INTERNET APPENDIX
for

Disaggregated Sales and Stock Returns

Appendix A: Variable Definitions and Constructions

1. Cumulative Abnormal Returns:

CAR[+2,+61] is the percentage buy-and-hold cumulative abnormal return over 60 trading days after the quarterly earnings announcement. It is constructed based on the six size×B/M Fama-French portfolio benchmark. Specifically, we define the buy-and-hold *CAR* following Hirshleifer, Lim, and Teoh (2009).

$$CAR[+2,+61]_{in} = \prod_{j=t+2}^{t+61}(1+R_{ij}) - \prod_{j=t+2}^{t+61}(1+R_{pj})$$

Where *t* is the earnings announcement date of firm *i* in fiscal quarter *n*; R_{ij} is the return of firm *i* on day *j* relative to the announcement day, and R_{pj} is the return of the matching size×B/M portfolio on day *j*. We use the nearest subsequent trading day if the earnings announcement date is a non-trading day. We accumulate the abnormal return till one day before the next earnings announcement date, if the number of trading days between two consecutive earnings announcements is less than 60 days. We require the number of days between two earnings announcement dates to be longer than 30 days but shorter than 365 days, and the number of days during reporting lag (the time after fiscal quarter end date but before earnings announcement day) to be longer than 0 day but shorter than 365 days.

Each stock is matched with one of the six size×B/M portfolios formed at the end of June each year. The *size* and *B/M* ratio for each stock used to match with the Fama-French portfolio are constructed in the same way as the Fama-French portfolio breakpoints. Specifically, *market equity* (or *size*) for a stock used to match with Fama-French portfolio in year *y* is the share price (CRSP variable *prc*) times shares outstanding (CRSP variable *shrout*) in the end of June of year *y*. The *book-to-market* ratio for a stock used to match with the Fama-French portfolio in June of year *y* is the *book equity* for the last fiscal year-end in *y-1*, divided by the *market equity* at the end of December of *y-1*. *Book equity* is the book value of stockholders' equity, plus balance sheet deferred taxes and investment tax credit (if available), minus the book value of preferred stock. Depending on availability, the redemption, liquidation, or par value (in that order) is used to estimate the book value of preferred stock. All definitions follow Kenneth French's website. The breakpoints of the six size×B/M portfolios, and the daily benchmark returns of the six portfolios are also obtained from Professor Kenneth French's data library.

2. Adjusted Spending, Earnings Surprise, and Sales Surprise:

Adjusted Spending (*AdjSpend****)*** is a firm-quarter's industry-adjusted customer credit card spending. Specifically,

$$AdjSpend_{ikn} = \frac{Spending_{ikn} - Industry\ average\ spending_{ikn}}{Sale_{ikn}+1}$$

Where $Spending_{ikn}$ is the aggregated credit card spending in dollar for firm *i* from industry *k* within fiscal quarter *n*; and $Industry\ average\ spending_{ikn}$ is the average credit card spending for all firms in industry *k* during the same period. Industry is defined based on the two-digit SIC code. $Sale_{ikn}$ is the total sales in millions of dollars for firm *i* from industry *k* within the fiscal quarter *n*. We scale by $(Sale_{ikn}+1)$ to account for zero sales cases.

Quintile of Adjusted Spending (*Q_AdjSpend****)*** is the quintile of *AdjSpend* sorted by every calendar quarter. *Q_AdjSpend* ranges from the bottom adjusted spending quintile (*Q_AdjSpend*=1) to the top adjusted spending quintile (*Q_AdjSpend*=5).

When we test the heterogeneity by customer spending capacity and customer loyalty (Table 4), we decompose the total credit card spending into spending from customer groups split by customer characteristics, and construct adjusted spending for different customer groups separately. For example,

$$AdjSpend\_high\ spending\ capacity_{ikn} = \frac{Spending\ from\ high\ capacity\ customers_{ikn} - Industry\ average\ spending_{ikn}}{Sale_{ikn}+1}$$

Standardized Unexpected Earnings (SUE) is the standardized earnings surprise based on a rolling seasonal random walk (SRW) model following Livnat and Mendenhall (2006). Specifically,

$$SUE_{in} = \frac{EPS_{in} - EPS_{in-4}}{P_{in}}$$

Where EPS_{in} is the primary Earnings Per Share before extraordinary items for firm *i* in fiscal quarter *n*, and P_{in} is the price per share for firm *i* at the end of quarter *n*. EPS_{in} and P_{in} are unadjusted for stock splits, but EPS_{in-4} is adjusted for any stock splits and stock dividends during the period {n−4, n}. If most analyst forecasts of *EPS* for a

firm-quarter are based on diluted *EPS*, we use COMPUSTAT's diluted *EPS* figures; otherwise we use basic primary *EPS*.

Quintile of Standardized Unexpected Earning (QSUE) is the quintile of *SUE* sorted by every calendar quarter. *QSUE* ranges from the bottom unexpected earnings quintile (*QSUE*=1) to the top unexpected earnings quintile (*QSUE*=5).

Standardized Unexpected Sales (SU_Sale) is the standardized sales surprise based on a rolling seasonal random walk (SRW) model. Specifically,

$$SU\_Sale_{in} = \frac{Sale\ per\ share_{in} - Sale\ per\ share_{in-4}}{P_{in}}$$

Where $Sale\ per\ share_{in}$ is sales per share for firm *i* in fiscal quarter *n*, and P_{in} is the price per share for firm *i* at the end of quarter *n*. Sales per share is calculated by dividing quarterly sales by the number of common shares used to calculate *EPS*. If most analyst forecasts of *EPS* for a firm-quarter are based on diluted *EPS*, we divide the sales by the number of common shares used to calculate diluted *EPS*; otherwise we use the number of common shares used to calculate primary *EPS*.

Quintile of Standardized Unexpected Sales (QSU_Sale) is the quintile of *SU_Sale* sorted by every calendar quarter. *QSU_Sale* ranges from the bottom unexpected sales quintile (*QSU_Sale*=1) to the top unexpected sales quintile (*QSU_Sale*=5).

3. Customer Characteristics:

Total credit card spending is the amount of total credit card spending within a fiscal quarter aggregated from credit card transactions, measured in US dollars. We only include firm-quarters that the whole fiscal-quarters are within our sample period (i.e., 1st March 2003 to 31st October 2003).

FICO score is the customer's FICO score, which measures his or her credit quality. Individuals with no lower than 740 quarter-beginning *FICO score* are defined as ***high FICO*** (hence *high spending capacity*) customers.

Credit utilization is the fraction of the total credit card balance out of the same-month credit limit. For individual *l* in month *t*, $credit\ utilization_{lt} = \frac{total\ credit\ card\ balance_{lt}}{credit\ limit_{lt}}$. Individuals with quarter-beginning *credit utilization* no higher than 30 percent are defined as ***low credit utilization*** (hence *high spending capacity*) customers.

Repeat customer is the individual who has ever purchased more than once from the same firm.

Loyal customer is the customer who intends to adhere to one or a few merchants to purchase a given category of goods. First, we exploit the goods type information from the Merchant Category Code in the credit card transaction record and divide the goods into nine categories: travel, transportation, supermarket, entertainment, apparel, dining, durable, service, and others. Second, for individual *l*, we calculate the *loyalty ratio* for goods category *c* = total number of category *c* goods purchases / total number of merchants that category *c* goods are purchased from during the whole sample period. We define a customer *l* as a loyal customer for a goods category *c* if the $loyalty\ ratio_{lc}$ is no lower than the median *loyalty ratio* for goods category *c*. Then for each merchant, if it sells goods from more than one category, we identify its major type of goods sold as the category with the largest fraction of purchase counts during the whole sample period. For a firm (mostly) selling goods category *c*, its loyal customers are the loyal customers for goods category *c*.

4. Firm Characteristics:

Sales is the total quarterly sales in millions of US dollars (COMPUSTAT variable *saleq*).

Net income is the total net income in millions of US dollars (COMPUSTAT variable *niq*).

Stock price is the quarterly close price, measured in US dollars (CRSP variable *prc*).

Market capitalization for a fiscal quarter is defined as the product of the share price (CRSP variable *prc*) and the total number of shares outstanding (CRSP variable *shrout*) reported in millions in fiscal quarter-end month. ***Log(size)*** is the log of market capitalization (in millions).

Book equity for a fiscal quarter is a firm's book value of equity constructed from COMPUSTAT data. It is the book value of stockholders' equity, plus balance sheet deferred taxes and investment tax credit (if available), minus the book value of preferred stock. Depending on availability, we use the redemption, liquidation, or par value (in that order) to estimate the book value of preferred stock. ***B/M*** for a fiscal quarter is the book-to-market ratio, calculated as book equity for the fiscal quarter end, divided by market equity at fiscal quarter-end month.

Number of analysts is the number of (active) analysts that have made forecasts within 90 days of the earnings announcement date. Firm-quarters with no analyst forecast during this period are assigned with 0 for this variable. ***Log(number of analyst + 1)*** is the log of the number of analysts that have made forecasts within 90 days before the quarterly earnings announcement date.

Reporting lag is the number of days between the fiscal-quarter end date and the earnings announcement date.

Consumer-oriented firms are firms from Transportation & Public Utilities division (two-digit SIC: 40-49), Retail Trade division (two-digit SIC: 52-59), or Service division (two-digit SIC: 70-89). The rest firms are classified as ***non-consumer-oriented firms***. Please see Appendix B for the detailed classification.

Firms relying more on direct sales are the firms with more than half of the disaggregated sales during our sample period is classified as Wellness or Cosmetics & Personal care-related spending (identified by the Merchant Category Code in the credit card transaction record). The rest firms are classified as ***firms relying less on direct sales***. Please see Appendix B for the detailed classification.

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Appendix B: Firm Classifications

We classify firms from Transportation & Public Utilities division (two-digit SIC: 40-49), Retail Trade division (two-digit SIC: 52-59), and Service division (two-digit SIC: 70-89) as consumer-oriented firms, and the rest firms as non-consumer-oriented firms. The division classification is from McKimmon Center of NCSU.

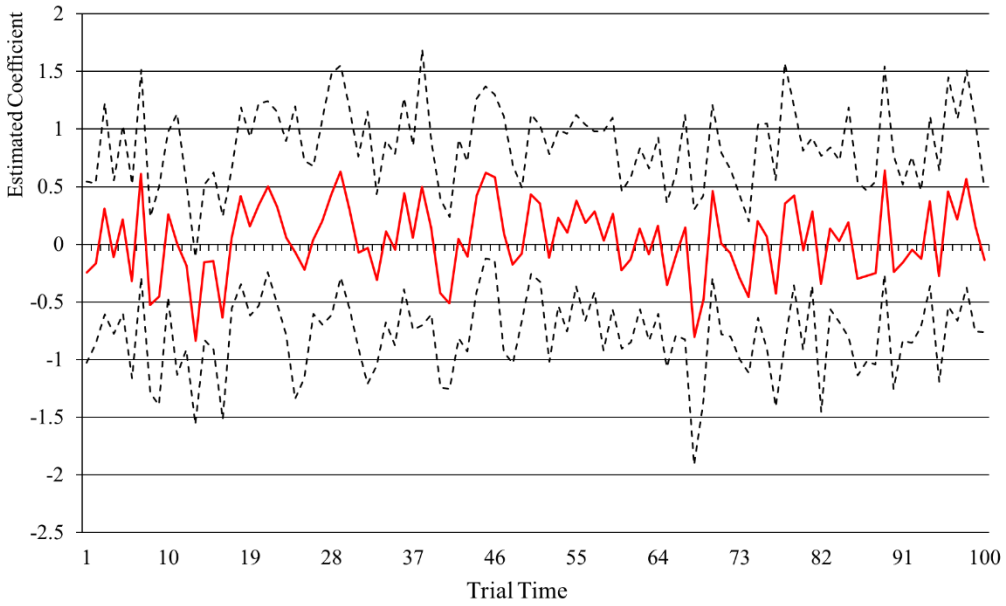
We define the firms' reliance on direct sales based on the type of goods or services they mainly sell. According to the report on the retail industry from WFDSA (2019), over 60 percent of direct sales come from two product categories: Wellness (33.2%) and Cosmetics & Personal care (31.2%). Therefore, we define a firm as relying more on direct sales if more than half of its disaggregated sales during our sample period is classified as Wellness or Cosmetics & Personal care-related spending (identified by the Merchant Category Code in the credit card transaction record); and the rest firms are classified as relying less on direct sales.

2-digit SIC code	Industry	Division	No. of firms in division	Fraction of firms with high reliance on direct sales (%)
Consumer-oriented				
40	Railroad Transportation	Transportation & Public Utilities	87	5
42	Trucking & Warehousing			
44	Water Transportation			
45	Transportation by Air			
46	Pipelines, Except Natural Gas			
47	Transportation Services			
48	Communications			
49	Electric, Gas, & Sanitary Services			
52	Building Materials & Gardening Supplies	Retail Trade	173	8
53	General Merchandise Stores			
54	Food Stores			
55	Automotive Dealers & Service Stations			
56	Apparel & Accessory Stores			
57	Furniture & Home furnishings Stores			
58	Eating & Drinking Places			
59	Miscellaneous Retail			
70	Hotels & Other Lodging Places	Services	172	8
72	Personal Services			
73	Business Services			
75	Auto Repair, Services, & Parking			
78	Motion Pictures			

79	Amusement & Recreation Services			
80	Health Services			
82	Educational Services			
83	Social Services			
87	Engineering & Management Services			
89	Services, Not Elsewhere Classified			
Sub total			432	7
Non-consumer-oriented				
01	Agricultural Production - Crops	Agriculture, Forestry, & Fishing	2	0
10	Metal, Mining	Mining	21	0
12	Coal Mining			
13	Oil & Gas Extraction			
14	Nonmetallic Minerals, Except Fuels			
15	General Building Contractors	Construction	12	0
16	Heavy Construction, Except Building			
17	Special Trade Contractors			
20	Food & Kindred Products	Manufacturing	276	6
22	Textile Mill Products			
23	Apparel & Other Textile Products			
24	Lumber & Wood Products			
25	Furniture & Fixtures			
26	Paper & Allied Products			
27	Printing & Publishing			
28	Chemical & Allied Products			
29	Petroleum & Coal Products			
30	Rubber & Miscellaneous Plastics Products			
31	Leather & Leather Products			
32	Stone, Clay, & Glass Products			
33	Primary Metal Industries			
34	Fabricated Metal Products			
35	Industrial Machinery & Equipment			
36	Electronic & Other Electric Equipment			

37	Transportation Equipment			
38	Instruments & Related Products			
39	Miscellaneous Manufacturing Industries			
50	Wholesale Trade - Durable Goods	Wholesale Trade	34	0
51	Wholesale Trade - Nondurable Goods			
60	Depository Institutions	Finance, Insurance, & Real Estate	80	4
61	Nondepository Institutions			
62	Security & Commodity Brokers			
63	Insurance Carriers			
64	Insurance Agents, Brokers, & Service			
65	Real Estate			
67	Holding & Other Investment Offices			
95	Environmental Quality & Housing	Public Administration	1	0
Sub total			426	5
Total			858	6

Figure IA1. Random Match between Adjusted Spending and Firm-quarters



Note. This figure plots the coefficients and 95% confidence intervals for *Q_AdjSpend* from the main regression, when the *Q_AdjSpend* is randomly assigned to an arbitrary firm-quarter in the sample. The random match is replicated for 100 times. The horizontal axis is the time of the random match, and the vertical axis is the magnitude of the regression coefficient for *Q_AdjSpend*. For detailed variable definitions and constructions, please see Appendix A in the Internet Appendix.

Table IA1. Aggregated Sales and Credit Card Spending within Industry

Panel A. Distribution of the difference: sales fraction – spending fraction within industry

Mean	Std. dev.	25 percentile	Median	75 percentile
(1)	(2)	(3)	(4)	(5)
0.000	0.147	-0.026	-0.003	0.012

Panel B. Exclude firm-quarters with |sales fraction – spending fraction|>10%

	CAR[+2,+61]
	(1)
Q_AdjSpend	1.778***
	(3.94)
QSUE	2.648***
	(4.65)
QSU_Sale	-0.128
	(0.32)
Firm characteristics controls	Y
Industry FE	Y
Year-quarter FE	Y
Observations	1,184
R-squared	0.14

Note. This table investigates the difference between firm-quarters' sales fraction and customer spending faction within industry in our sample. S*ales fraction* is the firm-quarter's reported sales scaled by total reported sales from all same-industry firms in the same calendar quarter in our sample. S*pending fraction* is the firm-quarter's customer credit card spending scaled by total customer credit card spending from all same-industry firms in the same calendar quarter in our sample. In Panel A, we report the distribution of the difference between *sales fraction* and *spending fraction*. In Panel B, we estimate our main result after excluding firm-quarters with over 10 percent of difference in *sales fraction* and *spending fraction*. All *CAR*s are measured in percentage. Coefficients for other control variables and constant term are omitted. For detailed variable definitions and constructions, please see Appendix A in the Internet Appendix. Industry and year-quarter fixed effects are included. Standard errors are clustered at the two-digit industry level. t-statistics are reported in parentheses. *** indicates significant at 1 percent, ** indicates significant at 5 percent, and * indicates significant at 10 percent respectively.

Table IA2. Heterogeneous Effect by Fraction of Sales to Consumers

	CAR[+2,+61]	
	High fraction of sales to consumers	Low fraction of sales to consumers
	(1)	(2)
Q_AdjSpend	1.739***	0.737
	(3.80)	(0.93)
QSUE	2.866***	1.861**
	(4.44)	(2.61)
QSU_Sale	-0.772	0.284
	(1.60)	(0.45)
Firm characteristics controls	Y	Y
Industry FE	Y	Y
Year-quarter FE	Y	Y
Observations	888	584
R-squared	0.15	0.12

Note. This table presents the heterogeneous effect under an alternative classification criterion for consumer-oriented firms. We report the average effect in consumer-oriented firms (column (1)) and non-consumer-oriented firms (columns (2)) under the alternative definition respectively. Specifically, we compute the fraction of credit card sales out of the reported sales for each firm quarter. Firms in industries with median fraction of sales to consumers higher than the 50th percentile among all industries in the sample are classified as consumer-oriented firms, and firms in the rest industries as non-consumer-oriented firms. For other detailed variable definitions and constructions, please see Appendix A in the Internet Appendix. Industry and year-quarter fixed effects are included. All *CAR*s are measured in percentage. Coefficients for other control variables and constant term are omitted. Standard errors are clustered at the two-digit industry level. t-statistics are reported in parentheses. *** indicates significant at 1 percent, ** indicates significant at 5 percent, and * indicates significant at 10 percent respectively.

Table IA3. Do Customer Spending Capacity Measures Predict Future Purchases?

	Repeat customer (dummy)		Repeat purchase amount ($)	
	FICO score	Credit utilization	FICO score	Credit utilization
	(1)	(2)	(3)	(4)
High spending capacity	0.046***	0.019***	25.527***	6.159**
	(22.33)	(8.86)	(7.17)	(2.47)
Firm FE	Y	Y	Y	Y
Observations	331,241	340,930	141,176	144,337
R-squared	0.09	0.09	0.17	0.17

Note. This table investigates the relation between customer spending capacity proxies and repeat purchase behaviors. Each customer in the sample is classified as with *high spending capacity* or *low spending capacity* according to the spending capacity characteristics (sample-beginning *FICO score* and *credit utilization*). *Repeat customer* for a firm is the individual who has purchased more than once from this firm. *Repeat purchase amount* for a firm is the total dollar amount for the repurchase transactions at the firm from each *repeat customer*. Columns (1)-(2) report the extensive margin effect; and columns (3)-(4) report the intensive margin effect. *High spending capacity* is a dummy equal to 1 for customers with high spending capacity. For detailed variable definitions and constructions, please see Appendix A in the Internet Appendix. Firm fixed effect is included, and standard errors are clustered at the firm level. Coefficients for the constant term are omitted. t-statistics are reported in parentheses. *** indicates significant at 1 percent, ** indicates significant at 5 percent, and * indicates significant at 10 percent respectively.

Table IA4. Heterogeneity by Customer Spending Capacity (Alternative Measures)

	CAR[+2,+61]	
	Behavior score	Delinquency
	(1)	(2)
Q_AdjSpend_high spending capacity	1.509**	1.483***
	(2.11)	(3.48)
Q_AdjSpend_low spending capacity	0.747	0.376
	(0.86)	(0.37)
Surprise controls	Y	Y
Firm characteristics controls	Y	Y
Industry FE	Y	Y
Year-quarter FE	Y	Y
Observations	1,438	1,439
R-squared	0.12	0.12

Note. This table presents the return predictability of the adjusted spending from the firm's customer groups with high and low spending capacity separately, under two alternative measures of consumer credit and liquidity status. We define high-spending-capacity customers as individuals with top tercile quarter-beginning *internal behavior score* (column (1)), or the individual who has never been delinquent during the whole sample period (column (2)). *Internal behavior score* is an internal-generated credit quality score for a credit card holder; a higher *internal behavior score* indicates better credit quality. Total credit card spending in each firm-quarter is decomposed into the amount from high spending capacity customers and low spending capacity customers respectively. *Q_AdjSpend_high spending capacity* is the quintile of adjusted spending from high spending capacity customers. *Q_AdjSpend_low spending capacity* is the quintile of adjusted spending from low spending capacity customers. All *CAR*s are measured in percentage. Coefficients for other control variables and constant term are omitted. For detailed variable definitions and constructions, please see Appendix A in the Internet Appendix. Industry and year-quarter fixed effects are included. Standard errors are clustered at the two-digit industry level. t-statistics are reported in parentheses. *** indicates significant at 1 percent, ** indicates significant at 5 percent, and * indicates significant at 10 percent respectively.

Table IA5. Heterogeneity by Customer Base

Panel A. Customer age diversity

	CAR[+2,+61]	
	High age diversity	Low age diversity
	(1)	(2)
Q_AdjSpend	2.324***	0.794
	(2.91)	(0.98)
QSUE	2.228***	2.526***
	(3.18)	(3.16)
QSU_Sale	-0.866	0.033
	(1.55)	(0.05)
Firm characteristics controls	Y	Y
Industry FE	Y	Y
Year-quarter FE	Y	Y
Observations	717	714
R-squared	0.17	0.17

Panel B. Customer regional diversity

	CAR[+2,+61]	
	High regional diversity	Low regional diversity
	(1)	(2)
Q_AdjSpend	2.370***	0.819
	(3.25)	(1.22)
QSUE	1.858***	3.026***
	(3.13)	(3.94)
QSU_Sale	-0.710	-0.079
	(1.25)	(0.13)
Firm characteristics controls	Y	Y
Industry FE	Y	Y
Year-quarter FE	Y	Y
Observations	716	716
R-squared	0.17	0.17

Panel C. Rural-urban diversity

	CAR[+2,+61]	
	High rural-urban diversity	Low rural-urban diversity
	(1)	(2)
Q_AdjSpend	2.329***	0.668
	(3.09)	(0.69)
QSUE	1.547**	3.183***
	(2.20)	(4.01)
QSU_Sale	-0.364	-0.222
	(0.75)	(0.33)
Firm characteristics controls	Y	Y
Industry FE	Y	Y
Year-quarter FE	Y	Y
Observations	714	712
R-squared	0.15	0.18

Note. This table presents the heterogeneous return predictability of the adjusted spending by the firm's customer base diversity. Panel A investigates the heterogeneity by the firm's customer age diversity. Firm-quarters with lower-than-median *HHI age* from three age groups (i.e., young (age<30), middle-age (30≤age<60), and old (age≥60)) are defined as diversified. Column (1) reports the regression results for firm-quarters with consumption from diversified customer age groups; and column (2) reports the regression results for firm-quarters with consumption from concentrated customer age groups. Panel B reports the heterogeneity by customer regional diversity. Firm-quarters with lower-than-median *HHI region* from five regional groups (i.e., Midwest, Northeast, West, South, and other) are defined as diversified. Column (1) reports the regression results for firm-quarters with regionally diversified consumption; and column (2) reports the regression results for firm-quarters with regionally concentrated consumption. Panel C reports the heterogeneity by customer rural-urban diversity. Firm-quarters with lower-than-median *HHI rural-urban* from rural and urban customers are defined as diversified. Column (1) reports the regression results for firm-quarters with diversified rural-urban consumption; and column (2) reports the regression results for firm-quarters with concentrated rural-urban consumption. Quintile ranking of *AdjSpend*, *SUE*, and *SU_Sale* are all based on independent sorts in each calendar quarter. All *CAR*s are measured in percentage. Coefficients for other control variables and constant term are omitted. For detailed variable definitions and constructions, please see Appendix A in the Internet Appendix. Industry and year-quarter fixed effects are included. Standard errors are clustered at the two-digit industry level. t-statistics are reported in parentheses. *** indicates significant at 1 percent, ** indicates significant at 5 percent, and * indicates significant at 10 percent respectively.

Table IA6. Predicting Future Earnings and Sales Surprises

	QSUE in quarter		*QSU_Sale* in quarter	
	n+1	*n*+4	*n*+1	*n*+4
	(1)	(2)	(3)	(4)
Q_AdjSpend	0.026	0.085**	0.058**	0.067**
	(0.82)	(2.34)	(2.11)	(2.17)
QSUE	0.328***	-0.158***	-0.044*	-0.043
	(9.60)	(3.62)	(1.91)	(1.45)
QSU_Sale	0.025	0.003	0.617***	0.024
	(1.08)	(0.08)	(22.62)	(0.56)
Firm characteristics controls	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Year-quarter FE	Y	Y	Y	Y
Observations	1,482	1,404	1,482	1,404
R-squared	0.24	0.14	0.45	0.16

Note. This table presents the predictability of the firm's adjusted spending on its future earnings and sales surprises. We construct earnings surprise (sales surprise) in future quarters as the change of *EPS* (*Sales per share*) scaled by price in quarter *n* to avoid the contamination of changing price caused by adjusted spending. For example, the *SUE* in quarter *n*+1 is $SUE_{i\mathrm{n}+1} = \frac{EPS_{i\mathrm{n}+1} - EPS_{i\mathrm{n}-3}}{P_{i\mathrm{n}}}$. Columns (1)–(2) report the predictive power of adjusted spending quintiles in quarter *n* for earnings surprise quintiles in quarter *n+1* and *n+4* respectively. Columns (3)-(4) report the predictive power of adjusted spending quintiles in quarter *n* for sales surprise quintiles in quarter *n+1* and *n+4* respectively. *Q_AdjSpend* is quintiles of adjusted spending. *QSUE* is quintile of earnings surprise. *QSU_Sale* is quintile of sales surprise. Quintile ranking of *AdjSpend*, *SUE*, and *SU_Sale* are all based on independent sorts in each calendar quarter. All *CAR*s are measured in percentage. Coefficients for other control variables and constant term are omitted. For detailed variable definitions and constructions, please see Appendix A in the Internet Appendix. Industry and year-quarter fixed effects are included. Standard errors are clustered at the two-digit industry level. t-statistics are reported in parentheses. *** indicates significant at 1 percent, ** indicates significant at 5 percent, and * indicates significant at 10 percent respectively.

Table IA7. Alternative Explanations

	CAR[+2,+61]		
	Earnings quality	Institutional ownership	Investor distraction
	(1)	(2)	(3)
Q_AdjSpend	1.309***	1.615***	1.490***
	(3.04)	(4.06)	(3.71)
QSUE	2.567***	2.418***	2.462***
	(4.96)	(4.78)	(4.73)
QSU_Sale	-0.339	-0.322	-0.316
	(0.84)	(0.78)	(0.77)
Earnings persistence	-2.963***		
	(2.83)		
Earnings volatility	-0.000***		
	(11.35)		
Institutional ownership		-3.839**	
		(2.08)	
Number of concurrent EA			-0.001
			(-0.15)
Firm characteristics controls	Y	Y	Y
Industry FE	Y	Y	Y
Year-quarter FE	Y	Y	Y
Observations	1,415	1,465	1,472
R-squared	0.14	0.13	0.13

Note. This table presents the test results for alternative explanations by controlling for three factors associated with the *Post-Earnings-Announcement-Drift*: earnings quality, institutional ownership, and investor distraction. Column (1) adds two earnings properties—*earnings persistence* and *earnings volatility*—as additional controls. *Earnings persistence* is the coefficient estimation of quarterly *EPS* regressed on the *EPS* in the same quarter last year (using the past four years of data to run the regression). *Earnings volatility* is the standard deviation during the preceding four years for the deviations of quarterly earnings from one-year-ago earnings. Column (2) adds firm-quarter's percentage of institutional ownership (*institutional ownership*) by the ending month of each fiscal quarter as additional control. Column (3) adds the number of concurrent earnings announcements on the same date (*number of concurrent EA*) for a firm-quarter as an additional control. Quintile ranking of *AdjSpend*, *SUE*, and *SU_Sale* are all based on independent sorts in each calendar quarter. All *CAR*s are measured in percentage. Coefficients for other control variables and constant term are omitted. For detailed variable definitions and constructions, please see Appendix A in the Internet Appendix. Industry and year-quarter fixed effects are included. Standard errors are clustered at the two-digit industry level. t-statistics are reported in parentheses. *** indicates significant at 1 percent, ** indicates significant at 5 percent, and * indicates significant at 10 percent respectively.

Table IA8. Post-announcement Return Predictability of Earnings Surprise

Panel A. Firms in sample vs. firms not in sample, 1980-2003

	All firms	Firms in sample	Firms not in sample	Difference (2)-(3)
	(1)	(2)	(3)	(4)
↑ in *CAR[+2,+61]* when 1 inter-quintile ↑ in *SUE*	1.3%	1.4%	1.3%	0.1%

Panel B. Sample period (2003 Q2-Q3) vs. other period, 1980-2003

↑in *CAR[+2,+61]* when 1 inter-quintile ↑ in *SUE*		All firms (1)	Firms in sample (2)	Firms not in sample (3)	Difference (2)-(3) (4)
(a)	During 2003Q2-Q3	2.3%	2.7%	2.2%	0.5%
(b)	During other time in 1980-2003	1.2%	1.3%	1.2%	0.1%
Difference (a)-(b)		1.1%***	1.4%**	1.0%***	0.4%

Note. This table presents the return predictability of the earnings surprise during the 60-day post-announcement period. In Panel A, we extend the time period to all quarters in 1980-2003, and check the return predictability of *SUE* for firms in sample and firms not in sample separately. In Panel B, we further divide the time period into sample period (2003 Q2-Q3) and other period, and check the return predictability of *SUE* for firms in sample and firms not in the sample during the two periods separately. Column (1) reports the effects for all firms together; columns (2) and (3) report the effects for firms in sample and not in sample respectively; and column (4) report the difference in effects between firms in sample and firms not in the sample. *QSUE* is quintile of earnings surprise (*QSUE*=1: bad earnings news, *QSUE*=5: good earnings news). Quintile ranking of *SUE* is based on independent sorts in each calendar quarter. For detailed variable definitions and constructions, please see Appendix A in the Internet Appendix. *** indicates significant at 1 percent, ** indicates significant at 5 percent, and * indicates significant at 10 percent respectively.

Table IA9. Robustness Tests

Panel A. Alternative definitions of sales surprise, earnings surprise, and adjusted spending

	CAR[+2,+61]			
	Industry-adjusted sales and earnings	Change in sales and earnings proportion in industry	Analyst forecast based *SUE*	Asset-scaled adjusted spending
	(1)	(2)	(3)	(4)
Q_AdjSpend	1.253***	1.345***	2.373***	
	(2.99)	(3.27)	(4.16)	1.656***
Q_AdjSpend_asset				(4.74)
Q_AdjEarning	0.707			
	(1.27)			
Q_ChgEarningProp		-0.033		
		(0.05)		
QSUE_af			0.266	
			(0.53)	
QSUE				2.469***
				(4.78)
Q_AdjSale	0.322			
	(0.31)			
Q_ChgSaleProp		0.281		
		(0.70)		
QSU_Sale			-0.199	-0.267
			(0.34)	(0.65)
Firm characteristics controls	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Year-quarter FE	Y	Y	Y	Y
Observations	1,472	1,472	959	1,472
R-squared	0.11	0.11	0.16	0.13

Panel B. Alternative benchmarks for *CAR*s

	CAR[+2,+61]		
	25 size × B/M Fama-French portfolio return	Value-weighted market return	125 size × B/M × Momentum DGTW portfolio return
	(1)	(2)	(3)
Q_AdjSpend	1.407***	1.572***	0.871**
	(3.56)	(3.93)	(2.57)
QSUE	2.336***	2.367***	2.653***
	(4.34)	(4.57)	(4.97)
QSU_Sale	-0.205	-0.350	-0.016
	(0.50)	(0.85)	(0.04)
Firm characteristics controls	Y	Y	Y
Industry FE	Y	Y	Y
Year-quarter FE	Y	Y	Y
Observations	1,471	1,486	1,306
R-squared	0.11	0.16	0.13

Panel C. Alternative industry classifications

	CAR[+2,+61]	
	Fama-French 48 industry (2)	3-digit NAICS industry
	(1)	(2)
Q_AdjSpend	1.483***	1.538***
	(2.90)	(3.57)
QSUE	2.392***	2.291***
	(6.00)	(3.43)
QSU_Sale	-0.268	-0.287
	(0.69)	(0.62)
Firm characteristics controls	Y	Y
Industry FE	Y	Y
Year-quarter FE	Y	Y
Observations	1,461	1,457
R-squared	0.12	0.13

Note. This table presents three sets of robustness tests. In panel A, we consider alternative specifications regarding sales surprise, earnings surprise, and adjusted spending. In column (1), we replace quintile of sales (earnings) surprise with quintile of industry-adjusted sales (earnings): *Q_AdjSale* (*Q_AdjEarning*), where $AdjSale_{ikn} = \frac{Sale_{ikn} - Industry\ average\ sale_{ikn}}{Sale_{ikn}+1}$, and $AdjEarning_{ikn} = \frac{NI_{ikn} - Industry\ average\ NI_{ikn}}{NI_{ikn}+1}$. In column (2), we replace quintile of sales (earnings) surprise with quintile of change in sales (earnings) as a fraction of the industry's total sales (earnings) from the same quarter of last year: *Q_ChgSaleProp* (*Q_ChgEarningProp*), where $ChgSaleProp_{ikn} = \frac{Sales_{ikn}}{Industry\ total\ sales_{kn}} - \frac{Sales_{ikn-4}}{Industry\ total\ sales_{kn-4}}$, and $ChgEarningProp_{ikn} = \frac{NI_{ikn}}{Industry\ total\ NI_{kn}} - \frac{NI_{ikn-4}}{Industry\ total\ NI_{kn-4}}$. In column (3), we replace *QSUE* with analyst forecast based earnings surprise: *QSUE_af*, where $SUE\_af_{in} = \frac{EPS_{in} - EPS\_AF_{in}}{P_{in}}$, and EPS_AF_{in} is the median of analysts' most recent earnings forecasts reported to I/B/E/S in the 90 days before the earnings announcement day. In column (4), we define the adjusted customer spending as $AdjSpend\_asset_{ikn} = \frac{Spending_{ikn} - Industry\ average\ spending_{ikn}}{Total\ asset_{ikn}}$, and investigate the effect of *Q_AdjSpend_asset*. In Panel B, we replicate the main results in Table 2 using three alternative benchmark portfolio returns to calculate *CAR*. Columns (1)-(3) use the benchmark returns as 25 size×B/M Fama-French portfolio returns, value-weighted market returns, and 125 size×B/M×Momentum DGTW portfolio returns respectively (Daniel, Grinblatt, Titman, and Wermers, 1997; Wermers, 2004). In Panel C, we replicate the main results in Table 2 using two alternative industry classifications: Fama-French 48 industry (column (1)) and 3-digit NAICS industry (column (2)). Industry and year-quarter fixed effects are included. Coefficients for other control variables and constant term are omitted. Standard errors are clustered at the two-digit industry level. t-statistics are reported in parentheses. *** indicates significant at 1 percent, ** indicates significant at 5 percent, and * indicates significant at 10 percent respectively.

Table IA10. Bootstrap Standard Error Estimation

	CAR[+2,+61]
	(1)
Q_AdjSpend	1.490***
	(3.73)
QSUE	2.465***
	(4.80)
QSU_Sale	-0.320
	(0.78)
Firm characteristics controls	Y
Industry FE	Y
Year-quarter FE	Y
Observations	1,472
R-squared	0.13

Note. This table presents the effect of adjusted spending on subsequent *CAR* when standard errors for regression are estimated by bootstrapping for 500 times. Quintile ranking of *AdjSpend*, *SUE*, and *SU_Sale* are all based on independent sorts in each calendar quarter. For detailed variable definitions and constructions, please see Appendix A in the Internet Appendix. All *CAR*s are measured in percentage. Coefficients for other control variables and constant term are omitted. Industry and year-quarter fixed effects are included, and standard errors are generated by bootstrap. t-statistics are reported in parentheses. *** indicates significant at 1 percent, ** indicates significant at 5 percent, and * indicates significant at 10 percent respectively.

Table IA11. Account for Industry-level Variations

Panel A. Exclude industries with less than N firms

	CAR[+2,+61]			
	N=3	N=5	N=10	N=20
	(1)	(2)	(3)	(4)
Q_AdjSpend	1.522***	1.464***	1.681***	1.575***
	(3.77)	(3.67)	(4.72)	(4.08)
QSUE	2.470***	2.534***	2.535***	2.361***
	(4.81)	(4.87)	(4.80)	(3.99)
QSU_Sale	-0.305	-0.245	-0.260	-0.623
	(0.75)	(0.61)	(0.66)	(1.62)
Firm characteristics controls	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Year-quarter FE	Y	Y	Y	Y
Observations	1,453	1,402	1,196	887
R-squared	0.12	0.12	0.12	0.11

Panel B: Control for firm size within industry

	CAR[+2,+61]	
	(1)	(2)
Q_AdjSpend	1.488***	
	(3.74)	
Q_ResSpend		1.291***
		(3.78)
QSUE	2.466***	2.414***
	(4.83)	(4.65)
QSU_Sale	-0.320	-0.283
	(0.79)	(0.70)
IndRank_size	0.005	
	(0.06)	
Firm characteristics controls	Y	Y
Industry FE	Y	Y
Year-quarter FE	Y	Y
Observations	1,472	1,472
R-squared	0.13	0.13

Panel C. Control for industry average *CAR*[+2,+61]

	CAR[+2,+61]
	(1)
Q_AdjSpend	1.460***
	(3.67)
QSUE	2.490***
	(4.90)
QSU_Sale	-0.248
	(0.59)
Industry Average CAR[+2,+61]	0.927***
	(6.55)
Firm characteristics controls	Y
Industry FE	Y
Year-quarter FE	Y
Observations	1,472
R-squared	0.16

Note. This table presents the effect of adjusted spending on post-announcement *CAR* after accounting for industry-level variations. Panel A excludes industries with less than X firms, with X being 3, 5, 10 or 20 in columns (1)-(4). Panel B controls for within-industry size difference of firms. Column (1) additionally controls for the rank of quarter-end firm size within the industry (*IndRank_size*) for each quarter in the regression. Column (2) replaces the quintile of *adjusted spending* with the quintile of a *residualized spending* measure orthogonal to the firm size. Specifically, we regress the deviation of customer spending from industry mean (i.e., the numerator for *AdjSpend* measure) on the quarter-end *size* for each firm-quarter and take the regression residual as *residualized spending*. Panel C includes the industry average *CAR* during the [+2,+61] trading day period after each firm-quarter's earnings announcement in the regression. Quintile ranking of *AdjSpend, residualized spending, SUE*, and *SU_Sale* are all based on independent sorts in each calendar quarter. For detailed variable definitions and constructions, please see Appendix A in the Internet Appendix. All *CAR*s are measured in percentage. Coefficients for other control variables and constant term are omitted. Industry and year-quarter fixed effects are included, and standard errors are clustered at the two-digit industry level. t-statistics are reported in parentheses. *** indicates significant at 1 percent, ** indicates significant at 5 percent, and * indicates significant at 10 percent respectively.

References

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