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

by

Paul H. Décaire and Denis Sosyura
Arizona State University

Rong Huang
Fudan University

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Overview

- How heuristics in capital budgets affect lower-level managers' expenditures?
  - Lower-level managers increase advertising expenditures sharply in the last month before budget deadlines, leading to lower sales and less efficient advertisement (price of market penetration and price per viewer-hour).
  - Lower-level managers reaching a budget constraint early in the fiscal cycle halt further spending.
  - The effects are stronger at firms with more hierarchical layers, more divisions, and higher subordinates-to-executives ratios.
- Heuristics in capital budgets engender managerial opportunism and investment inefficiency.

Contribution

- Contribute to the literature on managerial heuristics in financial decisions
  - Capital budgeting for lower-level managers
- Contribute to the literature on intra-year patterns in corporate investment
  - Advertising expenditure, sales, market penetration, price per viewer-hour
- Contribute to the literature on the practice of budgeting
  - Delegating capital budgeting and using simple rules
- Provide granular project-level evidence on managerial budgets

Strength

- Important and innovative research question
  - Budgeting and variance analysis, resource allocation, capital rationing
- Novel data
  - Monthly and product-level data on managerial advertising expenditures
- Comprehensive analysis
  - Graphical results
  - Regression analyses
    - Overall advertising allocation, TV advertising allocation
    - Robustness: Fiscal year changes, placebo tests, December effect
    - Budget depletion, financial constraint
    - Performance: sales, market penetration, price per viewer-hour
    - Cross-sectional analyses on monitoring effect
- Very well-written

Incremental contribution

- Prior evidence on expenditure spikes towards fiscal year end
  - Zimmerman (1976 JAR）
    - A government-funded laboratory defers expenditures until the end of the fiscal year due to budget uncertainty.
  - Balakrishnan, Soderstrom, and West (2007 JMAR）
    - Hospital administrators stockpile pharmaceuticals and other supplies toward the end of a fiscal year and reduce spending at the start of the next year: a saving-dissaving model.
  - Liebman and Mahoney (2017 AER)
    - U.S. federal government agencies rush to spend in the last week of the year, leading to lower quality year-end information technology projects.
  - Underlying reason: “Use-it-or-lose-it” feature of time-limited budget

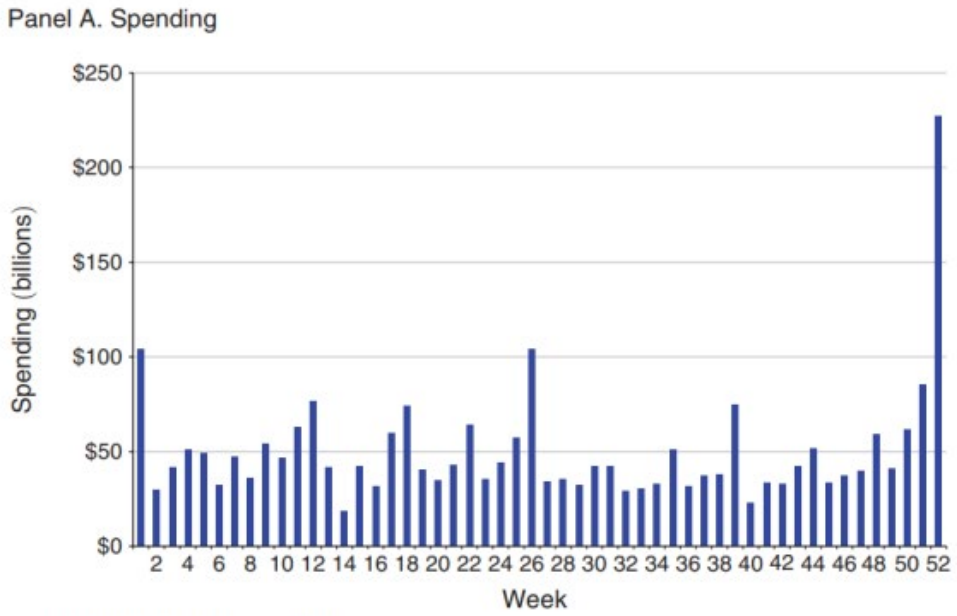
Balakrishnan, Soderstrom, and West (2007 JMAR）

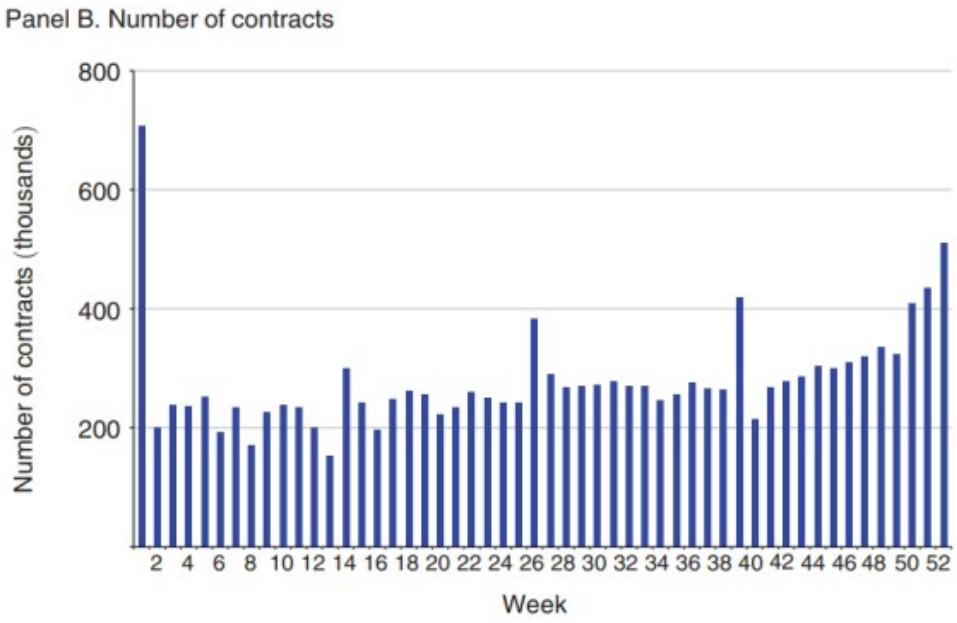
TABLE 2
Descriptive Statistics

Panel A: Average Expense by Month ($ '000)[a]

	Total Expense				
	Total	Inpatient Services	Ambulatory Services	Ancillary Services	Support Services
	n = 145–147	n = 121–123	n = 145–147	n = 145–147	n = 145–147
October	5,308	506	1,584	1,553	1,765
November	5,647	510	1,601	1,808	1,850
December	6,262	570	1,764	2,004	2,096
January	6,521	564	1,783	2,339	2,077
February	6,117	526	1,699	2,193	1,953
March	6,748	554	1,789	2,315	2,188
April	6,665	556	1,828	2,356	2,023
May	6,631	552	1,783	2,284	2,110
June	6,907	533	1,788	2,534	2,142
July	6,749	550	1,757	2,424	2,111
August	6,949	556	1,841	2,458	2,188
September	7,705	588	2,033	2,820	2,364

Liebman and Mahoney (2017 AER)





Incremental contribution

- Advertising expenditure
  - Firms increase advertising in the third month of a fiscal quarter and in the fourth quarter to beat prior year's earnings (Cohen, Mashruwala, and Zach 2010 RAST).
  - Soup manufacturers double the frequency and change the mix of marketing promotions at the fiscal quarter-end to boost earnings (Chapman and Steenburgh 2011 MS).
  - Firms decrease R&D budgets but increase marketing budgets in response to investor expectations for short-term stock returns (Chakravarty and Grewal 2011 MS)
  - Earnings management or compensation incentives

Theory development

- Spending spikes towards year-end are due to managerial opportunism or rational decision-making?

- Rational decision
  - Uncertainty (Zimmerman 1976 JAR; Balakrishnan et al. 2007 JMAR)
    - Facing economic downturn during the second half of the year, managers may need to incur extra advertising expense to boost sales.
  - Optimal decision based on cost-benefit analysis (Liebman and Mahoney 2017 AER)
    - Unspent funding may represent a lost opportunity
    - Unspent funding can signal a lack of need to budget-setters, decreasing funding in future budget cycles (Laffont and Tirole 1986; Lee and Johnson 1998; Jones 2005).

Theory

- Alternative explanation: inefficient budget-setting process
  - Target ratcheting (Indjejikian and Nanda 2002; Indjejikian and Matějka 2006; Indjejikian et al. 2014)
    - Set future target based on past target
    - Output-based targets: Motivate managers to withhold efforts to avoid higher targets in the future
    - Input-based targets: Incentivize managers to over-spend to avoid lower budgets in the future

Institutional background

- Does the effect of other expenditure budget in government and non-profit organizations apply to advertising budget in for-profit firms?
- More discussion about budgeting process of advertising activities
  - Top-down or bottom-up?
  - Are managers held responsible for advertising budget variance?
  - Are major advertising campaigns determined by top managers (CMOs) or lower-level managers?
  - Are advertising contracts signed for multiple years and renewed afterwards?
    - Firms sign contracts or make one-time payments towards year end?

Data and sample

- 347 public firms' retail stores over 2010-2019
  - Monthly sales and advertising activities by products
- Examine specific settings where advertising spending becomes very important?
  - Launch a new product
  - Enter into a new region
  - Open a new store
- Examine different forms of advertising
  - TV, web, radio, print, etc.
- Examine online sales? Subsample analysis based on product categories?

Data and sample

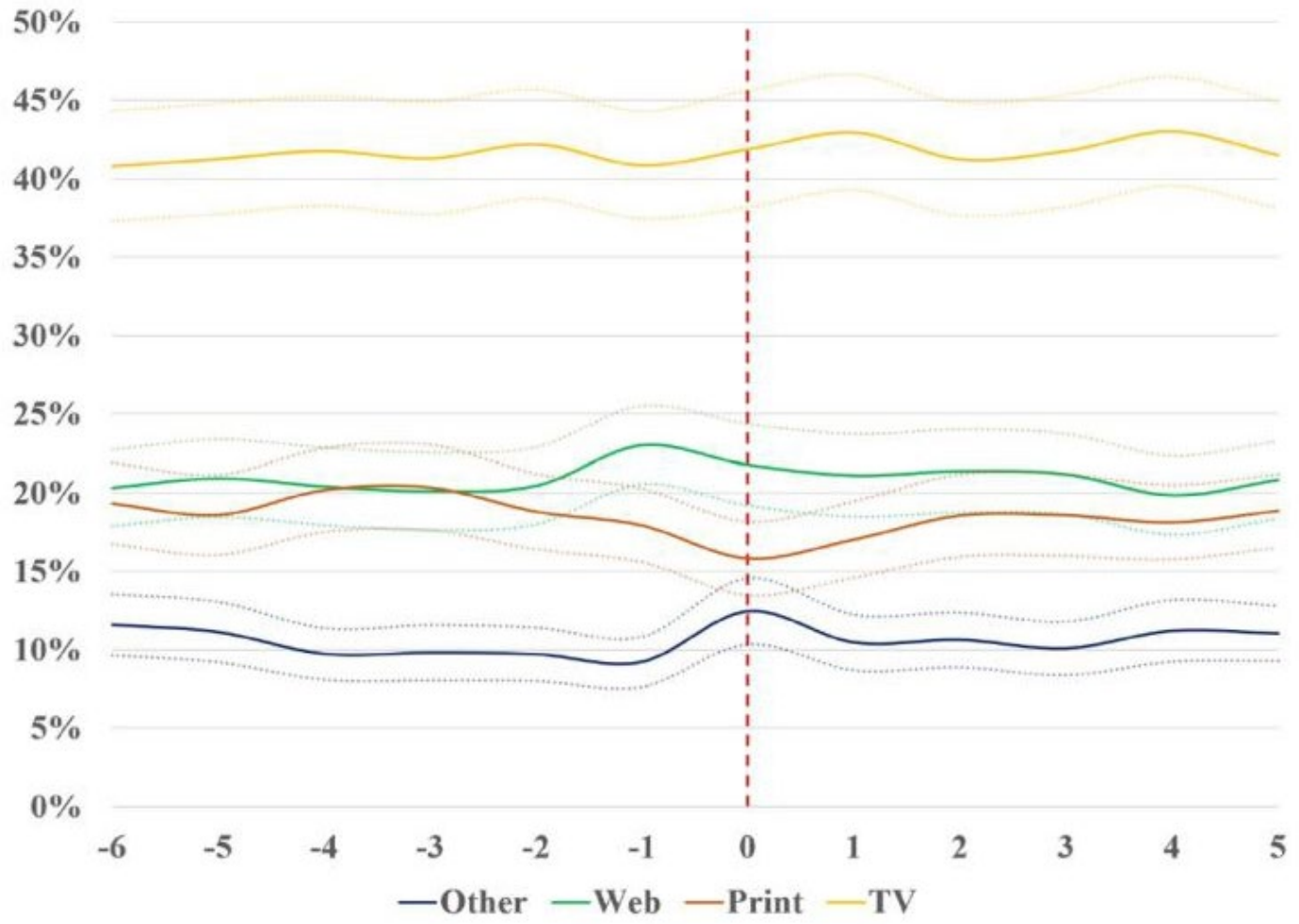
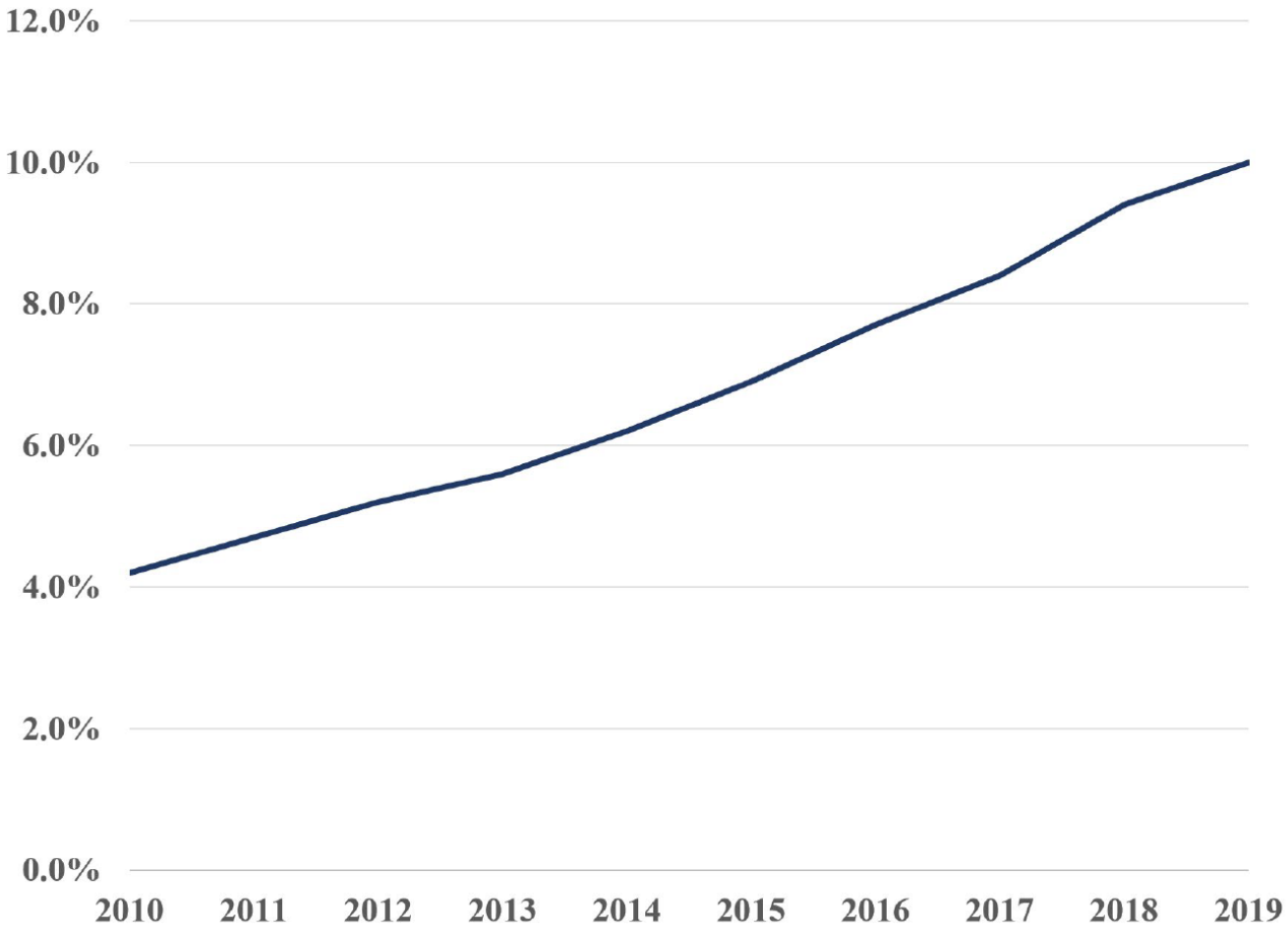


FIGURE 6.1: Share of Firms' Advertising Portfolio

Data and sample

FIGURE 5: E-Commerce Retail Sales as a Percent of Total Retail Sales

The figure plots the share of e-commerce retail sales over the period 2010-2019. Data is obtained from the Federal Reserve Economic Data of Saint-Louis (FRED), using the data code: ECOMPCTSA.



Research Design

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 is $\text{Spendings}_{i,t} = \frac{\text{Monthly Spending}_{i,t}}{\text{Fiscal Year Spending}_{i,y}}$, or $\text{Spendings}_{i,k,t} = \frac{\text{Monthly Spending}_{i,k,t}}{\text{Fiscal Year Spending}_{i,k,y}}$ for firm "i" in product category "k" on month "t" in Panel A and B respectively. The first variable of interest $\textit{Last Month}_{i,t}$ is a binary indicator that equals 1 if it is the last month of the firms' fiscal year, and 0 otherwise. 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: Firm-Level	$\text{Spendings}_{i,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	3.78***	2.80***	2.74***	2.67***		
	(9.22)	(6.42)	(6.22)	(6.09)		
R^2	0.01	0.01	0.03	0.07		
F-Statistics	84.93	41.21	38.66	37.08		
No. Obs.	35,250	35,250	35,250	35,250		
Panel B: Product-Level	$\text{Spendings}_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	2.94***	2.60***	2.54***	2.52***	2.74***	2.70***
	(10.83)	(8.99)	(8.75)	(8.70)	(10.08)	(9.92)
R^2	0.00	0.00	0.01	0.02	0.04	0.11
F-Statistics	117.35	80.79	76.60	75.61	101.56	98.33
No. Obs.	299,718	299,718	299,718	299,718	299,614	299,610
Month FE	No	Yes	Yes	Yes	Yes	No
Fiscal Year FE	No	Yes	Yes	No	No	No
Firm FE	No	No	Yes	No	No	No
Firm*Fiscal Year FE	No	No	No	Yes	Yes	No
Product Category FE	No	No	No	No	Yes	No
Product Category*Month FE	No	No	No	No	No	Yes
Product Category*Fiscal Year*Firm FE	No	No	No	No	No	Yes

Liebman and Mahoney (2017 AER)

TABLE 5—SENSITIVITY ANALYSIS OF THE EFFECT ON OVERALL RATINGS

	Odds ratio of higher overall rating from ordered logit				Coefficients from linear model	
	Contracts < $62M (1)	Contracts ≥ $62M (2)	Unweighted (3)	Winsorized weights (4)	OLS (5)	Heckman selection model (6)
Last week	0.60	0.18	0.56	0.37	−1.00	−1.57
	(0.23)	(0.11)	(0.14)	(0.12)	(0.39)	(0.64)
Year fixed effects	X	X	X	X	X	
Agency fixed effects	X	X	X	X	X	X
Project characteristics	X	X	X	X	X	X
Weighted by spending	X	X		X	X	X
λ						−0.87
						(0.85)
R^2					0.69	
Observations	335	336	671	671	671	3,803

• Balakrishnan, Soderstrom, and West (2007 JMAR)

TABLE 3
Hospital-Level Analysis of Intra-Year Spending Patterns

$$Log(TExp/FTE) = \alpha + \beta_1 Yrstart + \beta_2 Yrend + \beta_3 FiscMth + \gamma_1 Qtr + \sum_{i=99-02} \gamma_i Yr_i + \varepsilon$$

Item	Prediction	Model 1 (Effects for First and Last Month)[a]	Model 2 (Effects for First Two and Last Two Months)[a]
Intercept		8.626***	8.622***
		(363.97)	(308.51)
Yrstart	−	−0.201***	−0.118***
		(−15.24)	(−6.60)
Yrend	+	0.147***	0.061***
		(6.39)	(3.46)
FiscMth	+	0.006***	0.005**
		(2.60)	(2.52)
Qtr	?	0.005	0.029**
		(0.66)	(4.22)
YR_{99}		0.014	0.014
		(0.48)	(0.48)
YR_{00}		0.022	0.022
		(0.77)	(0.77)
YR_{01}		0.218***	0.218***
		(7.47)	(7.47)
YR_{02}		0.211***	0.211***
		(6.80)	(6.80)
Number		1,751	1,751
Adjusted R^2		0.23	0.22
Yrend + *Yrstart* = 0	t-statistic	−2.45**	−3.25**

Research Design

- Controlled for month, fiscal year, firm, product category fixed effects

- What types of firms/products/managers exhibit more advertising spikes in the last month?

Empirical results

TABLE 8: Firms' Monthly Sales and the Advertising Efficiency

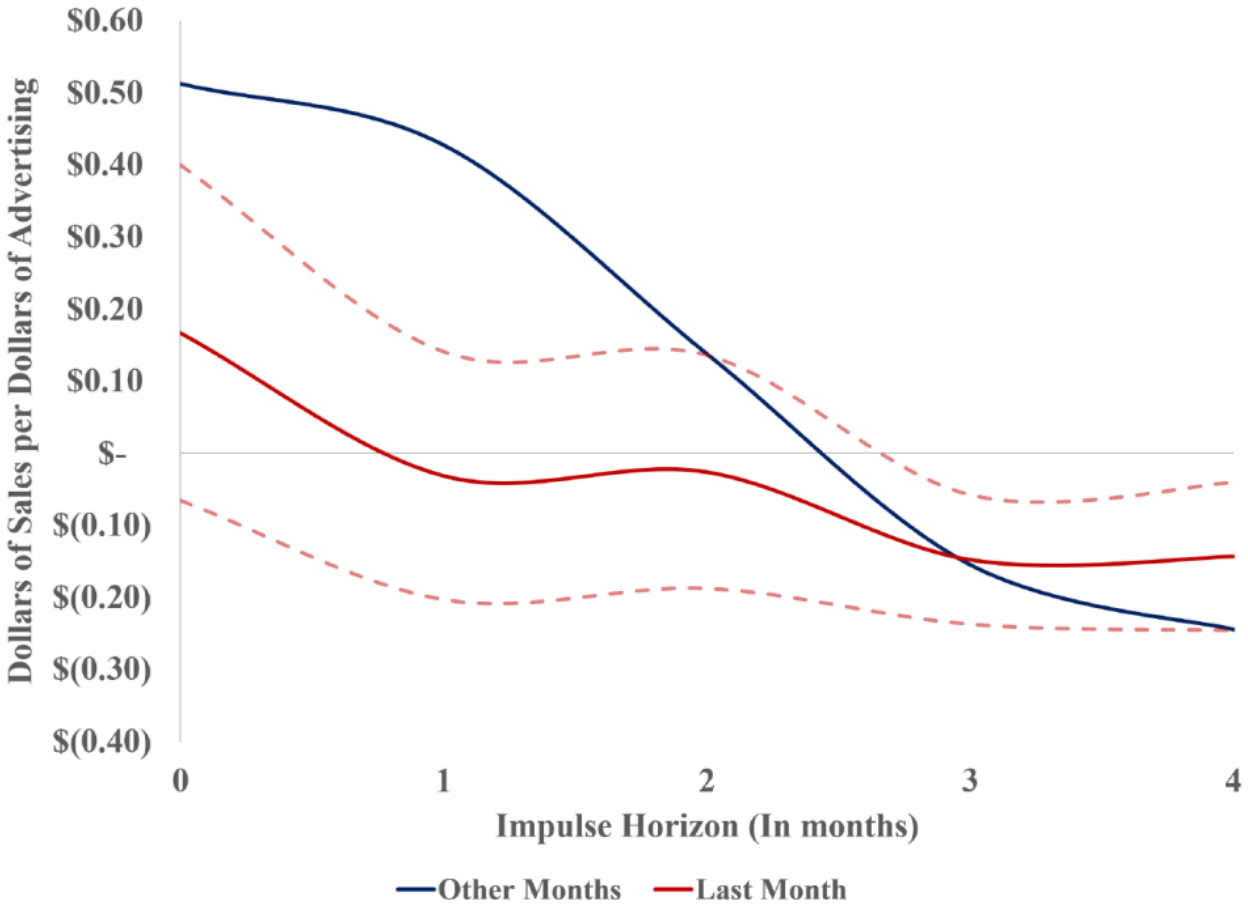
This table studies how each dollar of advertising spendings spent in the last month of the fiscal year generates in terms in sales using an OLS regression. The dependent variable is $Sales_{i,t}=\frac{Monthly\ Sales_{i,t}}{Fiscal\ Year\ Sales_{i,y}}$, or $Sales_{i,k,t}=\frac{Monthly\ Sales_{i,t}}{Fiscal\ Year\ Sales_{i,y}}$ in Panel A and B respectively. The first variable of interest is the *Last 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 $Spendings_{i,t}=\frac{Monthly\ Spending_{i,t}}{Fiscal\ Year\ Spending_{i,y}}$, or $Spendings_{i,k,t}=\frac{Monthly\ Spending_{i,k,t}}{Fiscal\ Year\ Spending_{i,k,y}}$ in Panel A and B respectively. 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: Firm Level	$Sales_{i,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	1.96***	0.94**	0.95**	0.97**		
	(5.13)	(2.14)	(2.14)	(2.19)		
(β_2) Last Month$_{i,t}$ * $Spending_{i,t}$	-0.05**	-0.05**	-0.05**	-0.05**		
	(-2.21)	(-2.47)	(-2.35)	(-2.44)		
(β_3) $Spending_{i,t}$	0.07***	0.07***	0.07***	0.08***		
	(5.28)	(5.32)	(5.22)	(5.46)		
R^2	0.02	0.02	0.05	0.10		
F-Statistics	7.14	4.86	4.62	4.87		
No. Obs.	21,294	21,294	21,294	21,294		
Panel B: Product Level	$Sales_{i,k,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Last Month$_{i,t}$	1.27***	0.56**	0.54**	0.54**	0.83***	0.87** *
	(5.68)	(2.12)	(2.03)	(2.06)	(2.97)	(3.10)
(β_2) Last Month$_{i,t}$ * $Spending_{i,k,t}$	-0.02*	-0.02**	-0.02*	-0.02*	-0.02**	-0.02**
	(-1.96)	(-2.11)	(-1.73)	(-1.75)	(-2.35)	(-2.58)
(β_3) $Spending_{i,k,t}$	0.04***	0.04***	0.03***	0.03***	0.02***	0.03** *
	(5.92)	(5.90)	(5.66)	(5.71)	(4.24)	(4.29)
R^2	0.01	0.02	0.04	0.06	0.18	0.21
F-Statistics	10.39	7.68	7.24	7.31	5.26	5.03
No. Obs.	38,100	38,100	38,100	38,100	38,044	38,044
Controls		$Spending_{i,[k],t-1}$, $Spending_{i,[k]t-2}$, $Spending_{i,[k],t-3}$, $Spending_{i,[k],t-4}$, $Spending_{i,[k],t-5}$, $Spending_{i,[k],t-6}$				
Month FE	No	Yes	Yes	Yes	Yes	No
Fiscal Year FE	No	Yes	Yes	No	No	No
Firm FE	No	No	Yes	No	No	No

Empirical results—Extend sales to future months?

FIGURE 9: Advertising to Sales Impulse Response Function

The figure 9 plot firms' the impulse response function of advertising spendings on sales over the first 5 months after the firms spent the money on advertising. For the average dollars spend on advertising, it takes up to 3 months to obtain a positive return on investment (RIO). For the average dollar spent on the end-of-year month, it is never achieved.



Empirical results

INTERNET APPENDIX TABLE IA.5: Who Engages in Capital Rationing?

This table shows which type of organization is more likely to engage in credit rationing using a Probit regression. There are 4 measures of organization complexity. First, there is the number of *Hierarchical Layers* measured as the number of layers that separate the CEO from the operating units as reported in the Lexis Nexis data. Second, *Flatness* of the firms, measures the number of units that are not direct reports to the CEO as reported in the Lexis Nexis data (scaled by 100). Third, *Number of Divisions,* measures the number of distinct business segment the firm engage in using Compustat data. Fourth, *Firm size,* is a measure of the firm's total assets. The dependent variable is *Capital Rationing* which is an indicator variable equal to 1 if the firm engaged in capital rationing on that year, and 0 otherwise. A firm is said to engaged in capital rationing if monthly expenses are below 8.33% (100%/12) in the month(s) following the moment the firm spent more than its last year level. 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%.

	Resource Allocation Binds When Budget is Busted$_{i,t}$ = 1					
	Flatness		Number of Product Divisions		Hierarchical Layers	
	(1)	(2)	(3)	(4)	(5)	(6)
(β_1) Capital Rationing$_{i,t}$	0.06***	0.13***	0.03	0.11***	-0.02	0.04
	(3.69)	(6.14)	(1.36)	(3.71)	(-0.59)	(0.92)
(β_2) Capital Rationing$_{i,t}$ * Complex Firm$_{i,t}$	0.32***	0.31**	0.44**	0.41*	0.04***	0.04***
	(3.39)	(2.51)	(2.35)	(1.92)	(3.00)	(2.76)
(β_3) Complex Firm$_{i,t}$	-0.11***		-0.28***		-0.02***	
	(-3.66)		(-7.47)		(-5.02)	
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Fiscal Year FE	No	No	No	No	No	No
Firm FE	No	No	No	No	No	No
Firm*Fiscal Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.01	0.15	0.02	0.15	0.02	0.15
F-Statistics	16.37	27.75	24.45	24.30	15.41	26.32
No. Obs.	38,100	38,100	38,100	38,100	38,100	38,100

Additional comments

- Investment efficiency
  - Overinvestment/underinvestment model (Biddle et al. 2009, Richardson 2006)
  - Year-end spikes create overinvestment/mitigate underinvestment?
  - Capital rationing creates underinvestment/mitigate overinvestment?
- Capital rationing and monitoring are substitutes?
  - Include them together in one regression

Summary

- A very interesting and innovative paper!
  - New granular project-level evidence on managerial budgets
  - Comprehensive analyses
- Highlight the incremental contribution
- Tighten the arguments
  - Managerial opportunism vs. rational decision-making
  - Target setting vs. budget implementation
- More institutional background on adverting budgeting process
- Empirical analysis: specific settings, determinants of spending spikes, long-term effect on sales,

Thank you!