



# Having the government as a client: Does this reduce earnings management of the firm?

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## ABSTRACT

Does government contracting translate to better earnings quality and less earnings management? In this study, we seek to answer this question. We find strong evidence that government suppliers strategically substitute accrual-based earnings management with real earnings management. Firms with government customers distinctively employ greater real activities manipulation than their industry peers, as proxied by abnormal discretionary expenditures, abnormal production costs, and total real activities manipulation while avoiding accrual manipulation. These findings are robust to a host of robustness checks including measurement errors, selection bias and endogeneity. Hence, our findings have implications for procurement policy as policymakers may underestimate the total earnings management activities of government suppliers.

## 1. Introduction

Government agencies are among the largest customers in the world. Consequently, procuring a contract to supply a government agency represents a tremendous financial opportunity for firms in the private sector.<sup>1</sup> These supplier-customer relationships can significantly reduce the operational risk of government contractors by decreasing demand uncertainty (Cohen and Li, 2020). Contractors also enjoy steadier cash flows, have better access to capital markets, and pay lower equity costs than their peers (Dhaliwal et al., 2016; Huang et al., 2016; Paglia and Harjoto, 2014). Therefore, to protect contract revenues, the political cost hypothesis avers that government suppliers often take actions to deflect or preempt potential negative government actions, which can result in higher political costs (e.g. Watts and Zimmerman, 1986).

For instance, U.S. government contractors are subject to strict supervision and monitoring mandates as authorized under the Federal Acquisition Regulations (FARs), the Cost Accounting Standards (CAS), and the National Defense Authorization Act (NDAA), including financial audits that are more in-depth and exhaustive than those performed by external auditors (see Cohen et al., 2021; Madsen and Abott, 2017; Samuels, 2021). As a result, contractors deploy various strategies to

avert scrutiny from regulators and watchdog groups that may cause adverse outcomes and the loss of contract revenues. The literature reports that contractors make campaign contributions, pay higher tax rates, constrain executive compensation, and use social responsibility media campaigns to stay below the radar of any added scrutiny (e.g. Craig and Hadley, 2020; Hadley, 2019; Mills et al., 2013; Watts and Zimmerman, 1986; Witko, 2011). Overall, the documented findings are consistent with the notion that political sensitivity influences corporate behavior.

This study is motivated by the research on accounting responses to political sensitivity. There is strong evidence to suggest that firms sensitive to government scrutiny use discretionary accruals to manage earnings downward (e.g. Fields et al., 2001; Han and Wang, 1998; Northcut and Vines, 1998). For instance, Ramanna and Roychowdhury (2010) show that politically sensitive firms with more extensive outsourcing activity restrict their earnings with discretionary accruals. The intuition is that politically sensitive firms have more income-decreasing discretionary accruals because of concerns about the potentially negative consequences of scrutiny when they declare large profits. Consequently, government contracts may induce firms to select accounting methods that achieve desired financial reporting objectives, especially when a substantial portion of their total revenue involves government-related sales.

Samuels (2021) argues that regulatory pressures improve the information environment around contractors, leading to better external financial reporting. Since information asymmetry creates uncertainty about the ability of government suppliers to fulfill their commitments, she purports that, to mitigate this risk, regulators require contractors to have certain financial attributes and internal information systems. Yet, Watts and Zimmerman (1986), Hadley (2019), Mills et al. (2013), and

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<sup>1</sup> This economic footprint at the micro-level of the economy has major implications at the macro-level. For instance, private sector contracts in the United States (U.S.) account for about 14% of the federal budget (Cohen et al., 2021; Sahadi, 2012). The Federal Procurement Data System reports that in 2017 government contracts accounted for over \$500 billion dollars, which highlights the importance of government agencies and their contractors U.S. economy.

others contend that scrutiny from regulators and watch-dog organizations affects firms' accounting choices as well as their financial behavior, which often leads to higher political costs owing to actions undertaken to avoid scrutiny and to protect contract revenues.

This paper enhances the discussion by examining how, and to what extent, government supplier-customer business relationships influence the trade-off between real activities and accrual-based earnings management among U.S.-based contractors to various types of government agencies (i.e., federal, state, local, and foreign). While earlier studies suggest that government scrutiny causes contractors to make accounting choices that reduce discretionary accruals, contractors' levels of real earnings management has been relatively unexplored. Mills et al. (2013) underscore that most of the research on the link between earnings management and political sensitivity examine accrual responses rather than cash flows and predates the recent focus on real earnings management. As a result, there is scant research, to date, on the relationship between real earnings management and government contracting. Our study helps to fill the gap in the literature.

It is both interesting and useful to examine how government supplier-customer business relationships affect the degree of real earnings management because decisions to manage earnings through real economic actions are made before decisions to manage earnings through accruals. Zang (2012), Farooqi et al. (2014), and others show that firms adjust accruals at fiscal year-end based on the outcome of their real activities management during the fiscal year. The justification is that real activities management changes actual business transactions, hence these activities take place during the fiscal year, whereas accruals are managed at the fiscal year-end and have no direct cash flow consequences. There is also robust evidence of a sequential substitutive effect between the two strategies, implying that the degree of accounting management depends on how successful firms are in using operational actions to meet their earnings targets (see Zang, 2012).

Provided that only limited research has been done on the operational activities contractors may use to manage earnings, our understanding of the relationship between political sensitivity and earnings management may be incomplete as we now know that real activities management precedes accrual management and does so in a substitutive way. The break in the literature is a significant oversight given that real activities management is pervasive (Gunny, 2010; Cohen and Zarowin, 2010). The current paper offers new insights to extend this strand of the literature. We postulate that government contracts influence earnings management behavior through operating- as well as monitoring- channels. Because contractors are subject to very strict auditing and supervising mandates, we theorize that they have incentives under the political cost framework to avoid accrual management (as this approach is easily detectable) and to favor more real activities management because of its greater secrecy.<sup>2</sup>

Graham et al. (2005) emphasize that while auditors can second-guess a firm's accounting practices, they cannot challenge real economic actions taken in the ordinary course of business to meet earnings targets. Accordingly, we expect government suppliers to engage in limited accrual management. Instead, we postulate that given their political sensitivity, contractors engage in more real activities management than their non-contracting industry peers because these pursuits can be disguised as sincere "operating" business decisions and so are harder to detect than managing accruals (e.g. Graham et al., 2005; Gunny, 2010; Farooqi et al., 2014). This prediction is consistent with the political cost hypothesis, which suggests that government contractors seek to elude added scrutiny regulators and watchdog organizations.

To test our predictions, we employ an unbalanced panel of firms that report customer level data in the Compustat segment customer file over the period from 1980 to 2017. This dataset is well suited for the

study because it includes companies of different sizes and industries extending over four decades; it encompasses firms with important customers who potentially could exert significant influence on managers due to the sheer size of their proportion of firm sales. Under Financial Accounting Standards Board (FASB) No. 14, firms must disclose whenever 10 percent or more of their revenues are derived from sales to any single customer.<sup>3</sup> We identify 2,124 unique non-financial government suppliers over the sample period representing 16,021 firm-year observations and map these data points to 82,337 firm-year observations of non-government suppliers with customer-level data. We employ three alternative matching criteria to check the robustness of our results. In these tests, non-government suppliers are matched based on fiscal year, industry, firm size, and book-to-market ratio (which are outlined below in Section 3.2).

Pursuant to earlier studies, we examine several traditional measures of real activities and accrual-based earnings management (Cohen and Zarowin, 2010; Farooqi et al., 2014; Harris et al. 2019; Roychowdhury, 2006; Zang, 2012). As anticipated, we find that supplier-customer business relationships with government agencies affect earnings management behavior through operating channels. There is strong evidence that government suppliers engage in greater real operational activities management than industry peers, as proxied by abnormal discretionary expenditures, abnormal production costs, and total real activities management. A higher fraction of sales coming from government agencies exacerbates all three real earnings management variables, with the strongest effects associated with federal government agencies. The documented impact of the contract sales effect is not only robust to alternative measures of real activities management, but also to the different firm matching conditions.

Moreover, our findings continue to hold even after accounting for endogeneity using the Heckman (1979) two-step approach considering that government contracts are not known to be randomly awarded (see Tahoun, 2014). We also employ a difference-in-differences method to address concerns of selection bias having to do with firms that may switch from zero government customers to at least one agency (or vice versa). The results from this approach largely confirm our baseline regression results, thereby providing further support for our main findings that business relationships with governmental agencies exacerbate real earnings management. Then again, the passage of the Sarbanes-Oxley Act (SOX) could skew our findings provided that managers shifted from managing accruals after SOX to more real operational activities (Cohen et al., 2008; Cohen and Zarowin, 2010). To ensure that our results are not affected by the enactment of SOX, we also employ subsample regression analyses (i.e., pre-SOX versus post-SOX) that statistically test for differences in the coefficients on the government supplier variables. The evidence shows that the sub-sample inquiries further strengthen our main results, indicating that the evidence is very robust that contractors of governmental agencies exhibit higher levels of real activities management than their non-contracting industry peers.

Given the limitations of traditional measures of earnings management (Chen et al., 2018), we also investigate performance-matched proxies to improve upon our earlier measures (Cohen et al., 2020; Kothari et al., 2005). Taken as a whole, we find qualitatively similar results using the performance-matched earnings management measures thereby indicating that our main findings are reliable. In particular, these results are consistent with the view that firms with government contracts favor real earnings management (to accruals management) because real activities manipulations can be masked as sincere "operating" business decisions, and contractors seek to avoid added scrutiny from regulators and watchdog groups (e.g. Graham et al., 2005; Gunny, 2010; Hadley, 2019; Mills et al., 2013; Watts and Zimmerman 1986).

<sup>2</sup> It is well documented in the literature that, unlike measures of accounting quality, earnings management via real activities is especially hard to detect (Cohen et al., 2008; Graham et al., 2005; Harris et al., 2019; Zang, 2012).

<sup>3</sup> Many firms also voluntarily report customer data even though the customer does not account for 10% of revenues.

In further robustness checks, we consider alternative proxies for earnings management as suggested by Lang et al. (2003). Firms with zero or negative earnings have an incentive to report positive earnings; so, a relatively high proportion of firms with small positive earnings indicate more earnings manipulation. Firms also have an incentive to spread out large losses; therefore, a relatively high proportion of firms with large negative earnings indicate less earnings management. Using logistic regressions, we test whether government suppliers are more likely to report small positive earnings and/or large negative earnings. The results indicate that firms reporting small positive earnings have an increased likelihood of being government suppliers. However, we find no significant relationship for firms reporting large negative earnings. Hence, there is ample evidence to suggest that government contractors manage earnings.

In a final set of analyses, we examine whether the earnings management behavior of government contractors is sensitive to the types of government customers. Again, we find limited evidence that government suppliers engage in accrual management. While there is marginal evidence of a negative relationship between government contract revenues and discretionary accruals, taken as a whole, this relationship is mostly insignificant. Furthermore, the results are mixed when we consider the fractional sales based on the type of government agency. For example, discretionary accruals increase with sales to foreign governmental agencies after considering other factors but decrease with sales to federal and state government agencies (but not local government agencies). Hence, we find at best only partial support for the notation that procurement-related requirements improve suppliers' accrual quality.

Our study has implications for policymakers not only in the US but also in other developed economies and many emerging markets where regulatory oversight is less stringent. Elevated levels of real activities management imply that government contractors deviate from optimal decision-making with a higher degree of secrecy than their peers. This should be of concern because government agencies have awarded more so-called cost-plus contracts in recent years than fixed-price contracts (see Berrios, 2006). These cost-reimbursement type contracts are hard to monitor, and the contractor is paid the negotiated amount regardless of incurred expenses (Berrios, 2006; Heese and Pérez-Cavazos, 2019). Under agency theory, this is a state of affairs that self-serving managers will exploit to extract more rent at the public's expense. Contractors may also develop a preference for a quiet life as they can rely on the steady cash flows from government customers while evading added scrutiny from regulators and watchdog groups.

This inquiry contributes to the wide-ranging literature on government suppliers. Overall, our findings broadly support the argument that government procurement intensifies the degree of real activities management because it provides greater secrecy than accrual management. This is consistent with the political cost hypothesis, which predicts that government suppliers take actions to deflect or preempt additional scrutiny that could bring about negative government reactions and the loss of contract revenues. Our study also complements recent studies showing that government contracts affect firm outcomes.<sup>4</sup> We also contribute to the earnings management literature by documenting new evidence on the earnings management behavior of firms having major business relationships with government agencies—i.e., firms where a government unit is an important customer.

The remainder of the paper is organized into five sections. Section 1 consists of a review of the relevant literature, while Section 2 outlines our main hypotheses. The data and methodology are hashed out in Section 3. Section 4 provides a discussion of the empirical results. Finally, we offer some closing remarks in Section 5.

<sup>4</sup> e.g. Craig and Hadley (2020), Dhaliwal et al. (2016), Esqueda et al. (2019), and Huang et al. (2016).

## 2. Literature review

### 2.1. The political sensitivity of contractors

Previous research show that government oversight and regulations affect the accounting choices and financial behavior of government contractors (e.g. Craig and Hadley, 2020; Hadley, 2019; Mills et al., 2013). This literature stems from the political cost hypothesis, which suggests that politically sensitive firms take actions to avoid or deflect scrutiny that could potentially result in costly negative government reactions (Watts and Zimmerman, 1986). For instance, scholars have long argued that government scrutiny influences accounting choices in ways that limit reported earnings as politically sensitive firms tend to manage profits downward using discretionary accruals (e.g. Fields et al., 2001; Han and Wang, 1998; Northcut and Vines, 1998). Ramanna and Roychowdhury (2010) also purport that political sensitive firms with extensive outsourcing activities use discretionary accruals to restrict their earnings. More recently, Samuels (2021) argues that the regulatory pressures of government procurement improve the information environment around contractors, thereby leading to better external financial reporting as measured by the number of management forecasts and the speed of earnings releases.

Consistent with the political cost hypothesis, Karpoff et al. (1999) affirm that when firms depend on government contracts for a substantial portion of their revenues they bear higher potential costs from government disfavor. Consequently, contractors try to avert scrutiny from regulators and watchdog organizations that could lead to negative government reactions and the possible loss of contract revenues. To elude scrutiny, Mills et al. (2013) show that contractors incur political costs by paying higher taxes when government contracts are large and represent an important share of firm revenue. Contractors with higher political sensitivity are also associated with lower total (and excess) managerial compensation (Hadley, 2019). There is also evidence that government suppliers make campaign contributions, engage in government lobbying, and use social responsibility media campaigns to avert scrutiny (e.g. Watts and Zimmerman, 1986; Witko, 2011), which further supports the political cost hypothesis.

### 2.2. Earnings management

Earnings management has been well documented in the accounting and finance literature as well as in related fields, and the motivations to manage earnings vary among firms. In general, accrual management involves accounting choices to distort a firm's true performance, while real activities management involves actions that change the timing or structuring of an operation, investment, and/or financing transaction (Badertscher, 2011; Zang, 2012). Graham et al. (2005) survey executives and report that a majority admits to some degree of real and/or accrual-based earnings management. Roychowdhury (2006) also documents evidence of both kinds of management. Collins and Hribar (2000) suggest that a motivating factor for managing earnings is to boost stock prices, which researchers find support for around equity offerings and stock-financed acquisitions (see Adams et al., 2009; Cohen and Zarowin, 2010; Erickson and Wang, 1999; Ibrahim et al., 2011; Rangan, 1998; Teoh et al., 1998).

Perry and Williams (1994) also suggest that earnings are managed downward before a management buyout. Bushee (1998) indicates that firms reduce R&D investment to meet zero- or last year's- earnings, while Xu (2016) documents accruals management to beat the zero earnings benchmark. Firms also manage earnings to lower their financing costs (Dechow et al., 1996) and to meet regulatory requirements (Yu et al., 2006). Bhojraj and Libby (2005) argue that earnings management is driven by external market pressures. Then again, Bens et al. (2002) and Dechow and Sloan (1991) argue that real earnings management stems from agency problems and managers expropriating from shareholders. The consensus view in the literature is that poor governance mecha-

nisms lead to weaker financial controls and more financial statement fraud (Beasley, 1996; Jiang et al., 2008; Klein, 2002; Larcker et al., 2007; Roychowdhury, 2006). Among governance variables found to reduce earnings management are institutional ownership, block holdings, board size, and outside directorship (Beasley, 1996; Del Guercio and Hawkins, 1999; Dou et al., 2016; Hartzell and Starks, 2003; McConnell and Servaes, 1990; Smith, 1996).

Cohen et al. (2008), Cohen and Zarowin (2010), Ibrahim et al. (2011), and Farooqi et al. (2014) document a shift away from accrual-based earnings management to more real earnings management due to the passage of SOX and the heightened scrutiny of accounting practices. Zang (2012) reports a sequential substitutive relationship between the two strategies, wherein managers adjust discretionary accruals at fiscal year-end based on the outcome of their real activities management during the fiscal year. Farooqi et al. (2014) and Zang (2012) explain that because real earnings management changes actual business transactions, such activities take place during the fiscal year, whereas accruals are generally manipulated at fiscal year-end.

### 3. Hypotheses

The government procurement process is a well-established network of regulations and bureaucrats with privileged information (Madsen and Abbott, 2017). As a result, contractors in the U.S., for example, are subject to stringent monitoring mandates as authorized by the government under regulations like FARs, CAS, and NDAA, which can subject firms to financial audits that are more exhaustive than audits performed by external auditors (e.g. Cohen et al., 2021; Samuels, 2021). As a result, contractors employ various strategies to avert scrutiny from regulators and watchdog groups that may cause adverse outcomes and the loss of contract revenues (see Hadley, 2019; Mills et al., 2013; Watts and Zimmerman, 1986).

Samuels (2021) purport that government customers improve contractors' information environment and reporting quality (e.g. more management forecasts and prompt earnings releases). However, it is not clear whether governmental contracts translate to better earnings quality and less earnings management. There is compelling evidence in the literature that political sensitivity influences corporate behavior in ways to circumvent oversight. Consistent with the political cost hypothesis, contractors are known to make campaign contributions, pay higher tax rates, constrain executive compensation, and use social responsibility media campaigns to stay below the radar of regulators and watchdog organizations (see Craig and Hadley, 2020; Hadley, 2019; Mills et al., 2013; Watts and Zimmerman, 1986; Witko, 2011).

Therefore, given the procurement-related auditing edicts, we postulate that government contractors have the incentives to avoid accounting shenanigans that are easily detectable. For this reason, government customers may influence contractors' earnings management choices through operating activities and not just through monitoring channels. Cohen and Zarowin (2010), Harris et al. (2019), and others report that unlike accounting methods, earnings management via real activities is especially hard to detect as these tactics can be disguised as sincere operating business decisions. Therefore, we posit that government customers affect the tools contractors employ to manage earnings and expect contractors to favor the management of real operational activities (i.e. over managing accruals) because of its greater secrecy. This prediction is consistent with the political cost hypothesis, which suggests that firms elude scrutiny that may cause adverse outcomes and the loss of contract revenues.

From this perspective, we theorize that a contractual affiliation with a government agency encourages more real activities and less accrual-based earnings management because the contract procurement system intensifies regulatory scrutiny. As such, we expect the degree of real earnings management to be higher among government contractors than their non-contracting industry peers, and to vary positively with the fraction of sales to government agencies (both domestic and foreign).

Accordingly, we also anticipate less accrual management among government contractors relative to other firms. Our predictions complement Samuels (2021), who shows that government suppliers have better reporting quality owing to procurement-related requirements.

**H1:** Government suppliers engage in more real activities management than other firms.

**H2:** Government suppliers engage in less accrual management than other firms.

**H3:** Real activities management is positively related to the fraction of sales to government agency customers.

**H4:** Accrual management is negatively related to the fraction of sales to government agency customers.

## 4. Data and methodology

### 4.1. Sample

We identify our sample from the Compustat segment customer file. Compustat reports details on customers accounting for more than 10% of a firm's total sales according to FASB No. 14 (and FAS No. 131). Customers are categorized in Compustat as either (i) corporate customers, (ii) government customers, or (iii) market customers. We are primarily concerned with the sub-sample of firms that have government customers during the sample period from 1980 to 2017. Compustat further classifies government customers into domestic (federal) government agencies (TYPE = GOVDOM), state government agencies (TYPE = GOVS-TATE), local government agencies (TYPE = GOVLOC), and foreign government agencies (TYPE = GOVFRN). We discard financial firms (SIC codes 6000–6999) from the sample, as well as all firm-year observations with insufficient information to compute at least one of the earnings management variables, which are outlined below. This process yields a revised sample of 2,124 government suppliers accounting for 16,021 firm-year observations over the sample period. We then map these data points to 82,337 firm-year observations of non-government suppliers with customer-level data in Compustat.

Table 1 reports the sample distribution by year in Panel A and by the Fama-French 48 sector classification in Panel B. Panel A shows that the distribution of the firms throughout the sample period is proportional. As expected, government suppliers in business services (BUSSV = 13.19%), computer technology (CHIPS = 13.05%), computers (COMP = 7.75%), healthcare (HLTH = 9.57%), and utilities (UTIL = 11.60%) sectors account for a significant fraction of the firms having major trading relationship with governmental agencies. We report the sales profile of the government contractors in Panel C. The overall sales from the different types of government agencies are computed as a percentage of total firm sales. On average, federal government agencies account for roughly 31.50% of a contracting firm's total sales, while state government agencies account for just 0.81%. Local government agencies account for a much smaller percentage of only 0.33% and foreign government agencies account for about 1.45%. By definition, non-government contractors have no government-related sales.

In Table 2, we provide summaries of firm characteristics and test statistics that compare government suppliers to non-government suppliers. Government contractors have a mean market capitalization of around \$1.9 billion, which is pointedly lower than their peers' (about \$2.8 billion); the difference is highly significant (t-statistic = -7.93). GOVSALERATIO is the total fractional sales from government customers, where we aggregate sales from federal, state, local and foreign governmental agencies as a percent of total firm sales at fiscal year-end. In total, contractors generate roughly 34.4% of their revenues on average from government agencies. Given that non-government suppliers generate no sales from government agencies, the mean difference is highly significant. We use the natural logarithm of total assets [denoted LN(AT)t] as a proxy for firm size, and the mean difference in size

**Table 1**  
Sample distribution and customer profiles of government suppliers

Panel A - Sample distribution by year					Panel B - Sample distribution by industry					
Year	Whole sample				Fama-French industry	Government suppliers		Whole sample		
	N	%	N	%		N	%	N	%	
1980	1,067	1.08%	379	2.37%	Aircraft	AERO	864	0.88%	667	4.16%
1981	1,255	1.28%	400	2.50%	Agriculture	AGRIC	262	0.27%	3	0.02%
1982	1,525	1.55%	511	3.19%	Automobiles and Trucks	AUTOS	1,946	1.98%	311	1.94%
1983	1,777	1.81%	549	3.43%	Beer & Liquor	BEER	340	0.35%	10	0.06%
1984	1,975	2.01%	586	3.66%	Construction	BLDMT	2,115	2.15%	181	1.13%
1985	2,050	2.08%	602	3.76%	Materials	BOOKS	427	0.43%	9	0.06%
1986	2,174	2.21%	609	3.80%	Printing and Publishing	BOXES	321	0.33%	55	0.34%
1987	2,347	2.39%	629	3.93%	Shipping Containers	BUSSV	13,461	13.69%	2,113	13.19%
1988	2,353	2.39%	614	3.83%	Business Services	CHEM	1,940	1.97%	180	1.12%
1989	2,272	2.31%	575	3.59%	Chemicals	CHIPS	9,527	9.69%	2,091	13.05%
1990	2,320	2.36%	587	3.66%	Electronic Equipment	CLTHS	1,727	1.76%	78	0.49%
1991	2,388	2.43%	608	3.80%	Apparel	CNSTR	1,211	1.23%	403	2.52%
1992	2,604	2.65%	614	3.83%	Construction	COMPS	5,418	5.51%	1,242	7.75%
1993	2,853	2.90%	631	3.94%	Computers	DRUGS	6,659	6.77%	269	1.68%
1994	2,995	3.04%	620	3.87%	Pharmaceutical Products	ELCEQ	2,030	2.06%	581	3.63%
1995	3,064	3.12%	594	3.71%	Electrical Equipment	FABPR	478	0.49%	87	0.54%
1996	3,407	3.46%	556	3.47%	Fabricated Products	FOOD	1,690	1.72%	83	0.52%
1997	3,382	3.44%	491	3.06%	Food Products	FUN	922	0.94%	13	0.08%
1998	3,129	3.18%	423	2.64%	Entertainment	GOLD	477	0.48%	2	0.01%
1999	2,622	2.67%	303	1.89%	Precious Metals	GUNS	284	0.29%	186	1.16%
2000	3,217	3.27%	292	1.82%	Defense	HLTH	2,216	2.25%	1,533	9.57%
2001	3,065	3.12%	289	1.80%	Healthcare	HSHLD	1,767	1.80%	55	0.34%
2002	3,012	3.06%	311	1.94%	Consumer Goods	LABEQ	2,826	2.87%	748	4.67%
2003	2,788	2.83%	294	1.84%	Measuring and Control Equipment	MACH	3,945	4.01%	363	2.27%
2004	2,784	2.83%	307	1.92%	Machinery	MEALS	403	0.41%	13	0.08%
2005	2,974	3.02%	323	2.02%	Restaurants, Hotels, Motels	MEDEQ	3,701	3.76%	336	2.10%
2006	2,995	3.04%	321	2.00%	Medical Equipment	MINES	550	0.56%	5	0.03%
2007	2,950	3.00%	312	1.95%	Non-metallic and Industrial Metal Mining	OIL	6,048	6.15%	169	1.05%
2008	2,855	2.90%	298	1.86%	Petroleum and Natural Gas	OTHER	2,490	2.53%	510	3.18%
2009	2,785	2.83%	316	1.97%	Almost Nothing	PAPER	1,314	1.34%	145	0.91%
2010	2,739	2.78%	296	1.85%	Business Supplies	PERSV	571	0.58%	185	1.15%
2011	2,668	2.71%	274	1.71%	Personal Services	RTAIL	1,678	1.71%	224	1.40%
2012	2,621	2.66%	259	1.62%	Retail	RUBBR	1,197	1.22%	99	0.62%
2013	2,670	2.71%	256	1.60%	Rubber and Plastic Products	SHIPS	343	0.35%	147	0.92%
2014	2,741	2.79%	257	1.60%	Shipbuilding, Railroad Equipment	SODA	279	0.28%	1	0.01%
2015	2,715	2.76%	256	1.60%	Candy & Soda	STEEL	1,605	1.63%	198	1.24%
2016	2,623	2.67%	245	1.53%	Steel Works Etc.	TELCM	2,202	2.24%	177	1.10%
2017	2,597	2.64%	234	1.46%	Communication	TOYS	1,066	1.08%	21	0.13%
Total	98358	100%	16021	100%	Recreation	TRANS	2,905	2.95%	316	1.97%
					Transportation	TXTLS	729	0.74%	46	0.29%
					Textiles	UTIL	4,241	4.31%	1,858	11.60%
					Utilities	WHLSL	4,183	4.25%	308	1.92%
					Wholesale		98358	100%	16021	100%

  

Panel C - Firm government-related sales profile									
	Federal gov. customers		State gov. customers		Local gov. customers		Foreign gov. customers		
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	
Government suppliers' % sales	31.50%	20.96%	0.81%	0.00%	0.33%	0.00%	1.45%	0.00%	
Non-government suppliers' % sales	-	-	-	-	-	-	-	-	

This table reports the sample distribution and customer profiles of government supplier firms relative to other firms. The sample includes firms that report customer data in the Compustat segment customer file. All firms in the financial sector (6000-6999) are removed from the sample, as well as all firm-year observations with insufficient information to compute at least one of the earnings management variables. We identify 16,021 firm-year observations over the sample period of government suppliers representing 2,124 unique non-financial firms and map these data points to 82,337 firm-year observations of non-government suppliers with customer-level data. We report the distribution of the sample firms by fiscal year in Panel A and by Fama-French 48-sector classification in Panel B. In Panel C, compute and report the total sales generated by government customers as a percentage of total firm sales. There are four types of government customers reported in Compustat: federal, local, state, and foreign government agencies.

**Table 2**  
Characteristics government suppliers and non-government suppliers

Variables	Panel A			Panel B			Difference-in-means (A) – (B)		
	Government suppliers			Non-government suppliers			Mean	t-statistic	Wilcoxon statistic
	N	Mean	Median	N	Mean	Median			
MKCAP <sub>it</sub>	16,021	1898.42	131.62	82,337	2806.99	151.68	-908.57	-7.93***	-4.45***
GOVSALERATIO <sub>it</sub>	16,021	0.344	0.235	82,337	0.000	0.000	0.344	254.65***	298.34***
LN(AT) <sub>it</sub>	16,021	5.028	4.880	82,337	5.131	5.022	-0.103	-5.33***	-4.45***
MKTSHARE <sub>it-1</sub>	15,325	0.014	0.001	76,276	0.008	0.001	0.007	14.89***	38.78***
ZSCORE <sub>it-1</sub>	15,177	4.030	3.088	74,241	5.208	3.395	-1.178	-23.6***	14.16***
INST <sub>it-1</sub>	16,021	0.228	0.059	82,337	0.263	0.076	-0.034	-13.09***	-9.42***
TAX <sub>it</sub>	14,489	0.288	0.325	65,470	0.242	0.289	0.046	40.92***	38.71***
BIG8 <sub>it</sub>	15,983	0.835	1.000	82,196	0.789	1.000	0.047	14.27***	13.36***
SOX <sub>it</sub>	16,021	0.263	0.000	82,337	0.449	0.000	-0.186	-47.74***	-43.56***
NOA <sub>it-1</sub>	15,326	0.439	0.000	76,280	0.494	0.000	-0.055	-12.45***	-11.82***
OPERCYCLE <sub>it-1</sub>	16,021	89.910	73.331	82,337	62.746	52.148	27.164	32.95***	35.15***
ROA <sub>it</sub>	16,016	-0.004	0.039	82,304	-0.058	0.026	0.054	31.66***	19.28***
MKBK <sub>it</sub>	16,018	2.318	1.625	82,272	3.026	1.927	-0.709	-22.02***	-20.69***
EARNINGS <sub>it</sub>	16,016	0.046	0.077	82,304	-0.009	0.057	0.056	36.81***	26.38***

This table provides the descriptive statistics for government suppliers as well as their non-government supplier counterparts. The sample includes firms that report customer data in the Compustat segment customer file. All firms in the financial sector (6000-6999) are removed from the sample, as well as all firm-year observations with insufficient information to compute at least one of the earnings management variables. MKCAP<sub>it</sub> denotes the market capitalization at fiscal year-end. GOVSALERATIO<sub>it</sub> is the total fractional sales from government customers, where we aggregate sales generated from federal, state, local and foreign government agencies as a percent of total firm sales at fiscal year-end. LN(AT)<sub>it</sub> is the natural logarithm of total assets. MKTSHARE<sub>it</sub> is market share at the beginning of the year, ZSCORE<sub>it-1</sub> is the Altman's Z-score at the beginning of the year, INST<sub>it-1</sub> is the percent of institutional ownership at the beginning of the year and TAX<sub>it</sub> is the marginal tax rate for the year. BIG8<sub>it</sub> equals 1 if the firm's auditor is one of the Big 8; zero otherwise. SOX equals 1 if the fiscal year is after 2003; zero otherwise. NOA<sub>it-1</sub> is net operating assets at the beginning of the year. OPERCYCLE<sub>it-1</sub> is the length of the operating cycles at the beginning of the year. ROA<sub>it</sub> is the return on assets. MKBK<sub>it</sub> is the market-to-book ratio. EARNINGS<sub>it</sub> is the earnings before extraordinary items minus discretionary accruals and production costs, plus discretionary expenditures. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% level, respectively.

between government suppliers and non-government suppliers is significant at the 1% level (t-statistic = -5.33).

Government suppliers also have significantly higher market shares, but lower Altman's Z-scores, lower institutional ownership, and lower market-to-book ratios relative to their peers. These findings support the view that managers of government contractors tend to settle for the stability of the revenue from their contracts causing suboptimal investments (Paglia and Harjoto, 2014) as suggested by their weaker financial health, less oversight by institutional monitors, and lower growth prospects. However, government suppliers exhibit higher earnings performance than non-government suppliers [denoted as EARNINGS<sub>it</sub>]. The mean earnings performance of government suppliers is about 0.046, whereas that of non-government suppliers is -0.009; the difference is significant at the 1% level (t-statistic = 36.81). Paired with their weaker financial health and lower growth opportunities, this result implies that government contractors may manage earnings to a greater extent than other firms. We formally measure and compare firms' engagement in both real activities and accrual-based earnings management in the next section.

#### 4.2. Earnings management variables

We follow Zang (2012) and others in our construction of two measures of real activities management: abnormal discretionary expenses and abnormal production costs.<sup>5</sup> We estimate the abnormal level of discretionary expenditure using the following model:

$$DISX_t/A_{t-1} = \alpha_0 + \alpha_1(1/A_{t-1}) + \alpha_2(S_{t-1}/A_{t-1}) + \varepsilon_t \quad (1)$$

where DISX<sub>t</sub> is the discretionary expenditures (i.e., the sum of advertising, R&D, and SG&A expenditures) of firm *i* in year *t*. A<sub>t-1</sub> and S<sub>t-1</sub> respectively denote total assets and net sales in year *t-1*. The abnormal

level of discretionary expenditures is measured as the residuals from Eq. 1, where lower values suggest that firms cut discretionary expenses excessively to inflate their earnings. Consistent with earlier studies, we multiply abnormal discretionary expenses by -1 (denoted ABDISX) so that higher values indicate higher real earnings management.

To estimate the abnormal level of production costs, we use the following model:

$$PROD_t/A_{t-1} = \alpha_0 + \alpha_1(1/A_{t-1}) + \alpha_2(S_t/A_{t-1}) + \alpha_3(\Delta S_t/A_{t-1}) + \alpha_4(\Delta S_{t-1}/A_{t-1}) + \varepsilon_t \quad (2)$$

where PROD<sub>t</sub> is the sum of the cost of goods sold in year *t* and the change in inventory from year *t-1* to year *t*. A<sub>t-1</sub> is total assets of firm *i* in year *t-1*, S<sub>t</sub> is its net sales in year *t*, and ΔS<sub>t</sub> is the change in net sales from year *t-1* to year *t*. Abnormal production cost (denoted ABPROD) is measured as the residuals from Equation 2. The larger the abnormal production costs, the greater the degree of real activities management.

Following previous research, we use abnormal discretionary accruals to proxy accrual-based earnings management (Cohen and Zarowin, 2010; Zang, 2012). Abnormal discretionary accruals are computed as the difference between a firm's actual level of accruals and its expected accruals level. We use the following modified Jones (1991) model to estimate the accruals:

$$TA_t/A_{t-1} = \alpha_0 + \alpha_1(1/A_{t-1}) + \alpha_2(\Delta S_t/A_{t-1}) + \alpha_3(PPE_t/A_{t-1}) + \varepsilon_t \quad (3)$$

where TA<sub>t</sub> is the total accruals in year *t* is defined as earnings before extraordinary items and discontinued operations minus operating cash flows from the statement of cash flows (net cash flow minus total receivables). A<sub>t-1</sub> is the total asset of firm *i* in year *t-1*, ΔS<sub>t</sub> is the change in net sales from year *t-1* to year *t*, and PPE<sub>t</sub> is the total gross value of property, plant, and equipment of firm *i* in year *t*. The residuals from Eq. 3 denote abnormal discretionary accruals (denoted DA), which is used as a proxy for accrual management of firm *i* in year *t*.

We estimate Equations (1) - (3) cross-sectionally for each industry-year with at least 15 observations, where industry is based on the Fama and French 48-sectors. The accounting data are from Compustat. We

<sup>5</sup> Roychowdhury (2006) constructs a third measure as well, abnormal cash flows from operations, but cautions that "the net effect [of real activities management] on abnormal CFO is ambiguous."

report the regression results of Equations (1) - (3) in Appendix 1. In addition, we follow Zang (2012) and Farooqi et al. (2014) to aggregate the two measures of real activities management into one measure of total real earnings management (RM), where higher values indicate more real activities management (i.e.,  $ABDISX + ABPROD = RM$ ). All our earnings management variables are based on prior work and are widely used in other studies. As is customary, we winsorize all the earnings management variables at the 1% level to avoid noise from extreme observations (e.g. Cohen et al., 2020).

Table 3 reports summary statistics on the various earnings management variables for government suppliers in Panel A and non-government suppliers in Panel B. Panel C presents the results of difference in means univariate tests between the two groups of firms. For robustness, we also report univariate tests for three alternative portfolios of non-government suppliers. In Column 1, we compare the earnings management measures of government suppliers to all non-government suppliers with customer data. In Column 2, we use the portfolio of non-government suppliers in the same fiscal year and industry (i.e. Fama-French 48 sectors) for each government supplier firm. Column 3 focuses on the portfolio of non-government suppliers in the same fiscal year, industry, and size (i.e. market capitalization) quintile for each government supplier firm. In Column 4, we use the portfolio of non-government suppliers in the same fiscal year, industry, size quintile, and market-to-book quintile as a government contractor.

Panel A reports evidence that government suppliers engage in real earnings management. The mean abnormal discretionary expenses is 0.083 ( $t$ -statistic = 36.11), the mean abnormal production cost is 0.031 ( $t$ -statistic = 17.46), and the mean total real activities management is 0.120 ( $t$ -statistic = 34.19). Consequently, the means of the real activities' proxies are significantly different from zero. On average, abnormal discretionary accruals is 0.031 ( $t$ -statistic = 10.37), implying that government suppliers also manage their accruals. While non-government suppliers also manage their earnings (see Panel B), their earnings management levels are acutely lower than those of government suppliers, irrespective of the earnings management variable involved or the portfolio of non-government suppliers used.

Panel C shows that across all the real activities proxies, government contractors exhibit significantly higher levels of management than non-government contractors, as evident by the test statistics of the mean differences all being significant at the 1% level. However, the results for accrual management are mixed and significance varies depending on the portfolio of non-government suppliers employed. These results are consistent with studies documenting a shift from accrual management to more real activities management. Overall, the univariate findings imply that firms with major government customers engage in more real earnings management than other comparable firms, which supports the argument that government contractors prefer real activities management given its higher secrecy and potential to mask earnings management.

## 5. Cross-sectional regression analyses

### 5.1. Model specifications

Pursuant to Zang (2012) and others, we estimate the following models which control for the costs of engaging in both real activities and accrual-based management:

$$EM_{it} = \beta_0 + \beta_1 GOV_{it} + \sum_k \beta_{2,k} CostofRM_{k,it} + \sum_l \beta_{3,l} CostofAM_{l,it} + \sum_m \beta_{4,m} OtherControl_{m,it} + \varepsilon_{it} \tag{4}$$

$$EM_{it} = \phi_0 + \phi_1 GOVSALERATIO_{it} + \sum_k \phi_{2,k} CostofRM_{k,it} + \sum_l \phi_{3,l} CostofAM_{l,it} + \sum_m \phi_{4,m} OtherControl_{m,it} + u_{it} \tag{5}$$

where  $EM_{it}$  denotes the level of earnings management in firm  $i$  in year  $t$ . We run separate regressions for each of the dependent variables: (1) abnormal discretionary expenses ( $ABDISX$ ), (2) abnormal production costs ( $ABPROD$ ), (3) total real earnings management ( $RM$ ), and (4) abnormal discretionary accruals ( $DA$ ).

The variable of interest in Eq. 4 is  $GOV_{it}$ , which is an indicator variable that is equal to 1 if the firm is a government supplier in year  $t$ , and zero otherwise. In subsequent analyses, we also capture a firm's total degree of sales generated from government customers using a continuous variable, as represented in Eq. 5. The variable  $GOVSALERATIO_{it}$  is the total fractional sales from government customers, where we aggregate sales generated from federal, state, local and foreign government agencies as a percent of total firm sales at fiscal year-end.

Zang (2012) suggests that real earnings management is negatively related to the costs associated with real activities management but positively related to the costs associated with accrual management (and vice versa). As suggested, we control for the firm's market share at the beginning of the year ( $MKTSHARE_{it-1}$ ) to capture leader status in the industry. Market share is the ratio of a firm's sales to the total sales of all firms in the same Fama-French 48 industry. We use a modified version of the Altman's Z-score ( $ZSCORE_{it-1}$ ) at the beginning of the year to proxy for a firm's financial condition.<sup>6</sup> Higher values for  $ZSCORE$  indicate a healthier financial condition and a lower cost associated with real activities management. Higher institutional ownership and higher marginal tax rates also reflect higher real activities management costs (see Zang, 2012; Farooqi et al., 2014).  $INST_{it-1}$  is the percentage of firm shares held by the respective institutional owners at the beginning of the year.  $TAX_{it}$  is the marginal tax rate for the fiscal year.

The costs of accrual management reflect scrutiny by auditors and regulators, the penalty of detection, and the flexibility within the firm's accounting systems Zang (2012). So, we control for big 8 auditors.<sup>7</sup>  $BIG8_{it}$  is the dummy variable for firms whose auditor is among the big 8 auditors for the fiscal year. We also control for the effects of the passage of the Sarbanes-Oxley Act on earnings management.  $SOX_{it}$  is the dummy variable equal to 1 for the years after 2003; zero otherwise. As in Cohen and Zarowin (2010) and Zang (2012),  $NOA_{it-1}$  represents net operating assets at the beginning of the year and serves as a proxy for the degree of accrual management in previous periods.<sup>8</sup> The variable  $OPERCYCLE_{it-1}$  is the length of the operating cycles, which we use to control for accounting flexibility. It is computed as the days' receivable plus the days' inventory less the days' payable at the beginning of the year.

Other controls include profitability and firm size.  $ROA_{it}$  represents the return on assets.  $LN(AT)_{it}$  is the natural logarithm of total asset.  $MKBK_{it}$  is the market-to-book ratio.  $EARNINGS_{it}$  is the earnings before extraordinary items minus discretionary accruals and production costs, plus discretionary expenditures. We also control for year fixed effects, industry fixed effects and correct the standard errors for the firm-level clustering effects. Finally, Zang (2012) finds an inverse relationship between the use of real activities management and accruals-based earnings management and explains that managers tend to favor real activities management during the year while they adjust accruals at the end of the year if needed. Consequently, we first estimate the model with total real activities management ( $RM$ ) as the dependent variable and obtain the residuals as a proxy for the unexpected level of real activities management ( $RES_{RM_{it}}$ ), which is then introduced as another control variable when estimating the model where abnormal discretionary accruals ( $DA$ ) is the dependent variable.

<sup>6</sup>  $ZSCORE_t = 0.3 \frac{NI_t}{Asset_t} + 1.0 \frac{Sales_t}{Asset_t} + 1.4 \frac{Retained\ Earnings_t}{Asset_t} + 1.2 \frac{Working\ capital_t}{Asset_t} + 0.6 \frac{(Stock\ Price \times Share\ Outstanding)_t}{Total\ Liabilities_t}$

<sup>7</sup> "Big 8" is now "big 4" due to consolidation and Arthur Andersen bankruptcy

<sup>8</sup> Calculated as:  $\frac{Shareholders'Equity_{t-1} - Cash\ and\ Marketable\ Securities_{t-1} + Total\ Debt_{t-1}}{Sales_{t-1}}$

**Table 3**  
Comparison of earnings management activities

Panel A – Government suppliers								
	N	Mean	Median	t-statistic				
ABDISX	16021	0.083	0.071	36.11***				
ABPROD	15362	0.031	0.015	17.46***				
RM	15362	0.120	0.089	34.19***				
DA	15730	0.031	0.005	10.37***				
Panel B – Non-government suppliers								
	All non-government suppliers [1]		Non-government suppliers in the same fiscal year and industry [2]		Non-government suppliers in the same fiscal year, industry, and size quintile [3]		Non-government suppliers in the same fiscal year, industry, size quintiles, and market-to-book quintile [4]	
	Mean	t-stat.	Mean	t-stat.	Mean	t-stat.	Mean	t-stat.
ABDISX	0.034	26.61***	-0.021	-22.65***	0.002	1.110	0.013	6.64***
ABPROD	-0.013	-15.22***	-0.010	-25.78***	-0.007	-8.52***	-0.005	-4.41***
RM	0.039	22.37***	-0.032	-27.09***	0.002	1.460	0.014	5.24***
DA	0.060	31.40***	0.015	4.67***	0.011	1.96*	0.005	0.68
Panel C – Government suppliers minus matched portfolio of non-government suppliers								
		[1]	[2]	[3]	[4]			
ABDISX		0.049	0.103	0.081	0.069			
	t-statistics	18.63***	46.92***	35.47***	27.54***			
	Wilcoxon statistics	11.20***	49.81***	38.01***	28.07***			
ABPROD		0.044	0.041	0.037	0.036			
	t-statistics	22.37***	23.19***	20.11***	17.99***			
	Wilcoxon statistics	25.30***	20.675***	18.68***	16.78***			
RM		0.081	0.152	0.117	0.106			
	t-statistics	20.77***	42.59***	30.75***	25.26***			
	Wilcoxon statistics	17.87***	43.44***	32.42***	25.23***			
DA		-0.029	0.016	0.020	0.026			
	t-statistics	-8.24***	-1.21	1.24	1.42			
	Wilcoxon statistics	0.127	-0.31	1.68*	1.18			

In this table, we provide summary descriptive and comparison of the earnings management measures of government suppliers and non-government suppliers. Panel A reports the summary for government suppliers. Panel B reports a summary of four distinct portfolios of non-government suppliers. Panel C reports difference in means test results. The sample includes firms that report customer data in Compustat segment customer file. All firms in the financial sector (6000-6999) are removed from the sample, as well as all firm-year observations with insufficient information to compute at least one of the earnings management variables. We first compare the earnings management measures of government suppliers to all non-government suppliers with customer data in Column 1. Three alternative matched portfolios of non-government suppliers are also considered. In Column 2, we use the portfolio of non-government suppliers in the same fiscal year and industry (i.e. Fama-French 48 sectors). Column 3 focuses on the portfolio of non-government suppliers in the same fiscal year, industry, and size (i.e. market capitalization) quintile. Column 4 uses the portfolio of non-government suppliers in the same fiscal year, industry, size quintile, and market-to-book quintile. The construction of the earnings management measures is described in Appendix 1. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% level, respectively



**Table 4**  
Regressions of earnings management activities on government supplier status

	ABDISX	ABPROD	RM	DA
<i>INTERCEPT</i>	-0.165 (-9.85***)	0.051 (3.83***)	-0.107 (-3.91***)	0.0118 (0.96)
<i>GOV<sub>it</sub></i>	0.034 (3.63***)	0.080 (7.68***)	0.063 (5.75***)	-0.004 (-0.97)
<i>MKTSHARE<sub>it-1</sub></i>	0.021 (2.64***)	0.002 (0.26)	0.014 (1.509)	-0.008 (-1.31)
<i>ZSCORE<sub>it-1</sub></i>	-0.017 (-2.15**)	-0.041 (-5.21***)	-0.037 (-4.34***)	-0.019 (-3.71***)
<i>INST<sub>it-1</sub></i>	0.017 (1.55)	-0.043 (-3.83***)	-0.012 (-1.01)	-0.030 (-4.32***)
<i>TAX<sub>it</sub></i>	0.081 (8.01***)	0.037 (3.56***)	0.073 (6.64***)	-0.013 (-1.91*)
<i>BIGS<sub>it</sub></i>	0.003 (0.37)	0.005 (0.55)	0.005 (0.48)	-0.009 (-1.80*)
<i>SOX<sub>it</sub></i>	-0.009 (-0.33)	-0.002 (-0.08)	-0.009 (-0.33)	0.055 (2.03**)
<i>NOA<sub>it-1</sub></i>	0.052 (7.31***)	-0.071 (-9.30***)	-0.001 (-0.10)	-0.014 (-3.39***)
<i>OPERCYCLE<sub>it-1</sub></i>	0.029 (3.44***)	-0.040 (-4.79***)	-0.004 (-0.50)	-0.017 (-3.27***)
<i>ROA<sub>it</sub></i>	0.015 (1.13)	0.102 (9.14***)	0.062 (5.06***)	0.107 (9.64***)
<i>LN(AT)<sub>it</sub></i>	-0.049 (-3.57***)	0.025 (1.73*)	-0.016 (-1.04)	0.034 (4.59***)
<i>MKBK<sub>it</sub></i>	-0.124 (-16.03***)	-0.076 (-10.87***)	-0.120 (-15.41***)	0.005 (0.93)
<i>EARNINGS<sub>it</sub></i>	0.190 (11.43***)	-0.394 (-26.71***)	-0.079 (-4.75***)	-0.061 (-5.22***)
<i>RES_RM<sub>it</sub></i>				0.009 (1.72*)
<i>F-statistics</i>	30.66***	24.46***	12.88***	24.21***
<i>Adjusted R-squared</i>	0.128	0.102	0.0553	0.0545
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes
<i>Industry fixed effects</i>	Yes	Yes	Yes	Yes
<i>Firms clustered std. err.</i>	Yes	Yes	Yes	Yes
<i>Number of observations</i>	75,519	74,850	74,850	74,306

We report regression results on abnormal discretionary expenses (ADISX), abnormal production cost (APROD), the composite score for total real earnings management (RM) and abnormal discretionary accruals (DA). The earnings management measures are described in Appendix 1.  $GOVSALERATIO_{it}$  is the fractional sales from government customers, where we aggregate sales generated from federal, state, local and foreign governmental agencies.  $IMR_{it}$  is the inverse Mills ratio from the Heckman first stage regression; it is a correction factor for selection bias as government contractors are not randomly selected. The other control variables are as defined earlier; see Table 4 for the definition of the control variables. We report the *t*-statistics in the parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% level, respectively

## 5.2. Empirical regression results

Table 4 presents the regression results from Eq. 4. Consistent with the univariate results, the variable  $GOV_{it}$  is positive and significant only in the models where either abnormal discretionary expenses (ABDISX), abnormal production costs (ABPROD), or total real earnings management (RM) is the dependent variable. Hence, government suppliers exhibit higher real earnings management relative to non-government suppliers even after controlling for factors known to influence earnings management. For instance, when RM is the dependent variable, the point estimate in Column 3 implies that management is 6.3 percent higher in government suppliers and the coefficient is significant at the 1 percent level (*t*-statistic = 5.75). The results for the two individual real activities management proxies (ABDISX and ABPROD) are also consistent with the overall results for RM, which provide very strong support for hypothesis 1. However, there is no evidence that the discretionary accruals of government suppliers are lower than industry peers on average. In Column 4, the coefficient on  $GOV_{it}$  is negative but does not reach significance at conventional levels (coef. = -0.004, *t*-statistic = -0.97).

These results strengthen the argument that firms with governmental contracts prefer real activities management over accrual management because of its higher secrecy and potential to conceal earnings management from scrutiny. Several of the control variables are significant and consistent with the findings of earlier studies (see Zang, 2012; Farooqi et al., 2014). However, we do not discuss the controls for

brevery. To test the robustness of our main findings, we perform regression analyses using the three alternative portfolios of non-government suppliers. The cross-sectional regression results from these robustness checks are consistent with those documented in Table 4. All the alternate portfolios of non-government suppliers produce very similar results, therefore we report only those based on our main collection of firms.

We provide cross-sectional regression results based on the total fractional sales generated from government customers in Table 5.  $GOVSALERATIO_{it}$  is a continuous variable, where sales from federal, state, local and foreign government agencies are aggregated as a percent of total firm sales. As expected, the coefficient for this variable is significantly positive in the models where the real activities proxies are used as the dependent variables (see Column 1–3). The results in Table 5 show that the estimated coefficients are more pronounced than those in Table 4. Hence, the marginal effect of government contracting on real earnings management is even larger than we previously thought. As an example, the coefficient on  $GOVSALERATIO_{it}$  in Column 3 suggests that total real earnings management is 9.9 percentage points higher for every unit increase in the fractional sales from government agencies. The *t*-statistic is 8.18, which indicates that the coefficient is significant at the 1 percent level. Robustness checks using the alternative portfolios of non-government suppliers, generally confirm the results in Table 5. So, we conclude that using the total fractional sales that firms generate

**Table 5**  
Earnings management and total fractional sales from government customers

	ABDISX	ABPROD	RM	DA
<i>INTERCEPT</i>	-0.165 (-9.83***)	0.0528 (3.93***)	-0.105 (-3.85***)	0.0117 (0.95)
<i>GOVSALERATIO<sub>it</sub></i>	0.060 (5.80***)	0.116 (10.00***)	0.099 (8.18***)	-0.007 (-1.55)
<i>MKTSHARE<sub>it-1</sub></i>	0.017 (2.30**)	-0.003 (-0.33)	0.009 (1.03)	-0.007 (-1.22)
<i>ZSCORE<sub>it-1</sub></i>	-0.017 (-2.11**)	-0.042 (-5.31***)	-0.037 (-4.35***)	-0.019 (-3.72***)
<i>INST<sub>it-1</sub></i>	0.016 (1.42)	-0.046 (-4.12***)	-0.015 (-1.20)	-0.030 (-4.30***)
<i>TAX<sub>it</sub></i>	0.079 (7.83***)	0.035 (3.38***)	0.070 (6.44***)	-0.013 (-1.88*)
<i>BIGS<sub>it</sub></i>	0.003 (0.33)	0.004 (0.44)	0.004 (0.40)	-0.009 (-1.79*)
<i>SOX<sub>it</sub></i>	-0.011 (-0.43)	-0.008 (-0.26)	-0.014 (-0.48)	0.055 (2.03**)
<i>NOA<sub>it-1</sub></i>	0.053 (7.54***)	-0.069 (-9.07***)	0.001 (0.16)	-0.014 (-3.41***)
<i>OPERCYCLE<sub>it-1</sub></i>	0.029 (3.53***)	-0.039 (-4.60***)	-0.003 (-0.36)	-0.017 (-3.29***)
<i>ROA<sub>it</sub></i>	0.015 (1.14)	0.101 (9.02***)	0.061 (5.02***)	0.107 (9.62***)
<i>LN(AT)<sub>it</sub></i>	-0.043 (-3.14***)	0.037 (2.57***)	-0.006 (-0.39)	0.033 (4.51***)
<i>MKBK<sub>it</sub></i>	-0.125 (-16.20***)	-0.079 (-11.29***)	-0.122 (-15.70***)	0.005 (0.95)
<i>EARNINGS<sub>it</sub></i>	0.190 (11.42***)	-0.393 (-26.69***)	-0.078 (-4.71***)	-0.061 (-5.21***)
<i>RES_RM<sub>it</sub></i>				0.009 (1.79*)
<i>F-statistics</i>	36.48***	25.10***	17.00***	24.32***
<i>Adjusted R-squared</i>	0.131	0.109	0.0611	0.0545
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes
<i>Industry fixed effects</i>	Yes	Yes	Yes	Yes
<i>Firms clustered std. err.</i>	Yes	Yes	Yes	Yes
<i>Number of observations</i>	75,515	74,846	74,846	74,303

We report regression results on abnormal discretionary expenses (*ADISX*), abnormal production cost (*APROD*), the composite score for total real earnings management (*RM*) and abnormal discretionary accruals (*DA*). The earnings management measures are described in Appendix 1. *GOVSALERATIO<sub>it</sub>* is the fractional sales from government customers, where we aggregate sales generated from federal, state, local and foreign governmental agencies. *IMR<sub>it</sub>* is the inverse Mills ratio from the Heckman first stage regression; it is a correction factor for selection bias as government contractors are not randomly selected. The other control variables are as defined earlier; see Table 4 for the definition of the control variables. We report the *t*-statistics in the parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% level, respectively.

from government units (i.e., rather than the dummy variable) reveals a significantly positive and more pronounced effect.

## 6. Robustness check section

In this subsection, we employ several robustness checks to mitigate endogeneity and measurement concerns. Specifically, we use a Heckman (1979) two-step approach to address endogeneity concerns and use a difference-in-difference method to check for selection bias. In addition, we employ a subsample approach to address potential confounding effects from the enactment of SOX. To address potential measurement errors, we also use a performance-matched substitute for each earnings management variable and consider alternative proxies for earnings management (e.g. Kothari et al., 2005; Cohen et al., 2020; Lang et al., 2003).

### 6.1. Robustness: Addressing endogeneity concerns

Studies by Tahoun (2014) and Goldman et al. (2013) suggest that government contracts are not randomly awarded. Therefore, a potential concern is that our results may be influenced by endogeneity. We address this concern using the Heckman (1979) two-step approach. For the first stage regression, we estimate a logistic regression of the probability of a firm having a government customer based on a model suggested

by Faccio, 2010. Pursuant to prior studies, we use firm size, firm age, market-to-book ratio and debt ratio as explanatory variables in the logit regression and report the results in Panel A of Table 6. We then compute the inverse Mills ratio (denoted *IMR<sub>it</sub>*) and include it as a correction factor for our main regression in the second stage. We based *IMR<sub>it</sub>* on the specification from Model 3 (see Table 6 Panel A) as it correctly classifies up to 86% of the pooled sample and controls for both year and industry fixed effects, while adjusting the standard errors for firm-clustering effect.

The second stage regression results are reported in Panel B of Table 6. Again, we find that the coefficient on the *GOV<sub>it</sub>* variable is positive and significant in the models in which *ABDISX*, *ABPROD*, and *RM* are dependent variables. These results validate our earlier finding that government suppliers engage in more real earnings management than otherwise comparable firms. Eq. 5 is also re-evaluated in the second stage analysis and the results reported in Panel C of Table 6. *GOVSALERATIO<sub>it</sub>* remains positive and highly significant in the models where the real activities proxies are used as the dependent variables, thereby confirming the direct link between real earnings management and the fraction of sales to government customers.

These findings continue to hold even when we apply the Heckman selection correction on the three alternative portfolios of non-government suppliers, which indicates that our main findings are very robust. In addition, we continue to find no evidence of a relationship between ac-

**Table 6**  
Heckman two-step regression results

Panel A – Stage 1: Logistic regression on the likelihood of having a government customer						
	Model 1		Model 2		Model 3	
Variables	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
INTERCEPT	0.309	2.16**	0.309	5.67***	0.397	6.51***
LN(AT) <sub>it</sub>	0.575	3.71***	0.575	12.33***	0.608	11.97***
LN(AGE) <sub>it</sub>	0.032	1.27	0.032	1.62	0.046	1.96*
DEBT <sub>it</sub>	-0.025	-1.54	-0.025	-1.49	-0.026	-1.38
MKBK <sub>it</sub>	-1.004	-5.29***	-1.004	-19.96***	-1.948	-15.30***
Chi-squared	1252***		1252***		1224***	
Pseudo R-squared	0.157		0.157		0.157	
% correctly classified	84.66%		84.66%		84.96%	
Year fixed effect	Yes		Yes		Yes	
Industry fixed effects	Yes		Yes		Yes	
Ind. clustered std. err.	Yes		No		Yes	
Firm clustered std. err.	No		Yes		Yes	
Observations	92,545		92,545		92,545	

  

Panel B – Stage 2: Cross-sectional regression results				
	ABDISX	ABPROD	RM	DA
INTERCEPT	0.403 (12.44***)	0.231 (8.88***)	0.631 (11.78***)	-0.099 (-3.95***)
GOV <sub>t</sub>	0.021 (2.33**)	0.075 (7.23***)	0.052 (4.83***)	-0.002 (-0.57)
MKTSHARE <sub>it-1</sub>	0.003 (0.39)	-0.006 (-0.64)	-0.002 (-0.19)	-0.005 (-0.82)
ZSCORE <sub>it-1</sub>	0.020 (2.45**)	-0.025 (-3.13***)	-0.004 (-0.45)	-0.024 (-4.61***)
INST <sub>it-1</sub>	0.006 (0.52)	-0.050 (-4.29***)	-0.024 (-1.91*)	-0.031 (-4.32***)
TAX <sub>it</sub>	0.081 (8.10***)	0.038 (3.61***)	0.073 (6.71***)	-0.013 (-1.96*)
BIG8 <sub>it</sub>	0.002 (0.18)	0.004 (0.45)	0.003 (0.33)	-0.009 (-1.74*)
SOX <sub>it</sub>	0.018 (0.69)	0.009 (0.32)	0.014 (0.48)	0.053 (1.96*)
NOA <sub>it-1</sub>	0.070 (10.01***)	-0.063 (-8.34***)	0.016 (2.01**)	-0.016 (-3.76***)
OPERCYCLE <sub>it-1</sub>	0.003 (0.38)	-0.052 (-5.92***)	-0.027 (-2.99***)	-0.014 (-2.64***)
ROA <sub>it</sub>	0.014 (1.10)	0.103 (9.16***)	0.062 (5.12***)	0.108 (9.65***)
LN(AT) <sub>it</sub>	-0.162 (-11.09***)	-0.022 (-1.40)	-0.116 (-7.19***)	0.051 (6.32***)
MKBK <sub>it</sub>	-0.100 (-12.96***)	-0.065 (-9.29***)	-0.099 (-12.65***)	0.001 (0.25)
EARNINGS <sub>it</sub>	0.179 (10.86***)	-0.399 (-26.92***)	-0.089 (-5.38***)	-0.059 (-5.07***)
IMR <sub>it</sub>	-0.442 (-20.71***)	-0.189 (-8.05***)	-0.392 (-16.33***)	0.059 (4.93***)
RES_RM <sub>it</sub>				0.011 (2.16**)
F-statistics	36.31***	24.40***	16.52***	24.30***
Adjusted R-squared	0.151	0.107	0.073	0.056
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Firms clustered std. err.	Yes	Yes	Yes	Yes
Number of observations	74,588	73,932	73,932	73,394

  

Panel C – Stage 2: Regression results using fractional sales from government agencies				
	ABDISX	ABPROD	RM	DA
INTERCEPT	0.388 (12.44***)	0.234 (9.12***)	0.620 (11.89***)	-0.102 (-3.95***)
GOVSALERATIO <sub>it</sub>	0.054 (5.25***)	0.113 (9.71***)	0.093 (7.75***)	-0.006 (-1.31)
CONTROLS	YES	YES	YES	YES
F-statistics	36.48***	25.10***	17.00***	24.32***
Adjusted R-squared	0.152	0.113	0.0782	0.0555
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Firms clustered std. err.	Yes	Yes	Yes	Yes
Number of observations	74,584	73,928	73,928	73,391

This table presents Heckman's 2-stage regression results. For the first stage regression, we estimate a logit regression of the probability of having a government agency as a customer based on the universe of firms that report customer data in Compustat Customer database (see Panel A). The dependent variable takes the value 1 for government supplier firms and zero otherwise. Pursuant to Faccio (2010), we control for firm size (LN(AT))<sub>it</sub> and age (LN(AGE))<sub>it</sub>. DEBT<sub>it</sub> is the debt-to-asset ratio and MKBK<sub>it</sub> is the market-to-book ratio. We also control for both year and industry fixed effects. In addition, we report results based on industry clustered standard errors, as well as firm clustered standard errors. We then compute the inverse Mills ratio and include it as a correction factor for our main regression in the second stage (see Panel B). We based the inverse Mills ratio on the specification in Model 3 because it correctly classifies up to 84.96% of the pooled sample and controls for year and industry fixed effects; it also corrects the standard errors for both industry-clustering and firm-clustering effects. Panel B reports results corresponding to abnormal discretionary expenses (ADISX), abnormal production cost (APROD), the composite score for total real earnings management (RM) and abnormal discretionary accruals (DA). These earnings management measures are described in Appendix 1. GOV equals 1 if the firm is a government supplier; zero otherwise. IMR<sub>it</sub> denotes the inverse Mills ratio from the stage 1 regression. All the other control variables are previously specified and are as defined earlier; see Table 4 for the definition of the control variables. Panel C show the corresponding results using the total fractional sales from government customers (denoted GOVSALERATIO<sub>it</sub>), where we aggregate sales generated from federal, state, local and foreign governmental agencies. CONTROLS is a vector denoting that all the other control variables from Panel B are also included and are as defined earlier. We report the t-statistics in the parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% level, respectively.

crual management and government contracting even after accounting for potential endogeneity bias. This finding further points to managers' preference for real earnings management.

## 6.2. Robustness: addressing selection concerns

It is also possible that there may be selection bias arising from a small subset of firms that may switch from no government customers to at least one government customer in any given year (or vice versa). We address potential selection bias by employing a difference-in-differences estimation on a revised sample built around the year a firm starts contracting with an agency. To test the main hypotheses on an unbiased sample, we refine the sample by first identifying the year in which a firm first becomes government supplier and then obtain data for these contractors starting 10 years before- and ending 10 years after- their business relationship with a government agency commences. We construct a dummy variable representing the period after a firm becomes a government supplier (denoted  $AFTER_{it}$ ). Additionally, for each year in this 21-year period, we then identify a matched portfolio of non-government contracting industry peers for each contractor.

This selection process generates a revised sample of 21,236 observations after accounting for missing variables. We augment the baseline regression in Eq. 4 by adding the variable  $AFTER_{it}$  and an interaction term between  $AFTER_{it}$  and the government supplier indicator variable  $GOV_{it}$ . The augmented model is then estimated using the difference-in-differences statistical technique. These results are reported in Panel A of Table 7. The estimated coefficient on  $GOV_{it}$  remains significantly positive when  $ABDISX$  and  $RM$  is the dependent variable. More importantly, the coefficient on the interaction term  $GOV_{it} * AFTER_{it}$  is positive and highly significant in all the models in which measures of real earnings management are dependent variables but insignificant for discretionary accruals, confirming the results from our baseline regressions.

We find similar results when we augment the model in Eq. 5 to include  $AFTER_{it}$  and the interaction term between  $AFTER_{it}$  and the fractional sales from government agencies variable  $GOVSALERATIO_{it}$ . These difference-in-differences estimations are reported in Panel B of the table and the results largely affirm our baseline regressions thereby providing further support for our main findings. In general, the overall results in Table 7 show that government suppliers exhibit higher real earnings management relative to non-government suppliers even after accounting for potential selection bias using a difference-in-differences framework.

## 6.3. Robustness: Addressing SOX confounding effects

The passage of the Sarbanes-Oxley Act may be another source for potential bias since managers shifted from managing accruals after SOX to more real operational activities (Cohen et al., 2008; Cohen and Zarowin, 2010). Even though we control for the enactment of SOX in our baseline results, here we consider sub-sample estimations (pre-SOX versus the post-SOX period) and use the Chow test to assess the statistical differences in the coefficients of the government supplier variables. These regression results are reported in Table 8; we present the sub-sample results from Eq. 4 using the  $GOV_{it}$  variable in Panel A of the table and the sub-sample results from Eq. 5 using the  $GOVSALERATIO_{it}$  variable in Panel B.

The results in Table 8 indicate that our key findings are not spurious or driven by SOX. For instance, when  $RM$  is the dependent variable, the Chow test statistics indicate that there are no significant differences between coefficients on the  $GOV_{it}$  variable (in Panel A, Chi-squared statistics = 2.86) nor between coefficients on the  $GOVSALERATIO_{it}$  variable (in Panel B, Chi-squared statistics = 2.52). Hence, the evidence suggests that the effect of government customers on contractors' total real earnings management activities is equally strong in both sub-periods, regardless of the government supplier variable used. However, in the

discretionary accruals ( $DA$ ) regressions, the Chow test statistics are statistically significant at the 1% level (i.e., the Chi-squared statistics = 6.62 in Panel A and 7.36 in Panel B). Moreover, in the post-SOX period, both the coefficients on  $GOV_{it}$  (in Panel A) and  $GOVSALERATIO_{it}$  (in Panel B) are significantly negative. This result is consistent with studies suggesting that because of the heightened scrutiny of accounting practices after SOX, managers moved away from accrual management as a tool for managing earnings.

## 6.4. Robustness: addressing measurement errors

### 6.4.1. Performance-matched earnings management variables

There may also be potential measurement errors associated with earnings management variables (e.g. Chen et al., 2018). Thus far, we have focused our analyses on traditional measures of earnings management: abnormal discretionary expenses ( $ADISX$ ), abnormal production cost ( $APROD$ ), the composite score for total real earnings management ( $RM$ ) and abnormal discretionary accruals ( $DA$ ). While these measures are widely used in the literature, they may suffer from drawbacks that could potentially distort our findings (see Chen et al., 2018; Cohen et al., 2020). For instance, Chen et al. (2018) criticize two-step methods that proxy earnings management as the residual component of a first regression that is then used as the dependent variable in a second regression because of potential biases.

Notwithstanding, Kothari et al. (2005) find that performance matching can lead to better specified measures of discretionary accruals compared to traditional measures. Cohen et al. (2020) report that neither approach, traditional or performance-matched, is consistently more powerful than the other in terms of detecting real activities management; so, they recommend that researchers consider and use both techniques. Thus, we estimate a performance-matched alternative of each earnings management measure (symbolize as  $PM\_ABDISX$ ,  $PM\_APROD$ ,  $PM\_RM$ , and  $PM\_DA$ ). Each alternative is the difference between a firm's traditional earnings management measure and that of its performance-based match portfolio of industry peers.

We first rank firms in the same 2-digit SIC code each year by their lagged return on assets ( $ROA$ ), where  $ROA$  is defined as the income before extraordinary items divided by total assets. Pursuant to Kothari et al. (2005) and Cohen et al. (2020), a firm's performance-matched earnings management measure is then computed as its traditional measure minus the value of the portfolio of firms in (1) the same industry (2-digit SIC codes), (2) the same year, and (3) the same quartile of lagged  $ROA$ . We winsorize the performance-matched measures at the 1% level (e.g. Cohen et al., 2020). To check the robustness of our findings, we re-estimate Eq. 4 and Eq. 5 using the performance-matched earnings management variables and report the regression results in Panel A and Panel B of Table 9, respectively.

Taken together, the results from the performance-matched measures are consistent and qualitatively similar with those obtained from baseline regressions using the traditional measures of earnings management. These results are important because they show that our earlier results are robust to alternative measures of earnings management. In sum, the evidence in Table 9 further support our hypothesis that government contractors engage in more real activities based earnings management than non-government contractors because of its greater discretion relative to managing discretionary accruals.

### 6.4.2. Alternative measures of earnings management

We further check the robustness of our preceding findings by considering alternative measures of earnings management. Lang et al. (2003) suggest that earnings management can be evident among firms with small positive net income where managers manipulate earnings numbers so as to report a positive (yet small) figure. They also use a firm's willingness to recognize large losses as they occur, as opposed to spreading large losses over multiple periods, to proxy for earnings quality. Spreading large losses out should make

**Table 7**  
Difference-in-difference regression results

Panel A: Results using government supplier status				
	ABDISX	ABPROD	RM	DA
INTERCEPT	-0.157 (9.97***)	0.050 (4.01***)	-0.103 (-3.97***)	0.018 (1.61)
GOV <sub>it</sub>	0.003 (2.76***)	0.002 (1.51)	0.003 (2.47**)	0.001 (0.66)
AFTER <sub>it</sub>	0.000 (0.30)	0.000 (0.20)	0.000 (0.22)	0.001 (1.21)
GOV <sub>it</sub> * AFTER <sub>it</sub>	0.070 (14.78***)	0.019 (3.73***)	0.038 (7.26***)	-0.000 (-0.04)
MKTSHARE <sub>it-1</sub>	0.019 (2.35**)	0.007 (0.74)	0.015 (1.54)	-0.004 (-0.68)
ZSCORE <sub>it-1</sub>	-0.022 (-2.54**)	-0.051 (-6.07***)	-0.045 (-5.05***)	-0.019 (-3.49***)
INST <sub>it-1</sub>	0.020 (1.80*)	-0.044 (-3.87***)	-0.011 (-0.89)	-0.017 (-2.48**)
TAX <sub>it</sub>	0.089 (9.33***)	0.048 (4.83***)	0.083 (8.03***)	-0.010 (-1.49)
BIG8 <sub>it</sub>	-0.002 (-0.21)	0.003 (0.30)	-0.000 (-0.01)	-0.016 (-3.04***)
SOX <sub>it</sub>	-0.024 (-2.93***)	0.011 (1.30)	-0.013 (-1.43)	0.093 (14.23***)
NOA <sub>it-1</sub>	0.057 (7.59***)	-0.066 (-8.05***)	0.005 (0.61)	-0.014 (-3.20***)
OPERCYCLE <sub>it-1</sub>	0.032 (3.66***)	-0.031 (-3.58***)	0.002 (0.18)	-0.022 (-3.93***)
ROA <sub>it</sub>	0.018 (1.22)	0.096 (7.92***)	0.063 (4.65***)	0.093 (7.77***)
LN(AT) <sub>it</sub>	-0.042 (-3.07***)	0.016 (1.11)	-0.015 (-0.99)	0.025 (3.34***)
MKBK <sub>it</sub>	-0.123 (-14.86***)	-0.082 (-10.75***)	-0.122 (-14.44***)	-0.001 (-0.26)
EARNINGS <sub>it</sub>	0.179 (9.91***)	-0.391 (-24.76***)	-0.086 (-4.85***)	-0.048 (-3.85***)
RES_RM <sub>it</sub>				0.012 (2.32**)
F-statistics	38.65***	10.84***	16.91***	14.008***
Adjusted R-squared	0.117	0.103	0.0504	0.0367
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Number of observations	21,236	21,236	21,236	21,236

  

Panel B: Results using fractional sales from government agencies				
	ABDISX	ABPROD	RM	DA
INTERCEPT	-0.157 (-8.37***)	0.050 (3.67***)	-0.103 (-4.59***)	0.018 (1.08)
GOVSALERATIO <sub>it</sub>	0.033 (3.33***)	0.016 (1.99**)	0.048 (3.16***)	0.011 (0.73)

We report difference-in-difference regression results on abnormal discretionary expenses (ADISX), abnormal production cost (APROD), the composite score for total real earnings management (RM) and abnormal discretionary accruals (DA). The earnings management measures are described in Appendix 1. The regression results in Panel A are based on firms' government supplier status. GOV equals 1 if the firm is a government supplier; zero otherwise. AFTER is a dummy variable equal to 1 for the period after a firm becomes government supplier; zero otherwise. All the other control variables are as defined earlier (see Table 4 for the definitions). Panel B provides the corresponding results using the total fractional sales from government customers (denoted GOVSALERATIO<sub>it</sub>), where we aggregate sales generated from federal, state, local and foreign governmental agencies. CONTROLS is a vector denoting that all the other control variables from Panel A are also included and are as defined earlier. We report the *t*-statistics in the parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% level, respectively

them relatively rare and difficult to observe. As such, the existence of large negative net income might indicate the willingness of the firm to report large losses and less earnings management.

Therefore, if government suppliers engage in more earnings management, then we should observe a positive relationship between the existence of small positive net income and the status of being a government contractor. Likewise, there should be a negative relationship between the existence of large negative net income and the status of being a government contractor. To test these conjectures, we estimate the following logistic regressions:

$$\begin{aligned}
 GOV_{it} = & k_0 + k_1 SPOS_{it} + k_2 GROWTH_{it} + k_3 EISSUE_{it} + k_4 DEBT_{it} \\
 & + k_5 DISSUE_{it} + k_6 TURN_{it} + k_7 OCF_{it} + k_8 BIG8_{it} \\
 & + k_9 LOSS_{it} + k_{10} LN(AT)_{it} + u_{it}
 \end{aligned} \tag{6}$$

$$\begin{aligned}
 GOV_{it} = & \varphi_0 + \varphi_1 LNEG_{it} + \varphi_2 GROWTH_{it} + \varphi_3 EISSUE_{it} \\
 & + \varphi_4 DEBT_{it} + \varphi_5 DISSUE_{it} + \varphi_6 TURN_{it} + \varphi_7 OCF_{it} \\
 & + \varphi_8 BIG8_{it} + \varphi_9 LOSS_{it} + \varphi_{10} LN(AT)_{it} + v_{it}
 \end{aligned} \tag{7}$$

**Table 8**  
Subsample analyses of the impact of SOX on earnings management of government suppliers

Panel A: Subsample regression results using government supplier status								
	ABDISX		ABPROD		RM		DA	
	Pre-SOX	Post-SOX	Pre-SOX	Post-SOX	Pre-SOX	Post-SOX	Pre-SOX	Post-SOX
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
<i>INTERCEPT</i>	-0.089 (-5.11***)	-0.154 (-6.40***)	0.063 (4.39***)	0.036 (1.974**)	-0.020 (-0.70)	-0.116 (-3.03***)	0.009 (0.97)	0.043 (1.99**)
<i>GOV<sub>it</sub></i>	0.048 (4.46***)	0.029 (2.12**)	0.071 (5.81***)	0.103 (6.91***)	0.067 (5.29***)	0.071 (4.57***)	0.008 (1.75*)	-0.017 (-2.37**)
<i>CONTROLS</i>	YES	YES	YES	YES	YES	YES	YES	YES
Chi-squared stats	0.46		6.93***		2.86		6.62***	
Observations	47,358	28,161	46,937	27,913	46,937	27,913	46,516	27,790
Adj. R-squared	0.106	0.187	0.0961	0.126	0.0476	0.0836	0.0340	0.0731
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: Subsample regression results using fractional sales from government agencies								
<i>INTERCEPT</i>	-0.090 (-5.18***)	-0.153 (-6.37***)	0.062 (4.33***)	0.037 (2.01**)	-0.022 (-0.78)	-0.115 (-2.99***)	0.009 (0.98)	0.043 (1.97**)
<i>GOVSALERATIO<sub>it</sub></i>	0.081 (6.81***)	0.033 (2.12**)	0.122 (8.79***)	0.107 (6.56***)	0.116 (8.18***)	0.075 (4.37***)	0.010 (1.94*)	-0.017 (-2.36**)
<i>CONTROLS</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Chi-squared stats	3.60*		0.52		2.52		7.36***	
Observations	47,358	28,161	46,937	27,913	46,937	27,913	46,516	27,790
Adj. R-squared	0.110	0.187	0.106	0.127	0.0562	0.0842	0.0340	0.0731
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

We report subsample regression results before and after the passage of the Sarbanes-Oxley Act (SOX) and use the Chi-squared stats to test the difference in the government supplier coefficient. The earnings management dependent variables are described in Appendix 1. In Panel A, *GOV* equals 1 if the firm is a government supplier; zero otherwise. *CONTROLS* is a vector denoting that the control variables from the baseline regression are also included and are as defined earlier. Panel B show the corresponding results using the total fractional sales from government customers (denoted *GOVSALERATIO<sub>it</sub>*), where we aggregate sales generated from federal, state, local and foreign governmental agencies. We report the t-statistics in the parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% level, respectively.

In these regressions, the dependent variable *GOV<sub>it</sub>* takes the value 1 for government suppliers; zero otherwise. The small positive net income variable (denoted *SPOS<sub>it</sub>*) is an indicator variable that is set to 1 for observations with annual net income scaled by total assets being between 0 and 0.01; zero otherwise (see Lang et al., 2003). Likewise, as in Lang et al. (2003), the large negative net income variable denoted *LNEG<sub>it</sub>* is an indicator variable set to 1 for observations for which annual net income scaled by total assets is less than -0.2; zero otherwise.

We include several controls. *GROWTH<sub>it</sub>* is the 1-year growth rate in sales. *EISSUE<sub>it</sub>* is the percent change in common stock. *DEBT<sub>it</sub>* is the debt-to-asset ratio. *DISSUE<sub>it</sub>* is the percent change in total liabilities. *TURN<sub>it</sub>* is the sales to total asset ratio. *OCF<sub>it</sub>* is the annual net cash flow from operating activities, scaled by total assets. *BIG8<sub>it</sub>* is a dummy variable equal to 1 if the firm's auditor is one of the Big 8 companies and zero otherwise. *LOSS<sub>it</sub>* is an indicator variable that equals one if the firm reports negative earnings for the year. *LN(AT)<sub>it</sub>* is the natural log value of total assets. We also control year and industry fixed effects in these regressions.

In Panel A of Table 10, we present the results of the logistic regressions in Eq. 6 and Eq. 7. Model 1 reports the results using small positive net earnings and Model 2 reports the results using large negative net earnings. These results show that the coefficient on the *SPOS<sub>it</sub>* variable is significantly positive at the 1% level. Hence, government suppliers are more likely than non-government suppliers to report a small positive net income, indicating that they manage earnings as suggested by the Lang et al. (2003) approach. The coefficient on the *LNEG<sub>it</sub>* variable is insignificant; this suggests that government suppliers are not more likely to record large losses as they occur, relative to other firms. Therefore, it appears that government suppliers and non-government suppliers spread large losses over multiple periods at the same rate.

For robustness, we also report cross-sectional regression analyses using the fractional sales to all government customers on these alterna-

tive earnings management measures in Panel B of the table. Consistent with the results in Panel A, the coefficient on *SPOS<sub>it</sub>* is positive and highly significant, indicating that the frequency of reporting small positive net income increases with the degree of sales to government customers. This confirms that government suppliers are more likely than non-government suppliers to report small positive net income as a way to manage earnings. The *LNEG<sub>it</sub>* variable is again insignificant suggesting that the frequency of reporting large loss does not correlate with the fractional sales to government customers.

## 7. Earnings management and sales from different types of government customers

In this section, we examine whether contractors' earnings management behavior is sensitive to the types of government customers. Table 11 presents univariate comparisons of earnings management by fractional sales from different types of government agencies. We contrast the earnings management levels of the sub-groups of government suppliers with low versus high fractional sales to federal agencies in Panel A, state government agencies in Panel B, local government agencies in Panel C, and foreign government agencies in Panel D. Low fractional sales is defined to be less than or equal to the median level, while high fractional sales are greater than the median. These analyses apply only to government contractors.

Overall, the results show that higher proportions of sales to government customers (except local government agencies), result in higher levels of real activities management, regardless of the measure considered. As evident by all of the test statistics, the mean differences between the low and high subsamples for the *ABDISX*, *ABPROD*, and *RM* variables are significant at the 1% level. Hence, it appears from these univariate tests that higher sales to government customers exacerbate real earnings management regardless of the type of agency. There is also marginal evidence of higher accrual management involving sales to federal gov-

**Table 9**  
Performance-matched earnings management variables

Panel A: Regression results using government supplier status				
	PM_ABDISX	PM_ABPROD	PM_RM	PM_DA
INTERCEPT	-0.035 (-2.21**)	-0.004 (-0.31)	-0.033 (-1.22)	0.042 (3.30***)
GOV <sub>it</sub>	0.042 (4.62***)	0.070 (6.84***)	0.062 (5.90***)	0.003 (0.74)
MKTSHARE <sub>it-1</sub>	0.024 (3.69***)	-0.000 (-0.01)	0.015 (1.99**)	0.000 (0.03)
ZSCORE <sub>it-1</sub>	-0.047 (-5.60***)	-0.007 (-0.86)	-0.037 (-4.40***)	-0.023 (-4.78***)
INST <sub>it-1</sub>	-0.019 (-1.82*)	-0.042 (-3.88***)	-0.036 (-3.09***)	-0.031 (-5.30***)
TAX <sub>it</sub>	0.006 (0.54)	0.085 (8.11***)	0.045 (4.14***)	-0.013 (-2.06**)
BIGS <sub>it</sub>	-0.001 (-0.13)	-0.005 (-0.60)	-0.004 (-0.41)	-0.005 (-1.08)
SOX <sub>it</sub>	0.007 (0.26)	-0.002 (-0.08)	0.003 (0.09)	0.029 (0.93)
NOA <sub>it-1</sub>	0.064 (9.12***)	-0.087 (-11.66***)	-0.003 (-0.35)	-0.002 (-0.55)
OPERCYCLE <sub>it-1</sub>	0.023 (2.58***)	-0.038 (-4.53***)	-0.008 (-0.85)	-0.017 (-3.43***)
ROA <sub>it</sub>	-0.005 (-0.36)	0.087 (7.69***)	0.039 (3.07***)	0.070 (6.00***)
LN(AT) <sub>it</sub>	-0.038 (-2.92***)	0.040 (2.86***)	-0.003 (-0.19)	0.006 (0.87)
MKBK <sub>it</sub>	-0.100 (-12.49***)	-0.073 (-10.12***)	-0.101 (-12.95***)	0.007 (1.28)
EARNINGS <sub>it</sub>	0.061 (3.40***)	-0.308 (-20.69***)	-0.118 (-6.98***)	-0.059 (-4.89***)
RES_RM <sub>it</sub>				0.001 (0.11)
F-statistics	10.61***	15.73***	8.19***	7.71***
Adjusted R-squared	0.0376	0.0619	0.0399	0.0115
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Firms clustered std. err.	Yes	Yes	Yes	Yes
Number of observations	75,456	74,790	74,790	74,305

  

Panel B: Regression results using fractional sales from government agencies				
	PM_ABDISX	PM_ABPROD	PM_RM	PM_DA
INTERCEPT	-0.035 (-2.18**)	-0.003 (-0.23)	-0.031 (-1.16)	0.042 (3.34***)
GOVSALERATIO <sub>it</sub>	0.070 (7.15***)	0.108 (9.29***)	0.100 (8.54***)	-0.003 (-0.75)
CONTROLS	YES	YES	YES	YES
F-statistics	10.98***	16.38***	8.66***	7.71***
Adjusted R-squared	0.0406	0.0684	0.0458	0.0115
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Firms clustered std. err.	Yes	Yes	Yes	Yes
Number of observations	75,453	74,787	74,787	74,302

This table report results for the four alternative performance adjusted earnings management measures: performance-matched abnormal discretionary expenses (PM\_ADISX), performance-matched abnormal production cost (PM\_APROD), performance-matched total real earnings management (PM\_RM) and performance-matched abnormal discretionary accruals (PM\_DA). Each performance-matched measure is a firm's traditional earnings management measure (as described in Appendix 1) minus the value of the portfolio of firms in the same industry (2-digit SIC codes), same year and same quartile of lagged return on assets (ROA), where ROA is defined as the income before extraordinary items divided by total assets (e.g. Kothari et al., 2005; Cohen et al., 2020). The regression results in Panel A are based on firms' government supplier status. GOV equals 1 if the firm is a government supplier; zero otherwise. All other variables are as defined earlier; see Table 4 for the definitions. Panel B provides the corresponding results using the total fractional sales from government customers (denoted GOVSALERATIO<sub>it</sub>), where we aggregate sales generated from federal, state, local and foreign governmental agencies. CONTROLS is a vector denoting that all the other control variables from Panel A are also included and are as defined earlier. We report the t-statistics in the parentheses. The symbols \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% level, respectively.

ernment agencies (see Panel A) as well as foreign government agencies (see Panel D).

Multivariate cross-sectional regression analyses are also used to examine the marginal effect of fractional sales from the various types of government agencies on earnings management after controlling for other factors. The general regression model is of the form:

$$EM_{it} = \gamma_0 + \gamma_1 GOVFEDSALES_{it} + \gamma_2 GOVSTATSALES_{it}$$

$$\begin{aligned}
 &+ \gamma_3 GOVLOCSALES_{it} + \gamma_4 GOVFRNSALES_{it} \\
 &+ \sum_k \gamma_{5,k} CostofAM_{k,it} + \sum_l \gamma_{6,l} CostofRM_{l,it} \\
 &+ \sum_m \gamma_{7,m} OtherControl_{m,it} + v_{it}
 \end{aligned} \tag{8}$$

GOVFEDSALE<sub>it</sub>, GOVSTATSALE<sub>it</sub>, GOVLOCSALE<sub>it</sub>, and GOVFRNSALE<sub>it</sub> denote the percent of sales generated from federal, state, local and foreign government agencies, respectively. All the

**Table 10**  
Alternative measures of earnings management: Small positive earnings and large negative earnings

	Panel A – Logistic regressions on being a government supplier				Panel B – Total fractional sales to government agencies			
	Model 1		Model 2		Model 1		Model 2	
	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
<i>INTERCEPT</i>	-4.361	-11.57***	-3.832	-10.36***	-0.010	-0.52	0.0117	0.81
<i>SPOS<sub>it</sub></i>	0.940	10.01***	-	-	0.039	8.28***	-	-
<i>LNEG<sub>it</sub></i>	-	-	-0.507	-7.20***	-	-	-0.017	-5.50***
<i>GROWTH<sub>it</sub></i>	-0.307	-6.78***	-0.365	-7.67***	-0.011	-6.40***	-0.031	-0.01
<i>EISSUE<sub>it</sub></i>	0.034	0.90	-0.027	-0.70	0.004	2.34**	0.002	1.22
<i>DEBT<sub>it</sub></i>	0.318	3.59***	0.424	4.76***	0.018	3.99***	0.022	4.84***
<i>DISSUE<sub>it</sub></i>	-0.002	-0.04	0.014	0.35	0.002	0.83	0.002	1.17
<i>TURN<sub>it</sub></i>	0.634	6.02***	0.579	5.52***	0.038	5.77***	0.035	5.42***
<i>OCF<sub>it</sub></i>	0.200	2.59***	-0.140	-1.94*	-0.003	-0.59	-0.016	-2.89***
<i>BIG8<sub>it</sub></i>	-0.261	-2.82***	-0.259	-2.81***	-0.006	-1.29	-0.006	-1.32
<i>LOSS<sub>it</sub></i>	0.353	3.48***	-0.307	-4.78***	0.006	1.31	-0.009	-0.02
<i>LN(AT)<sub>it</sub></i>	0.825	5.77***	0.821	5.73***	0.015	1.68*	0.016	1.71*
Observations	78,176		78,176		78,172		78,172	
Year fixed effects	Yes		Yes		Yes		Yes	
Industry fixed effects	Yes		Yes		Yes		Yes	
Firms clustered std. err.	Yes		Yes		Yes		Yes	
Chi-squared statistics	1060		1013		-		-	
% correct	86.48%		86.52%		-		-	
F-statistics					11.32***		11.31***	
Adj. R-squared					0.012		0.012	

Panel A reports logit regression results on small positive earnings (Model 1) and on large negative earnings (Model 2) on the probability of being a government supplier. The dependent variable equals 1 if a firm is a government supplier and 0 otherwise. Small positive earnings (*SPOS<sub>it</sub>*) equal to 1 for firms with income-to-asset ratio between 0 and 0.01; zero otherwise. Large negative earnings (*LNEG<sub>it</sub>*) equal to 1 for firms with income-to-asset ratio less than -0.2; zero otherwise. *GROWTH<sub>it</sub>* is the growth rate in sales in the year. *EISSUE<sub>it</sub>* is the percentage of change in common stock. *DEBT<sub>it</sub>* is the debt-to-asset ratio. *DISSUE<sub>it</sub>* is the percentage of change in total liabilities. *TURN<sub>it</sub>* is the sales to total asset ratio. *OCF<sub>it</sub>* is the annual net cash flow from operating activities, scaled by total assets. *BIG8<sub>it</sub>* is a dummy variable equal to 1 if the firm's auditor is one of the Big 8, and 0 otherwise. *LOSS<sub>it</sub>* is an indicator variable that equals one if the firm reports negative earnings for the year. *LN(AT)<sub>it</sub>* is the natural log value of total assets. Panel B reports cross-sectional regression analyses using the fractional sales to all government customers on small positive earnings (Model 1), large negative earnings (Model 2) on the total fractional sales from government customers. The controls are those in Panel A. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% level, respectively.

**Table 11**  
Comparison of earnings management by fractional sales from different types of government customers

Panel A: Earnings management based on fractional sales generated from federal government agencies							
Variables	Low fractional sales		High fractional sales		Difference		
	Mean	Median	Mean	Median	Mean	t-statistic	Wilcoxon statistic
<i>ABDISX</i>	0.051	0.035	0.108	0.114	0.057	12.77***	21.33***
<i>ABPROD</i>	0.004	0.002	0.056	0.035	0.052	15.18***	18.55***
<i>RM</i>	0.060	0.042	0.172	0.153	0.112	16.61***	22.7***
<i>DA</i>	0.028	0.003	0.032	0.007	0.004	0.70	1.84*
Panel B: Earnings management based on fractional sales generated from state government agencies							
<i>ABDISX</i>	0.077	0.068	0.169	0.195	0.093	6.7***	7.69***
<i>ABPROD</i>	0.028	0.011	0.099	0.077	0.071	6.41***	5.6***
<i>RM</i>	0.111	0.074	0.270	0.296	0.159	7.86***	7.49***
<i>DA</i>	0.029	0.004	0.053	-0.001	0.024	0.95	0.06
Panel C: Earnings management based on fractional sales generated from local government agencies							
<i>ABDISX</i>	0.079	0.071	0.101	0.059	0.022	1.36	1.09
<i>ABPROD</i>	0.030	0.013	0.053	0.012	0.023	1.65	0.83
<i>RM</i>	0.116	0.077	0.153	0.067	0.038	1.43	0.80
<i>DA</i>	0.030	0.004	0.016	0.004	-0.014	-0.46	-0.59
Panel D: Earnings management based on fractional sales generated from foreign government agencies							
<i>ABDISX</i>	0.078	0.068	0.104	0.086	0.026	3.25***	5.13***
<i>ABPROD</i>	0.028	0.013	0.052	0.010	0.024	4.04***	4.45***
<i>RM</i>	0.112	0.076	0.162	0.084	0.049	4.19***	5.03***
<i>DA</i>	0.027	0.004	0.062	0.012	0.035	2.73***	1.94*

This table compares the earnings management of government suppliers by the degree of fractional sales from different types of government customers. Panel A through D presents univariate tests of the average earnings management activity based on the fractional sales to federal, state, local and foreign government customers respectively, where “low” is less than or equal to the sample median fractional sales level and “high” is greater than the median. The earnings management measures are described in Appendix 1. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.



**Table 12**  
Regression results on fractional sales from different types of government agencies for the full sample

	Panel A: Full sample				Panel B: Sub-sample of government suppliers			
	ABDISX	ABPROD	RM	DA	ABDISX	ABPROD	RM	DA
<i>INTERCEPT</i>	-0.165 (12.44***)	0.053 (9.11***)	-0.105 (11.89***)	0.011 (-3.94***)	0.355 (4.44***)	0.273 (3.89***)	0.640 (4.58***)	-0.156 (-2.48**)
<i>GOVFEDSALE<sub>it</sub></i>	0.054 (5.19***)	0.109 (9.32***)	0.091 (7.52***)	-0.008 (-1.70*)	0.147 (6.01***)	0.181 (6.67***)	0.184 (6.75***)	-0.000 (-0.01)
<i>GOVSTATSALE<sub>it</sub></i>	0.004 (0.62)	0.018 (1.99**)	0.013 (1.57)	-0.006 (-2.05**)	0.025 (1.43)	0.043 (1.75*)	0.039 (1.83*)	-0.012 (-1.29)
<i>GOVLOCSALE<sub>it</sub></i>	-0.002 (-0.62)	0.011 (1.32)	0.003 (0.56)	0.001 (0.16)	0.003 (0.25)	0.024 (1.23)	0.013 (0.83)	0.007 (0.39)
<i>GOVFRNSALE<sub>it</sub></i>	0.005 (0.52)	0.008 (1.00)	0.007 (0.70)	0.010 (2.26**)	0.039 (1.66*)	0.023 (1.18)	0.034 (1.49)	0.035 (2.05**)
<i>MKTSHARE<sub>it-1</sub></i>	-0.000 (-0.05)	-0.011 (-1.30)	-0.007 (-0.78)	-0.005 (-0.85)	-0.001 (-0.04)	-0.009 (-0.61)	-0.005 (-0.31)	0.012 (1.13)
<i>ZSCORE<sub>it-1</sub></i>	0.021 (2.56**)	-0.025 (-3.15***)	-0.003 (-0.39)	-0.024 (-4.60***)	0.007 (0.39)	-0.032 (-1.77*)	-0.013 (-0.69)	-0.023 (-1.57)
<i>INST<sub>it-1</sub></i>	0.005 (0.44)	-0.053 (-4.59***)	-0.026 (-2.07**)	-0.030 (-4.27***)	-0.036 (-1.37)	-0.067 (-2.46**)	-0.058 (-1.99**)	-0.026 (-1.52)
<i>TAX<sub>it</sub></i>	0.079 (7.90***)	0.035 (3.37***)	0.070 (6.49***)	-0.013 (-1.92*)	0.068 (2.75***)	0.059 (2.23**)	0.074 (2.72***)	-0.011 (-0.55)
<i>BIGS<sub>it</sub></i>	0.001 (0.11)	0.003 (0.34)	0.002 (0.24)	-0.009 (-1.74*)	0.009 (0.41)	0.015 (0.67)	0.013 (0.55)	0.022 (1.57)
<i>SOX<sub>it</sub></i>	0.015 (0.59)	0.004 (0.14)	0.010 (0.33)	0.053 (1.96**)	-0.031 (-0.56)	0.105 (1.71*)	0.036 (0.62)	0.186 (2.49**)
<i>NOA<sub>it-1</sub></i>	0.072 (10.27***)	-0.060 (-8.07***)	0.018 (2.32**)	-0.016 (-3.82***)	0.041 (2.67***)	-0.066 (-4.11***)	-0.007 (-0.41)	-0.007 (-0.59)
<i>OPERCYCLE<sub>it-1</sub></i>	0.003 (0.39)	-0.050 (-5.77***)	-0.026 (-2.90***)	-0.015 (-2.71***)	-0.045 (-2.02**)	-0.104 (-4.63***)	-0.079 (-3.38***)	0.006 (0.31)
<i>ROA<sub>it</sub></i>	0.014 (1.07)	0.101 (9.06***)	0.061 (5.05***)	0.107 (9.67***)	-0.018 (-0.72)	0.104 (4.79***)	0.041 (1.76*)	0.085 (2.89***)
<i>LN(AT)<sub>it</sub></i>	-0.158 (-10.82***)	-0.011 (-0.72)	-0.107 (-6.72***)	0.050 (6.25***)	-0.123 (-3.56***)	-0.009 (-0.24)	-0.082 (-2.21**)	0.029 (1.47)
<i>MKBK<sub>it</sub></i>	-0.100 (-13.05***)	-0.068 (-9.71***)	-0.100 (-12.89***)	0.001 (0.26)	-0.067 (-4.67***)	-0.031 (-1.90*)	-0.057 (-3.73***)	0.025 (1.19)
<i>EARNINGS<sub>it</sub></i>	0.179 (10.86***)	-0.398 (-26.92***)	-0.088 (-5.35***)	-0.059 (-5.07***)	0.238 (6.33***)	-0.273 (-8.23***)	0.004 (0.09)	-0.039 (-1.13)
<i>IMR<sub>it</sub></i>	-0.441 (-20.79***)	-0.191 (-8.25***)	-0.392 (-16.48***)	0.058 (4.91***)	-0.469 (-8.60***)	-0.256 (-4.36***)	-0.425 (-7.24***)	0.091 (2.64***)
<i>RES_RM<sub>it</sub></i>				0.012 (2.23**)				-0.020 (-1.26)
<i>F-statistics</i>	34.97***	24.09***	16.29***	23.43***	29.59***	24.14***	12.82***	23.33***
Adjusted <i>R</i> -squared	0.152	0.113	0.0782	0.0557	0.205	0.106	0.132	0.0324
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firms clustered std. err.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	74,588	73,932	73,932	73,394	13,846	13,727	13,727	13,618

This table report regression results on the relationship between Earnings management and fractional sales from different types of government customers for the full sample. The dependent variables in Panel A are the Traditional measures of earnings management: abnormal discretionary expenses (*ADISX*), abnormal production cost (*APROD*), the composite score for total real earnings management (*RM*) and abnormal discretionary accruals (*DA*). The earnings management measures are described in Appendix 1. The variables *GOVFEDSALE<sub>it</sub>*, *GOVSTATSALE<sub>it</sub>*, *GOVLOCSALE<sub>it</sub>*, and *GOVFRNSALE<sub>it</sub>* are the fractions of firm sales generated from federal, state, local and foreign government agencies, respectively. *IMR* is the inverse Mills ratio from the Heckman first stage regression; it is a correction factor for selection bias as government contractors are not randomly selected. The other control variables are as defined earlier; see Table 4 for the definition of the control variables. The dependent variables in Panel B are the four alternative performance adjusted earnings management measures: performance-matched abnormal discretionary expenses (*PM\_ADISX*), performance-matched abnormal production cost (*PM\_APROD*), performance-matched total real earnings management (*PM\_RM*) and performance-matched abnormal discretionary accruals (*PM\_DA*). Each performance-matched measure is a firm's traditional earnings management measure (as described in Appendix 1) minus the value of the portfolio of firms in the same industry (2-digit SIC codes), same year and same quartile of lagged return on assets (*ROA*), where *ROA* is defined as the income before extraordinary items divided by total assets (e.g. Kothari et al., 2005; Cohen et al., 2020). We report the *t*-statistics in the parentheses. The symbols \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% level, respectively.

control variables from the baseline regression are included in Eq. 8 and are as defined earlier. We also control for the inverse Mills ratio (*IRM<sub>it</sub>*) as a correction factor for the fact that government contracts are not randomly awarded (e.g. Tahoun, 2014; Goldman et al., 2013).

We report the cross-sectional regression results in Table 12. Panel A presents the results for the full sample, whereas Panel B presents the results for the sub-sample of government suppliers. The evidence in Panel A shows that the coefficient on the *GOVFEDSALE<sub>it</sub>* variable is consis-

tently positive and highly significant where either *ABPROD*, *ABDISX*, or *RM* is used as the dependent variable (see Columns 1 – 3). After controlling for other factors, sales generated from the other types of government agencies do not appear to influence real activities management; the one exception being that abnormal production cost (*ABPROD*) is positive and significantly related to sales generated from state government agencies (*GOVSTATSALE<sub>it</sub>*) in Column 2.

**Table 13**  
Results on performance-matched measures and fractional sales from different types of government agencies

	Panel A: Full sample				Panel B: Sub-sample of government suppliers			
	PM_ABDISX	PM_ABPORD	PM_RM	PM_DA	PM_ABDISX	PM_ABPORD	PM_RM	PM_DA
<i>INTERCEPT</i>	0.399 (13.47***)	0.158 (6.35***)	0.558 (11.07***)	-0.046 (-1.62)	0.364 (4.76***)	0.189 (2.68***)	0.571 (4.13***)	-0.068 (-0.95)
<i>GOVFEDSALE<sub>it</sub></i>	0.065 (6.53***)	0.101 (8.57***)	0.093 (7.89***)	-0.003 (-0.88)	0.144 (5.89***)	0.177 (6.55***)	0.179 (6.49***)	-0.011 (-0.89)
<i>GOVSTATESALE<sub>it</sub></i>	0.008 (1.35)	0.020 (2.39**)	0.014 (1.98*)	-0.004 (-1.29)	0.031 (1.88*)	0.047 (2.15**)	0.041 (2.08**)	-0.008 (-0.87)
<i>GOVLOCSALE<sub>it</sub></i>	-0.001 (-0.32)	0.009 (1.13)	0.003 (0.56)	0.000 (0.01)	0.004 (0.37)	0.020 (1.08)	0.012 (0.78)	0.001 (0.07)
<i>GOVFRNSALE<sub>it</sub></i>	0.003 (0.37)	0.008 (1.11)	0.005 (0.57)	0.006 (0.93)	0.029 (1.42)	0.028 (1.48)	0.029 (1.34)	0.018 (0.81)
<i>MKTSHARE<sub>it-1</sub></i>	0.007 (1.04)	-0.012 (-1.66*)	-0.002 (-0.27)	0.003 (0.80)	0.011 (0.89)	-0.010 (-0.69)	0.002 (0.16)	0.016 (1.84*)
<i>ZSCORE<sub>it-1</sub></i>	-0.017 (-2.01**)	0.008 (0.96)	-0.010 (-1.21)	-0.027 (-5.50***)	-0.021 (-1.07)	0.011 (0.65)	-0.007 (-0.38)	-0.037 (-2.98***)
<i>INST<sub>it-1</sub></i>	-0.031 (-2.85***)	-0.052 (-4.67***)	-0.048 (-4.08***)	-0.032 (-5.28***)	-0.058 (-2.29**)	-0.063 (-2.39**)	-0.069 (-2.49**)	-0.023 (-1.46)
<i>TAX<sub>it</sub></i>	0.003 (0.31)	0.082 (7.96***)	0.082 (3.95***)	-0.013 (-2.10**)	0.043 (-0.14)	0.091 (3.46***)	0.047 (1.68*)	-0.021 (-1.16)
<i>BIGS<sub>it</sub></i>	-0.003 (-0.35)	-0.007 (-0.77)	-0.006 (-0.61)	-0.005 (-1.01)	0.003 (0.16)	0.010 (0.47)	0.008 (0.37)	0.021 (1.52)
<i>SOX<sub>it</sub></i>	0.025 (0.97)	0.004 (0.12)	0.017 (0.62)	0.028 (0.88)	-0.034 (-0.50)	0.095 (1.51)	0.029 (0.46)	0.206 (2.65***)
<i>NOA<sub>it-1</sub></i>	0.081 (11.63***)	-0.077 (-10.55***)	0.013 (1.75*)	-0.003 (-0.85)	0.055 (3.44***)	-0.077 (-4.84***)	-0.006 (-0.36)	0.005 (0.52)
<i>OPERCYCLE<sub>it-1</sub></i>	0.003 (0.35)	-0.047 (-5.48***)	-0.025 (-2.69***)	-0.015 (-2.94***)	-0.050 (-2.38**)	-0.101 (-4.51***)	-0.085 (-3.72***)	0.010 (0.56)
<i>ROA<sub>it</sub></i>	-0.006 (-0.37)	0.087 (7.70***)	0.087 (3.07***)	0.071 (6.14***)	-0.023 (-0.78)	0.098 (4.47***)	0.032 (1.31)	0.059 (1.99**)
<i>LN(AT)<sub>it</sub></i>	-0.122 (-8.67***)	0.007 (0.48)	-0.074 (-4.82***)	0.018 (2.43**)	-0.106 (-3.18***)	0.005 (0.13)	-0.069 (-1.89*)	-0.003 (-0.14)
<i>MKBK<sub>it</sub></i>	-0.082 (-10.12***)	-0.065 (-9.07***)	-0.086 (-10.90***)	0.004 (0.75)	-0.051 (-3.69***)	-0.028 (-1.70*)	-0.045 (-3.01***)	0.038 (1.86*)
<i>EARNINGS<sub>it</sub></i>	0.051 (2.878***)	-0.312 (-20.97***)	-0.126 (-7.49***)	-0.058 (-4.81***)	0.147 (3.75***)	-0.210 (-6.38***)	-0.019 (-0.50)	-0.039 (-1.12)
<i>IMR<sub>it</sub></i>	-0.354 (-17.25***)	-0.174 (-7.67***)	-0.316 (-13.83***)	0.041 (3.44***)	-0.383 (-7.16***)	-0.226 (-3.86***)	-0.357 (-6.09***)	0.048 (1.31)
<i>RES_RM<sub>it</sub></i>				0.003 (0.50)				-0.013 (-0.91)
<i>F-statistics</i>	14.87***	15.76***	10.57***	7.69***	4.28***	4.09***	2.99***	2.48**
Adjusted <i>R</i> -squared	0.0545	0.0719	0.0569	0.0119	0.0975	0.0898	0.0924	0.0146
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firms clustered std. err.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	74,528	73,875	73,875	73,393	13,838	13,719	13,719	13,618

This table reports regression results on the relationship between earnings management and fractional sales from different types of government customers for the sub-sample of government suppliers. The dependent variables in Panel A are the traditional measures of earnings management: abnormal discretionary expenses (*ADISX*), abnormal production cost (*APROD*), the composite score for total real earnings management (*RM*) and abnormal discretionary accruals (*DA*). The earnings management measures are described in Appendix 1. The variables *GOVFEDSALE<sub>it</sub>*, *GOVSTATESALE<sub>it</sub>*, *GOVLOCSALE<sub>it</sub>*, and *GOVFRNSALE<sub>it</sub>* are the fractions of firm sales generated from federal, state, local and foreign government agencies, respectively. *IMR* is the inverse Mills ratio from the Heckman first stage regression; it is a correction factor for selection bias as government contractors are not randomly selected. The other control variables are as defined earlier; see Table 4 for the definition of the control variables. The dependent variables in Panel B are the four alternative performance-adjusted earnings management measures: performance-matched abnormal discretionary expenses (*PM\_ADISX*), performance-matched abnormal production cost (*PM\_APROD*), performance-matched total real earnings management (*PM\_RM*) and performance-matched abnormal discretionary accruals (*PM\_DA*). Each performance-matched measure is a firm's traditional earnings management measure (as described in Appendix 1) minus the value of the portfolio of firms in the same industry (2-digit SIC codes), same year and same quartile of lagged return on assets (*ROA*), where *ROA* is defined as the income before extraordinary items divided by total assets (e.g. Kothari et al., 2005; Cohen et al., 2020). We report the *t*-statistics in the parentheses. The symbols \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Yet, as a whole, the results indicate that the relationship between real earnings management and government contracting is driven primarily by the level of sales engendered from federal government agencies. The finding is notable since firms tend to have their largest trading relationship with the federal part of the U.S. government. It is also worth noting that *GOVFEDSALE<sub>it</sub>* and *GOVSTATESALE<sub>it</sub>* are inversely related to abnormal discretionary accruals (*DA*) at the 10% level or better. These findings indicate that accrual management is lower when sales gener-

ated from both federal and state government agencies are higher (see Column 4). However, the result in Column 4 also shows a positive and significant association between *DA* and *GOVFRNSALE<sub>it</sub>*, suggesting that sales generated from foreign government agencies escalate accrual management.

When we examine the sub-sample of government suppliers in Panel B, the results largely confirm the inference that sales from federal government agencies exacerbate real earnings management, while sales

from foreign government agencies exacerbate accrual management. Hence, there is robust evidence that real activities management increases when firms contract with the federal government. However, we find only limited evidence that their level of accrual management decreases as suggested by Samuels (2021). For robustness, we also present results using the performance-matched earnings management measures in Table 13. In these regression results, we continue to find a strong positive relationship between real earnings management and sales from federal government agencies, whereas the association between accrual management and foreign government related sales does not persist. Yet, the marginal effect of sales from state government agencies ( $GOVSTATESALE_{it}$ ) on real earnings management appears to strengthen in magnitude and statistical significance to some extent. Overall, the performance-matched results in Table 13 validate our earlier findings.

### 8. Conclusion

We examine real activities and accrual-based earnings management among U.S. firms within the context of sales to government agencies over the period from 1980 to 2017 using a large sample of firms with customer-level data in Compustat. We study various measures of earnings management and sales levels to different types of government agencies. We find robust evidence that government suppliers engage in more real earnings management than their non-government contracting industry peers. This finding is robust to alternative definitions of earnings management, and persists even after accounting for potential endogeneity and selection biases. However, there is limited and mixed evidence that government suppliers manage accruals depending on the type government agency. We find that discretionary accruals increase with sales to foreign government agencies after considering other factors, whereas they decrease with sales to federal and state government agencies (but not local government agencies). We also consider other earnings management practices and find ample evidence to suggest that government suppliers are more prone to distort earnings than other firms.

In general, our findings support the view that government contractors prefer real earnings management to accrual-based earnings management because of its higher secrecy, which is consistent with the political cost hypothesis. As such, our study contributes both to the earnings management literature as well as to the growing literature on government contractors. We document novel evidence on the earnings management behavior of firms having major government customers that build upon earlier studies. Our inquiry also complements recent studies showing that government contracts affect firm outcomes.

Finally, our findings have implications for procurement policy and policymakers not only in the U.S. but also in other major economies like Canada and the Europe Union, as well as in many emerging markets where regulatory oversight is less stringent. Greater levels of real activities management implies that government suppliers tend to deviate from optimal decision making with a high level of secrecy. This is concerning because governmental agencies have awarded more cost-plus contracts in recent years than fixed-price contracts. Even though these cost-reimbursement style contracts are hard to monitor, the contractor is paid the negotiated amount regardless of incurred expenses.

Agency theory predicts that contractors will likely exploit this condition to extract more rent at the public's expense. The theory also suggests that contractors may develop a preference for a quiet life because they may grow to rely on steady contract-related cash flows. As a result, policymakers need to focus more on the real earnings management strategies that government contractors use to circumvent scrutiny or else they underestimate the total earnings management activities of suppliers. Improvement in procurement monitoring and oversight may reduce contractors' inefficiencies and government waste, thereby promoting fiscal responsibility.

### Appendix 1

Regression analysis to measure real activities management and accrual-based management						
	Discretionary Accrual <sub>(t)</sub> / Asset <sub>(t-1)</sub> (Equation 1)		Production Cost <sub>(t)</sub> / Asset <sub>(t-1)</sub> (Equation 2)		Discretionary Expense <sub>(t)</sub> / Asset <sub>(t-1)</sub> (Equation 3)	
	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Intercept	-0.014	-0.505	-0.074	-	0.107	-
				24.37***		23.87***
$1/Asset_{(t-1)}$	-0.575	-2.71***	0.089	0.38	1.307	
$Sales_{(t)}$	-	-	0.772	-	-	10.36***
$Sales_{(t-1)}$	-	-	-	227.48***	-	-
$\Delta Sales_{(t)}$	-	-	-	-	0.143	-
$\Delta Sales_{(t-1)}$	0.047	2.60***	0.018	1.91*	-	41.61***
$PPE_{(t)}$	-	-	-0.031	-3.58***	-	-
$PPE_{(t-1)}$	-0.078	-2.38**	-	-	-	-
Mean	0.540		85.39%		45.07%	
Adj. R <sup>2</sup>						
Mean # of obs.	92.538		115.580		130.806	
# industry-years	2,675		2,338		2,338	

The regressions are estimated cross-sectionally for each industry-year for the period 1980-2017 using the universe of firms in Compustat. The Fama-French 48 industry grouping is used. The reported coefficients are the mean values of the coefficients across industry-years. The t-statistics are calculated using the standard errors of the coefficients across industry-years. The adjusted R<sup>2</sup> (number of observations) is the mean adjusted R<sup>2</sup> (number of observations) across industry-years. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

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