D: Budget Flexibility	Spendings$_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Peer Spendings$_{i,t}$	0.11***	0.11***	0.14***	0.14***	0.10***	0.13**
	(4.89)	(4.88)	(3.77)	(3.73)	(3.03)	(2.52)
(β_2) PE Backed$_{i,t}$ * Peer Spendings$_{i,t}$	0.05	0.04	0.04	0.04	0.01	0.05
	(1.04)	(0.95)	(0.69)	(0.56)	(0.16)	(0.40)
(β_3) PE Backed$_{i,t}$	0.35**	0.35**	0.27			
	(2.41)	(2.52)	(0.91)			
R^2	0.00	0.01	0.01	0.02	0.04	0.11
F-Statistics	13.47	12.66	10.23	11.89	5.38	3.84
No. Obs.	429,498	429,498	429,498	429,498	429,420	429,420
Month FE	No	Yes	Yes	Yes	No	No
Fiscal Year FE	No	No	Yes	No	No	No
Firm FE	No	No	Yes	No	No	No
Firm*Fiscal Year FE	No	No	No	Yes	Yes	No
Product Category*Month FE	No	No	No	No	Yes	Yes
Product Category*Fiscal Year*Firm FE	No	No	No	No	No	Yes

51

Appendix 1: Variables Description

Advertising spendings in dollars: $\ln(Spending\ Amount_{i,k,t} + 1)$	The natural logarithm of advertising spendings in dollar of firm "i" for product category "k" on month "t".
Blockholders$_{i,t}$ (No. of Blockholders)	A binary variable equal to 1 if the number of blockholders is above the sample median, and 0 otherwise. Blockholders are investors that own 5% and more of the firms outstanding shares.
Blockholders$_{i,t}$ (Blockholders Ownership (%))	A binary variable equal to 1 if blockholders ownership is above the sample median, and 0 otherwise. Blockholders are investors that own 5% and more of the firms outstanding shares.
Budget Depleted$_{i,k,t}$	A binary variable equal to 1 if firm "i" has spent more or as much of their last year spending level for product category "k" by month "t", and 0 otherwise.
CEO Financial Knowledge$_{i,t}$ (MBA)	binary variable equal to 1 if the CEO has an MBA, and 0 otherwise.
CEO Financial Knowledge$_{i,t}$ (Experience as CFO)	binary variable equal to 1 if the CEO was a CFO before, and 0 otherwise.
Close $Peers\ Use\ Zero-Base\ Budgets_{i,y-1}$	A count variable equal to the number of the 10 closest peers that have adopted zero-base budgets in the previous year. We define close peers as the 10 closest peers on a given year measured using the Hoberg-Phillips index, updated annually.
Complexity$_{i,t}$ (Firm Flatness)	A binary variable equal to 1 if the number of business unit per direct reports to the headquarters is above the sample median, and 0 otherwise.
Complexity$_{i,t}$ (Hierarchical Layers)	A binary variable equal to 1 if the number of hierarchical layers between the headquarters and operating units is above the sample median, and 0 otherwise.
Fin. Constraint$_{i,t}$ (HP Index)	A binary variable equal to 1 if the Hadlock and Pierce index is below the sample median, and 0 otherwise. The Hadlock and Pierce index is measured as -0.737*size+0.043*size*size-0.04*age, where size is the natural logarithm of total asset (at), and age from the first year the firm appears in Compustat as min(age,30).
Fin. Constraint$_{i,t}$ (Cash on Hand)	A binary variable equal to 1 if the cash on hand (che/at) is below the sample median, and 0 otherwise.
$Kraft-Heinz's\ Deal\ Exposure_{i,y}$	An indicator variable equal to 1 if Kraft-Heinz is one of the 10 closest peers of the firm after 2015, and 0 otherwise.
Last Month$_{i,t}$	A binary indicator that equals 1 if it is the last month of the firms' fiscal year, and 0 otherwise.
Peers Spendings$_{i,k,t}$	The average of firm's "i" peers spendings in product category "k" on month "t".
PE Target$_i$	An indicator variable equal to 1 if firm "i" was ever the successful target of a private equity owner, and 0 otherwise.
PE backed$_{i,y}$	An indicator variable equal to 1 if firm "i" was the backed by a private equity owner on year "y", and 0 otherwise.
Market Penetration$_{i,k,t}$	$\dfrac{\text{Total Viewers Reached}_{i,k,t}}{Viewership\ universe/1{,}000{,}000}$
$Month\ sales$: $\ln(Sales_{i,k,t})$	The natural logarithm of product sales by firm "i" for product category "k" on month "t".
Quantity sold: $\ln(Qty_{i,k,t})$	The natural logarithm of the number of products sold by firm "i" for product category "k" on month "t".
Spendings$_{i,k,t}$	$\dfrac{\text{Monthly Spending}_{i,k,t}}{\text{Fiscal Year Spending}_{i,k,y}}$, for firm "i" in product category "k" on month "t".
TV Spendings$_{i,k,t}$	$\dfrac{\text{TV Monthly Spending}_{i,k,t}}{\text{Fiscal Year TV Spending}_{i,k,y}}$, for firm "i" in product category "k" on month "t".
Upfront Season$_{i,y}$	A binary variable if the firm's fiscal year ends in May or June, the upfront season, and 0 otherwise.
Viewership Total Time$_{i,k,t}$	$\dfrac{\text{Total Air time in second}_{i,k,t}/60*60*24}{\text{Total Viewers Reached}_{i,k,t}/1{,}000}$
ZBB$_{i,y}$	An indicator variable equal to 1 if the firm adopted a zero-base budget strategy, and 0 otherwise.

INTERNET APPENDIX

On a Spending Spree:
The Real Effects of Heuristics in Managerial Budgets

PAUL H. DÉCAIRE AND DENIS SOSYURA

INTERNET APPENDIX TABLE IA.1: Spendings Year-Over-Year Dynamics

This table studies how deadlines impact firms' resource allocation over the fiscal year, by estimating the proportion of firms' annual spending done during the last month of the period using an OLS regression. The dependent variable, $Ln(\text{Spendings}_{i,k,y})\big/Ln(\text{Spendings}_{i,k,y-1})$, denotes the ratio of firm "i" advertising spendings for product category "k" on year "y", winsorized at the 1 and 99th percentile. The control variable, *Sales Growth*, is $Ln(\text{Sales}_{i,k,y})\big/Ln(\text{Sales}_{i,k,y-1})$, denotes the ratio of firm "i" sales for product category "k" on year "y". The *t*-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.

	$Ln(\text{Fiscal Year Spendings}_{i,k,y})\big/Ln(\text{Fiscal Year Spendings}_{i,k,y-1})$	
	(1)	(2)
(β_1) *Constant*	1.06***	1.06***
	(592.20)	(200.70)
(β_2) Sales change$_{i,k,y}$		0.00***
		(40.36)
R^2	0.90	0.91
F-Statistics	350,704.49	20,939.50
No. Obs.	27,455	2,823

INTERNET APPENDIX TABLE IA.2: Peer Entry and Budget Depletion

This table studies how peer entry into a firm product category impacts firms advertising spendings using an OLS regression. In Panel A, the dependent variable $Depleted\ Budget_{i,k,y}$ is an indicator variable equal to 1 if firm "i" depleted product category "k" budget before the end of the fiscal year "y", and 0 otherwise. The variable of interest $Entry_{i,k,y}$ is an indicator variable equal to 1 if the share of advertising expenditure in year "y" conducted by firm "I" new rivals in product category "k" is above the sample median, and 0 otherwise. In Panel B, the variable of interest $Depleted\ Budget_{i,k,t}$ is an indicator variable equal to 1 if firm "i" depleted the product category "k" budget on month "t". The variable of interest $Entry_{i,k,y}$ is an indicator variable equal to 1 if the share of advertising expenditure in month "t" conducted by firm "I" new rivals in product category "k" is above the sample median, and 0 otherwise. Variable definitions appear in Appendix 1. The *t*-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.

Panel A: Extensive Margin	Depleted Budget$_{i,k,y}$		
	(1)	(2)	(3)
(β_1) Entry$_{i,k,y}$	0.29***	0.28***	0.30***
	(21.49)	(19.42)	(18.98)
Firm FE	No	Yes	No
Product Category*Fiscal Year FE	Yes	Yes	Yes
Firm*Fiscal Year FE	No	No	Yes
R^2	0.19	0.21	0.29
F-Statistics	461.95	377.28	360.31
No. Obs.	42317	42311	41804
Panel B: Intensive Margin	Depleted Budget$_{i,k,t}$		
	(1)	(2)	(3)
(β_1) Entry$_{i,k,t}$	0.07***	0.05***	0.18***
	(9.71)	(7.42)	(6.65)
Month FE	No	Yes	No
Fiscal Year FE	No	Yes	No
Firm FE	No	Yes	No
Product Category*Month FE	No	No	Yes
Product Category*Fiscal Year*Firm FE	No	No	Yes
R^2	0.00	0.13	0.48
F-Statistics	94.25	55.12	44.18
No. Obs.	30,021	29,999	23,074

INTERNET APPENDIX TABLE IA.3: Budget Annual Dynamics

This table studies how finishing the previous fiscal year with surpluses impacts the subsequent budget allocation using an OLS regression. The dependent variable is the natural logarithm of firm "i" spendings in product category "k" on month "t" of the fiscal year. The variable of interest is $Finished\ with\ surplus_{i,k,y-1}$ an indicator variable equal to 1 if the managers finished the previous with a budget surplus, and 0 otherwise. The control variable, *Sales Growth*, is $Ln(Sales_{i,k,y})\big/Ln(Sales_{i,k,y-1})$, denotes the ratio of firm "i" sales for product category "k" on year "y". The *t*-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.

	Ln(Spendings$_{i,k,y}$)					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) *Finished with surplus$_{i,k,y-1}$*	-2.41***	-2.22***	-2.22***	-0.47***	-0.46***	-0.34***
	(-45.58)	(-48.02)	(-47.80)	(-9.38)	(-10.38)	(-7.33)
(β_2) *Sales change$_{i,k,y}$*				0.00***	0.00***	0.00***
				(10.97)	(11.28)	(11.21)
Firm FE	No	Yes	Yes	No	Yes	Yes
Year FE	No	No	Yes	No	No	Yes
R^2	0.18	0.19	0.22	0.18	0.33	0.33
F-Statistics	121.82	2305.84	2284.73	121.82	128.73	87.67
No. Obs.	21,219	37,943	37,943	21,219	21,194	21,194

INTERNET APPENDIX TABLE IA.4: Pricing Strategy and Over the Fiscal Year

This table studies how firms adjust retail product prices throughout the fiscal year using an OLS regression. The dependent variable is $Product\ Price_{i,k,t}$ which denotes the average price at which firm "i" sells products in category "k" on month "t". The variables of interest distinctly denote indicator variables equal to 1 if the observation is recorded "x" month from the end of the fiscal year, and 0 otherwise. For example, $Month\ Rank\ (t-1)_{i,t}$ takes the value of 1 for observations recorded in the last month of the fiscal year, and 0 otherwise. The t-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.

	Product Price$_{i,k,t}$ (in dollars)							
	Last-Month Effect						Fiscal Year Patterns	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(β_1) Last Month$_{i,t}$	-0.23	-0.09	-0.49	-0.34	-0.12	-0.10		
	(-0.56)	(-0.26)	(-0.86)	(-0.76)	(-0.46)	(-0.41)		
(β_2) Month Rank $(t-5)_{i,t}$							0.18	0.01
							(0.52)	(0.04)
(β_3) Month Rank $(t-4)_{i,t}$							0.13	0.03
							(0.24)	(0.09)
(β_4) Month Rank $(t-3)_{i,t}$							0.01	0.00
							(0.03)	(0.01)
(β_5) Month Rank $(t-2)_{i,t}$							-0.07	0.00
							(-0.14)	(0.02)
(β_6) Month Rank $(t-1)_{i,t}$							-0.16	-0.18
							(-0.32)	(-0.66)
(β_7) Month Rank $(t)_{i,t}$							-0.39	-0.40
							(-0.80)	(-1.44)
(β_8) Month Rank $(t+1)_{i,t}$							-0.28	-0.34
							(-0.55)	(-1.06)
(β_9) Month Rank $(t+2)_{i,t}$							0.04	-0.33
							(0.07)	(-0.95)
(β_{10}) Month Rank $(t+3)_{i,t}$							0.15	0.06
							(0.39)	(0.25)
(β_{11}) Month Rank $(t+4)_{i,t}$							0.35	-0.03
							(1.28)	(-0.26)
(β_2) Month Rank $(t+5)_{i,t}$							0.56	-0.01
							(1.43)	(-0.05)
Month FE	No	Yes	Yes	Yes	No	No	No	No
Fiscal Year FE	No	No	Yes	No	No	No	No	No
Firm FE	No	No	Yes	No	No	No	No	No
Firm*Fiscal Year FE	No	No	No	Yes	Yes	No	No	No
Product Category*Month FE	No	No	No	No	Yes	Yes	No	Yes
Product Category*Fiscal Year*Firm FE	No	No	No	No	No	Yes	No	Yes
R^2	0.00	0.00	0.59	0.87	0.91	0.99	0.00	0.99
F-Statistics	0.31	0.07	0.75	0.58	0.22	0.17	1.88	1.16
No. Obs.	86,551	86,551	86,550	86,522	86,504	86,395	86,551	86,395

INTERNET APPENDIX TABLE IA.5: Placebo Tests

This table studies how deadlines impact firms' resource allocation over the fiscal year by estimating the proportion of firms' annual spending done during the last month of the period for the firms that change the last month of their fiscal year using an OLS regression. The dependent variable $Spendings_{i,k,t} = \frac{Monthly\ Spending_{i,k,t}}{Fiscal\ Year\ Spending_{i,k,y}}$ for firm "i" in product category "k" on month "t", and fiscal year "y". The first variable of interest $Last\ Month_{i,t}$ is a binary indicator that equals 1 if it is the last month of the firms' fiscal year, and 0 otherwise. Panel A performs the analysis by imposing the initial yearend date of the fiscal year on the second part of the sample. Panel B includes additional fixed effects (*Product Category*Month FE*Firm FE*) to account for the specific seasonal patterns of each firm product category. Variable definitions appear in Appendix 1. The t-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.

Panel A: Placebo Yearend Dates	Spendings$_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	0.44	0.85	0.86	0.85	0.33	0.06
	(0.53)	(0.90)	(0.90)	(0.89)	(0.26)	(0.05)
R^2	0.00	0.01	0.01	0.02	0.24	0.26
F-Statistics	0.28	0.81	0.82	0.80	0.07	0.00
No. Obs.	6,314	6,314	6,314	6,313	6,090	6,084
Month FE	No	Yes	Yes	Yes	No	No
Fiscal Year FE	No	No	Yes	No	No	No
Firm FE	No	No	Yes	No	No	No
Firm*Fiscal Year FE	No	No	No	Yes	Yes	No
Product Category*Month FE	No	No	No	No	Yes	Yes
Product Category*Fiscal Year*Firm FE	No	No	No	No	No	Yes
Panel B: Additional Fixed Effects	Spendings$_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	3.64***	4.07***	4.01***	4.02***	2.42***	2.19***
	(5.03)	(4.77)	(4.60)	(4.61)	(4.13)	(4.47)
R^2	0.00	0.01	0.02	0.03	0.29	0.35
F-Statistics	25.32	22.74	21.20	21.25	17.03	19.98
No. Obs.	14,982	14,982	14,982	14,982	14,412	14,410
Month FE	No	Yes	Yes	Yes	No	No
Fiscal Year FE	No	No	Yes	No	No	No
Firm FE	No	No	Yes	No	No	No
Firm*Fiscal Year FE	No	No	No	Yes	Yes	No
Product Category*Month FE*Firm FE	No	No	No	No	Yes	Yes
Product Category*Fiscal Year*Firm FE	No	No	No	No	No	Yes

INTERNET APPENDIX TABLE IA.6: Adoption and Use of Zero-Based Budgeting

This table studies firms' decision to adopt zero-base budget strategy using an OLS regression. The dependent variation is an indicator variable equal to 1 if the uses zero-base budgets, and 0 otherwise. Close $Peers\ Use\ ZBB_{i,y-1}$ counts the number of close peers that have adopted a zero-base budget approach in the previous year. We define close peers as the 10 closest peers on a given year measured using the Hoberg-Phillips index, updated annually. $Kraft-Heinz's\ Deal\ Exposure_{i,y}$ is an indicator variable equal to 1 if Kraft-Heinz is one of the 10 closest peers of the firm after 2015, and 0 otherwise. Variable definitions appear in Appendix 1. The t-statistics (in parenthesis) are based on standard errors that are heteroskedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.

	Use Zero $-$ Base Budgets$_{i,y}$				
	(1)	(2)	(3)	(4)	(5)
(β_1) Close $Peers\ Use\ ZBB_{i,y-1}$	0.04***	0.03***	0.02**	0.01*	
	(4.31)	(3.80)	(2.17)	(1.76)	
(β_2) $Kraft-Heinz's\ Deal\ Exposure_{i,y}$					0.41*
					(1.89)
Firm FE	No	No	No	Yes	Yes
Fiscal Year FE	No	No	Yes	No	No
Industry (2-digit SIC)	No	Yes	Yes	No	No
Industry# Fiscal Year FE	No	No	No	Yes	Yes
R^2	0.05	0.09	0.13	0.61	0.61
F-Statistics	18.59	14.43	4.72	3.09	3.10
No. Obs.	4,229	4,229	4,229	4,122	4,122