Government procurement and changes in firm transparency

Delphine Samuels
dsamuels@mit.edu
Sloan School of Management
MIT

Draft: May, 2018

Abstract:

The government monitors its suppliers' internal information processes to reduce uncertainty about the suppliers' ability to fulfill their commitments. In this paper, I argue that these monitoring procedures improve the suppliers' internal information, which in turn leads to higher quality external reporting. Using a dataset of U.S. government contracts, I find a positive relation between government contract awards and the quality of firms' external reporting environment. Consistent with government monitoring of internal information processes driving this relation, I find that firms improve their external reporting when they first start contracting with the government, and that the magnitude of the improvement varies predictably with contract characteristics that entail a greater degree of government scrutiny. Finally, I use the establishment of the Cost Accounting Standards Board (CASB) in 1970 as an exogenous shock to contractor monitoring, and find greater improvements in the external reporting environment among firms affected by the CASB's monitoring requirements. Overall, these results suggest that monitoring by the government as a customer plays a role in shaping the firm's transparency.

This paper is based on my dissertation. I am very grateful to the members of my dissertation committee for their support, guidance and insightful comments: Wayne Guay (co-chair), Luzi Hail, Chris Ittner (co-chair), and Dan Taylor. I also thank Brian Bushee, Paul Fischer, Stephen Glaeser, Mirko Heinle, Bob Holthausen, Chongho Kim, Rick Lambert, Cathy Schrand, Robert Verrecchia, Frank Zhou, and seminar participants at the 2016 Carnegie Mellon Accounting Mini Conference, Harvard University, Massachusetts Institute of Technology, Stanford University, the University of Chicago, the University of California Los Angeles, the University of Michigan, the University of North Carolina, the University of Southern California, the University of Texas at Austin, the Wharton School of the University of Pennsylvania, and Yale University for helpful comments. Finally, I thank the Wharton School, the Connie K. Duckworth Endowed Doctoral Fellowship, and the Deloitte Foundation for their generous financial support.

1. Introduction

Information asymmetry among government agencies and their suppliers creates uncertainty about the ability of suppliers to fulfill their commitments. For example, agencies might require information to assess whether the supplier has adequate financial resources to deliver the goods and services specified in the contract, and provide services or spare parts for products on an ongoing basis. To reduce the costs associated with this information asymmetry, the government carefully monitors the financial attributes of prospective and existing suppliers—particularly those suppliers that represent an influential portion of its purchases. Building on prior literature, I predict that, to the extent that these procedures improve suppliers' internal information processes, government monitoring will manifest in higher quality external reporting environments.

I investigate this prediction using a comprehensive dataset of over $7 trillion in U.S. government contracts awarded between 2000 and 2016.[1] These contracts provide a powerful institutional setting to examine how customer monitoring of internal information processes relates to the supplier's information environment for several reasons. First, these contracts represent a substantial component of the U.S. economy. On average, the U.S. government awards over $400 billion in contracts each year and is the single largest buyer of goods and services in the country. As a result, its procurement processes and associated monitoring procedures impact a large number of suppliers. Second, the U.S. government's monitoring procedures are very extensive and far more detailed than financial audits performed by external auditors. These procedures are formalized by Federal Acquisition Regulations (the FARs), which codify the policies and procedures for acquisition by all government agencies, and include specific requirements pertaining to contractors'

[1] The *Federal Funding Accountability and Transparency Act of 2006* mandates the U.S. government to publicly disclose detailed information on its transactions with organizations receiving federal funds. These data are available in the Federal Procurement Data System–Next Generation database (FPDS–NG) at www.USAspending.gov. The initial site went live in 2007 and provides data starting in 2000.

internal information processes. For example, prior to awarding a contract, the government determines whether the prospective contractor has adequate financial resources, and the necessary organization, accounting systems, and accounting and operational controls to perform the contract. For certain types of contracts, the government continues to monitor financial and operational compliance and performance. More importantly, because data on U.S. government contracts are publicly available, it is possible for market participants (and researchers) to infer the scope and focus of supplier monitoring, which vary with contract size, duration, and various other characteristics.[2]

I argue that government monitoring of contractors' internal information processes improves their external reporting environment. This prediction relies on the joint hypothesis that (1) government monitoring improves firms' internal information, and (2) higher quality internal information leads to higher quality external reporting. With regard to the first link, I argue that contractors improve their internal information processes to satisfy the requirements imposed by the FARs, resulting in an upward shift of the optimal quality of contractors' internal information processes.[3] With regard to the second link, prior theoretical and empirical research suggests a positive relation between the quality of the firm's internal information processes and external reporting environment: as managers gain access to higher quality internal information, this information should manifest itself in improved external reporting (e.g., Corollary 1 of Verrecchia (1990)).[4] Consequently, if monitoring activities by the government improve the production of

[2] One added benefit of these data is their availability for all contract amounts. In contrast, the Compustat segment files only provide data for customers that represent over 10% of annual firm sales.

[3] For example, the government requires certain contractors to produce detailed information to support all the costs allocated to the contract. Absent a government contract, the firm might not deem the production of this information cost-effective.

[4] For example, firms with internal control weaknesses tend to generate lower quality management forecasts as managers rely on erroneous internal reports (Feng, Li, and McVay, 2009). For further examples, see, e.g., Doyle, Ge, and McVay (2007), Ashbaugh-Skaife, Collins, Kinney, and LaFond (2008); Dornates, Li, Peters, and Richardson (2013), and Ittner and Michels (2017).

internal information, then the extent of government monitoring should be associated with higher quality external reporting.

On the other hand, the government's standardized and bureaucratic procedures might not be effective or timely in monitoring contractors' information processes. Contractors view some of these procedures as an administrative burden, far too costly to be an effective management tool (e.g., Christensen, 1998). In addition, the government has built up a substantial backlog of contractor audits in recent years, and might not be performing required monitoring procedures (e.g., Francis, 2013). Even if government monitoring improves some dimensions of contractors' internal information, they might not affect external reporting. Unlike financial audits, the scope of these procedures tends to be *contract*-specific, as opposed to targeting overall firm performance, and their objective is not to assess external reporting.

I test my prediction using three attributes of the firm's external reporting environment: (i) the quality of voluntary disclosure, (i) the speed of a firm's earnings announcement release after fiscal year end, and (iii) the overall quality of public information about the firm. Finding results across multiple attributes provides greater confidence that there exists a relation between government monitoring and the firm's external reporting. First, I use management forecasts to measure voluntary disclosure. Specifically, I use the existence of a management forecast over the fiscal year, the number of forecasts provided, and the number of different forecast items ((forecasts of EPS, cash flow, sales, etc.) to proxy for the quality of voluntary disclosure (e.g., Shroff, Sun, White, and Zhang, 2013). Second, I use the speed of a firm's earnings release to measure how quickly the firm's accounting system can integrate information from various parts of its organization (e.g., Gallemore and Labro, 2015). Finally, I use a measure of liquidity to proxy for the overall quality of information about the firm. Specifically, I use the proportion of zero return trading days

over the fiscal year (e.g., Lang, Lins and Maffett, 2012), which is a readily available measure across all samples in my analyses. Market-based measures of liquidity encompass all sources of public information (including information provided by intermediaries), and can be viewed as an ex-post proxy for the firm's overall quality of public information (e.g., Balakrishnan, Core, and Verdi, 2014).

I first assess the extent of government monitoring using the size and/or existence of government contracts. These variables allow me to examine whether the dollar amount obligated by the government, and whether having a government contract *itself* has implications for the firm's external reporting environment. I find a positive association between the size and existence of government contracts and the quality of contractors' external reporting environment. I then narrow my focus to firms that first start contracting with the government. In contrast to established government contractors, firms that begin a contracting relationship with the government are likely to experience the strongest effects from monitoring. Using a difference-in-differences design, I find that the contract starters' quality of external reporting is greater once they begin contracting with the government, relative to an otherwise similar control group.

An alternative explanation for my results is that the award of a government contract may affect firms' external reporting through channels other than monitoring. For example, the award may represent "good news" in the form of higher expected revenues, or more persistent future earnings, which can lead to higher quality external reporting environments. To shed light on these alternative explanations, I examine whether the association between government contracts and external reporting varies predictably with contract characteristics that directly influence the focus and extent of the government's monitoring of contractors' internal information processes.

Within my sample of government contractors, I find that the association between the size of government contracts and external reporting varies with contract duration, and with the following

four contract characteristics that influence the extent of monitoring: (1) whether the contractor is required to provide cost or pricing data, which are extensively reviewed by the government; (2) whether the contractor is required to adopt a set of unique, government-specific cost accounting standards, which requires the government to verify compliance with the standards; (3) whether the contractor has "cost reimbursement" contracts, which require the government to systematically review the contractor's incurred costs; and (4) whether the contractor provides goods and services not available on commercial markets, as non-commercial items are subject to greater government scrutiny. Consistent with the monitoring of internal information processes being a driving force behind my results, I find that the quality of the external reporting environment is increasing in each of these contract characteristics.

Finally, I use the establishment of the Cost Accounting Standards Board (CASB) to study the effect of a change in government monitoring of contractors' internal information processes on their external reporting environment. In 1970, Congress passed a statute establishing the CASB for the purpose of promulgating a set of uniform cost accounting standards for defense contractors, and requiring defense contractors to detail their cost accounting standards in a "Disclosure Statement." The industry was opposed to the imposition of uniform cost accounting standards, and this regulation marked a significant increase in government monitoring of defense contractors' internal information processes.[5] The primary advantage of this analysis is that it exploits arguably exogenous variation in the monitoring of well-established government contractors, making it less likely that the results are driven by potentially confounding effects of contract awards. Employing a difference-in-differences design, I examine changes in the external reporting quality of top military contractors

[5] All national defense contractors with contracts in excess of $100,000 were required to comply with the CASB's regulations.

around this regulation. I find an increase in liquidity for military contractors after the establishment of CASB relative to other firms in the same industry.[6]

Collectively, my results suggest that monitoring by the government as a customer plays a role in shaping the firm's external reporting environment. To my knowledge, my paper is the first to suggest that customers can improve their suppliers' external reporting by monitoring their internal information processes. In this regard, this study contributes to a growing literature on the monitoring role of non-investor stakeholders, such as supply chain participants. One stream of papers studies how customers' and suppliers' demand for financial accounting information to assess firms' underlying economic performance influences reporting quality.[7] A different stream of the literature focuses on how specific supplier monitoring mechanisms improve firms' operating performance (e.g., through information sharing, supplier audits, or supplier certification).[8] My study integrates these two literatures by examining how supplier monitoring mechanisms, rather than the demand for financial information, relates to their external reporting environment.

My paper also contributes to the literature linking firms' internal information and external reporting processes. In contrast to the conventional textbook-view that internal information requirements should be separate and distinct from those necessary for external reporting (e.g., Kaplan and Atkinson, 1989), a recent stream of literature shows that firms' internal information processes are closely aligned with the processes used for external reporting (e.g., Dichev, Graham, Harvey, and Rajgopal, 2013; Ittner and Michels, 2017). My paper adds to this literature by

[6] I use the proportion of zero return trading days over the fiscal year as my measure of external reporting quality because the data on voluntary disclosure and earnings release dates are not readily available for this time period.
[7] For example, Hui, Klasa, and Yeung (2012) suggest that firms cater to their customers' or suppliers' demand for greater accounting conservatism by recognizing more timely losses. See also Bowen, Ducharme, and Shores (1995), Raman and Shahrur (2008), and Costello (2013).
[8] See, e.g., Ittner, Larcker, Nagar, and Rajan (1999), Caglio and Ditillo (2008) and Anderson and Dekker (2009).

suggesting that improvements to internal information processes through customer monitoring can be associated with higher quality external reporting.

The remainder of the paper proceeds as follows. Section 2 describes the institutional background and develops predictions. Section 3 describes the sample. Section 4 describes the research design, measurement choices, and results. Section 5 discusses alternative explanations. Section 6 concludes.

2. Background and predictions

Government procurement agencies carefully monitor prospective and existing suppliers, for example by performing audits around the supplier's financial viability, internal controls, and other attributes of their internal information processes that are relevant to their contracts (e.g., Feldman and Keyes, 2011). The Federal Acquisition Regulations (the FARs) codify the policies and procedures for acquisition by all government agencies, and include extensive requirements pertaining to the monitoring of suppliers' internal information processes. I examine these monitoring procedures using detailed data on U.S. government contracts.

2.1 Institutional background

The U.S. government's procurement process begins when a government agency identifies a need for a product or service. The agency's contracting officer (CO) posts a Request for Proposal on the Federal Business Opportunities website, and prospective contractors begin submitting their offers. The CO then initiates a series of extensive monitoring procedures, which span both the pre- and post-award contracting periods.

Prior to awarding a contract, the CO determines whether a prospective contractor meets a number of "responsibility" criteria (FAR 9.104), including access to adequate financial resources,

and the necessary organization, experience, accounting and operational controls and technical skills to perform the contract. The CO must obtain sufficient information to be satisfied that the prospective contractor meets these standards (FAR 9.105). For example, the CO performs a pre-award survey that includes a financial condition risk assessment, which evaluates the contractor's financial statements and internal controls, and any issues that might impair the contractor's ability to perform on the contract (e.g., going concern or litigation issues). The survey also includes an evaluation of the contractor's accounting system, which must be sufficiently detailed to accumulate the type of cost information required by the contract (e.g., ability to segregate direct and indirect costs, ability to allocate costs by contract, accuracy of employees' timekeeping system, accuracy of cost accounting data to support billings, etc.). By monitoring internal controls and imposing a very precise cost accounting system, these procedures can improve various aspects of the contractor's information environment. For example, improved cost allocation can result in more accurate and predictable inventories and cost of goods sold, both at an aggregate level and across the firm's various segments.

The CO is also required to establish a fair and reasonable price by reviewing the prospective contractor's price proposal, a breakdown of all incurred and estimated costs. The contractor is sometimes required to submit cost or pricing data to support the proposal, and certify that the data are accurate, complete and current (FAR 15.403). The CO performs an extensive review of this data and any relevant supporting documentation, including underlying cost estimation systems. This can lead to improvements in the contractor's estimation processes, and generally benefit management's internal projections of costs, revenues, and other factors (e.g., capital expenditures).

After awarding a contract, the CO continues to monitor the contractor through an annual financial condition risk assessment. Depending on the type of contract, the CO performs a number

of supplemental monitoring procedures. In case of a cost reimbursement contract, the contractor bills the government for incurred costs on a systematic basis. Prior to issuing payment, the CO reviews the incurred cost proposal, and determines whether the costs are allowable, allocable to the contract and in compliance with applicable cost principles. This process typically includes an in-depth analysis of each cost item, and may include an audit of the underlying supporting documentation (e.g., the contractors' billing system, accounts payable, labor timekeeping system, etc.). In addition, in case of a contract that requires performance-based progress payments, the CO assesses whether the relevant performance criteria (e.g., project milestones) have been achieved prior to issuing payment, which can have implications for the contractor's revenue recognition process.

These monitoring procedures are much more extensive and detailed than financial audits performed by external auditors. The Defense Contracting Audit Agency (DCAA) assists COs from all government agencies in all of these tasks. The DCAA's general audit interests are three-fold: (a) identify and evaluate all activities that either contribute to, or have an impact on, proposed or incurred costs of government contracts; (b) evaluate contractors' financial policies, procedures, and internal controls; and (c) perform audits that identify opportunities for contractors to reduce or avoid costs (i.e., operations audits) (DCAA, 2012). While some of these audit interests are similar to those performed by external auditors (e.g., internal control audits), DCAA audits tend to be broader in scope, and focus on account balances and cost elements that pertain to the contract in much greater detail (Ahadiat and Ehrenreich, 1996).[9] DCAA audits focus primarily on business systems, management policies and procedures, the accuracy and reasonableness of contractors' forward

[9] For example, the DCAA Contract Audit Manual states: "While these internal and external auditors' final audit objectives are not the same as DCAA's, the information contained in their reports may be useful to DCAA in the course of our audits. The audit team, as part of the risk assessment, should ask contractor management if any internal audits were performed and request a summary listing of the internal audits that would assist in understanding and evaluating the efficacy of the internal controls relevant to the subject matter of the audit (Section 4-202, DCAA)."

pricing and incurred cost representations, the adequacy and reliability of records and accounting systems, and contractor compliance with contractual provisions (e.g., compliance with applicable cost principles and data certification).[10]

Compliance with the FARs is key for government contractors. Any inadequacies in contractors' processes could result in withheld billed receivables and the suspension of payments. If an audit finds any illegal activities, the contractor can be subject to civil and criminal penalties, contract termination, and suspension from doing business with the government (FAR 9.4).[11]

2.2 Empirical predictions

2.2.1 Government contracting and the external reporting environment

I argue that the extensive requirements mandated by the FARs (discussed in Section 2.1) shift the optimal quality of contractors' internal information processes to a higher level. That is, government contractors improve their internal information processes to conform to applicable standards and generate information required by their contracts (e.g., detailed cost allocation by product), because the expected contract revenue justifies the cost of these improvements (i.e., absent the contract, such improvements would not be deemed cost-effective).

Theory predicts that an increase in the quality of the manager's private information will result in improved external reporting through higher quality disclosure (e.g., Corollary 1 of Verrecchia

[10] These audit interests and areas of emphasis are taken directly from the DCAA Manual "Information for Contractors," DCAA (2012, p.8).

[11] Contractors typically disclose the government monitoring procedures they are subject to. The following excerpt is from Boeing's 2014 annual report: "*U.S. government agencies, including the Defense Contract Audit Agency and the Defense Contract Management Agency, routinely audit government contractors. These agencies review our performance under contracts, cost structure and compliance with applicable laws, regulations, and standards, as well as the adequacy of and our compliance with our internal control systems and policies. Any costs found to be misclassified or inaccurately allocated to a specific contract will be deemed non-reimbursable, and to the extent already reimbursed, must be refunded. Any inadequacies in our systems and policies could result in withholds on billed receivables, penalties and reduced future business. Furthermore, if any audit, inquiry or investigation uncovers improper or illegal activities, we could be subject to civil and criminal penalties and administrative sanctions, including termination of contracts, forfeiture of profits, suspension of payments, fines, and suspension or debarment from doing business with the U.S. government. We also could suffer reputational harm if allegations of impropriety were made against us, even if such allegations are later determined to be false.*" (p.10)

(1990)). To the extent that improvements in contractors' internal information are relevant to external reporting, I argue that such improvements will manifest themselves in higher quality external reporting.[12] Prior literature suggests that firms' processes used for internal decision making are closely related to those used for external reporting (e.g., Hemmer and Labro, 2008; Dichev, Graham, Harvey, and Rajgopal, 2013; Shroff, 2017). For example, several studies assume that internal control weaknesses are a reflection of poor internal information systems and find that such weaknesses are negatively related to the quality of external reporting (Doyle, Ge, and McVay, 2007; Ashbaugh-Skaife, Collins, Kinney, and LaFond, 2008; Feng, Li, and McVay, 2009). Other studies examine more specific attributes of internal information processes, such as the implementation of Enterprise Systems or risk-based forecasting and planning, and find that they are related to higher quality external reporting (e.g., Dornates, Li, Peters, and Richardson, 2013; Ittner and Michels, 2017). Consequently, I predict that the extent of government monitoring is positively associated with the quality of the contractors' external reporting environment.

2.2.2 Contractual characteristics and government monitoring

In this section, I develop predictions about how various characteristics of government contracts that influence the extent and focus of government monitoring are related to the contractor's external reporting environment.

2.2.2.1 Contract duration

First, I examine contract duration. Longer contracts represent a greater commitment by government agencies and consume more government resources. I thus expect longer contracts to

[12] Note that "improvements" to internal information processes include increases in the *perceived* quality of these processes through government scrutiny. That is, even if the contractor's internal information processes are of sufficient quality, a government audit of these processes increases their quality as perceived by investors and other stakeholders.

require heightened monitoring, all else equal, and predict a stronger association between contract size and the external reporting environment for longer contracts.

2.2.2.2 Cost or pricing data

In certain circumstances, contractors are required to submit cost or pricing data along with their price proposal, and to certify that the data are accurate, complete, and current through a "Certificate of Current Cost or Pricing Data."[13] This requirement applies to contracts exceeding $700,000. However, when the contract falls below this threshold, the CO can still request cost or pricing data (without a certification) if they are necessary to establish a fair and reasonable price (FAR 15.4). The CO and DCAA then review the data and any necessary supporting schedules and documentation to establish their accuracy. For example, they might review detailed schedules of labor and overhead rates, verify that all schedules tie into the accounting system, evaluate the rationale used in obtaining the cost projections, and verify compliance with relevant cost principles (e.g., GAAP or CAS). Given these extensive monitoring procedures, I expect a stronger association between contract size and external reporting quality when the contractor is required to provide cost or pricing data to the government.

2.2.2.3 Cost Accounting Standards

Certain contractors are required to comply with Cost Accounting Standards (CAS), a set of 19 government-specific accounting rules designed to achieve uniformity and consistency in contractors' cost accounting practices. These standards control how costs are measured, accumulated and allocated to a final cost objective, and are far more detailed than cost accounting guidance provided by GAAP. For example, CAS 401 requires accounting systems to estimate and accumulate costs in the same manner to avoid that a contractor estimates costs using one method (generating

[13] In accordance with the Truth in Negotiations Act of 1962.

low costs), and then allocates costs using a different method (generating high costs). CAS 402 requires consistency in allocating costs incurred for a same purpose to avoid double counting (e.g., to avoid that cost items are allocated directly to a cost objective without eliminating like costs from indirect cost pools allocated to the same cost objective). CAS 403 establishes criteria for the allocation of home office expenses to various segments, CAS 410 establishes criteria for the allocation of business unit general and administrative expenses to final cost objectives, and CAS 418 provides guidance for the consistent determination of direct and indirect costs. In contrast, GAAP does not directly address any of these issues.

Depending on the amount and type of contract award, a contractor could be subject to full CAS coverage (required to follow all 19 standards), or modified CAS coverage (required to follow only a subset of four standards, including standards on consistency, the cost accounting period, and accounting for costs that are unallowable under the FARs). Some contractors are exempt from CAS requirements altogether (e.g., sealed-bid contracts, negotiated contracts under $500,000, etc.). Contractors subject to CAS coverage are required to submit a "Disclosure Statement" to formally document and disclose their cost accounting practices in detail, and are expected to follow the disclosed practices consistently. The CO evaluates whether the disclosure statement adequately describes the contractor's cost accounting practices, whether the practices are compliant with CAS, and whether they are followed consistently. These monitoring procedures scrutinize the contractor's accounting system in great detail. Consequently, I expect a stronger association between contract size and external reporting quality when the contractor is subject to CAS compliance.

2.2.2.4 Cost reimbursement contracts

Contract pricing terms fall into two basic categories: fixed price vs. cost reimbursement (also referred to as "cost plus") contracts.[14] In a fixed price contract, the contractor provides a product or service to the government at a fixed price that is not adjustable to incurred costs, and thus bears the risk associated with any cost overruns. In a cost reimbursement contract, contract revenue is equal to the contractor's incurred cost of production plus a fixed fee or profit margin. A cost reimbursement contract thus provides incentives to manipulate reported costs through cost inflation or cost shifting, which leads the government to monitor such contractors to a greater extent (e.g., Rogerson, 1992; Chen and Gunny, 2014). For example, prior to awarding a cost reimbursement contract, the CO must conclude that the contractor's accounting system is adequate for determining the applicable costs; and after the contract award, government officers perform in-depth audits of incurred cost proposals.[15] As a result, I expect a stronger association between contract size and external reporting quality when the contractor has cost reimbursement contracts.

2.2.2.5 Non-commercial products or services

Commercial items are products of a type customarily used for nongovernment purposes and offered to the general public, or services offered to the government and the general public contemporaneously under similar terms and conditions. Such products and services are subject to the discipline of the marketplace, thus reducing the need for government monitoring to achieve a competitive price and efficient production process. The FARs include a set of simplified and stream-

[14] Contracts range on a spectrum between these two categories, from firm fixed price, fixed price incentive, cost plus incentive to pure cost plus (very few contracts are "pure" cost reimbursement contracts). Incentive-type contracts can provide additional incentive to rein in costs below a certain threshold (e.g., a fixed price incentive contract specifies a target cost that, if achieved, increases the contract price up to a ceiling). Cost plus contracts generally require a greater degree of government monitoring than fixed price contracts, and I group all contracts in these two categories for the purpose of my analyses.

[15] In support of this point, the DCAA's 2014 Report to Congress states that the agency prioritizes audits of contracts considered "high risk," such as *"circumstances where there may be less incentive to control costs such as on cost-type contracts"* (DCAA, 2015, p.7).

lined acquisition procedures for commercial items, including the usage of only fixed price methods, and the reliance on the contractor's existing quality assurance system as a substitute for government inspection and testing (FAR 12). For many of these contracts, the FARs encourage simplified methods of contractor evaluation limited to technical capability, price and past performance. Moreover, such contracts are generally exempt from Cost Accounting Standards (CAS) and from providing cost or pricing data to the contracting officer (FAR 12.2). As a result, I expect a stronger association between government contracts and external reporting quality for contractors that provide *non*-commercial products or services.

3. Sample

My sample begins in October 1999, when data on federal procurement becomes available on the Federal Procurement Data System–Next Generation database (FPDS–NG) (available at www.USAspending.gov), and ends in September 2016 (spanning government fiscal years 2000 – 2016). The database includes all contracts that are awarded by the U.S. government and that exceed an individual transaction value of $3,000.[16] Many firms have multiple contracts that span several years. Consistent with prior research using these data (e.g., Mills, Nutter and Schwab, 2013; Goldman, Rocholl and So, 2013), I use a firm's aggregate contract award amount for each fiscal year. I merge federal contract data from FPDS–NG with the CRSP/Compustat population by the name of the vendor's parent company using a fuzzy matching algorithm. I then manually inspect each match and delete any inaccurate matches. This yields a sample of 79,383 firm-year observations, of which 23,182 are firm–years with government contract awards, representing 3,108 firms.

[16] A "contract" is any number of transactions between the government and the contractor, which includes the initial "contract award", any subsequent "modifications" (e.g., an exercise of an option to modify the contract), or a "purchase order" pertaining to the contract.

Table 1, Panel A, provides details about yearly aggregate government contract awards on the FPDS–NG by year. Between 2000 and 2016, the government awarded on average $421 billion in contracts per year. About 50% of this contract value has an average duration of over a year, roughly 20% is subject to CAS and requires that contractors provide cost or pricing data to government agents, 26% represents cost reimbursement contracts, and 81% of this value represents contracts for non-commercial products or services. Panel B provides details about my sample of government contract awards merged with the CRSP/Compustat population. The sample represents about 40% of the total contract value, and the distribution of contract characteristics is similar to that in Panel A.[17] Panel C details the industry composition of my sample. The dominant industry is manufacturing, representing nearly 50% of all government contractors in my sample, followed by the Business Equipment (25%).

Table 2 presents descriptive statistics for the variables used in my analyses. Consistent with prior studies (e.g., Mills, Nutter and Schwab, 2013), government contractors have an average annual contract value of about 5% of sales, and the distribution of this variable is heavily right–skewed, with a median of 0.1%, and a rapid increase in the top decile, from 5% at the 90th percentile to 77% at the 99th percentile. Contractors' average amount of annual federal dollars obligated is $124 million, with a median of about $628,000.

4. Research design and results

In an effort to triangulate my results, I employ multiple measures of government monitoring and external reporting in my analyses, and use four distinct sets of tests. I first examine the overall relation between the existence and size of government contracts and the firm's external reporting

[17] Note that my data ends with government fiscal year 2016, on September 30, 2016. As such, my sample of firms with fiscal years 2016 is limited to firms with fiscal year end dates between June 30 and September 30, 2016.

quality using a broad sample of firms, both with and without government contracts. I then narrow my focus to firms that first start contracting with the government. In contrast to well-established contractors with a history of government audits, contract starters likely experience the strongest effects from government monitoring. Using a difference-in-differences design, I estimate the reporting quality for contract starters relative to an otherwise similar control group of non-contractors.

A potential concern with these tests is that a contract award may affect the firm's external reporting through channels other than monitoring (e.g., increased future earnings persistence, leading to higher quality external reporting). To reduce these concerns, I use two additional tests that focus more specifically on variation in the monitoring of contractors' internal information processes. First, I examine how, within my sample of government contractors, the association between the size of government contract awards and the external reporting environment varies with contractual characteristics that directly influence the focus and extent of the government's monitoring procedures, but would not otherwise be expected to manifest in higher quality external reporting. Second, I use the establishment of the Cost Accounting Standards Board (CASB) in 1970 as an exogenous shock to defense contractor monitoring. Using a difference-in-differences design, I estimate the change in reporting quality for the largest defense contractors after they became subject to CASB monitoring, relative to other firms in the same industries.

4.1 Government contract awards and external reporting quality

4.1.1 Research design

I begin by examining the association between government contract awards and the firm's external reporting quality, controlling for known determinants of these two constructs. I use two distinct measures of government contract awards. First, I use *ContractSize*, a continuous measure of

contract award size relative to the firm's sales (e.g., Mills, Nutter and Schwab, 2013). Government monitoring may vary with contract size for two reasons. First, the extent of monitoring tends to be related to the dollar amount obligated by the government. Second, the extent of the contractor's compliance with government-imposed changes to its internal information processes—and any resulting spillover effects on the firm as a whole—may vary with the importance of the contract from the contractor's perspective. Because *ContractSize* is heavily right-skewed (see Table 1), I transform the variable into decile ranks scaled to range from 0 to 1. This transformation has the advantage of being robust to both outliers and nonlinearities, and eases the interpretation of the results (i.e., the estimated regression coefficient measures the change in the respective measure of external reporting when moving from the bottom decile to the top decile of contract size, ceteris paribus).[18] Second, I use *Contract*, a binary indicator variable equal to one if the firm received a contract award in year *t*. Using an indicator variable allows me to assess whether having a government contract *itself* has implications for the firm's external reporting environment, regardless of contract size.

I use three distinct types of measures of the quality of the firm's external reporting environment. First, I use three measures of voluntary disclosure: the existence of management forecasts (*VolDisc*), the number of forecasts issued over the fiscal year (*VolDisc_Freq*), and the number of different forecast items provided (*VolDisc_Nitems*). Consistent with disclosure theory, I expect managers with higher quality internal information to increase voluntary disclosure (e.g., increase the frequency and/or scope of their forecasts) (e.g., Verrecchia, 1990). I argue that improvements in firms' internal information processes resulting from government contracts likely manifest in improved projections of revenues, costs and other items, such as capital expenditures.

[18] My inferences are unaffected when using the untransformed measure, or when using ranked measures of all the independent variables.

For example, cost plus contracts require contracting officers and/or government auditors to review cost projections (as well as their underlying estimation systems), and verify compliance with consistent cost principles. In addition, the government often reviews supporting cost or pricing data (e.g., detailed schedules of labor and overhead rates). Contractors are thus more likely to produce management forecasts, and those forecasts are likely to include a greater number of different items (e.g., EPS as well as sales, costs, or capital expenditures).

Second, I use the speed of a firm's earnings release, measured as the number of days between the earnings announcement and the fiscal year end, divided by 365 and multiplied by -1 (*Speed*). Gallemore and Labro (2012) argue that the speed of the earnings release reflects the ability of a firm to quickly and efficiently integrate information from various parts, and discuss how firms that receive professional advice on how to improve their information acquisition processes typically increase the speed at which they close their books. Many consulting firms offer government contract advisory services that help contractors implement DCAA compliant accounting and ERP systems to generate the information required by government agencies. If government contracts result in improved internal information systems, I would thus also expect improvements in the firm's speed in releasing earnings announcements.

Finally, I use a measure of firm illiquidity. Market-based measures of illiquidity encompass all sources of public information, and represent an ex-post proxy for the firm's overall quality of public information (e.g., Balakrishnan, Core, and Verdi, 2014). I measure illiquidity using the proportion of zero return trading days in a given fiscal year (*Illiquidity*) (e.g., Bekaert, Harvey, and Lundblad, 2007; Lang, Lins, and Maffett, 2012). Days without price movements typically reflect infrequent trading—a manifestation of greater illiquidity. Using this measure is advantageous in my analyses because stock prices are available in every time period, including the establishment of the

CASB in 1970.[19] I examine the relation between government contracting and the quality of the firm's external reporting by estimating regressions of the form:

$$Reporting_{t+1} = \alpha_0 + \alpha_1 GovContracting_t + \theta_n Controls_t + \varepsilon_t, \quad (1)$$

where *GovContracting* is one of two measures of government contracting defined above, and *Controls* is a vector of the following control variables. *Size* is the natural logarithm of market value of equity as of the fiscal year-end. *Leverage* is long-term debt plus short-term debt scaled by total assets. *MTB* is the market value of equity divided by book value of common equity. *SalesGrowth* is the growth in firm sales relative to the prior year. *ROA* is return on assets, measured as income before extraordinary items scaled by total assets. *Loss* is a binary indicator variable equal to one if income before extraordinary items is negative. *Returns* is the buy and hold return over the fiscal year. *σReturns* is the standard deviation of monthly returns over the fiscal year. *SpecialItems* is special items scaled by total assets. *BigN* is a binary indicator variable equal to one if the firm has a Big N auditor. *Reporting* is one of five measures of the firm's external reporting quality defined above. Note that I measure *Reporting* in the year subsequent to the contract award (*t+1*), which is the latest point at which I expect the firm's reporting environment to adjust as a result of the award.[20] See Appendix A for variable definitions.

I also include year and industry fixed effects in all my specifications. Year fixed effects help control for common shocks that might impact both contract awards and firms' external reporting environment (e.g., defense spending). In addition, the results from a pooled regression design could be attributable to industry effects. For example, government contractors may generally have a higher

[19] My primary analyses are robust to using the average bid-ask spread as an additional measure of illiquidity.
[20] Note that it is not clear precisely when the firm might begin to adjust its external reporting relative to the contract award. Firms might begin adjusting their external reporting in anticipation of the government's evaluation procedures (e.g., during—or perhaps several years before—the negotiation process), at the time they are awarded the contract, or thereafter.

quality reporting environment because of industry practices, which could be unrelated to government monitoring. Throughout all my analyses, I cluster standard errors by firm and fiscal year end date, and winsorize all continuous variables at the top and bottom percentile.

Table 2 presents descriptive statistics for my variables. About 47% of firm-years in my sample provide a management forecast on average, and average forecast frequency is about 4.8, with about one type of forecast item (typically EPS). The average *Speed* of a firm's earnings announcement release is about -14, which represents about 51 days after year end. The average proportion of zero return trading days (*Illiquidity*) is 4%, about 10 trading days.

Descriptive statistics for the control variables show that my sample firms have a mean (median) return–on–assets of –0.04 (0.017), a mean (median) leverage ratio of 0.22 (0.17), a mean (median) market–to–book ratio of 5.4 (3.6), and mean (median) special items of –0.02 (0.00). Approximately 31% of firm-years in my sample report a loss, and the average (median) annual buy and hold return is about 11.5% (5.1%) over the fiscal year.

4.1.2 Results

Table 3 presents results from estimating equation (1). I measure government contracting using *ContractSize* in Panel A. Across all measures of external reporting, I find strong evidence that firms with larger contract awards have a higher quality external reporting environment. The results suggest that firms in the top decile of *ContractSize* are about 11% more likely to provide a management forecast, and tend to provide 2 more forecasts and 0.4 more different forecast items relative to firms without government contracts. These firms also release their earnings announcement about 0.007 (or 2.5 days) more quickly, and have 0.3% (or nearly one) fewer zero return days. In Panel B, I measure government contracting using the binary indicator *Contract*, and find evidence that firms with government contracts also generally have higher quality external

reporting, regardless of contract size. The only exception is *Illiquidity*, which is not significantly different from zero in column (5) of Panel B.[21]

4.2 Cross-sectional variation in contractual characteristics

4.2.1 Research design

In this section, I describe the research design used to test whether the relation between government contract size and external reporting varies with characteristics of government contracts that influence the scope and focus of government monitoring. First, I examine *ContractDuration*, measured as the average annual length of all contracts signed during the fiscal year, weighted by contract dollar amount, where annual length is the contract completion date minus signed date, divided by 365. Next, I examine four distinct contract terms that are directly related to the intensity of government monitoring: (1) *CPData*, a binary indicator variable equal to one if the firm has to provide cost or pricing data to the government in year *t*, (2) *CAS*, a binary indicator variable equal to one if the firm is subject to CAS in year *t*, (3) *CostPlus*, a binary indicator variable for whether the firm has a cost reimbursement contract in year *t*, and (4) *NonComm*, a binary indicator variable equal to one if the firm provides non-commercial goods and services in year *t*. I also construct a monitoring index that combines all four of these contract terms using principal component analysis. Specifically, *MonitoringIndex* is the first principal component of *CPData*, *CAS*, *CostPlus* and *NonComm*.

Appendix B presents the results from my principal component analysis in Panel A, and the correlations among the four contract terms and the index in Panel B. The analysis shows that only a single factor has an eigenvalue greater than one, that this factor explains 54% of the variation in

[21] However, untabulated results show a strongly negative association when using the average bid-ask spread over the year as an alternative measure of illiquidity, suggesting that firms with government contract awards also tend to have lower liquidity.

these measures. In addition, all contract terms are fairly highly correlated with each other and with *MonitoringIndex*. This provides confidence that these factors capture a common underlying economic construct.

I conduct the following tests within my sample of firm-years with government contract awards. First, I estimate the model in equation (1), except that I interact my measure of *ContractValue*, in turn, with *ContractDuration*, *MonitoringIndex*, and each of the four index components (*CPData*, *CAS*, *CostPlus*, *NonComm*). I also add *ContractDuration* as an additional control variable in all specifications. Including this variable helps control for the length of time over which investors might expend heightened uncertainty, and potential mechanical effects of the contract on earnings persistence. If the relation between contracting with the government and external reporting quality is increasing in contract characteristics requiring greater government monitoring, I expect positive coefficients on all interaction terms in specifications using *VolDisc*, *VolDisc_Freq*, *VolDisc_Nitems* and *Speed* as the dependent variable, and negative coefficients on all interaction terms in specifications using *Illiquidity* as the dependent variable.

4.2.2 Results

Table 4 presents results from estimating cross-sectional cuts on *ContractDuration*. I restrict my sample to firm-years with government contracts, and mirror the specifications in Table 3, except that I interact my measure of *ContractSize*, with *ContractDuration*. Across all measures of external reporting, I find strong evidence that the association between contract size and external reporting quality is increasing in contract duration. This result is consistent with contractors with longer commitments to the government as a customer producing higher quality external reporting.

Table 5 presents results from estimating cross-sectional cuts on contract terms association with more intense government monitoring. Specifically, Panel A mirrors the specification in Table

4, except that I interact *ContractSize* with *MonitoringIndex*, and include *ContractDuration* as an additional control variable. The results show that, across all measures of external reporting quality, the association between contract size and external reporting quality is strongly increasing in the index of government monitoring measures.

Panels B through E estimate the same specification as in Panel A, except that I interact *ContractSize* with, in turn, *CPData*, *CAS*, *CostPlus*, and *NonComm*. These tests are helpful in assessing whether my results in Panel A are driven by any specific component of my monitoring index. Overall, I find that each individual contract characteristic associated with greater government monitoring strengthens the association between contract size and different measures of external reporting. This suggests that these contract terms capture various aspects of firms' internal information processes, which relate to external reporting quality in different ways. Collectively, the results from my cross-sectional analyses suggest that the association between the size of a government contract and a firm's external reporting quality is increasing in the intensity of government monitoring of the firm's internal information processes.

4.3 Difference-in-differences analysis using contract starters

4.3.1 Research design

I now narrow my focus to firms that first begin contracting with the government, and examine changes in their external reporting environment relative to a propensity-score matched sample of otherwise similar firms that do not contract with the government. The primary advantage of this research design is that firms that first begin their contracting relationship with the government ("treatment" firms) are likely to experience the strongest effects from government monitoring. Relative to a research design that pools all government contractors, this setting allows me to examine how the external reporting quality of these firms changes over time. Second, this design allows me

to construct a sample of "control" firms that closely match the treatment firms on a set of covariates (i.e., determinants of the reporting environment that might also drive government contracting). To the extent that the treatment and control firms are similar in all relevant respects except for their contracting type, any difference in their reporting environment can be attributed to the government contract.

I identify the treatment firms as those that first begin contracting with the government in my sample of government contractors. As my sample begins in 2000 (when the government contracting data becomes available) and many firms have been awarded government contracts prior to that year, I require that a firm have at least two years without any federal dollars obligated prior to assigning it to the treatment sample. To ensure that that contract represents a sufficiently material amount to warrant detectable changes in the firm's information environment, I further restrict the sample to firms with a cumulative *ContractSize* greater or equal to 0.5% of sales over the time-series available in my sample.[22] I use propensity score matching to form one-to-one matched-pairs by estimating a propensity score in the year prior to the treatment firm's initial contract award as a function of the relevant set of control variables.[23] I then match each treatment firm to a corresponding control firm, with replacement, on the propensity score, fiscal year and industry. Tests for covariate balance between the two groups appear in Appendix B. I estimate the following regression:

$$Reporting_{t+1} = \alpha_0 + \alpha_1 Treated + \alpha_2 Post_t + \alpha_3 Treated \times Post_t + \theta_n Controls_t + \varepsilon_t, \quad (2)$$

[22] I match government contractors to CRSP/Compustat by the contractors' parent name. Thus, many firms in my sample have subsidiaries that contract with the government, but the contract represents a negligible percentage of the parent firms' sales (see the highly right-skewed distribution in Table 2). Restricting the sample of contract starters to those with non-negligible contract amounts increases confidence that the sample captures first-time contractors that adjust their information processes to accommodate the government's needs, and that those changes will be detected in external reporting. My sample is reduced, but my inferences are unaffected when I use 1% of sales as an alternative cutoff point. Inferences from my analyses in Sections 4.1 and 4.2 are also unaffected when using this reduced sample of contractors.

[23] I estimate the propensity score using the control variables in equation (1).

where *Reporting* is one of five measures of external reporting, *Treated* is a binary indicator variable equal to one for treatment firms, and zero for control firms, *Post* is a binary indicator variable equal to one for fiscal years starting with the first year of the contract award, and *Controls* is the vector of control variables used in equation (1).

In addition to control variables, I include various levels of fixed effects in my regressions. First, I include year fixed effects to help control for common time trends in external reporting that might coincide with the timing of the firm's contract award. Second, I include industry fixed effects to reduce concerns that my results could be attributable to industry-specific practices, rather than government monitoring. Finally, I also include firm fixed effects. Although this specification significantly reduces the variation in my estimations, it helps mitigate concerns that government contractors may generally have a higher quality reporting environment for reasons unrelated to government monitoring that are not industry-specific (e.g., firm or manager type).[24] The resulting regressions measure *within-firm* difference-in-differences in contractors' external reporting quality after they begin their contract with the government. Note that in this specification firm fixed effects absorb the main effect on *Treated*.

I estimate equation (2) over a period of four years prior to and four years after the contract award, for a total of nine years. It is unclear precisely when firms begin changing their reporting environment relative to their initial contract award. For example, firms might begin adjusting their reporting environment in anticipation of the government's evaluation procedures (e.g., during—or perhaps even several years before the negotiation process), at the time they are awarded the contract, or thereafter (e.g., when they become subject to incurred cost audits). Examining a relatively long

[24] The adjusted R^2 from a regression of my measures of external reporting on year and firm fixed effects is 66% for *VolDisc*, 69% for *VolDisc_Freq*, 64% for *VolDisc_Nitems*, 77% for Speed, and 62% for *Illiquidity*.

pre- and post-period around the firm's initial contract start date increases the likelihood of capturing any effect on external reporting.

4.2.2 Results

Table 6 presents results from estimating my difference-in-differences model in equation (2). Columns (1), (3), (5), (7) and (9) present results from specifications including year and industry fixed effects. When using *VolDisc_Freq*, *VolDisc_Nitems* and *Speed* to measure external reporting quality, the difference-in-differences coefficient is positive and significant, and when using *Illiquidity* as the dependent variable, the coefficient is negative and significant. This suggests that, within a given industry, contract initiators have a higher quality external reporting environment after they begin contracting with the government, relative to a sample of otherwise similar firms. Columns (2), (4), (6), (8) and (10) present results from specifications including year and firm fixed effects. In these specifications, the difference-in-differences coefficient has the predicted sign and is significant when using *VolDisc_Freq*, *VolDisc_Nitems* and *Illiquidity* as the dependent variable.[25] Neither of the difference-in-differences estimations using *VolDisc* as the dependent variable are significantly different from zero, suggesting that the decision to provide management forecasts is fairly persistent and does not vary with contract initiation in this sample.

4.4 Establishment of the Cost Accounting Standards Board

4.4.1 Research design

In this section, I examine changes in the quality of external reporting for the largest military contractors after the establishment of the CASB in 1970. In the late 1960s, Congressional hearings raised concerns over firms making excessive profits on defense contracts through cost manipulation.

[25] Note that the difference-in-differences is no longer significantly different from zero when including firm fixed effects in the regression using *Speed* as the measure of external reporting, where the remaining variation is smallest after the inclusion of firm fixed effects (see footnote 33).

Prior to the establishment of the CASB, the Armed Services Procurement Act relied on GAAP to evaluate contractors' cost accounting practices, which arguably offered contractors enough discretion to select methods to overstate costs for reimbursement. Consistent with this conjecture, the industry was opposed to the imposition of uniform cost accounting standards, and Pownall (1986) shows that defense contractors incurred a net decline in shareholder wealth over the two-year period of Congressional hearings preceding the establishment of the CASB. In 1970, Congress passed a statute establishing the CASB for the purpose of promulgating a set of uniform cost accounting standards for defense contractors, and requiring defense contractors to detail their cost accounting standards in a Disclosure Statement.[26] This regulation marked a significant increase in government monitoring of defense contractors' internal information processes, and thus arguably represents an exogenous shock to my variable of interest. The advantage of this analysis is that it exploits variation in the monitoring of well-established government contractors, making it less likely that my results are driven by the potentially confounding effects of contract awards.

To identify firms affected by this regulation, I refer to the list of top 100 contractors published by the Department of Defense in 1970. 72 of these firms have the required CRSP/Compustat data for my analysis, and represent my group of treatment firms. I use any remaining firms in the CRSP/Compustat population that belong to the same industries as the treatment firms as my control group (2,832 firms).[27] Given the limitations in data availability during the time period used in this analysis (i.e., the data on voluntary disclosure and earnings announcement dates are not readily available for this time period), I use *Illiquidity* as the measure of external reporting quality in these tests. I estimate the following difference-in-differences design:

[26] Public Law 91-379, an amendment to the Defense Production Act of 1950.

[27] The data on which of these firms are also government contractors are not readily available, so there are certainly other government contractors in my control group. However, this likely works against the likelihood of finding my predicted results.

$$Illiquidity_{t+1} = \beta_0 + \beta_1 TopMilitary + \beta_2 Post + \beta_3 TopMilitary \times Post + \theta_n Controls_t + \varepsilon_t, \quad (3)$$

TopMilitary is a binary indicator variable equal to one for treatment firms, and zero for control firms. *Post* is a binary indicator variable equal to one for fiscal years equal to or greater than 1970. *Controls* is a vector of control variables as defined in equation (1). Consistent with my analysis in Table 6, I include year fixed effects, and industry or firm fixed effects in the model. I estimate equation (3) over fiscal years 1966-1974. The coefficient of interest is β_3, which measures the difference-in-differences in the quality of external reporting for treatment firms after the establishment of the CASB, relative to the control firms.

Next, I examine the difference in *Illiquidity* between the treatment and control firms in each year surrounding the event. A potential concern with the results in Panel A is that the difference in external reporting pertains to a single period, rather than being a permanent effect resulting from the establishment of the CASB. Observing differences by year can help alleviate this concern, and illustrate how external reporting trends prior to and after the event period evolve over time. I estimate the same model as in equation (3), except that I interact *TopMilitary*, in turn, with each of the years in my event window in the same model. I omit 1969 in order to use the year prior to the CASB establishment as my benchmark.

4.4.2 Results

My results appear in Table 7. Panel A presents results from estimating equation (3). Column (1) presents results after including year and industry fixed effects in the model, and column (2) presents results after including year and firm fixed effects. Both columns show a negative and significant difference-in-differences coefficient, suggesting that top defense contractors experienced a significant increase in external reporting quality after the establishment of CASB, relative to other firms in the

same industry. Specifically, column (2) indicates that, within a given firm, the proportion of zero-return trading days declined by about 2% (or about 5 days) after the establishment of CASB.

In Panel B, I examine differences in *Illiquidity* between treatment and control firms in each year surrounding the event, relative to 1969 (the benchmark). I also illustrate these results in Figure 1. The results are consistent with top defense contractors having significantly higher levels of *Illiquidity* relative to the control firms in the years leading up to the establishment of the CASB. In 1970, and through 1972, the difference in illiquidity between treatment and control firms drops to zero, and treatment firms subsequently become more liquid relative to control firms in 1973 and 1974. Overall, these results suggest that top defense contractors had a lower quality external reporting environment in the period leading up to the CASB establishment, and subsequently caught up with—and eventually surpassed—the external reporting quality of the control group.

5. Potential alternative explanations

Government contracting could affect firms' external reporting environment through several ways other than monitoring. The purpose of this section is to discuss these alternative explanations, and how my collective tests attempt to address them.

First, the award of a government contract represents not only a stream of future revenues throughout the duration of the contract, but also a greater potential for receiving future contracts (e.g., Goldman, Rocholl, and So, 2013). Simply put, a contract award is arguably good news to the contractor, and firms with good news tend to provide more voluntary disclosure than firms with bad news (e.g., Verrecchia, 1983).[28]

[28] There is, however, also some evidence of adverse effects of having a government customer on firm fundamentals. Cohen and Malloy (2016) find that firms that depend on the government for over 10% of their sales spend less on investments in physical and intellectual capital, and have significantly lower sales growth than their industry peers. They conclude that government-dependence may have adverse effects on firms' incentives to compete and innovate.

Second, a government contract may also reflect changes in the firm's business environment and lead to increased uncertainty among investors and other stakeholders, where an increase in investor uncertainty leads to greater voluntary disclosure (e.g., Verrecchia, 1990). For example, a new contract award might lead the firm to initiate capital investments in preparation to execute the contract, which can prompt management to provide information to keep investors updated about such activities and their implications for future performance.

Third, government contract awards may represent a more *persistent* stream of future earnings. For example, Cohen and Li (2016) show that firms with government contracts have less volatile future earnings. The effect of an increase in earnings persistence on voluntary disclosure is theoretically ambiguous. Increased future earnings persistence can either result in *reduced* voluntary disclosure, because investors' uncertainty about earnings is less, or *increased* voluntary disclosure, because managers are better able to forecast earnings (e.g., Verrecchia, 1990). My paper includes several tests that attempt to address these alternative explanations.

Results from my cross-sectional tests should help reduce such concerns for two reasons. First, my cross-sectional tests are conducted *within the sample of government contractors*, and also include contract duration as an additional control variable. If the second and third alternative explanations are present in the data, including contract duration in my regression specifications helps control for the length of time over which investors might expend heightened uncertainty, and any mechanical effect of the contract on earnings persistence. Second, my cross-sectional tests show that the relation between government contract size and the quality of the firms' external reporting depends on characteristics of the contract that are directly associated with the scope and focus of government monitoring of the contractor's internal information processes. Thus, to explain my results, an omitted variable would have to be correlated not only with: (i) contract size, (ii) each of

my five measures of external reporting quality, but also (iii) the contract characteristics. For example, the notion that increases in voluntary disclosure are solely due to the effect of the contract on investors' demand for information would not explain why the increase in voluntary disclosure varies with whether the contract requires the application of CAS.

Additionally, the results from my quasi-natural experiment using the establishment of the CASB should also help address such concerns. This setting examines variation in external reporting quality within a sample of well-established government contractors (i.e., the top defense contractors) around a regulatory change aimed at enhancing the monitoring of their internal information processes. This regulatory change is unlikely to coincide with other events unrelated to government monitoring that might affect the contractors' external reporting environment or with firm-specific characteristics (e.g., variation in investor uncertainty or earnings persistence).

Finally, using multiple measures of external reporting quality in my tests helps mitigate concerns related to these alternative explanations. For example, increased investor uncertainty can explain why voluntary disclosure increases, but not why illiquidity decreases. In equilibrium, increased investor uncertainty leads to an increase in illiquidity which managers would then partially or fully mitigate with additional voluntary disclosure or other information (e.g., Guay, Samuels, and Taylor, 2016). Thus, while greater demand for information stemming from increased uncertainty potentially explains the increase in voluntary disclosure, it does not explain a *net decrease* in illiquidity.

6. Conclusion

In this paper, I examine the association between customer monitoring and the firm's external reporting environment using U.S. government contracts. Federal Acquisition Regulations impose a

formalized set of procedures to monitor contractors' financial attributes and internal information processes. I argue that such procedures help improve contractors' internal information, and that these improvements manifest themselves in higher quality external reporting.

In an effort to triangulate my results, I test my prediction using various research designs, and employing multiple measures of government monitoring and external reporting. I find that both the size and existence of government contracts are positively associated with the quality of firms' voluntary disclosure, the speed of firm's earnings release, and liquidity. I also find higher levels in the quality of external reporting for firms that start contracting with the government for the first time, relative to an otherwise similar control group.

I also focus on specific monitoring mechanisms and examine contract characteristics directly related to the extent and focus of government monitoring: contract duration, contracts requiring the provision of cost or pricing data to the government, contracts requiring compliance with Cost Accounting Standards (CAS), cost-reimbursement contracts, and contracts for non-commercial items. I find that the association between the size of government contract awards and the quality of firms' external reporting environment is increasing in each of these characteristics. I further examine the effect of one of these mechanisms, compliance with CAS, on the quality of external reporting by using the establishment of the Cost Accounting Standards Board in 1970 as a quasi-natural experiment. I find that the external reporting environment improved significantly for top military contractors subject to CASB-related monitoring relative to other firms in the same industires.

Collectively, my results suggest that customers play a role in shaping the firm's external reporting environment. In contrast to existing studies focusing on the influence of customers' demand for financial information (e.g., Bowen, Ducharme, and Shores, 1995; Raman and Shahrur,

2008; Hui, Klasa, and Yeung, 2012), my study shows that the direct monitoring of internal information processes can have spillover effects on suppliers' external reporting.

Although my study focuses on government contracts, many of the monitoring practices used by the government are similar to those used in other settings. For example, prior to selecting a supplier, customers tend to evaluate their product quality, price, operating performance and financial stability. It is also common for customers to keep current on the supplier's performance and compliance with their requirements through periodic supplier audits. Often customers rely on standard industry certifications (e.g., ISO 9000) to facilitate this monitoring process (e.g., Joyce, 2006). In addition, certain industries use specific contracts requiring supplier cost audits (e.g., contracts with target cost incentive fees in the construction industry), or revenue audits (e.g., license agreements in the entertainment industry). To the extent that these monitoring procedures influence suppliers' internal information processes, I expect my results to generalize beyond government contracting.

References

Ahadiat, N. and Ehrenreich, K., 1996. Regulatory audit functions and auditor-contractor relationships. Managerial Auditing Journal, 11 (6): 4-10.

Anderson, S. and Dekker, H., 2009. Strategic cost management in supply chains, Part 2: Executional cost management. Accounting Horizons, 23 (3): 289-305.

Ashbaugh-Skaife, H., Collins, D., Kinney, W., and LaFond, R., 2008. The effect of SOX internal control deficiencies and their remediation on accrual quality. The Accounting Review, 83 (1): 217-250.

Balakrishnan, K., Core, J., Verdi, R., 2014. The relation between reporting quality and financing and investment: Evidence from changes in financing capacity. Journal of Accounting Research 52, 1–36.

Bekaert, G., Harvey, C. and Lundblad, C., 2007. Liquidity and expected returns: Lessons from emerging markets. The Review of Financial Studies, 20(6), p.1783-1831.

Bowen, R., DuCharme, L., and Shores D., 1995. Stakeholders' implicit claims and accounting method choice. Journal of Accounting and Economics 20 (3): 255–295.

Caglio, A. and Ditillo, A., 2008. A review and discussion of management control in inter-firm relationships: Achievements and future directions. Accounting, Organizations and Society, 33 (7): 865-898.

Chen, H., and Gunny, K., 2014. Profitability and cost shifting in government procurement contracts. Working paper.

Christensen, D., 1998. The costs and benefits of the earned value management process. Journal of Parametrics, 18 (2): 1-16.

Cohen, D., and Li, 2016. Why do firms hold less cash? A customer base explanation. Working paper.

Cohen, L. and Malloy, C., 2016. Mini West Virginias: Corporations as government dependents. Working Paper.

Costello, A., 2013. Mitigating incentive conflicts in inter–firm relationships: Evidence from long–term supply contracts. Journal of Accounting and Economics, 56 (1): 19–39.

DCAA Manual: Information for contractors, 2012. DCAA.

DCAA Report to Congress on FY 2014 Activities, 2015. DCAA.

Dichev, I., Graham, J., Harvey, C., and Rajgopal, S., 2013. Earnings quality: Evidence from the field. Journal of Accounting and Economics, 56 (2): 1-33.

Dorantes, C., Li, C., Peters, G., and Richardson, V., 2013. The effect of enterprise systems implementation on the firm information environment. Contemporary Accounting Research, 30 (4): 1427-1461.

Doyle, J., Ge, W. and McVay, S., 2007. Accruals quality and internal control over financial reporting. The Accounting Review, 82 (5): 1141-1170.

Feldman, S. and Keyes N., 2011. Government Contracts in a Nutshell, 5th Edition. St. Paul: West Publishing Co.

Feng, M., Li, C. and McVay, S., 2009. Internal control and management guidance. Journal of Accounting and Economics, 48 (2): 190-209.

Francis, D., 2013. Pentagon's failure to audit contracts wastes billions. The Fiscal Times, May 21, 2013.

Gallemore, J. and Labro, E., 2015. The importance of the internal information environment for tax avoidance. Journal of Accounting and Economics, 60(1), p.149-167.

Goldman, E., Rocholl, J., and So, J., 2013. Politically connected boards of directors and the allocation of procurement contracts. Review of Finance 39.

Guay, W., Samuels, D. and Taylor, D., 2016. Guiding through the fog: Financial statement complexity and voluntary disclosure. Journal of Accounting and Economics, 62(2-3), p.234-269.

Hemmer, T. and Labro, E., 2008. On the optimal relation between the properties of managerial and financial reporting systems. Journal of Accounting Research, 46 (5): 1209-1240.

Hui, K., Klasa, S., and Yeung E., 2012. Corporate suppliers and customers and accounting conservatism. Journal of Accounting and Economics 53 (1): 115–135.

Ittner, C., Larcker, D., Nagar, V. and Rajan, M., 1999. Supplier selection, monitoring practices, and firm performance. Journal of Accounting and Public Policy, 18 (3): 253-281.

Ittner, C. and Michels, J., 2017. Risk-based forecasting and planning and management earnings forecasts. Review of Accounting Studies, 22(3), p.1005-1047.

Joyce, W., 2006. Accounting, purchasing and supply chain management. Supply Chain Management: An International Journal, 11 (3): 202-207.

Kaplan, R. and Atkinson, A., 2015. Advanced management accounting. PHI Learning.

Lang, M., Lins, K. and Maffett, M., 2012. Transparency, liquidity, and valuation: International evidence on when transparency matters most. Journal of Accounting Research, 50(3), p.729-774.

Mills, L., Nutter, S., and Schwab, C., 2013. Do federal contractors suffer tax–related political costs? The Accounting Review, 88 (3): 977–1005.

Pownall, G., 1986. An empirical analysis of the regulation of the defense contracting industry: The Cost Accounting Standards Board. Journal of Accounting Research, 291-315.

Raman, K. and Shahrur H., 2008. Relationship–specific investments and earnings management: Evidence on corporate suppliers and customers. The Accounting Review 83 (4): 1041–1081.

Rogerson, W., 1992. Contractual solutions to the hold-up problem. The Review of Economic Studies, 59 (4): 777-793.

Shroff, N., 2017. Corporate investment and changes in GAAP. Review of Accounting Studies, 22(1), p.1-63.

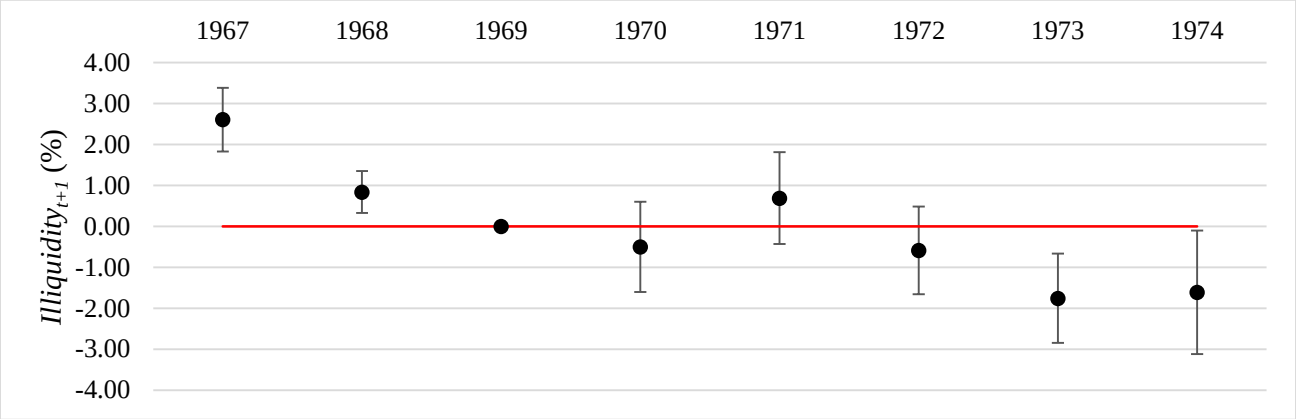
Shroff, N., Sun, A., White, H., and Zhang, W., 2013. Voluntary disclosure and information asymmetry: Evidence from the 2005 securities offering reform. Journal of Accounting Research, 51 (5): 1299-1345.

Verrecchia, R., 1983. Discretionary disclosure. Journal of Accounting and Economics, 5: 179-194.

Verrecchia, R., 1990. Information quality and discretionary disclosure. Journal of Accounting and Economics, 12 (4): 365-380.

Figure 1. Trend in the external information environment around the establishment of the Cost Accounting Standards Board

This figure plots the coefficients presented in Table 7, Panel B, and their 90% confidence intervals. The coefficients represent the difference in *Illiquidity* between top defense contractors subject to the CASB, established in 1970, and other firms in the same industries.



Appendix A. Variable definitions

Measures of government contract awards

DollarsObligated	Total federal dollars obligated to a firm ("dollars obligated" from the Federal Procurement Data System available at USAspending.gov) over the fiscal year.
ContractSize	*DollarsObligated* scaled by sales at fiscal year–end.
Contract	Binary indicator variable equal to one if *DollarsObligated* is non-missing.

Measures of the reporting environment

VolDisc	Binary indicator variable equal to one if the firm issued a management forecast over the fiscal year.
VolDisc_Freq	Number of management forecasts issued over the fiscal year.
VolDisc_Nitems	Number of different management forecast items issued over the fiscal year.
Speed	Number of days between the earnings announcement date and the end of the fiscal year, divided by 365 and multiplied by negative one.
Illiquidity	Proportion of zero-return trading days over the fiscal year.

Control variables

Size	Natural logarithm of market value of equity.
Leverage	Long term debt plus short term debt, scaled by total assets.
MTB	Market value of equity divided by book value of equity.
SalesGrowth	End of fiscal year sales minus beginning of fiscal year sales, divided by beginning of fiscal year sales.
ROA	Return on assets, measured as income before extraordinary items scaled by total assets.
Loss	Binary indicator variable equal to one if income before extraordinary items is negative, and zero otherwise.
Returns	Buy and hold return over the fiscal year.
σReturns	Standard deviation of monthly returns over the fiscal year.
SpecialItems	Special items scaled by total assets.
BigN	Binary indicator variable equal to one if the firm is audited by a Big N auditor over the fiscal year.

Variables used in cross-sectional tests

ContractDuration	Average annual length of all contracts signed during the fiscal year, weighted by contract dollar amount, where annual length is the contract completion date minus signed date, divided by 365.
CPData	Binary indicator variable equal to one if the firm is required to provide cost or pricing data to the government.
CAS	Binary indicator variable equal to one if the firm is subject to Cost Accounting Standards, pursuant to FAR 30.
CostPlus	Binary indicator variable equal to one if the firm has "cost reimbursement" contracts as defined by FAR 16.3.
NonComm	Binary indicator variable equal to one if the firm provides goods or services that are not subject to commercial item acquisition procedures, pursuant to FAR 12.

Table 1. U.S. government contract awards

This table presents descriptive statistics for U.S. government contract awards for government fiscal years 2000 through 2016 (i.e., October 1, 1999 – September 30, 2016). The table presents the total value of contract awards by year (in billions of dollars), the total number of contracts, the share of value awarded subject to the requirement to provide cost or pricing data (*CPData*), the share of value awarded subject to Cost Accounting Standards (*CAS*), the share of value awarded subject to cost reimbursement pricing (*CostPlus*), the share of value awarded not subject to commercial items acquisition procedures (*NonComm*) and the share of value by contract duration (*ContractDuration*). Panel A presents descriptive statistics by government fiscal year for the entire sample of U.S. government contracts downloaded from USAspending.gov. Panel B presents descriptive statistics by firm fiscal year for the sample of *CRSP/Compustat* contracts used in the analysis. Panel C presents the distribution of the sample of *CRSP/Compustat* contracts used in the analysis by industry, using the Fama-French 12 industry classification.

Panel A. U.S. government contract awards

Government Fiscal Year	Contract value ($ billions)	Number of contracts	*CPData* (% of value)	*CAS* (% of value)	*CostPlus* (% of value)	*NonComm* (% of value)	*Contract Duration* > 1 year (% of value)
2000	206	594,574	0.22	0.02	0.24	0.86	0.51
2001	223	641,969	0.20	0.09	0.25	0.83	0.52
2002	264	830,361	0.20	0.10	0.22	0.81	0.51
2003	325	1,183,238	0.20	0.15	0.23	0.82	0.50
2004	339	1,997,099	0.23	0.18	0.23	0.84	0.50
2005	390	2,918,378	0.13	0.13	0.24	0.90	0.45
2006	430	3,792,822	0.09	0.15	0.25	0.87	0.47
2007	469	4,107,291	0.16	0.19	0.27	0.82	0.52
2008	540	4,500,387	0.16	0.19	0.27	0.82	0.51
2009	540	3,490,967	0.15	0.23	0.30	0.81	0.49
2010	559	3,532,784	0.17	0.27	0.23	0.76	0.45
2011	538	3,398,114	0.25	0.26	0.26	0.78	0.49
2012	520	3,120,004	0.24	0.26	0.25	0.77	0.51
2013	463	2,507,805	0.24	0.29	0.26	0.76	0.51
2014	445	2,521,275	0.23	0.27	0.28	0.75	0.48
2015	438	4,360,396	0.23	0.27	0.28	0.75	0.51
2016	474	4,808,498	0.24	0.29	0.28	0.76	0.52
Mean	421	2,841,527	0.20	0.20	0.26	0.81	0.50
Sum	7,163	48,305,962					

Table 1. U.S. government contract awards (cont'd)

Panel B. CRSP/Compustat sample of U.S. government contract awards

Firm Fiscal Year	Contract value ($ billions)	% of total contract value (Panel A)	Number of contracts	% of total contracts (Panel A)	*CPData* (% of value)	*CAS* (% of value)	*CostPlus* (% of value)	*NonComm* (% of value)	*Contract Duration* > 1 year (% of value)
2000	78	0.38	99,225	0.17	0.33	0.06	0.18	0.87	0.64
2001	89	0.40	132,455	0.21	0.31	0.17	0.17	0.85	0.60
2002	121	0.46	169,698	0.20	0.37	0.21	0.15	0.87	0.62
2003	136	0.42	268,637	0.23	0.36	0.27	0.17	0.84	0.62
2004	145	0.43	404,930	0.20	0.32	0.30	0.20	0.89	0.61
2005	141	0.36	587,367	0.20	0.17	0.22	0.22	0.92	0.57
2006	203	0.47	853,325	0.22	0.21	0.29	0.25	0.91	0.65
2007	204	0.43	1,044,611	0.25	0.24	0.29	0.28	0.86	0.60
2008	246	0.46	1,093,473	0.24	0.23	0.29	0.31	0.87	0.56
2009	219	0.41	898,940	0.26	0.23	0.31	0.32	0.85	0.55
2010	233	0.42	881,357	0.25	0.31	0.41	0.26	0.85	0.56
2011	228	0.42	812,499	0.24	0.36	0.38	0.28	0.85	0.57
2012	242	0.47	713,120	0.23	0.35	0.44	0.26	0.84	0.60
2013	188	0.41	583,615	0.23	0.34	0.44	0.28	0.83	0.55
2014	194	0.44	727,958	0.29	0.33	0.46	0.30	0.83	0.57
2015	185	0.42	1,365,283	0.31	0.34	0.44	0.30	0.82	0.57
2016	18	0.04	695,710	0.14	0.27	0.26	0.22	0.80	0.48
Mean	169	0.39	666,600	0.22	0.30	0.31	0.24	0.86	0.58
Sum	2,869		11,332,203						

Table 1. U.S. government contract awards (cont'd)

Panel C. Distribution by industry

Industry	Contract value ($ billions)	% of sample contract value (Panel B)	Number of contracts	% of sample contracts (Panel B)
Business Equipment	704	0.25	2,014,573	0.18
Chemicals	7	0.00	148,682	0.01
Consumer Durables	59	0.02	330,641	0.03
Energy	64	0.02	29,407	0.00
Healthcare	59	0.02	722,187	0.06
Manufacturing	1,394	0.49	2,305,463	0.20
Finance	107	0.04	115,144	0.01
Consumer Non-Durables	20	0.01	105,179	0.01
Other	293	0.10	778,453	0.07
Retail	114	0.04	4,310,475	0.38
Telecom	29	0.01	391,651	0.03
Utilities	18	0.01	80,348	0.01
Sum	2,869	1.000	11,332,203	1.000

Table 2. Descriptive statistics

This table presents descriptive statistics for the variables used in the analysis. All variables are as defined in Appendix A.

Variable	Observations	Mean	Std	5th	10th	25th	Med.	75th	90th	95th	99th
Measure of contract awards (contract sample of 3,108 unique firms)											
ContractSize (%)	23,182	5.501	126.383	0.000	0.000	0.008	0.104	0.803	4.949	17.517	77.089
DollarsObligated (in millions)	23,182	124.000	1,240.000	0.000	0.006	0.056	0.628	6.727	48.300	192.000	2,320.000

Variable	Observations	Mean	Std	25th	Median	75th
Measures of reporting						
VolDisc	79,383	0.469	0.499	0.000	0.000	1.000
VolDisc_Freq	79,383	4.785	7.835	0.000	0.000	7.000
VolDisc_Nitems	79,383	1.000	1.429	0.000	0.000	2.000
Speed	79,383	–0.142	0.065	–0.181	–0.132	–0.090
Illiquidity	79,383	0.040	0.046	0.008	0.024	0.056
Control variables						
Size	79,383	6.042	2.199	4.421	5.995	7.548
Leverage	79,383	0.222	0.220	0.029	0.168	0.346
MTB	79,383	5.426	8.283	2.196	3.636	6.858
SalesGrowth	79,383	0.149	0.492	–0.041	0.067	0.206
ROA	79,383	–0.038	0.245	–0.023	0.017	0.061
Loss	79,383	0.314	0.464	0.000	0.000	1.000
Returns	79,383	0.115	0.600	–0.236	0.051	0.334
σReturns	79,383	0.136	0.095	0.071	0.109	0.169
SpecialItems	79,383	–0.018	0.067	–0.009	0.000	0.000
BigN	79,383	0.720	0.449	0.000	1.000	1.000
Variables used in cross–sectional tests (contracts sample)						
ContractDuration	22,051	0.782	0.993	0.164	0.515	0.976
CPData	23,182	0.165	0.371	0.000	0.000	0.000
CAS	23,182	0.124	0.330	0.000	0.000	0.000
CostPlus	23,182	0.252	0.434	0.000	0.000	1.000
NonComm	23,182	0.807	0.395	1.000	1.000	1.000

Table 3. Government contract awards and the external reporting environment

This table presents results from estimating the association between government contract awards and the firm's external reporting environment. Panel A measures contract awards using the size of the award (*ContractSize*), and Panel B measures contract awards using an indicator variable for whether a contract was awarded (*Contract*). All variables are as defined in Appendix A. *t*–statistics appear in parentheses and are based on standard errors clustered by firm and datadate. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels (two–tail), respectively.

Panel A. Contract size

	$VolDisc_{t+1}$	$VolDisc\_Freq_{t+1}$	$VolDisc\_Nitems_{t+1}$	$Speed_{t+1}$	$Illiquidity_{t+1}$
Variable	(1)	(2)	(3)	(4)	(5)
ContractSize	0.105***	2.002***	0.369***	0.007***	–0.003***
	(6.84)	(6.70)	(7.33)	(4.22)	(–3.94)
Control variables					
$Size_t$	0.067***	0.953***	0.170***	0.013***	–0.012***
	(21.00)	(13.13)	(12.86)	(34.11)	(–10.96)
$Leverage_t$	0.083***	1.436***	0.335***	–0.018***	0.006***
	(4.25)	(4.52)	(5.52)	(–6.35)	(3.68)
MTB_t	–0.001**	–0.000	–0.000	–0.000**	0.000
	(–2.25)	(–0.05)	(–0.13)	(–2.29)	(0.48)
$SalesGrowth_t$	0.004	0.081	0.004	–0.003***	–0.002***
	(0.56)	(1.27)	(0.31)	(–4.41)	(–8.64)
ROA_t	0.193***	2.285***	0.498***	0.014***	–0.006***
	(12.15)	(7.21)	(7.04)	(6.15)	(–2.94)
$Loss_t$	–0.020**	–0.590***	–0.111***	–0.008***	0.006***
	(–2.47)	(–4.71)	(–5.14)	(–7.77)	(5.58)
$Returns_t$	–0.005	0.128	0.007	0.000	–0.002***
	(–0.67)	(1.34)	(0.40)	(0.55)	(–3.29)
$\sigma Returns_t$	0.100**	–2.433***	–0.458***	–0.028***	–0.056***
	(2.34)	(–4.03)	(–3.87)	(–2.80)	(–6.13)
SpecialItems	–0.409***	–5.399***	–1.210***	–0.014*	0.015***
	(–10.81)	(–7.92)	(–8.85)	(–1.75)	(3.01)
BigN	0.092***	1.103***	0.242***	0.019***	–0.004***
	(9.45)	(7.76)	(8.32)	(10.31)	(–3.53)
Year Effects	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes
Observations	79,383	79,383	79,383	79,383	79,383
R^2 (%)	26.6	27.3	29.7	38.3	47.9

Table 3. Government monitoring and the external reporting environment (cont'd)

Panel B. Contract indicator

	$VolDisc_{t+1}$	$VolDisc\_Freq_{t+1}$	$VolDisc\_Nitems_{t+1}$	$Speed_{t+1}$	$Illiquidity_{t+1}$
Variable	(1)	(2)	(3)	(4)	(5)
Contract	0.074***	1.198***	0.235***	0.006***	–0.001
	(6.93)	(6.45)	(7.06)	(5.84)	(–1.53)
Control variables					
$Size_t$	0.065***	0.930***	0.165***	0.012***	–0.012***
	(19.84)	(12.87)	(12.54)	(33.11)	(–10.88)
$Leverage_t$	0.079***	1.380***	0.324***	–0.018***	0.006***
	(4.08)	(4.35)	(5.36)	(–6.49)	(3.71)
MTB_t	–0.001**	–0.000	–0.000	–0.000**	0.000
	(–2.25)	(–0.06)	(–0.12)	(–2.28)	(0.50)
$SalesGrowth_t$	0.004	0.083	0.005	–0.003***	–0.002***
	(0.65)	(1.31)	(0.38)	(–4.35)	(–8.69)
ROA_t	0.191***	2.254***	0.492***	0.013***	–0.006***
	(12.10)	(7.19)	(7.03)	(6.08)	(–2.93)
$Loss_t$	–0.020**	–0.599***	–0.113***	–0.008***	0.006***
	(–2.53)	(–4.82)	(–5.25)	(–7.80)	(5.61)
$Returns_t$	–0.004	0.139	0.010	0.000	–0.002***
	(–0.58)	(1.47)	(0.52)	(0.63)	(–3.27)
$\sigma Returns_t$	0.099**	–2.489***	–0.466***	–0.028***	–0.056***
	(2.36)	(–4.19)	(–4.00)	(–2.78)	(–6.10)
SpecialItems	–0.403***	–5.317***	–1.194***	–0.014*	0.015***
	(–10.64)	(–7.77)	(–8.72)	(–1.69)	(3.02)
BigN	0.091***	1.094***	0.241***	0.019***	–0.004***
	(9.42)	(7.69)	(8.27)	(10.32)	(–3.51)
Year Effects	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes
Observations	79,383	79,383	79,383	79,383	79,383
R^2 (%)	26.7	27.3	29.7	38.4	47.9

Table 4. Cross–sectional analysis: Contract duration

This table presents results from examining whether, within the sample of government contract awards, the relation between contract size and the external reporting environment varies with contract duration. The specifications follow Table 3, Panel A, except that I interact *ContractSize* with a measure of contract duration (*ContractDuration*). All variables are as defined in Appendix A. For parsimony I do not tabulate coefficients on control variables. *t*–statistics appear in parentheses and are based on standard errors clustered by firm and datadate. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels (two–tail), respectively.

	$VolDisc_{t+1}$	$VolDisc\_Freq_{t+1}$	$VolDisc\_Nitems_{t+1}$	$Speed_{t+1}$	$Illiquidity_{t+1}$
Variable	(1)	(2)	(3)	(4)	(5)
$ContractSize_t$ x $ContractDuration_t$	0.009***	0.134*	0.021*	0.001**	–0.0003**
	(2.81)	(1.89)	(1.86)	(2.14)	(–2.54)
$ContractSize_t$	0.002	0.156*	0.025*	–0.000	0.000
	(0.61)	(1.92)	(1.76)	(–0.91)	(0.06)
$ContractDuration_t$	–0.073***	–1.020*	–0.163*	–0.005**	0.003***
	(–2.81)	(–1.87)	(–1.81)	(–2.53)	(3.01)
Controls	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes
Observations	22,051	22,051	22,051	22,051	22,051
R^2 (%)	19.3	24.2	26.6	40.5	45.7

Table 5. Cross–sectional analysis: Contract terms associated with greater monitoring

This table presents results from examining whether, within the sample of government contract awards, the relation between contract size and the external reporting environment varies with measures associated with greater government monitoring. In Panel A, I follow the specifications in Table 4, except that I interact *ContractSize* with an index composed of four monitoring measures (*MonitoringIndex*). In Panels B-E, I interact *ContractSize* in turn with each of the four monitoring measures that compose the index: a binary indicator variable equal to one if the firm is required to provide cost or pricing data to the government (*CPData*) in Panel B, a binary indicator variable equal to one if the firm is subject to Cost Accounting Standards (*CAS*) in Panel C, a binary indicator variable equal to one if the firm has cost reimbursement contracts (*CostPlus*) in Panel D, and a binary indicator variable equal to one if the firm provides goods or services that are not subject to commercial item acquisition procedures (*NonComm*) in Panel E. I include *ContractDuration* as an additional control variable in all panels. All variables are as defined in Appendix A. For parsimony I do not tabulate coefficients on control variables. *t*–statistics appear in parentheses and are based on standard errors clustered by firm and datadate. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels (two–tail), respectively.

Panel A. Monitoring index

	$VolDisc_{t+1}$	$VolDisc\_Freq_{t+1}$	$VolDisc\_Nitems_{t+1}$	$Speed_{t+1}$	$Illiquidity_{t+1}$
Variable	(1)	(2)	(3)	(4)	(5)
$ContractSize_t$ x $MonitoringIndex_t$	0.011**	0.265***	0.034**	0.001**	–0.001***
	(2.46)	(3.21)	(2.53)	(2.26)	(–3.17)
$ContractSize_t$	0.006*	0.214***	0.030**	0.000	–0.000**
	(1.70)	(3.10)	(2.49)	(0.97)	(–2.06)
$MonitoringIndex_t$	–0.072*	–1.912***	–0.228**	–0.009**	0.007***
	(–1.96)	(–2.77)	(–2.00)	(–2.59)	(3.40)
$ContractDuration_t$	–0.004	–0.000	–0.002	–0.000	0.000
	(–0.77)	(–0.00)	(–0.13)	(–0.88)	(1.50)
Controls	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes
Observations	22,051	22,051	22,051	22,051	22,051
R^2 (%)	19.4	24.4	26.7	40.6	45.7

Table 5. Cross–sectional analysis: Contract terms associated with greater monitoring (cont'd)

Panel B. Cost/Pricing data

	$VolDisc_{t+1}$	$VolDisc\_Freq_{t+1}$	$VolDisc\_Nitems_{t+1}$	$Speed_{t+1}$	$Illiquidity_{t+1}$
Variable	(1)	(2)	(3)	(4)	(5)
$ContractSize_t$ x $CPData_t$	0.026**	0.557**	0.100**	0.001	–0.002**
	(2.25)	(2.58)	(2.57)	(1.14)	(–2.50)
$ContractSize_t$	0.002	0.124*	0.019	–0.000	–0.000
	(0.60)	(1.67)	(1.51)	(–0.01)	(–0.33)
$CPData_t$	–0.169*	–3.779**	–0.697**	–0.012	0.013***
	(–1.71)	(–2.06)	(–2.12)	(–1.41)	(2.63)
$ContractDuration_t$	–0.003	0.013	0.002	–0.000	0.000
	(–0.64)	(0.13)	(0.11)	(–1.05)	(1.63)
Controls	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes
Observations	22,051	22,051	22,051	22,051	22,051
R^2 (%)	19.5	24.4	26.7	40.5	45.7

Panel C. Cost Accounting Standards

	$VolDisc_{t+1}$	$VolDisc\_Freq_{t+1}$	$VolDisc\_Nitems_{t+1}$	$Speed_{t+1}$	$Illiquidity_{t+1}$
Variable	(1)	(2)	(3)	(4)	(5)
$ContractSize_t$ x CAS_t	0.020	0.448*	0.059	0.003*	–0.002***
	(1.55)	(1.75)	(1.26)	(1.91)	(–3.08)
$ContractSize_t$	0.004	0.146*	0.024*	–0.000	–0.000
	(1.07)	(1.95)	(1.86)	(–0.30)	(–0.28)
CAS_t	–0.125	–2.727	–0.320	–0.023**	0.019***
	(–1.12)	(–1.26)	(–0.81)	(–2.10)	(3.21)
$ContractDuration_t$	–0.003	0.007	0.001	–0.001	0.0004*
	(–0.58)	(0.07)	(0.05)	(–1.14)	(1.71)
Controls	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes
Observations	22,051	22,051	22,051	22,051	22,051
R^2 (%)	19.4	24.4	26.7	40.5	45.7

Table 5. Cross–sectional analysis: Contract terms associated with greater monitoring (cont'd)

Panel D. Cost plus contracts

	$VolDisc_{t+1}$	$VolDisc\_Freq_{t+1}$	$VolDisc\_Nitems_{t+1}$	$Speed_{t+1}$	$Illiquidity_{t+1}$
Variable	(1)	(2)	(3)	(4)	(5)
$ContractSize_t$ x $CostPlus_t$	0.012	0.244*	0.028	0.001	–0.001**
	(1.37)	(1.79)	(1.05)	(1.64)	(–2.37)
$ContractSize_t$	–0.082	–1.876*	–0.165	–0.013*	0.010***
	(–1.16)	(–1.69)	(–0.73)	(–1.82)	(2.82)
$CostPlus_t$	0.004	0.168**	0.026*	–0.000	–0.000
	(0.97)	(2.06)	(1.80)	(–0.64)	(–0.14)
$ContractDuration_t$	–0.001	0.063	0.007	–0.001	0.000
	(–0.19)	(0.59)	(0.39)	(–1.11)	(1.28)
Controls	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes
Observations	22,051	22,051	22,051	22,051	22,051
R^2 (%)	19.3	24.2	26.6	40.5	45.7

Panel E. Non-commercial contracts

	$VolDisc_{t+1}$	$VolDisc\_Freq_{t+1}$	$VolDisc\_Nitems_{t+1}$	$Speed_{t+1}$	$Illiquidity_{t+1}$
Variable	(1)	(2)	(3)	(4)	(5)
$ContractSize_t$ x $NonComm_t$	0.018**	0.504***	0.068***	0.000	–0.001*
	(2.49)	(4.04)	(3.03)	(0.10)	(–1.71)
$ContractSize_t$	–0.007	–0.165	–0.018	0.000	0.000
	(–1.10)	(–1.42)	(–0.94)	(0.07)	(1.25)
$NonComm_t$	–0.125**	–3.862***	–0.491***	–0.004	0.006
	(–2.33)	(–3.95)	(–2.90)	(–0.68)	(1.61)
$ContractDuration_t$	–0.000	0.072	0.011	–0.001	0.0004*
	(–0.04)	(0.67)	(0.61)	(–1.11)	(1.72)
Controls	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes
Observations	22,051	22,051	22,051	22,051	22,051
R^2 (%)	19.3	24.3	26.6	40.5	45.7

Table 6. Contract starters

This table presents results from examining the relation between government contract awards and the external reporting environment for a sample of firms that first begin contracting with the government, relative to a propensity score matched sample of firms that do not contract with the government. I match firms in the year prior to the initial contract award on the basis of the control variables in Table 3, fiscal year, and industry. Tests for covariate balance appear in Appendix C. The table presents results from using a difference–in–differences design to estimate the effect of government contracting on the firm's external reporting environment. Columns (1), (3), (5), (7) and (9) present results from specifications including year and industry fixed effects. Columns (2), (4), (6), (8) and (10) present results from specifications including year and firm fixed effects. *Treated* is a binary indicator variable equal to one for firms that contract with the government, and zero for the matched control firms. *Post* is an indicator variable equal to one for fiscal years starting in the year that the firm begins contracting with the government, and zero otherwise. My analysis spans a window of four years prior to, and four years after the firm begins contracting (for a total of nine years). All other variables are as defined in Appendix A. For parsimony I do not tabulate coefficients on control variables. *t*–statistics appear in parentheses and are based on standard errors clustered by firm and datadate. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels (two–tail), respectively.

	$Forecast_{t+1}$		$Forecast\_Freq_{t+1}$		$Forecast\_Nitems_{t+1}$		$Speed_{t+1}$		$Illiquidity_{t+1}$	
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treated x *Post*	0.021	0.017	0.894**	1.086***	0.184**	0.178**	0.005*	0.004	–0.006**	–0.005*
	(0.76)	(0.63)	(2.15)	(3.29)	(2.17)	(2.42)	(1.90)	(1.11)	(–2.20)	(–1.74)
Treated	0.062**		–0.063		0.018		0.008		0.002	
	(2.16)		(–0.13)		(0.23)		(1.63)		(0.80)	
Post	0.065**	0.027	0.038	–0.197	–0.023	–0.061	0.002	–0.004	0.002	0.003
	(2.35)	(1.25)	(0.09)	(–0.82)	(–0.30)	(–1.02)	(0.57)	(–1.02)	(0.77)	(1.45)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Firm Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	3,485	3,485	3,485	3,485	3,485	3,485	3,485	3,485	3,485	3,485
R^2 (%)	30.5	66.5	26.4	74.8	29.5	70.3	39.0	81.1	51.9	73.2

Table 7. Establishment of the Cost Accounting Standards Board

Panel A of this table presents results from estimating the effect of the establishment of the Cost Accounting Standards Board in 1970 on firms' external reporting environment. *TopMilitary* is a binary indicator variable equal to one for firms among the top 100 military contractors in 1970 (treatment firms), and zero for all other CRSP/Compustat firms in the same industries. *Post* is a binary indicator variable equal to one for fiscal years greater or equal to 1970. Column (1) presents results from a specification including year and industry fixed effects. Column (2) presents results from a specification including year and firm fixed effects. Panel B uses the same specification as Panel A, except that I interact *TopMilitary* in turn with each of the fiscal years used in my analysis, omitting 1969 (the benchmark). For parsimony I do not tabulate coefficients on control variables. All other variables are as defined in Appendix A. My analysis spans fiscal years 1967-1974, and includes 72 treatment firms and 2,832 control firms, for a sample of 9,637 observations. *t*–statistics appear in parentheses and are based on standard errors clustered by firm and datadate. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels (two–tail), respectively.

Panel A: Difference-in-differences regression

	$Illiquidity_{t+1}$	
Variable	(1)	(2)
TopMilitary x *Post*	–0.048***	–0.019**
	(–2.79)	(–2.20)
TopMilitary	0.068***	
	(4.39)	
Control variables		
$Size_t$	–0.055***	–0.061***
	(–8.95)	(–23.58)
$Leverage_t$	0.015	0.031**
	(1.01)	(2.26)
MTB_t	0.000	0.000
	(0.50)	(0.46)
$SalesGrowth_t$	–0.009	–0.012***
	(–0.93)	(–3.61)
ROA_t	0.111*	0.021
	(1.94)	(0.54)
$Loss_t$	0.017***	–0.001
	(2.99)	(–0.26)
$Returns_t$	–0.021***	–0.012***
	(–3.58)	(–3.23)
$\sigma Returns_t$	–0.233***	–0.024
	(–4.56)	(–0.97)
SpecialItems	0.511	–0.158
	(1.43)	(–0.63)
BigN	–0.008	–0.001
	(–0.71)	(–0.12)
Year Effects	Yes	Yes
Industry Effects	Yes	No
Firm Effects	No	Yes
Observations	9,637	9,637
R^2 (%)	51.6	91.7

Table 7. Establishment of the Cost Accounting Standards Board (cont'd)

Panel B: Trend analysis

	$Illiquidity_{t+1}$
Variable	(1)
TopMilitary x *1967*	0.026***
	(5.55)
TopMilitary x *1968*	0.008***
	(2.73)
TopMilitary x *1970*	–0.005
	(–0.75)
TopMilitary x *1971*	0.007
	(1.03)
TopMilitary x *1972*	–0.006
	(–0.91)
TopMilitary x *1973*	–0.018***
	(–2.68)
TopMilitary x *1974*	–0.016*
	(–1.77)
Controls	Yes
Year Effects	Yes
Firm Effects	Yes
Observations	9,637
R^2 (%)	91.7

Appendix B. Principal component analysis of monitoring measures

I construct *MonitoringIndex* as the first principal component of four contract terms associated with greater monitoring. Panel A presents the principal component output. Panel B presents correlations between the index and its four index components.

Panel A. Principal component output

Factor	Eigenvalue	Proportion of the variation explained	Cumulative Proportion of the variation explained	Contract Characteristics	First Principal Component Weights
1st	2.14	53.56%	53.56%	*CPData*	0.37979
2nd	0.89	22.26%	75.81%	*CAS*	0.37394
3rd	0.53	13.16%	88.97%	*CostPlus*	0.36993
4th	0.44	11.03%	100.00%	*NonComm*	0.21419

Panel B. Correlation matrix

	MonitoringIndex	*CPData*	*CAS*	*CostPlus*	*NonComm*
MonitoringIndex	1.00				
CPData	0.81	1.00			
CAS	0.80	0.60	1.00		
CostPlus	0.79	0.57	0.54	1.00	
NonComm	0.46	0.40	0.35	0.50	1.00

Appendix C. Covariate balance

This table presents cross–sample differences in covariates for the firms that start contracting with the government (*Treatment Firms*) and their propensity score matched sample counterparts (*Control Firms*) used in the analysis of contract starters in Table 6. The differences are measured in the year prior to the contract start year. *p*–values (two–tailed) test for differences between means and medians and appear in brackets.

	Treatment Firms		Control Firms		Diff. in		Diff. in	
Variable	Mean	Median	Mean	Median	means	*p*–value	medians	*p*–value
Size	4.97	5.11	4.89	4.78	0.08	[0.63]	0.33	[0.14]
Lev	0.17	0.09	0.20	0.08	–0.03	[0.16]	0.01	[0.83]
MTB	4.57	3.33	4.30	2.94	0.27	[0.67]	0.40	[0.14]
SalesGrowth	0.33	0.08	0.21	0.06	0.13	[0.08]	0.01	[0.65]
ROA	–0.17	–0.03	–0.20	–0.04	0.03	[0.44]	0.02	[0.41]
Loss	0.54	1.00	0.57	1.00	–0.04	[0.41]	0.00	NA
Returns	0.17	–0.01	0.18	0.03	–0.01	[0.84]	–0.04	[0.51]
σReturns	0.19	0.16	0.21	0.18	–0.02	[0.12]	–0.02	[0.07]
SpecialItems	–0.02	0.00	–0.03	0.00	0.01	[0.31]	0.00	NA
BigN	0.76	1.00	0.74	1.00	0.02	[0.59]	0.00	NA