

Accounting Disclosure Requirements in Procurement Contracting

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Abstract

This paper studies how requirements for suppliers to privately disclose accounting information affect the bidding and execution of government procurement contracts. Using thresholds related to a federal procurement regulation known as the Truth in Negotiations Act (TINA), which requires suppliers to disclose data supporting their proposed prices unless there is a minimum number of competing bidders, I find that compared to below-threshold contracts, above-threshold contracts experience greater competition, performance (i.e., less frequent re-negotiations and cost overruns), and completeness (i.e., decreased reliance on cost-plus contracts). These findings are consistent with the procurement system paying greater attention to promote competition for above-threshold contracts.

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1 Introduction

This paper studies the effects of accounting disclosure requirements on product markets and bidding outcomes using a quasi-experimental setting related to federal procurement contracting. In 2018 alone, governments around the world spent \$13 trillion on procurement (defined as the purchase of goods or services from a supplier by an organization)¹, which was equivalent to 15% of global GDP (OCP [2020], World Bank [2020]). The private sector and non-governmental organizations also engage extensively in the procurement of goods and services. When designing procurement processes, buyers must decide what types of policies they will employ to ensure bid prices are reasonable. One such policy consideration is, should the buyer mandate that suppliers provide accounting information to support their proposed prices? The answer to this question is unclear. Requirements to provide accounting information related to a supplier’s pricing can protect the buyer by lessening information asymmetry and agency problems (Jensen and Meckling [1976]). However, such requirements can dissuade potential suppliers from competing due to data gathering and proprietary costs, as well as increase the buyer’s information processing costs (Blankespoor, deHaan, and Marinovic [2020]). To alleviate these costs of requiring data, buyers may use alternative methods of ensuring reasonable prices, such as seeking more competing suppliers.

As a first step towards answering this question, I examine the effects of a regulation that requires suppliers to privately disclose accounting information to the federal government. Specifically, I study the effect of the Truth in Negotiations Act (TINA) for federal contracts on competition (i.e., the number of bids), as well as contract performance (i.e., the frequency of renegotiations and budget overruns) and completeness (i.e., thoroughness as measured by the frequency of cost-plus contracts).² TINA stipulates comprehensive accounting data disclosure by suppliers to the government when multiple bids are not expected, for

¹ Procurement typically involves a single buyer that bids contracts to either one or multiple suppliers, called contractors. Buyers usually employ agents called procurement officers to manage the procurement process on their behalf, as discussed below.

² TINA is now officially called the Truthful Cost or Pricing Data (“TCPD”) Act, but it is still colloquially called by its original name.

contracts above a threshold price (the “TINA threshold”).³ TINA’s requirements imply that government representatives, called procurement officers (PO’s), may use either competition or accounting data to assure reasonable prices.⁴ Competition can be valuable because it may lower prices, improve fairness of the procurement system, and lead to better quality goods and services (OECD [2011]). Practitioners widely appear to expect TINA’s requirements to reduce competition due to suppliers’ costs associated with the data.⁵ However, since PO’s can avoid requiring the costly data by encouraging additional bidders, these data requirements may increase competition.

TINA represents a form of a buyer procurement policy which is common in both the public and private sectors. Generally, in practice, buyers’ procurement organizations require their agents to reduce the buyer’s pricing information disadvantage in at least one of three ways: (1) by relying on competition among multiple, independent bidders, (2) by depending on their agents’ judgment and analyses of prices, and (3) by requiring private supplier disclosures supporting their proposed prices. These approaches can strengthen the buyer’s bargaining power and reassure the buyer that a price is reasonable.⁶ Given that buyers’ agents may be prone to errors of judgment and moral hazard (in the forms of shirking or colluding with bidders), buyers commonly enact policies that restrict their agents from relying on only their judgment for contracts above a certain price threshold. This leaves agents with just the other two, more objective options of price assurance for higher-dollar

³ TINA’s requirements only apply for contracts for goods or services where a commercial market does not exist. That is, for non-standard goods or services, where any degree of customization or specialization is necessary. Non-commercial goods and services span such categories as electronics, software, construction, helicopters, bunkers, medical supplies, and more.

⁴ Contracting Officers are typically the specific procurement officers responsible for managing the writing, solicitation, bidding, and performance of contract awards. To the extent these responsibilities are shared among (or in some instances even allocated) to other procurement employees, such as sourcing specialists, engineers, scientists, lawyers, administrators, contracting assistants, and others, I include these roles in the term “procurement officer”.

⁵ For example, one popular media outlet and radio station in the Washington D.C. area states, “The time has come for TINA to be modernized because it undermines innovation and competition...” (Federal News Network [2021]).

⁶ In the public and private sectors, these supplier disclosures can take a variety of forms, including data related to the supplier’s dependability and financial stability, cost estimates coordinated with an independent third party, or detailed cost breakouts. See Section 2.2 for further discussion.

contracts. I provide the first empirical evidence on the impact of such a buyer disclosure policy (as in TINA) on product market outcomes.

A priori, the effect of the TINA supplier data mandate on contract competition is not clear. Data management costs, weakened bargaining power, and exposure risk may ward off some suppliers from competing (Darrough [1993], Berger and Hann [2007], Bens, Berger, and Monahan [2011], Tomy [2019]).⁷ TINA requires suppliers provide “cost or pricing data”, defined as all factual information that prudent buyers and suppliers would reasonably expect to affect price negotiations significantly. It includes detailed cost line items and supporting facts, such as quotes, drawings, and specifications, which can be costly for suppliers to manage and prepare. Although intended to remain private, there is the risk this information could fall into the hands of competitors through the hiring of government employees by suppliers, bid protests, legal challenges, and Freedom of Information Act requests (Sheffner [2019]). Prior literature finds proprietary costs related to the provision of confidential information lessen companies’ (especially innovative firms’) willingness to bid on government contracts (He, Li, Li, and Zhang [2021]).

Conversely, the requirements may increase competition by focusing POs’ attention towards above-threshold contracts (Warren [2014]), for several reasons. First, given that additional information provision represents a “cost” to suppliers and the government when there is an insufficient number of bids, PO’s may try to lower these costs by seeking additional suppliers, relaxing bid specifications, and/or lessening restrictions on which suppliers can bid (Kang and Miller [2017]). Second, data requirements may encourage PO’s to not simply choose their favored suppliers, but rather base the decision on their expectations of total government costs. Finally, data requirements may enhance suppliers’ perceptions of fairness by signaling impartiality and that procurement is paying closer attention to contract allocations, thereby attracting competitors. To shed light on how TINA’s mandatory data

⁷ An internet search reveals dozens of law and accounting consultancy firms offering to advise suppliers to reduce their compliance costs with TINA, as well as suppliers expressing their colorful opinions about the requirements.

requirements affect competition, I use a combination of descriptive and quasi-experimental approaches including regression discontinuity design (RDD), using contracts above the TINA data threshold (and subject to its requirements) as the treatment group (i.e., “affected contracts”).⁸

My primary findings suggest that PO’s actively encourage competition to reduce procurement’s costs associated with data requirements. First, PO’s are more likely to write solicitations (i.e., requests for bid proposals) where multiple bids can occur, as reflected by both fewer “sole source” contracts (bidding is restricted in the solicitation to a single supplier) and more “open competition” solicitations (all registered suppliers are allowed to bid). I find that the prevalence of sole source contracts decreases by 3.89 percentage points (pp) (or 14.7%) for affected contracts. In addition, realized (i.e., actual) competition increases: the frequency of contracts with multiple bids is 4.39 pp (or 7.5%) greater above the threshold than below the threshold. Overall, regarding the impact of TINA’s requirements on competition, these results suggest that the positive effects of procurement paying greater attention to promote competition outweigh the negative effects of added costs to suppliers. This finding is surprising, because the press, government documents, and interviews with federal procurement experts⁹ suggest that most practitioners and even the government expect TINA’s requirements to primarily dissuade suppliers from competing.

I also study the effect of data requirements on contract performance, in terms of renegotiations (also known as modifications or contract changes) and cost overruns.¹⁰ I examine performance both because it is an important contracting outcome, and because it provides insight into the mechanism underlying my competition results (as explained below). Data requirements could lead to higher performance for affected contracts due to improved monitoring by procurement, both if accounting data is provided or if there is greater procurement

⁸ This includes negotiated, non-commercial contracts. See Section 3.2 for details.

⁹ Interviews were conducted by the author between 2020-2022.

¹⁰ These measures are regularly used by governments and researchers for assessing the execution performance of contracts. See for instance Mohamed et al. [2011], Duguay et al. [2020], Iimi [2013], and Bajari et al. [2014].

system attention to not require the data. Supplier data requirements may also aid PO's to write more complete contracts that are easier to monitor.¹¹ However, to the extent that data requirements lead to greater competition, this may lower POs' discretion to choose their favored (likely higher-performing) suppliers and increase pressure on suppliers to make up for lower profits by attempting to renegotiate later. I find affected contracts' performance improves in terms of the number of contract changes and cost overruns. Affected contracts are also more complete, as data requirements cause a significant drop in the frequency of cost-plus contracts. These results are consistent with prior literature, which finds greater procurement attention leads to better performance and more complete contracts (Warren [2014]).

By itself, my finding that data requirements lead to increased competition could be explained by PO's evading the disclosure requirement by opening bidding, but then selecting their favored suppliers regardless. Such an increase in competition should help price assurance, as long as PO's did not (directly or indirectly) signal to their favored suppliers that they will select them regardless, leading them to not feel any competitive pressure (OECD [2011]). Institutional safeguards (e.g., legal risk to PO's, management oversight, bid protests) make such coordination unlikely. Further, if such coordination between PO's and their favored suppliers, rather than procurement system attention, is the primary driver of my competition results, then there should not be any effect of the threshold on performance and completeness for those contracts that did not require the data (since data may improve performance). However, I find the threshold improves performance and completeness even when restricting my analysis to these contracts, suggesting that the results are indeed due to greater procurement attention.

My results differ between contracts for supplies versus those for services and works, commercial versus non-commercial items, and other samples in a manner that is consistent

¹¹ I use the term "completeness" to mean to what extent the final contract terms depend on certain contingencies, as in prior literature (Christensen, Nikolaev, and Wittenberg-Moerman [2016]; Warren [2014]). In this sense, cost-plus contracts are less complete than fixed-price contracts, because the final price is dependent on the actual costs and the scope is often less fixed.

with accounting data requirements driving my findings. Placebo tests show that only affected contracts respond to the threshold exclusively while it is in effect, and this response changes in concert with the threshold's value as expected. I also find that accounting information and contract competition can act as substitutes for the purposes of reducing the buyer's information disadvantage. Additionally, supplemental analyses confirm an assumption made by my RDD analyses: the extent to which suppliers and/or PO's manipulate contract prices to undercut the threshold is economically insignificant and thus unlikely to drive my results.

This study makes several contributions. First, it contributes to the literature on the use of accounting information in contracts between buyers and suppliers. Watts and Zimmerman [1986] show that financial statement information can be an important input to contract design. Costello [2013] documents the use of financial covenants based on (future) performance in supply contracts to alleviate risk due to asymmetric information. I build on this literature by introducing a novel setting, and documenting that a common type of buyer policy that leverages accounting disclosures and competitive bidding to lessen suppliers' information advantages results in increased contract competition, completeness, and performance.¹² I also provide evidence that buyers use competition and accounting information as substitutes for the purpose of verifying prices.

Second, my study contributes to the literature on government contracting (Williamson [2002], Tadelis [2002], Samuels [2021], Brogaard, Denes, and Duchin [2021]). Related studies examine how competition for federal contracts is affected by public disclosure of procurement data (Duguay, Rauter, and Samuels [2020]) and contract advertising (Carril, Gonzalez-Lira, and Walker [2020]). These papers find greater visibility improves competition and decreases contract prices, but worsens performance likely due to higher oversight by outsiders resulting in diminished PO discretion and greater fixation on bid prices instead of overall project costs (Alesina and Tabellini [2008]). My evidence suggests that private accounting data disclo-

¹²Several studies discuss TINA's data requirements, but few empirically evaluate its effects (see Dahl [1988], Lorell, Graser, and Cook [2005], and Bodenheimer and McLaughlin [2018]). Many studies examine the False Claims Act (FCA) (e.g., Heese and Pérez-Cavazos [2019]), which imposes penalties for making false statements to the government but does not mandate data provision by suppliers.

sure requirements increase both competition and performance, because these requirements focus insiders' (procurement's) attention on assuring reasonable prices, rather than opening competition for competition's sake. My findings are consistent with Warren [2014]'s evidence that greater PO attention increases competitive acquisition procedures and improves performance.¹³ Further, my study highlights that both cost or pricing data and TINA's requirements represent important factors for accounting researchers to consider while analyzing federal contracts.¹⁴

This study is related to the literature on the effects of disclosure on product market competition (e.g., Gal-Or [1986], Darrough [1993], Berger and Hann [2007], Tomy [2019]). Bernard, Burgstahler, and Kaya [2018] uncover that firms go to great lengths to minimize their costs of proprietary disclosure, even managing firm size to stay below mandatory disclosure thresholds. Some suppliers might thus avoid proprietary disclosure requirements. Prior literature also finds that public disclosures can signal investment opportunities and attract competitors (e.g., Bernard [2016], Granja [2018], Breuer [2021]). I document that a mandate for suppliers to *privately* provide accounting information also bolsters product market competition despite the added costs to participants. However, this effect occurs through a different mechanism: focusing buyer attention on affected contracts.

This study also relates to the literature on information processing costs, which typically focuses on investors' processing of financial market information (e.g., Indjejikian [1991], Ball [1992], Healy and Palepu [2001], Blankespoor et al. [2020]). I find that due to the costs to process mandatory accounting disclosures, the government pays greater attention to promote competition to avoid having to require the disclosures in the first place.

The rest of this paper is organized as follows. Section 2 describes the institutional context. Section 3 outlines the conceptual framework and research design. Section 4 presents

¹³ My results also complement those of Decarolis et al. [2020], who find greater bureaucratic competence improves performance.

¹⁴ For example, Samuels [2021] considers cost or pricing data when she finds her primary finding, a positive relationship between sales to the government and voluntary disclosure measures, is stronger for suppliers awarded contracts requiring this data.

my results exploring the effects of the data requirements on bidding and execution outcomes. Section 5 contains several robustness checks. The last section concludes. Additional details are discussed in the Appendix and the Online Appendix.

2 Institutional Context

In this section, I discuss procurement contracting as it relates to the public and private sectors in the U.S., and I provide details about TINA.

2.1 Federal Procurement Contracting

In the U.S. in 2019, procurement accounted for one of the largest parts of the federal government's \$4.4 trillion budget, at \$586 billion (CBO [2020], GAO [2020]). Federal procurement is governed by the U.S. Code, which is a set of legal statutes devised by Congress, along with various regulations. The Federal Acquisition Regulation (FAR) implements the code and contains detailed policies and procedures for federal procurement of goods and services.¹⁵

The federal government's process for requiring data and awarding of negotiated contracts can be summarized as follows. Negotiated contracts are awarded not solely based on price but also on contract terms and suppliers' capabilities and performance history. These contracts comprise the vast majority of federal procurement contracts and are the only contracts affected by TINA's requirements.¹⁶ The award of a negotiated contract occurs in several steps. First, a solicitation is made, which is typically posted publicly online.¹⁷ The solicitation contains the government's requirements, such as technical specifications, time

¹⁵ The FAR, which contains over 2,000 pages, also prescribes policy goals and guiding principles for the procurement process. The FAR applies to executive agencies (i.e., headed by a Cabinet secretary) and independent agencies. Select legislative agencies (e.g., the Government Accountability Office) also follow the FAR. The full FAR document may be accessed at: <https://www.acquisition.gov/sites/default/files/current/far/pdf/FAR.pdf>.

¹⁶ Based on data from the Federal Procurement Data System - Next Generation (FPDS-NG) database.

¹⁷ See www.sam.gov for a list of the U.S. government's active contract solicitations.

frames, and information required with the proposal. Second, the government receives proposals from suppliers describing their technical approach, estimated costs, fee structure, and more. The government may require any type and quantity of data to be submitted with a proposal; however, PO's are directed to request the minimum data necessary to do so, to lessen preparation costs, award times, and government resources expended (FAR 15.402-3). The most comprehensive data is known as "cost or pricing data", which FAR 2.101 defines as "all facts that, as of the date of price agreement... prudent buyers and sellers would reasonably expect to affect price negotiations significantly." This information includes accounting data, vendor quotes, and *any facts* contributing to the supplier's judgment of future costs. Cost or pricing data can be a major advantage to the government during negotiations as it can be used to reliably establish reasonable prices and effectively lower suppliers' profits. Finally, the government selects the winning proposal and, after negotiating direct costs, indirect costs, and fees, the contract is signed (awarded).

As the employees responsible for managing contract contents and the procurement process, PO's play a key role in the competition for and performance of contracts. They are responsible for establishing prices are "fair and reasonable" (discussed below), lowering contract and procurement operating costs, and promoting competition, among other duties (FAR Part 15 and FAR 1.102).¹⁸ The FAR grants PO's substantial leeway in determining pre-award contract characteristics, such as specifications, contract type (e.g. fixed price, cost-plus-fixed-fee), and type of solicitation procedure used (e.g. private negotiations, sealed bids). PO's also determine if only one supplier can reliably meet the specifications and requirements and thus whether a proposal will be solicited *only* from that source (i.e., a "sole source" contract per FAR 6.302-1 and FAR 2.101), or whether additional suppliers should be sought to increase competition. PO's review any supplier data submitted and, after the contract is awarded, monitor contract performance (FAR Part 16). Government

¹⁸ FAR 31.201-3 states that, "a cost is reasonable if, in its nature and amount, it does not exceed that which would be incurred by a prudent person in the conduct of competitive business." A fair price on the other hand is one which is fair to both the buyer and supplier.

managers and auditors oversee PO's, who can face punishment for not ensuring compliance with regulations such as TINA.

Based on FAR 15.402 and discussions with practitioners, I provide a theoretical framework describing how fair and reasonable prices are established in supply contracting in the public and private sectors. I classify the available approaches into three general methods: (1) determining whether adequate competition exists (defined in federal procurement as having two or more independent bidders that submit offers satisfying the government's requirements¹⁹), (2) relying on PO's own judgment based on their market research and experience, and (3) requiring private supplier disclosures supporting their proposed prices. I discuss supplier disclosures in the public and private sectors, as well as how TINA's requirements affect this framework, in the following subsection.

2.2 Truth in Negotiations Act (TINA)

In 1962, after a series of high-profile incidents of unfair competitive practices and price manipulation arising from collusion between government officials and suppliers, Congress enacted the Truth in Negotiations Act (TINA).²⁰ Per TINA, suppliers bidding on a negotiated contract *must* disclose cost or pricing data whenever PO's *expect* the contract price to surpass the TINA threshold (currently set at \$2,000,000), with some exceptions (discussed below). Further, for contracts with an agreed (i.e., realized) price above the TINA threshold, suppliers must certify that to the best of their knowledge, "the cost or pricing data they provided is accurate, complete, and current." PO's and governmental auditors are responsible for ensuring that suppliers comply with TINA.²¹

Exceptions to TINA's requirements include contracts where prices are more likely

¹⁹ Specifically, FAR 15.403-1(c)(1) states that for "adequate competition", it should be "expected there will be two or more responsible bidders, competing independently, that submit offers which satisfy the government's solicited requirements." See Section A.1.1 of the Online Appendix for details. The DOD in 2019 changed this from the expectation of two or more bidders to there actually being two or more bidders.

²⁰ U.S.C. 2306a and 41 U.S.C. Chapter 35.

²¹ This paper focuses on prime contracts. However, subcontracts and modifications that exceed the threshold are also subject to TINA's requirements.

reasonable, and thus requiring the data would likely unnecessarily drain procurement and supplier resources. These exceptions include contracts where PO's anticipate adequate price competition (i.e., two or more offers), contracts with prices set by law or regulation, and acquisitions classified as “commercial items” for which an established, competitive market already exists.²² Irrespective of TINA’s requirements, the FAR grants PO’s the ability to request cost or pricing data (uncertified) when necessary to ensure reasonable prices (see FAR 15.403-3 and Section A.1.1 of the Online Appendix for additional details on certification). Below-threshold contracts may also require certified data with higher-up approval if one of the exceptions is not met (FAR 15.403-4(a)(2)). Figure 1 summarizes application of the TINA threshold.

In essence, TINA stipulates that for contracts above the threshold the government should protect its interest by requiring greater verification that prices are reasonable. For these contracts, procurement should rely less on POs’ judgment and more on cost or pricing data and competition (15.403-4). PO’s can be subject to agency problems, such as colluding with bidders on contract awards and shirking, as well as errors of judgment, especially as technology and production processes change). These agency problems can reduce competition by negatively impacting suppliers’ perceptions of fairness. For higher-dollar contracts, these costs and the costs of a price being unreasonable can substantially increase.²³

Despite their benefits, TINA’s data requirements also pose several costs to suppliers and the government. First, suppliers must gather and prepare the data for submission (see Table 15-2 of FAR 15.408). Certifying cost or pricing data requires the data to be the latest available across the supplier’s *entire enterprise*, which can involve time-consuming data collection “sweeps” that add 30 days on average to the award process, according to

²² A last exception is if a PO applies for an “exceptional case” waiver from TINA’s data requirements because sufficient data has been provided recently for a very similar purchase or the supplier refuses to provide the data and necessary supplies or services cannot be obtained by alternative means. These waivers are uncommon (see Table 2).

²³ Several other countries’ procurement systems similarly require additional information when information asymmetry is likely to be high. Such requirements can be threshold-based, such as the U.K.’s Single Source Regulations of 2014.

one government estimate (Lorell et al. [2005]). These sweeps can disproportionately affect larger companies with multiple offices, though the costs to implement a specialized system for certification can be costly for smaller companies. Second, cost or pricing data can be highly proprietary, thus deterring companies who would otherwise like to contract with the government (Sheffner [2019]; He et al. [2021]). Third, pecuniary and reputational penalties for providing “defective” (i.e., incomplete, inaccurate, and outdated) cost or pricing data can be high and are feared by suppliers.²⁴ Investigations can also be costly. Government claims against suppliers can lower their supplier ratings in the Contractor Performance Assessment Reporting System and diminish future prospects of contracting with the government (Heese and Pérez-Cavazos [2019]). Finally, the government must verify the additional information, such as by conducting forward-priced proposal estimate audits, which adds time to the award process.

Between October 1st, 2015 and June 30th, 2018, the TINA threshold was set at \$750,000 per the FAR. However, on July 1st, 2018, a several agencies including the Department of Defense (DOD) increased their threshold to \$2,000,000. These “early adopter” agencies updated their threshold before the FAR mandated doing so to reduce suppliers’ data management costs and to comply with the 2018 National Defense Authorization Act, which changed the U.S. Code and signaled an eventual FAR update. This threshold increase was the largest (by dollar value) in the history of TINA (see Appendix B for details). Table 1 presents the dollars obligated by the 15 largest federal agencies in fiscal years 2016–2020 until emergency COVID procurement rules were instituted by the White House on March 13th, 2020 (FR Proclamation 9994). The bottom row shows that early adopter contracts comprised the majority of federal contracts, both in number (81.1%) and dollar (84.6%) terms. The analyses in this paper thus focus on early adopter agencies’ contracts around the \$750,000

²⁴ TINA imposes expensive fines for defective data. Per the False Claims Act, it is illegal to make false statements to the government regarding contracting matters above and below the threshold. Defective pricing claims may therefore also result in civil litigation (Bodenheimer and McLaughlin [2018]), penalties (with treble damages), and criminal charges, regardless of whether there was fraudulent intent. See Section A.1.1 in the Online Appendix for details.

and \$2,000,000 TINA thresholds (see Section 3.2 for further discussion and a list of these agencies).²⁵ In Section 3.1, I discuss the conceptual underpinnings of this study and provide details about how the threshold may affect contract bidding and execution.

Corollaries to TINA’s data requirements exist in the private sector as well. Private firms follow a similar approach for establishing price reasonableness as public procurement. Firms want to avoid the risks associated with relying entirely on POs’ judgment for higher-dollar contracts. Thus, for contracts expected to surpass a certain dollar amount, firms frequently require a minimum number of bidders or costly additional information (e.g., detailed pricing breakouts; supplier finances; the supplier’s own vendors; independent, third-party, ground-up estimates). For example, one Fortune 50 company requires non-commercial procurements exceeding \$100,000 to either have a minimum of three independent bidders or a ground-up estimate provided by a third party estimator.²⁶

3 Research Design

In this section, I develop this study’s conceptual underpinnings, describe how my primary samples are constructed, and specify the research design.

3.1 Conceptual Underpinnings

This section outlines my hypotheses of the effects of TINA’s data requirements on contract outcomes, including whether cost or pricing data is required, competition, completeness, and performance.

²⁵ Hereafter, I always refer to early adopters’ contracts unless explicitly noted otherwise. My primary findings (see Section 4) are unchanged by including “late adopter” agencies’ contracts. Note that the threshold change for late adopters occurred on August 8th, 2020 (FR 85128) but was confounded by the emergency COVID rules. Given that late adopters’ threshold change applied retroactively to July 1st, 2018, it is not clear how this should affect late adopters’ bidding outcomes prior to 2020.

²⁶ Per the author’s interview with a procurement employee of the company who wishes to remain anonymous.

3.1.1 Cost or Pricing Data Hypotheses

Above-threshold contracts typically require cost or pricing data to be submitted with bids unless an exception is met (see Figure 1). Although one might expect this requirement to lead to cost or pricing data being required more often, PO's could circumvent the requirement by simply ignoring TINA's data requirements or promoting sufficient competition to trigger an exception so frequently that the requirements have an insignificant effect on the data. Moreover, the threshold could reduce the frequency of data being required, if suppliers often withdraw altogether from bidding. However, I predict that TINA's data requirements will produce a net increase in the rate at which cost or pricing data is submitted (i.e., that H1 will hold):

H1: TINA's requirements are likely to increase the rate of cost or pricing data submission.²⁷

3.1.2 Competition Hypotheses

The net effect of TINA's data requirements on contract competition is not obvious, as competition is subject to two countervailing effects, which I call the *supplier effect* and the *procurement system effect*. The *supplier effect* has a negative impact on competition due to costly disclosures forcing suppliers to manage more detailed accounting data, assume greater liability in cases of data issues, face weakened bargaining power, and incur proprietary costs (Darrough [1993], Tomy [2019]). Information leaks, bid protests, legal challenges, and FOIA requests increase the risk that competitors might learn about suppliers' proprietary information (Sheffner [2019]). Information asymmetry may bolster supplier innovation and suppliers' desire to foster a relationship with the government (He et al. [2021], Breuer, Leuz, and Vanhaverbeke [2019]). Data disclosure requirements may thus dissuade firms who would

²⁷ Note that this hypothesis relates to whether either certified or uncertified cost or pricing data are required with bids. The FPDS does not indicate whether data are certified, so I do not analyze the effects of the threshold on certification.

otherwise like to compete. In fact, reducing suppliers' data management costs was the stated reason behind the 2018 National Defense Authorization Act relaxing TINA's requirements for lower-priced contracts.

In contrast, the *procurement system effect* has a positive impact on competition in several ways, each involving greater procurement attention paid to affected contracts. First, as stipulated in the FAR, PO's should avoid requesting cost or pricing data unless necessary to establish the proposed price is reasonable (FAR 15.402(a)(3)), and they should promote competition (FAR Part 2). For contracts expected to surpass the threshold, the primary way for PO's to bypass the data requirements is via encouraging competition, such as by avoiding sole source contracts, proactively seeking bidders, allowing more "open competition", or loosening specifications.²⁸ Encouraging competition has its own costs: it requires attention, increases the risk of bid disputes and legal costs to settle, and requires PO's to verify offered prices are realistic. However, promoting competition is often still less costly than requiring cost or pricing data, which entails processing costs, potentially higher contract prices, and project delays as submission of certified cost or pricing data can add weeks or even months to award times.

Second, PO's may promote competition to avoid audit involvement. Audit organizations, such as the DOD's Defense Contracting Audit Authority (DCAA) often have special requirements for TINA-covered contracts that require additional documentation from PO's. Similarly, incurred-cost audits, which are common for cost-plus contracts, require extra effort from PO's when suppliers submit cost or pricing data. To avoid audit involvement, PO's may prefer to promote competition.

Third, data requirements may hinder PO's from awarding contracts to a favored supplier due to familiarity or higher expected performance rather than to competitors who are

²⁸ PO's could conceivably decide to be more "optimistic" in their expectations of adequate competition to take advantage of TINA's exception, which should have an insignificant effect on competition or even a negative effect as PO's could substitute competitive solicitations for less competitive ones. The extent to which this occurs is likely limited given PO's are monitored by management.

qualified and cheaper overall but likely to deliver lower quality (though acceptable) output.²⁹ Developing relationships with trusted suppliers can be beneficial, and PO's may wish to avoid the attention and monitoring that lower quality or newer suppliers often need. However, forcing suppliers to be transparent about their costs can make it tougher for PO's to convince their management that selecting their preferred suppliers is in the government's (and not just the PO's and favored supplier's) best interest or, in the case of a sole source contract, that only a single supplier is capable of providing the good or service. Requirements to disclose cost data thus may lead PO's to put effort towards relaxing contract specifications and opening the competition to alternative suppliers.

Last, improving suppliers' perceptions of fairness may increase competition. Greater disclosure requirements for favored suppliers who historically may not have faced much scrutiny could signal increased impartiality in the procurement system. As trust in the procurement process increases, more bidders may compete. Overall, data requirements could improve competition by focusing the procurement system's attention on affected contracts.

These channels by which supplier data policies can affect contract competition are summarized below. I predict H2b will hold (that is, the *procurement system effect* will dominate):

H2a: TINA's data requirements are likely to *decrease* competition if the *supplier effect* dominates the *procurement system effect*.

H2b: TINA's data requirements are likely to *increase* competition if the *procurement system effect* dominates the *supplier effect*.

3.1.3 Performance Hypotheses

I identify two opposing channels by which supplier data requirements can impact contract performance in terms of renegotiations and cost overruns. The first is the *data/attention*

²⁹ Cost data can also reduce various forms of collusion between PO's and suppliers such as accepting bribes and providing favored suppliers with useful information that is not shared with other suppliers.

effect. Supplier data requirements may cause the procurement system to improve monitoring of above-threshold contracts due to additional data and/or greater attention to avoid the data, resulting in improved contract performance, such as reduced renegotiations and cost overruns (Warren [2014], Decarolis et al. [2020]). To the extent TINA increases competition, this may also press suppliers to improve their quality. In addition, PO's often shift risk to bidders via cost-plus contracts but may do so less frequently if data requirements reduce information asymmetry due to supplier data and/or improved competition. If data requirements aid PO's in writing more complete contracts, then contracts may also become easier to monitor. If the *data/attention effect* dominates, I would expect data requirements to *improve* performance.

The second effect on performance is the *undercut/discretion effect*. Higher competition has been found to lead to two related consequences: reduced PO discretion and more price undercutting – both of which can result in poorer performance. Undercutting, or “buying in”, is a strategy by which suppliers lower their prices to undercut competitors but then attempt to compensate for diminished profits by generating additional revenue via negotiating changes to the contract later (Decarolis [2014]).³⁰ If suppliers face heightened competition due to data requirements, they may become likelier to use this strategy. Also, if PO's have less discretion to choose preferred (higher quality) suppliers due to more open competition procedures, then lower-quality bidders may lead to poorer performance. To the extent data requirements heighten competition, the number of contract modifications and cost overruns may increase (Alesina and Tabellini [2008]). Thus, if the *undercut/discretion effect* dominates, data requirements should have a *negative* effect on performance.

The channels by which supplier data policies can affect performance are summarized below.³¹ I predict H3a will hold (i.e., the *data/attention effect* will dominate):

³⁰ Suppliers also may lower the quality of their goods or services, but the government has specifications and quality assurance methods that limit this tactic, and data are unavailable to study this phenomenon.

³¹ As long as the *data/attention effect* plays a role, regardless of whether it or the *undercut/discretion effect* dominates, I would expect a negative effect on cost-plus contracts, because the *undercut/discretion effect* should not affect completeness.

H3a: TINA's data requirements are likely to *improve* performance if the *data/attention effect* dominates the *undercut/discretion effect*.

H3b: TINA's data requirements are likely to *decrease* performance if the *undercut/discretion effect* dominates the *data/attention effect*.

Figure 2 summarizes these and the rest of the hypotheses in this section.

3.2 Sample Construction

In this study, I focus on the TINA thresholds of \$750,000 and \$2,000,000 (see Section 2.2). The \$750,000 threshold for all federal agencies (that follow the FAR), in effect from October 1st, 2015 to June 30th, 2018, increased to \$2,000,000 on July 1st, 2018 for early adopter agencies. These agencies are: the DOD, Department of Agriculture, Agency for International Development, Department of the Treasury, NASA, Department of Energy, and Department of Veteran Affairs.³² Such a large shift in the threshold is rare (see Appendix B). The reason for this sizable increase was to save taxpayers money by lowering suppliers' data management costs in the region where TINA's requirements are relaxed.

The \$750,000 and \$2,000,000 TINA thresholds are particularly ripe for study because they are relatively far apart, allowing me to perform placebo and other robustness checks for stronger inference.³³ Importantly, these two thresholds were effective during periods for which the Federal Procurement Data System (FPDS) - Next Generation populates the data used in this study. The FPDS tracks federal contracts from the time of award. Moreover, both thresholds are effective during time periods relatively free from contemporaneous confounding events, such as major U.S. conflicts or economic recessions.³⁴

³² I classify early adopters as agencies for which regulatory documentation confirms the threshold changed before the FAR update in 2020 (see Appendix B). The Department of Veteran Affairs' threshold change went into effect on August 6th, 2018, but applied retroactively to contracts signed after June 30th, 2018.

³³ To run these tests, it is necessary that the TINA thresholds studied are chronologically adjacent and far enough away from other threshold values.

³⁴ Another reason for studying the \$750,000 and \$2,000,000 thresholds is they were the first TINA thresholds to move at the same time and to the same value as the Cost Accounting Standards threshold, allowing me to study the effects of both together. See Appendix B for details.

I focus on prime contracts signed by early adopters.³⁵ Sealed bid and commercial solicitations are exempt from TINA’s data requirements.³⁶ Therefore, I restrict my analyses to contracts that are the least likely to be exempt: negotiated, non-commercial contracts.³⁷ Small Business Innovation Research Program contracts are also excluded due to a lack of price competition (see Appendix A.1.2 for details). The “Full Baseline” sample includes all agency contracts that meet the above criteria with prices between \$250,000 and \$3,000,000 during periods when *either* the \$750,000 or \$2,000,000 threshold was in effect.³⁸ I exclude contracts below \$250,000, because several early adopters used a simplified acquisition threshold of \$250,000 during the study period.³⁹ My Full Baseline sample is primarily used for descriptive exercises.

Next, I create two threshold-specific Baseline samples for use in my primary analyses (specified in Section 3.3). I do this in two steps. First, I split the Full Baseline sample into two periods corresponding with the effective periods for each threshold. Specifically, the “\$750,000 Threshold” sample contains contracts signed between October 1st, 2015 and June 30th, 2018. The “\$2,000,000 Threshold” period starts August 6th, 2018, the date the VA’s deviation from FAR was signed, and ends on March 13th, 2020, the day the White House instituted emergency COVID procurement rules.⁴⁰ Second, for each sample, I apply a bandwidth centered around the effective threshold (see Section 3.3).

These price ranges are likely to be material to even the largest of private companies.

³⁵ I exclude contracts signed by the U.S. Defense Logistics Agency (a bureau of the DOD) due to several peculiarities (see Section A.1.2 in the Online Appendix). However, retaining these contracts in my samples does not change my primary results.

³⁶ Negotiated contracts are also known as “other than sealed bid” contracts (FAR 15.000). Cost or pricing data would not be as useful for sealed bid contracts, as they are awarded solely based on price.

³⁷ I do not exclude indefinite delivery vehicles (IDVs) because both the master contracts and orders on these contracts are subject to TINA’s data requirements.

³⁸ The TINA threshold applies using a prime contract’s base price plus the value of any unexercised options included in the contract at initial award.

³⁹ Contracts below the simplified acquisition threshold are subject to different rules regarding procurement’s discretion for supplier selection and PO’s are restricted from requiring certified cost or pricing data for these contracts (FAR 15.403-4(a)(2)). The DOD, for example, set its simplified acquisition threshold to \$250,000, effective April 13th, 2018 (see DARS Class Deviation 2018-O0013).

⁴⁰ Contracts signed between July 1st, 2018, and August 6th, 2018, are dropped to lessen the impact of any lag in implementation of the new threshold or spillover effects on Department of Veteran Affairs contracts. My primary findings are not sensitive to this design choice.

However, the federal government negotiates some contracts that cost tens of billions of dollars. Thus, one might argue that contracts in the Baseline samples may be inconsequential to the government. Figure A.1 addresses this concern: panels (a) through (c) show that the density of federal contracts decreases exponentially with price across a variety of price ranges, and panel (d) shows that the threshold-specific Baseline samples used for my analyses contain about 80% of *all* contracts above the two TINA thresholds while each was in effect, and that meet the sample filters described above. See Section A.1.3 of the Online Appendix for further discussion of the price distribution. In sum, the price ranges examined in this study should be highly pertinent.

3.3 Regression Discontinuity Design Specification

To study the effects of TINA's data requirements on contract characteristics, I implement an RDD around each threshold while it is in effect. Formally, for *each* TINA threshold P_c (i.e., \$750,000 and \$2,000,000), I use the corresponding threshold-specific sample (i.e., contracts where $P_i \in [P_c - h, P_c + h]$ and which were signed when the threshold was effective; see Section 3.2) to estimate the following model:

$$Y_i = \alpha_0 + \alpha_1 Distance_i + \alpha_2 Treat_{TINAi} + \alpha_3 Treat_{TINAi} * Distance_i + \delta_i + \eta_i + \chi_i + \epsilon_i, \quad (1)$$

where $Treat_{TINAi}$ is a dummy for contracts priced above the corresponding TINA threshold, leaving contracts below that threshold as control contracts. The coefficient of interest, α_2 , captures the discontinuity in the outcome variable (see below) at the threshold. $Distance = P_i^* = P_i - P_c$ is the distance (in dollars) between the price of contract i and the corresponding threshold.⁴¹ All regressions contain a vector of control variables (δ_i), which includes the original duration of the contract prior to any modifications and a set of dummies indicating whether the contract has been set aside for disadvantaged firms such

⁴¹ *Distance* is divided by 1,000 for exposition of estimated coefficients.

as small businesses or women or minority-owned firms.⁴² η_i and χ_i represent the two-digit product-service code (PSC) and year-quarter fixed effects, respectively. The coefficient α_2 is the RDD estimator and identifies the treatment effect of supplier data requirements. For the RDD around the \$750,000 threshold, bandwidth h is selected to be \$500,000, and for the RDD around the \$2,000,000 threshold, bandwidth h is selected to be \$1,000,000. Contracting offices differ in the mix of contracts they originate and the audit offices assigned to them (audit offices vary in the types of contracts they prefer to audit). Therefore, I cluster standard errors at the agency-contracting office level.⁴³

The vector of contract outcomes I study, Y , contains variables related to cost or pricing data, competition, contract completeness, and contract performance. *CP Data* is a dummy that equals 100 if cost or pricing data is required with the bid, and zero otherwise. The competition variables are *Sole Source* and *Multiple Offers*.⁴⁴ *Sole Source* is an indicator set to 100 if the contract is awarded as part of a sole source solicitation (i.e., all but one bidder is excluded), and zero otherwise. Given TINA's competition exception is based on whether the contract is expected to receive multiple bids, I also examine *Multiple Offers*, an indicator that equals 100 if the contract receives multiple bids, and zero otherwise.⁴⁵ Importantly, *Sole Source* and *Multiple Offers* are not the converse of each other. A contract can have a solicitation where many bidders are *allowed* to bid but only a single bid is received (in which case *Multiple Offers* = 0 and *Sole Source* = 0).

Also included in Y are contract performance and completeness variables. *Log(Number of Modifications)* contains the natural logarithm of the number of modifications (i.e., contract changes). Following Decarolis et al. [2020], I exclude modifications that are unlikely to have

⁴² These quotas are set by the Small Business Administration. Each agency head sets its own targets by set-aside type, and these targets are not influenced by PO's. Anecdotally, a contract is often simply declared a set aside if no other type of supplier bids. The primary results of my study hold if I remove set-aside controls from my analyses.

⁴³ For example, the Defense Contracting Audit Authority offices vary in the minimum cost-plus contract price they will audit and are more likely to audit higher-value contracts than lower-value ones.

⁴⁴ Note that data on whether the PO expected adequate competition prior to bidding is not available.

⁴⁵ Table A.4 in the Online Appendix shows that the general results of the paper hold when using *Log of the Number of Offers* and *Open Competition* as alternative, less direct competition measures.

performance implications (e.g., contractor address changes).⁴⁶ I also exclude changes that are explicit at the initial contract signing (i.e., exercise of options). *Cost Overrun* is a dummy that equals 100 if the contract has a modification that results in a price increase, and zero otherwise.⁴⁷ All variables are detailed in Appendix A.

Columns (1), (2) and (3) of Table 2 contain the means of the primary variables for contracts in the three Baseline samples used in this study: Full Baseline, \$750,000 Baseline, and \$2,000,000 Baseline. In the Full Baseline sample, approximately 18.5% of contracts require cost or pricing data, with an additional 1.0% having the data requirement formally waived. Approximately 77.8% of contracts are fixed-price, 18.5% are cost-plus, and the rest are time and material contracts.⁴⁸ The average contract in this sample receives 6.9 bids. Sole source contracts constitute 28.2% of contracts. 57.1% of contracts receive multiple bids, leaving 42.9% with one or zero offers. Contracts in the sample received 1.5 modifications on average. The (unconditional) likelihood of a contract having a cost overrun associated with a modification was 17.8%. Contracts written by three DOD bureaus (Army, Air Force, or Navy), by far the largest federal bureaus by procurement volume, comprise 78.5% of the sample. Per Table A.1 in the Online Appendix, contracts that receive one or zero offers require cost or pricing data at a rate of 24.4% (16.7%) in the \$750,000 (\$2,000,000) Baseline sample. Meanwhile, contracts receiving multiple offers require cost or pricing data at just under half the rate: 10.3% (7.3%) for the \$750,000 (\$2,000,000) Threshold Baseline sample. This finding is consistent with PO's requiring cost or pricing data when competition is expected to be insufficient to determine price reasonableness.

An identification assumption behind my research design is that there is not significant

⁴⁶ Specifically, according to the FPDS data dictionary, I exclude all amendments classified as “Additional Work (new agreement, FAR part 6 applies)”, “Novation Agreement”, “Vendor DUNS or name change - Non-Novation” and “Vendor Address Change”.

⁴⁷ TINA’s requirements also apply to modifications above the threshold. Thus, I base both performance variables only on modifications that occur during the threshold period in which the prime contract is signed, so these variables are not affected by the 2018 threshold change. I rely on year-quarter fixed effects to control for any discrepancies in performance of contracts signed earlier versus later in each period.

⁴⁸ In the Full Baseline sample, cost-plus contracts require cost or pricing data about twice as often as fixed-price contracts do: 32.7% versus 15.2% respectively. It is coincidental that the share of contracts requiring cost or pricing data is nearly the exact same as the share of cost-plus contracts in this particular sample.

manipulation of contract prices to circumvent the threshold. Two factors should limit the extent to which suppliers reduce their bid prices below the threshold (i.e., “bunch”). First, TINA requires data based on the prices PO’s expect prior to bidding. Second, data required from suppliers is posted in the solicitation prior to bidding and thus is largely independent of bid prices. However, suppliers may still bunch to avoid certification of data they provide or to influence POs’ expectations of prices for similar future contracts. Further, PO’s may also split contracts (i.e., create multiple lower-value contracts rather than a single higher-value contract) to avoid the data requirements, although splitting to undercut the threshold is explicitly prohibited (FAR 13.003(c)(2)(ii)). In the Online Appendix, Section A.3 shows that any bunching below the threshold is economically insignificant and Section A.4’s results indicate the rate of splitting to undercut the threshold is likewise low.

4 Results

In this section, I present my primary results analyzing the effects of TINA’s supplier data requirements on cost or pricing data (i.e., comprehensive accounting data) submission, contract competition, completeness, and performance.

4.1 Cost or Pricing Data Results

In this section, I assess the effects of TINA’s supplier data requirements on how often cost or pricing data are required. My empirical approach includes graphical and RDD analyses around the TINA threshold while in effect.

Figure 3 visualizes the effect of these data requirements on whether cost or pricing data were required in each threshold period for different samples, described below. Note that when the threshold increased for early adopters in 2018, contracts in the Full Baseline sample between \$750,000 and \$2,000,000 were no longer subject to the data mandate. The y-axis is *CP Data*, the share of contracts requiring cost or pricing data. The x-axis is the contract price.

Panel (a) contains the Full Baseline sample, and shows that very few contracts below the \$750,000 cutoff require cost or pricing data in either period. This makes sense, because it is costly to gather and process this additional information, so PO's tend to only request it when required to do so. As the \$750,000 cutoff is crossed from the left, a sharp increase occurs in the fraction of contracts providing the data in the \$750,000 threshold period as represented by the unshaded circles (in blue), and that fraction remains higher for all prices above \$750,000. During the period after the threshold increases to \$2,000,000 (corresponding with the shaded circles in red), the discontinuity shifts to the right, from \$750,000 to \$2,000,000, indicating that TINA's requirements significantly impact how often cost or pricing data are required for bids. These discontinuities do not occur at each threshold value when the threshold is not in effect. These findings are even more pronounced in panel (b), which restricts the sample to definitive and purchase order contracts (which are subject to less competition historically and thus less likely to be exempt from TINA's data requirements). As a placebo test, panel (c) shows that commercial contracts, which are exempt from TINA's data requirements, do not exhibit a discontinuity in the rate of data being required across either threshold while in effect.⁴⁹

Table 3 presents results from the RDD (see equation 1) exploring how the data requirements affect the data being required around each threshold while it is in effect. Column (1) uses the \$750,000 Threshold Baseline sample, and column (2) uses the \$2,000,000 Threshold Baseline sample. The dependent variable is whether cost or pricing data is required. The coefficient of interest is α_2 (on $Treat_{TINA}$), which captures the effect of the requirements on how often the data are required. Columns (1) and (2) demonstrate that the requirements statistically and economically significantly increase the frequency with which cost or pricing data are required by 2.81 pp (17.2%) and 3.85 pp (21.9%) for contracts above the \$750,000 and \$2,000,000 thresholds, respectively, compared to below-threshold contracts (though α_2 is

⁴⁹ See Section 5.2 for discussions on definitive, purchase order contracts, and commercial contracts and Table 2 for summary statistics for these samples.

significant only at the 10% level around the \$750,000 threshold).⁵⁰ These results complement the visual evidence in Figure 3, panels (a) and (b), and provide support for H1.

4.2 Competition Results

The results from the competition RDD tests are presented in Table 4. Examining *Sole Source*, columns (1) and (3) show negative and statistically significant coefficients on $Treat_{TINA}$ in each time period, indicating that sole source contracts experience a negative discontinuity at the TINA thresholds. Specifically, the prevalence of sole source contracts decreases by 14.7% ($=3.893/26.51$) and 13.0% ($=3.927/30.20$) for affected contracts above the \$750,000 and \$2,000,000 thresholds, respectively, compared to those below these thresholds. Columns (2) and (4) show that contracts above both thresholds are also significantly more likely to receive multiple offers. The frequency of contracts with multiple bids is greater by 7.5% ($=4.388/58.46$) and 11.4% ($=6.306/55.50$) above the \$750,000 and \$2,000,000 thresholds, respectively, than below them. These results are evidence that TINA’s requirements increase competition. Figures A.3 and A.4 in the Online Appendix contain RDD plots that mirror the findings from this table.

These results suggest that the *procurement system effect* dominates the *supplier effect*. This is a surprising finding, given that it differs from experts’ expectations regarding TINA. However, it makes sense: PO’s promote competition in order to reduce data provision and processing costs and/or a procurement system perceived as fairer increases competition. This positive effect outweighs any negative effects on competition due to suppliers’ data management costs and proprietary concerns as described in Section 3.1.2. However, based on these results it is unclear whether PO’s promote an actual improvement in competition, or whether they promote competition “on paper” by soliciting more bids, but then signaling (directly or indirectly) to their favored supplier they will choose them regardless. Though

⁵⁰ Note that the coefficients on $Distance$ and/or $Treat_{TINA} * Distance$ in the tables in this section are statistically (and in many cases economically) significant in most regressions, which suggests that including these linear trend terms in the specification is warranted.

institutional factors make this unlikely, in the following section, I explore this question further by examining how the threshold affects contract performance and completeness. Additionally, if PO's can reduce the need for cost or pricing data by promoting competition, a primary mechanism underlying the *procurement system effect*, then a substitution effect should occur between multiple bids and how frequently such data are required. In Section 5.3, I show suggestive evidence of such a substitution effect.

4.3 Performance and Completeness Results

In this section, I test whether the *data/attention effect* or the *undercut/discretion effect* dominate (as described in Section 3.1.3) at each value of the TINA threshold. Table 5 presents the results. This table features the coefficient α_2 on $Treat_{TINA}$ from equation 1 with performance and completeness variables as outcomes, using two types of samples. First, the top row contains the focal results: the threshold-specific Baseline samples. Examining the \$750,000 threshold, the coefficient on $Treat_{TINA}$ in column (1) indicates a modest improvement in the rate of re-negotiations of 2.9% for affected contracts. In addition, the significant, negative coefficient on $Treat_{TINA}$ in column (2) indicates that affected contracts are 13.0% ($=1.868/14.42$) less likely to experience a cost overrun. Column (3) shows a small decrease in completeness for affected contracts, as the use of cost-plus contracts declines slightly, but this effect is statistically insignificant.

Next, examining the \$2,000,000 threshold, columns (5) and (6) show the thresholds' effects on contract performance are statistically insignificant. As shown in column (6), the cost-plus type becomes 11.3% ($=2.612/23.19$) less common among affected contracts (significant at the 10% level), suggesting that data requirements may help PO's to write more complete contracts as the government's information environment improves. Figures A.5 and A.6 in the Online Appendix provide the corresponding RDD plots, which align with these results.

Taken together, this evidence suggests that the *data/attention effect* dominates the

undercut/discretion effect, monitoring and the subsequent performance of contracts improves due to the data requirements. This effect appears to occur at least partly due to PO’s originating more complete contracts due to the data requirements. Figure 2 summarizes the observed effects on cost or pricing data, competition, and performance from this study.⁵¹

An alternative explanation for my competition findings in Section 4.2 is that PO’s intentionally promote competition to avoid requiring additional data but then signal to their favored suppliers (directly or indirectly) that they will choose them regardless.⁵² Although such collusion to avoid the data requirements is unlikely due to institutional factors (e.g., illegality, monitoring by management, bid protests), it could negate any benefits from increased bidding (e.g., reduced prices) and harm competitors and the government by wasting resources. Of course, one cannot observe the counterfactuals of the number of bidders and who the winners would have been if the data requirements were not in effect, and studying the effect of increased bidding on equilibrium prices presents its own estimation challenges. However, such collusion implies PO’s simply select the same suppliers that they would have if the data requirements were not in effect and do not require any additional data, which should not have an effect on contract performance or completeness.

To investigate this alternative hypothesis, I test whether my performance and completeness results hold for contracts that do not require cost or pricing data. This hypothesis predicts insignificant results, while the *data/attention effect* predicts my results should still hold, due to PO attention. As shown in the second row of Table 5, my previous results are unchanged.⁵³ These findings suggest PO’s improving competition “on paper” is not the main driver of my competition results, and that PO attention indeed plays a role in my results.⁵⁴

⁵¹ In untabulated analyses, I plot the coefficients and confidence intervals for each outcome in this section using bandwidths from \$100,000 to \$500,000 for the \$750,000 Threshold sample and \$200,000 to \$1,000,000 for the \$2,000,000 Threshold sample. These plots show that my conclusions are generally supported using these alternative bandwidths.

⁵² Competition should be beneficial for assuring reasonable prices even if the favored supplier is still chosen, provided the bidders believed the acquisition was truly competitive.

⁵³ My main performance results also hold when I restrict the threshold samples to contracts requiring cost or pricing data, as expected, which suggests cost or pricing data also improves monitoring (untabulated).

⁵⁴ My competition results hold only for contracts that do not require cost or pricing data, which is consistent with this interpretation.

5 Robustness Checks

In this section, I present the results of robustness checks of my main findings from Section 4. Then, I explore whether these results differ across various samples in ways that are consistent with TINA’s requirements driving my findings. Finally, I show my main results hold using a difference-in-discontinuities design, exploiting the 2018 TINA threshold change as a natural experiment.

5.1 Placebo Tests

To further validate my findings in Section 4, I conduct placebo RDD tests. For these tests, I examine the effect of the \$750,000 and \$2,000,000 cutoffs on each outcome variable from Section 4, while each threshold is *not* in effect. These tests use samples obtained by applying the same filters as the threshold-specific Baseline samples but using an alternative time period for each threshold.⁵⁵ In contrast to the RDD results from the time periods during which the thresholds were in effect (see Tables 3 through 5), in these alternative time periods I expect the coefficient α_2 on $Treat_{TINA}$, which now captures the effect of the placebo thresholds on contract outcomes, should by and large be insignificant. These placebo test results are presented in Tables A.8 through A.10 in the Online Appendix. Importantly, all estimated coefficients on $Treat_{TINA}$ for the Baseline samples (in the first row of each table) are statistically and economically insignificant as expected (the remaining rows in these tables are related to heterogeneity test results, discussed in Section 5.2). These findings constitute additional evidence that my primary results are driven by the supplier data requirements.

⁵⁵ Specifically, for the first placebo test I use contracts around \$750,000 (i.e., from \$250,000 to \$1,250,000), but in the \$2,000,000 threshold period. For the second, I use contracts around \$2,000,000 (i.e., from \$1,000,000 to \$3,000,000) in the \$750,000 threshold period.

5.2 Heterogeneity Tests

To further explore whether my results in Section 4 are driven by TINA’s data requirements, I devise a set of heterogeneity tests that analyze how the effects of the data threshold vary across different samples of contracts that are likely to experience stronger or weaker effects due to TINA’s requirements (see Section A.2.1 of the Online Appendix for details and the full results).

First, I compare the effects of TINA’s requirements on indefinite delivery vehicles (IDVs) and non-IDVs (i.e., definitive and purchase order contracts). IDVs entail more frequent competition than non-IDVs (because they tend to involve less sole source contracts and more bids, per Table A.3 in the Online Appendix). Thus, IDVs should be more frequently exempt from the data requirements. Consistent with this prediction, I find that non-IDVs exhibit statistically stronger effects from the threshold than IDVs in terms of data required and performance.

Second, I compare the effects of the threshold on contracts for supplies (i.e., goods), which are often standardized, against services and works contracts, which tend to have ex-post cost uncertainty, multidimensional quality heterogeneity and limited contractibility (Tadelis [2002]). Contracts for supplies also face less competition (see Table A.3 in the Online Appendix). Thus, I predict it is easier for suppliers to provide cost or pricing data and for PO’s to promote competition for supplies than for services and works contracts. Also, services contracts are less straight-forward to monitor than contracts for supplies, as evidenced by more modifications for services. Thus, I expect service contracts’ performance to benefit more from additional monitoring due to data requirements. I find evidence in favor of each of these predictions.

Third, contracts expected to receive multiple offers are exempt from the data requirements; thus, I predict that contracts of product service codes that historically tend not to receive multiple offers will exhibit a significantly stronger effect on competition due to the threshold, compared to product service codes whose contracts tend to have multiple bids. My

findings confirm this prediction. Importantly, placebo tests using each subsample described above show that only contracts subject to the TINA threshold (while in effect) exhibit a response at the threshold value.

I also analyze the effects of the threshold on commercial contracts (which are excepted from TINA's requirements) versus commercial contracts. As anticipated, I find only non-commercial contracts exhibit a discontinuity at the thresholds solely while they are in effect.⁵⁶ Together, the results of these heterogeneity tests suggest that my primary results in Section 4 are indeed driven by TINA's data requirements.

5.3 Substitution Between Cost or Pricing Data and Competition

The FAR outlines three ways for price reasonableness to be established below the TINA threshold: expecting multiple (independent) bids, PO judgement, and provision of additional data. A substitution effect (i.e., a negative relationship) might thus occur between the frequency of requiring cost or pricing data and that of contracts with multiple bids. Furthermore, above the threshold, these options decrease to two: expecting multiple bidders or additional data submission. Therefore, any substitution effect between multiple bids and comprehensive data submission should be stronger above the threshold.⁵⁷ To test these substitution predictions, I modify equation 1 from Section 3.3 to include an indicator variable for multiple bids and its interactions with $Treat_{TINA}$ and $Distance$ (see Section A.2.2 of the Online Appendix for details on the implementation and results).

My results suggest that below the threshold there is a substitution effect: below-threshold contracts with multiple offers have a 52.3% ($=11.746/22.19$) lower likelihood of the data being required than below-threshold contracts without multiple offers (the base group).

⁵⁶ As an additional robustness check I find my primary results hold when restricting the Baseline samples to contracts signed by the three largest DOD bureaus: the Army, Air Force, and Navy. Also, research and development contracts can be subject to different procedures in the FAR. In untabulated results, I find my main findings hold when excluding these contracts.

⁵⁷ A possible counterpoint is that the FAR permits PO's to request cost or pricing data (uncertified), regardless of whether multiple bids are received, if it is necessary to establish a price is reasonable (as mentioned in Section 2.2), per FAR 15.403-3(a)(1)(ii). Therefore, this substitution effect may not be detectable below or even above the threshold.

I also find the TINA threshold enhances the substitution effect. In fact, the results suggest that my previous finding that the TINA threshold increases the rate cost or pricing data is required (see Section 4.1) is concentrated among contracts without multiple offers for both the \$750,000 and \$2,000,000 thresholds. Together, these results suggest that competition and accounting information can act as substitutes for the purposes of reducing information asymmetry for supply contracts. They also provide verification that PO's can avoid requiring cost or pricing data by promoting competition.

These results suggest that cost or pricing data being required and contract competition, as well as other contract outcomes, are likely simultaneously determined. However, it becomes prohibitively difficult to obtain multiple exogenous instruments to jointly estimate all contractual terms. Thus, I estimate the cost or pricing data, competition, completeness, and performance regressions from Section 4 as a system of equations using a seemingly unrelated regression model, allowing the error terms to be correlated in all regressions. My primary findings are robust to this estimation (untabulated).

5.4 Difference-in-Discontinuities Design

In this section, I discuss results of a difference-in-discontinuities design (“Diff-in-Disc”) as an additional robustness check of my main findings from Section 4. Section A.2.3 of the Online Appendix contains the specification and details about the results. This design exploits the change in the TINA threshold from \$750,000 to \$2,000,000 in 2018 as an additional source of exogenous variation to analyze the impact of data requirements on contract outcomes. A difference-in-discontinuities design has an important advantage over an RDD: if a persistent confounding factor similarly affects the variable of interest around the threshold both before and after a policy change, then under certain assumptions (see Grembi et al. [2016]), that effect can be “differenced out” across the two periods.⁵⁸ The results of these tests echo those of my RDD analyses in Section 4, as anticipated.

⁵⁸ However, this design is more susceptible to confounding policies introduced over time that have differential effects on above and below-threshold contracts. See Section A.2.3 of the Online Appendix for details.

6 Conclusion

This paper examines the effect on supply contracting outcomes of a buyer policy that mandates suppliers privately provide accounting information. Specifically, it analyzes the effect of such a policy on contract competition (i.e., the number of bids), completeness (i.e., frequency of cost-plus and fixed-price contracts), and performance (i.e., the prevalence of re-negotiations and cost overruns) by exploiting quasi-experimental variation introduced by a regulation requiring federal suppliers of contracts above a certain value submit detailed accounting data, called cost or pricing data, to the government.

My primary findings are three-fold. First, as evidenced by graphical and RDD analyses, the TINA threshold substantially increases the rate at which cost or pricing data is required. This rate decreases when the government expects multiple bids, indicating a substitution effect between accounting information and competition, an effect that is enhanced by the TINA threshold. Second, the data requirements result in overall *greater* competition, which is surprising to practitioners, who tend to predict that data management and proprietary costs will dissuade competition. My findings suggest this higher competition results from the procurement system attempting to reduce costly information requirements by promoting competition and/or the system attracting additional suppliers because it is perceived as fairer. Both of these outcomes can be achieved when PO's pay more attention to affected contracts. Third, I find improved contract performance and completeness for affected contracts, likely due to closer monitoring.

In 2018, the government increased the TINA threshold to lower suppliers' data management costs, thereby saving taxpayers money. Information on the intended effects of TINA's requirements on competition is not available, but if this policy only lowers supplier costs, then relaxing the requirements should encourage competition. It is possible, however, that this change had unintended consequences: relaxing TINA's requirements for lower-priced contracts means PO's are less incentivized to seek an exemption in the form of adequate competition for contracts in this price range. Saving PO resources on lower-dollar

contracts could allow PO's to focus on higher-dollar contracts above the new threshold. In this way, increasing the TINA threshold may help align the government's limited resources with its higher priority needs, thereby increasing the government's utility.

I find that TINA's requirements improve contract competition, completeness, and performance. However, this paper does not attempt to evaluate the net effect of the 2018 TINA threshold change on the government's overall objective function, mainly because information on actual accounting data management costs saved by suppliers due to the relaxation of TINA's requirements is not readily available to researchers. I also do not analyze how TINA's requirements affect bid prices. Further, it is difficult to assign a dollar value to the benefits of fairer bidding or lower corruption resulting from data requirements. Finally, supplier data requirements likely decrease the government's ability to award contracts swiftly, which would be especially costly for urgent projects. However, data on award phase length and the costs of delaying project awards are not publicly available and thus not examined in this study.⁵⁹

To the best of my knowledge, this is the first study to link mandatory accounting disclosure requirements with explicit contracting outcomes. This study conducts a novel exploration of the effects of TINA's data requirements on the bidding and execution of supply contracts. Further research will be needed to determine whether the findings extend to private sector procurement, which also faces an information asymmetry problem and additional costly data provision requirements but has different laws, enforcement, funding sources, and approval processes.

⁵⁹ Theory suggests that the effects of information disclosure on product market competition depend on the information content of the disclosure (e.g., price versus demand-related) and the nature of the competition (Gal-Or [1986], Darrough [1993], Arya, Mittendorf, and Yoon [2019], Bagnoli and Watts [2015]). A limitation of this study and the wider product markets literature is that theory implies that results are not easily generalizable.

References

- Alesina, A. and G. Tabellini (2008). Bureaucrats or politicians? part ii: Multiple policy tasks. *Journal of Public Economics* 92(3-4), 426–447.
- Arya, A., B. Mittendorf, and D.-H. Yoon (2019). Public disclosures in the presence of suppliers and competitors. *Contemporary Accounting Research* 36(2), 758–772.
- Bagnoli, M. and S. G. Watts (2015). Competitive intelligence and disclosure. *The RAND Journal of Economics* 46(4), 709–729.
- Bajari, P., S. Houghton, and S. Tadelis (2014). Bidding for incomplete contracts: An empirical analysis of adaptation costs. *American Economic Review* 104(4), 1288–1319.
- Ball, R. (1992). The earnings-price anomaly. *Journal of Accounting and Economics* 15(2-3), 319–345.
- Bens, D. A., P. G. Berger, and S. J. Monahan (2011). Discretionary disclosure in financial reporting: An examination comparing internal firm data to externally reported segment data. *The Accounting Review* 86(2), 417–449.
- Berger, P. G. and R. N. Hann (2007). Segment profitability and the proprietary and agency costs of disclosure. *The Accounting Review* 82(4), 869–906.
- Bernard, D. (2016). Is the risk of product market predation a cost of disclosure? *Journal of Accounting and Economics* 62(2-3), 305–325.
- Bernard, D., D. Burgstahler, and D. Kaya (2018). Size management by european private firms to minimize proprietary costs of disclosure. *Journal of Accounting and Economics* 66(1), 94–122.
- Blankespoor, E., E. deHaan, and I. Marinovic (2020). Disclosure processing costs, investors' information choice, and equity market outcomes: A review. *Journal of Accounting and Economics* 70(2-3), 101344.
- Bodenheimer, D. Z. and B. T. McLaughlin (2018). Defective pricing and the false claims act.
- Breuer, M. (2021). How does financial-reporting regulation affect industry-wide resource allocation? *Journal of Accounting Research* 59(1), 59–110.
- Breuer, M., C. Leuz, and S. Vanhaverbeke (2019). Reporting regulation and corporate innovation.

- Brogaard, J., M. Denes, and R. Duchin (2021). Political influence and the renegotiation of government contracts. *The Review of Financial Studies* 34(6), 3095–3137.
- Carril, R. (2021). *Rules versus discretion in public procurement*.
- Carril, R., A. Gonzalez-Lira, and M. S. Walker (2020). Competition and contract performance: Evidence from U.S. defense procurement. *Unpublished paper*.
- CBO (2020). “The Federal Budget in 2019: An Infographic”. Accessed at: <https://www.cbo.gov/publication/56324>.
- Christensen, H. B., V. V. Nikolaev, and R. Wittenberg-Moerman (2016). Accounting information in financial contracting: The incomplete contract theory perspective. *Journal of Accounting Research* 54(2), 397–435.
- Costello, A. M. (2013). Mitigating incentive conflicts in inter-firm relationships: Evidence from long-term supply contracts. *Journal of Accounting and Economics* 56(1), 19–39.
- Dahl, S. S. (1988). Ethics on the table: Stretching the truth in negotiations. *Rev. Litig.* 8, 173.
- Darrough, M. N. (1993). Disclosure policy and competition: Cournot vs. Bertrand. *Accounting review*, 534–561.
- Decarolis, F. (2014). Awarding price, contract performance, and bids screening: Evidence from procurement auctions. *American Economic Journal: Applied Economics* 6(1), 108–32.
- Decarolis, F., L. M. Giuffrida, E. Iossa, V. Mollisi, and G. Spagnolo (2020). Bureaucratic competence and procurement outcomes. *The Journal of Law, Economics, and Organization* 36(3), 537–597.
- Duguay, R., T. Rauter, and D. Samuels (2020). The impact of open data on public procurement. *Unpublished paper*.
- Federal News Network (2021). “DoD’s commercial buying challenges”. Accessed at: <https://federalnewsnetwork.com/commentary/2021/10/dods-commercial-buying-challenges/>.
- Gal-Or, E. (1986). Information transmission—cournot and bertrand equilibria. *The Review of Economic Studies* 53(1), 85–92.
- GAO (2020). “A Snapshot of Government-wide Contracting for FY 2019”. Accessed at: <https://www.gao.gov/blog/snapshot-government-wide-contracting-fy-2019-infographic>.

- Granja, J. (2018). Disclosure regulation in the commercial banking industry: Lessons from the national banking era. *Journal of Accounting Research* 56(1), 173–216.
- Grembi, V., T. Nannicini, and U. Troiano (2016). Do fiscal rules matter? *American Economic Journal: Applied Economics*, 1–30.
- He, J., K. Li, N. Li, and W. Zhang (2021). Proprietary information cost of contracting with the government. *Unpublished paper*.
- Healy, P. M. and K. G. Palepu (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics* 31(1-3), 405–440.
- Heese, J. and G. Pérez-Cavazos (2019). Fraud allegations and government contracting. *Journal of Accounting Research* 57(3), 675–719.
- Iimi, A. (2013). Testing low-balling strategy in rural road procurement. *Review of Industrial Organization* 43(3), 243–261.
- Indjejikian, R. J. (1991). The impact of costly information interpretation on firm disclosure decisions. *Journal of Accounting Research* 29(2), 277–301.
- Jensen, M. C. and W. H. Meckling (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3(4), 305–360.
- Kang, K. and R. A. Miller (2017). Winning by default: Why is there so little competition in government procurement? *Unpublished paper*.
- Lorell, M. A., J. C. Graser, and C. R. Cook (2005). *Price-Based Acquisition: Issues and Challenges for Defense Department Procurement of Weapon Systems*. Santa Monica, CA: RAND Corporation.
- Mohamed, K. A., S. S. Khoury, and S. M. Hafez (2011). Contractor's decision for bid profit reduction within opportunistic bidding behavior of claims recovery. *International Journal of Project Management* 29(1), 93–107.
- OCP (2020). “How Governments Spend: Opening Up the Value of Global Public Procurement”. Accessed at: <https://www.open-contracting.org/wp-content/uploads/2020/08/>

- 0CP2020-Global-Public-Procurement-Spend.pdf.
- OECD (2011). “Competition and Procurement”. Accessed at: <https://www.oecd.org/daf/competition/sectors/48315205.pdf>.
- Palguta, J. and F. Pertold (2017). Manipulation of procurement contracts: Evidence from the introduction of discretionary thresholds. *American Economic Journal: Economic Policy* 9(2), 293–315.
- Saez, E. (2010). Do taxpayers bunch at kink points? *American Economic Journal: Economic Policy* 2(3), 180–212.
- Samuels, D. (2021). Government procurement and changes in firm transparency. *The Accounting Review* 96(1), 401–430.
- Sheffner, D. (2019). When does the government have to disclose private business information in its possession? *Congressional Research Service*.
- Tadelis, S. (2002). Complexity, flexibility, and the make-or-buy decision. *American Economic Review* 92(2), 433–437.
- Tomy, R. E. (2019). Threat of entry and the use of discretion in banks’ financial reporting. *Journal of Accounting and Economics* 67(1), 1–35.
- Warren, P. L. (2014). Contracting officer workload, incomplete contracting, and contractual terms. *The RAND Journal of Economics* 45(2), 395–421.
- Watts, R. L. and J. L. Zimmerman (1986). Positive accounting theory.
- Williamson, O. E. (2002). The lens of contract: private ordering. *American Economic Review* 92(2), 438–443.
- World Bank (2020). “World GDP”. Accessed at: <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD>.

Appendix A Variable Definitions

Table A.1: Variable Definitions

Variable	Definition
CP Data	Equals 100 if cost or pricing data was required to be submitted with proposals, and 0 otherwise.
Cost or Pricing Data Waived	Equals 100 if the contract had an exceptional case waiver from the requirement to submit cost or pricing data, and 0 otherwise.
Cost-Plus	Equals 100 if the contract was of cost-plus type, and 0 otherwise.
Fixed-Price	Equals 100 if the contract was of fixed-price type, and 0 otherwise.
Sole Source	Equals 100 if the contract was only solicited to a single source, and 0 otherwise.
Multiple Offers	Equals 100 if the contract received more than one bid, and 0 otherwise.
Multiple Bids	Defined similarly as Multiple Offers, but equals 1 if the contract received more than one bid, and 0 otherwise.
Open Competition	Equals 100 if the solicitation allowed full and open competition (with or without set asides), and 0 otherwise.
Log(Number of Offers)	The natural logarithm of one plus the number of bids.
Log(Number of Modifications)	The natural logarithm of one plus the number of modifications (see Section 3.3 for details).
Cost Overrun	Equals 100 if the contract had a net increase in cost due to modifications over the threshold period in which the contract was signed, and 0 otherwise.
Treat _{TINA}	Equals 1 if the realized price of the contract was strictly above the corresponding TINA threshold, and 0 otherwise.
Treat _R	Equals 1 if the realized price of the contract is greater or equal to \$750,000 and less than \$2,000,000, and 0 otherwise.
Distance	The difference between the realized price of the contract and the corresponding TINA threshold.
Initial Duration	The original estimated length of the contract (in days) at the time of signing.
Definitive and Purchase Orders	Equals 1 if a contract is a definitive or purchase order contract (i.e., FPDS award type code equals “B” or “D”, respectively), and 0 otherwise.
Indefinite Delivery Vehicle	Equals 1 if a contract is a indefinite delivery vehicle (i.e., any sample contract that is not a definitive or purchase order contract), and 0 otherwise.
Supplies	Equals 1 for contracts for supplies (i.e., FPDS product service code begins a digit 0 through 9), and 0 otherwise.
Services and Works	Equals 1 for contracts for services and works (i.e., FPDS product service code begins with a letter other than “A”), and 0 otherwise.
Research	Equals 1 for research contracts (i.e., FPDS product service code begins with “A”), and 0 otherwise.
Army, Air Force, and Navy	Equals 1 for contracts signed by the Army, Air Force, or Navy, and 0 otherwise.

Notes: Definitions of the variables used in this study.

Appendix B Historical TINA Thresholds

Table B.1: Changes to the Truth in Negotiations Act (TINA) Threshold Over Time

Threshold Value	Year	Federal Agencies Affected	Inflation Adjustment?	Regulatory Act
\$100,000	1962	DOD, Coast Guard, NASA	No	Public Law 87-653
\$500,000	1990	DOD, Coast Guard, NASA	No	Public Law 101-510
\$500,000	1994	All remaining	No	FASA
\$550,000	2000	All	Yes	65 FR 60553
\$650,000	2006	All	Yes	71 FR 57363
\$700,000	2010	All	Yes	75 FR 53129
\$750,000	2015	All	Yes	80 FR 38293
\$2,000,000	2018	Early Adopters	No	Class deviations
\$2,000,000	2020	All remaining	No	85 FR 40071

Notes: The historical values of the Truth in Negotiations Act (TINA) threshold since its inception in 1962. Each threshold applied to all agencies that followed the Federal Acquisition Regulation (FAR) unless otherwise indicated.

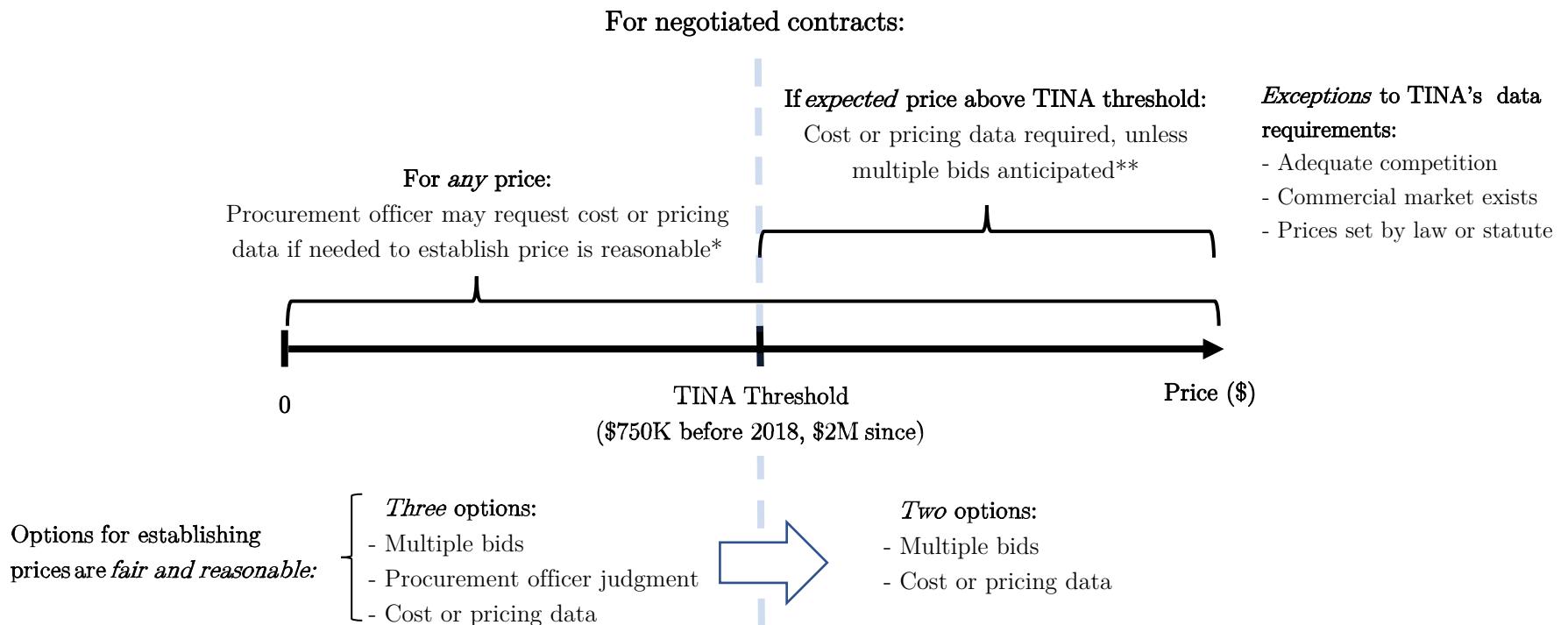
In this section, I discuss changes to the TINA threshold since its inception in 1962. Threshold updates occur via Congressional and regulatory actions, most of which are relatively small, periodic inflation adjustments.

TINA was passed in 1962 with an initial value of \$100,000. The first update to the threshold in 1990 was relatively large to account for the effects of inflation over the prior decades. From 2000 to 2015, all changes to the TINA threshold were smaller inflation adjustments, which have been mandatory every five years for all statutory thresholds since October 1st, 1995 and occur in multiples of \$50,000 (10 U.S.C. 2306a(a)(7) and 41 U.S.C. 254b(a)(7)). Since the \$750,000 threshold was introduced in 2015, the FAR has tied compliance with the Cost Accounting Standards (CAS) to the TINA threshold, rather than a different value as was typical beforehand (see Appendix A.1.1 for details about the CAS threshold).

On December 12th, 2017, Congress passed the National Defense Authorization Act of Fiscal Year 2018, which contained the largest change to the TINA threshold in its history, from \$750,000 to \$2,000,000. Due to bureaucratic delays, the FAR was not updated to

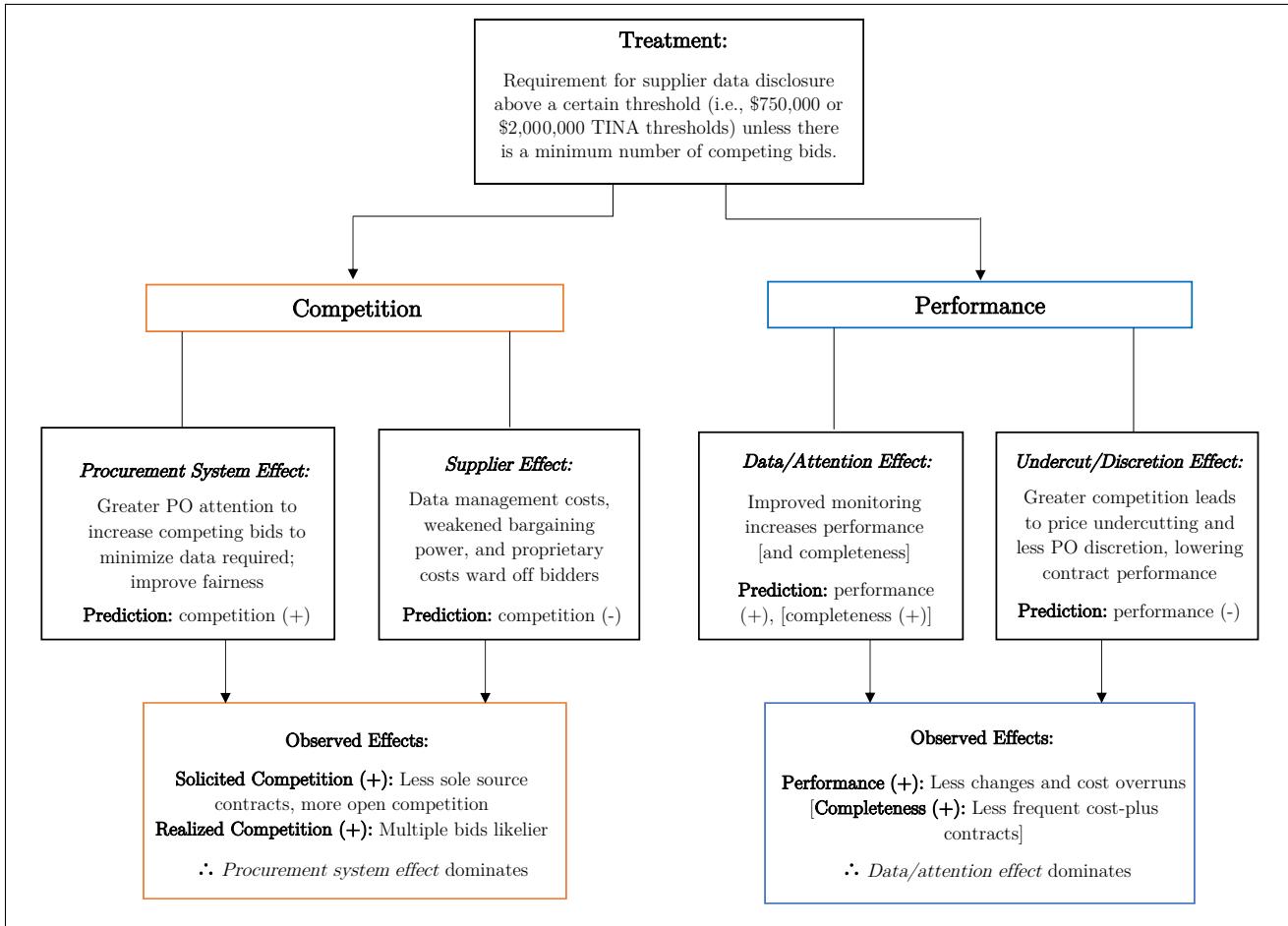
reflect this change until 2020, however. See Section 3.2) for discussion on the threshold change from \$750,000 to \$2,000,000, which agencies passed class deviations from FAR to adopt the threshold earlier than the FAR was updated to reflect this change (i.e., early adopter agencies), and the effective date for each agency.

Figure 1: TINA Threshold Application



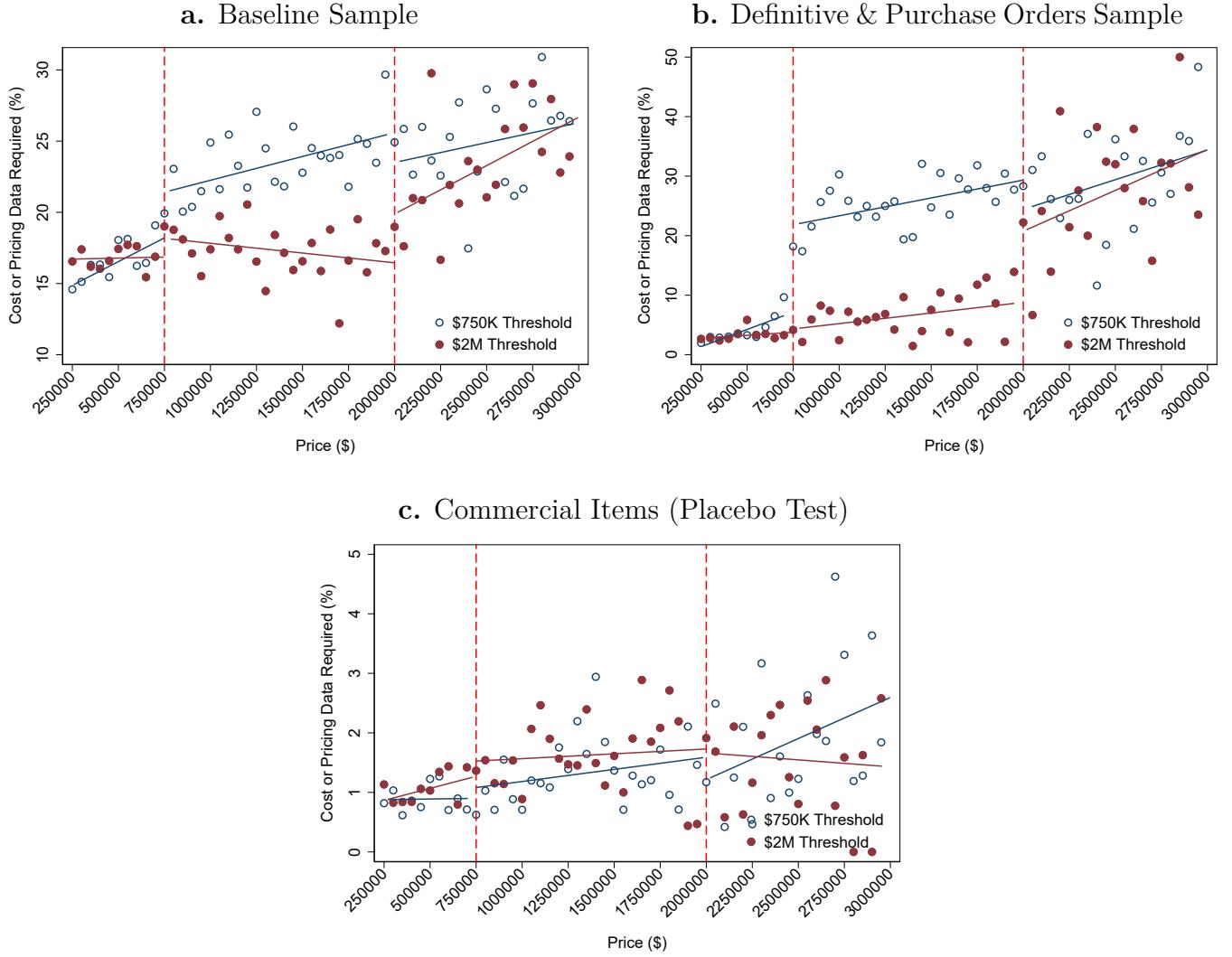
Notes: This figure depicts the application of the TINA threshold. For contracts at any price, procurement officers may request any data necessary to determine a price is reasonable. For contracts with prices expected to exceed the TINA threshold, cost or pricing data (i.e., comprehensive accounting data) is required unless an exception applies. An exception to TINA's data requirements is made for contracts where multiple, independent bidders are expected, a commercial market exists, or prices are set by law or regulation. The TINA threshold changed from \$750,000 to \$2,000,000 for contracts awarded by early adopter agencies after June 30th, 2018. See Section 2.2 and Section A.1.1 of the Online Appendix for more on the TINA threshold. For a list of early adopter agencies and the dates they adopted the new threshold, see Section 3.2. See Section 2.1 for a discussion of how procurement officers can establish prices are fair and reasonable. * For contracts below the TINA threshold but above the simplified acquisition threshold (SAT), procurement officers may request certified data with higher-up approval, unless one of TINA's exceptions is met. ** If a contract's realized (i.e, actual) price is above the TINA threshold, certification of the cost or pricing data submitted is also required.

Figure 2: Predicted and Observed Effects of Supplier Data Requirements on Contract Competition and Performance



Notes: This figure illustrates the predicted and observed effects of buyer requirements for suppliers to provide additional information when insufficient information is available to determine price reasonableness, on contract competition and performance. See Section 3.1 for more on these predicted effects and Section 4 for details about the results. See Appendix A for definitions of the variables listed under observed effects.

Figure 3: Cost or Pricing Data Required Versus Price, Binned Scatter-Plots



Notes: Binned scatter-plots with \$50,000 price bins. Panel (a) contains the Full Baseline sample, which is restricted to negotiated, non-commercial, prime contracts awarded by early adopters and valued between \$250,000 and \$3,000,000. Panel (b) further restricts the sample in panel (a) to definitive and purchase order contracts. Panel (c) is similar to the sample in panel (a), except it includes *only* contracts for commercial items (rather than excluding them), as a placebo test. The y-axis is the variable *CP Data*, which equals 100 when cost or pricing data (i.e., comprehensive accounting data) is required to be submitted with the contract proposal and zero otherwise. Each dot represents the mean of the y-variable across all contracts in the price bin for the time period shown. Unshaded circles (in blue) correspond to contracts signed during the period when the \$750,000 TINA threshold was effective. Shaded circles (in red) correspond to contracts signed in the period when the \$2,000,000 TINA threshold was effective. Early adopters are defined as agencies that deployed the \$2,000,000 TINA threshold in 2018. See Section 3.2 for a list of early adopter agencies and when each threshold applied for each agency.

Table 1: Dollars Obligated to and Number of Contracts Signed by Federal Agencies: Negotiated, Non-Commercial, Prime Contracts Valued Over \$250,000

Rank	Agency	Early Adopter?	Fiscal Year						Total	% of All Agencies
			2016	2017	2018	2019	2020 (Until COVID)			
1	Department of Defense (DOD)	Yes	65.9 (36,978)	71.7 (36,082)	81.6 (35,067)	94.0 (40,174)	29.8 (11,598)	343.1 (159,899)	78.6% (74.2%)	
2	Department of Health and Human Services (HHS)	No	3.9 (2,147)	3.7 (1,919)	3.1 (1,750)	4.7 (2,010)	1.1 (322)	16.5 (8,148)	3.8% (3.8%)	
3	Department of Veterans Affairs (VA)	Yes	2.7 (1,623)	4.2 (1,297)	2.5 (1,274)	2.2 (1,462)	0.4 (285)	12.1 (5,941)	2.8% (2.8%)	
4	Department of Homeland Security (DHS)	No	2.9 (1,279)	2.6 (1,237)	2.9 (1,321)	2.6 (1,099)	0.5 (284)	11.5 (5,220)	2.6% (2.4%)	
5	Department of State (DOS)	No	1.9 (888)	3.4 (939)	2.4 (937)	1.8 (924)	0.1 (173)	9.6 (3,861)	2.2% (1.8%)	
6	General Services Administration (GSA)	No	1.9 (1,321)	2.6 (1,325)	1.7 (1,147)	2.0 (1,272)	0.6 (388)	8.8 (5,453)	2.0% (2.5%)	
7	Department of Justice (DOJ)	No	1.4 (970)	1.4 (894)	0.9 (820)	1.4 (835)	0.5 (379)	5.6 (3,898)	1.3% (1.8%)	
8	Department of the Treasury (TREAS)	Yes	1.8 (558)	1.4 (520)	0.6 (305)	0.8 (391)	0.4 (119)	4.9 (1,893)	1.1% (0.9%)	
9	Department of Transportation (DOT)	No	1.0 (1,449)	1.0 (1,352)	1.1 (1,544)	1.1 (1,389)	0.4 (424)	4.6 (6,158)	1.1% (2.9%)	
10	Department of the Interior (DOI)	No	0.8 (805)	0.8 (688)	0.8 (727)	0.8 (770)	0.1 (128)	3.3 (3,118)	0.8% (1.4%)	
11	Agency for International Development (USAID)	Yes	1.0 (405)	0.7 (376)	0.6 (274)	0.8 (336)	0.2 (138)	3.3 (1,529)	0.8% (0.7%)	
12	National Aeronautics and Space Administration (NASA)	Yes	0.6 (460)	0.5 (395)	0.5 (449)	0.8 (528)	0.1 (151)	2.6 (1,983)	0.6% (0.9%)	
13	Department of Agriculture (USDA)	Yes	0.6 (646)	1.0 (810)	0.4 (544)	0.5 (647)	0.1 (56)	2.5 (2,703)	0.6% (1.3%)	
14	Department of Commerce (DOC)	No	0.5 (381)	0.4 (300)	0.4 (304)	0.5 (307)	0.1 (72)	2.0 (1,364)	0.5% (0.6%)	
15	Department of Housing and Urban Development (HUD)	No	0.5 (93)	0.6 (69)	0.4 (66)	0.3 (81)	0.1 (38)	1.8 (347)	0.4% (0.2%)	
								All Early Adopter Agencies Total:	369.1 (174,624)	84.6% (81.1%)

†

Notes: Dollars (in billions) obligated to negotiated, non-commercial, prime contracts valued over \$250,000, with counts of these contracts signed in parentheses, by fiscal year. The last two columns present totals and shares of all such federal contracts across the time period examined. This table ranks the top 15 federal agencies by total dollars obligated to such contracts (valued above \$250,000 each). The sample follows the Full Baseline sample's time period, spanning between October 1st, 2015 (i.e., the beginning of fiscal year 2016) and March 13th, 2020 (i.e., the date the COVID emergency procurement orders were issued), as described in Section 3.2. The last column contains the percentage that the dollars obligated to (contract counts of) a given agency comprise of all federal agencies' dollars obligated (contract counts) for such contracts. In the bottom right corner, totals and shares of contracts are presented for *all* early adopter agencies (including those not listed in this table). Early adopters are defined as agencies that deployed the \$2,000,000 TINA threshold in 2018. See Section 3.2 for the full list of early adopter agencies.

Table 2: Descriptive Statistics of the Baseline Samples

	Baseline		
	(1)	(2)	(3)
	Full	\$750,000 Threshold	\$2,000,000 Threshold
Cost or Pricing Data Required (%)	18.529 (0.130)	17.689 (0.186)	19.291 (0.385)
Cost or Pricing Data Waived (%)	0.939 (0.032)	0.936 (0.047)	0.715 (0.082)
Cost-Plus Contract (%)	18.514 (0.130)	16.962 (0.183)	24.828 (0.422)
Fixed Price Contract (%)	77.715 (0.140)	79.492 (0.197)	72.293 (0.437)
Number of Offers Received	6.907 (0.171)	6.461 (0.185)	9.004 (0.804)
Sole Source (%)	28.269 (0.151)	26.740 (0.216)	30.080 (0.448)
Multiple Offers (%)	57.188 (0.190)	58.461 (0.254)	56.044 (0.639)
Open Competition (%)	38.981 (0.164)	41.914 (0.241)	37.124 (0.472)
Number of Modifications	1.530 (0.008)	1.421 (0.012)	1.852 (0.023)
Modification (%)	60.978 (0.164)	58.557 (0.240)	69.968 (0.448)
Cost Overrun (%)	17.835 (0.128)	14.969 (0.174)	26.067 (0.429)
Initial Duration (Days)	362.490 (1.086)	331.518 (1.468)	443.161 (3.304)
Definitive and Purchase Orders (%)	16.492 (0.124)	15.476 (0.176)	19.758 (0.389)
Indefinite Delivery Vehicles (IDV's) (%)	83.508 (0.124)	84.524 (0.176)	80.242 (0.389)
Supplies (%)	16.973 (0.126)	16.567 (0.181)	16.717 (0.364)
Services (%)	73.672 (0.148)	75.246 (0.211)	69.615 (0.449)
Research (%)	9.355 (0.098)	8.187 (0.134)	13.668 (0.335)
Army, Air Force, and Navy (%)	78.718 (0.137)	77.858 (0.203)	81.433 (0.380)
<hr/>			
Observations	88,967	41,993	10,492

Notes: Standard errors in parentheses. Characteristics of negotiated, non-commercial, prime contracts awarded by early adopter agencies in the sample indicated, with standard errors in parentheses. Column (1) contains characteristics of all these contracts in the Full Baseline sample (which contains contracts priced between \$250,000 and \$3,000,000) in both the \$750,000 and \$2,000,000 threshold periods. Column (2) restricts these contracts to those included in the \$750,000 Threshold Baseline sample (in the \$750,000 threshold period with prices between \$250,000 and \$1,250,000). Column (3) restricts the sample in Column (1) to contracts in the \$2,000,000 Threshold Baseline sample (in the \$2,000,000 threshold period with prices between \$1,000,000 and \$3,000,000). Early adopters are defined as agencies that deployed the \$2,000,000 TINA threshold in 2018. See Section 3.2 for the list of early adopter agencies and when the \$750,000 and \$2,000,000 TINA thresholds applied for each agency. All variables are defined in Appendix A.

Table 3: Regression Discontinuity Design: Effect of the TINA Threshold on Cost or Pricing Data Being Required

	\$750,000 Threshold	\$2,000,000 Threshold
	(1) CP Data (%)	(2) CP Data (%)
Treat _{TINA}	2.812* (1.460)	3.851** (1.899)
Distance	0.005** (0.002)	-0.001 (0.002)
Treat _{TINA} * Distance	-0.002 (0.004)	0.006** (0.003)
Controls	Yes	Yes
Product Service Code Fixed Effects	Yes	Yes
Year-Quarter Fixed Effects	Yes	Yes
Bandwidth (h, \$1,000's)	500	1,000
Mean Outcome (Below Threshold)	16.32	17.55
Std. Dev. Outcome	36.96	38.04
Observations	41,993	10,492

Notes: Standard errors clustered by agency-contracting-office shown in parenthesis. All columns present results from equation 1 in Section 3.3. The coefficient of interest, on *Treat_{TINA}*, represents the discontinuity (i.e., change in level) in the outcome variable at the threshold indicated. *Distance* is the difference (in dollars) between the contract price and the threshold value shown in each column. The regressions in this table include the following controls: *Distance* is the difference (in dollars) between the contract price and the threshold value shown for each column; *Initial Duration* is the expected duration of the contract at signing; a vector of dummies controlling for (1) set asides for small businesses and (2) all other set asides (e.g., women and minority-owned businesses). The dependent variable is defined as follows: *CP Data* equals 100 if cost or pricing data (i.e., comprehensive accounting data) was required to be submitted with the contract proposal and zero otherwise. Contracts are from the threshold-specific Baseline sample indicated (i.e., negotiated, non-commercial, prime contracts awarded by early adopter agencies in the threshold-period and within the bandwidth indicated) in each column. The \$750,000 threshold period is between October 1st, 2015 and June 30th, 2018. Early adopters are defined as agencies that deployed the \$2,000,000 TINA threshold in 2018. See Section 3.2 for the list of early adopter agencies and when the \$2,000,000 TINA threshold applied for each agency.

Table 4: Regression Discontinuity Design: Effect of the TINA Threshold on Competition

	\$750,000 Threshold		\$2,000,000 Threshold	
	(1)		(3)	
	Sole Source (%)	Multiple Offers (%)	Sole Source (%)	Multiple Offers (%)
Treat_{TINA}	-3.893*** (1.092)	4.388*** (1.136)	-3.927** (1.992)	6.306** (2.625)
Distance	0.006** (0.003)	-0.007** (0.003)	0.003* (0.002)	-0.006** (0.003)
Treat _{TINA} * Distance	-0.002 (0.004)	0.005 (0.005)	-0.002 (0.003)	-<0.001 (0.004)
Controls	Yes	Yes	Yes	Yes
Product Service Code Fixed Effects	Yes	Yes	Yes	Yes
Year-Quarter Fixed Effects	Yes	Yes	Yes	Yes
Bandwidth (h, \$1,000's)	500	500	1,000	1,000
Mean Outcome (Below Threshold)	26.51	58.46	30.20	55.50
Std. Dev. Outcome	44.14	49.28	45.92	49.70
Observations	41,993	37,769	10,492	6,024

48

Notes: Standard errors clustered by agency-contracting-office shown in parenthesis. All columns present results from equation 1 in Section 3.3. The coefficient of interest, on *Treat_{TINA}*, represents the discontinuity (i.e., change in level) in the outcome variable at the threshold indicated. *Distance* is the difference (in dollars) between the contract price and the threshold value shown for each column. The regressions in this table include the following controls: *Distance* is the difference (in dollars) between the contract price and the threshold value shown for each column; *Initial Duration* is the expected duration of the contract at signing; a vector of dummies controlling for (1) set asides for small businesses and (2) all other set asides (e.g., women and minority-owned businesses). The dependent variables are defined as follows: *Sole Source* equals 100 if the contract was awarded as part of a sole source solicitation (i.e., where all but one bidder is excluded), and zero otherwise; *Multiple Offers* equals 100 if the contract received multiple bids and zero otherwise. Contracts are from the threshold-specific Baseline sample indicated (i.e., negotiated, non-commercial, prime contracts awarded by early adopter agencies in the threshold-period and within the bandwidth indicated) in each column. The \$750,000 threshold period is between October 1st, 2015 and June 30th, 2018. Early adopters are defined as agencies that deployed the \$2,000,000 TINA threshold in 2018. See Section 3.2 for the list of early adopter agencies and when the \$2,000,000 TINA threshold applied for each agency.

Table 5: Regression Discontinuity Design: Effect of the TINA Threshold on Contract Performance and Completeness

	\$750,000 Threshold			\$2,000,000 Threshold		
	(1) Log(Number of Modifications)	(2) Cost Overrun (%)	(3) Cost-Plus (%)	(4) Log(Number of Modifications)	(5) Cost Overrun (%)	(6) Cost-Plus (%)
Coefficient: α_2 (on $Treat_{TINA}$)						
Sample						
Baseline	-0.029** (0.014)	-1.868** (0.787)	-0.957 (0.765)	0.024 (0.026)	2.982 (1.858)	-2.612* (1.419)
Cost or Pricing Data Not Required	-0.026* (0.016)	-2.165** (0.917)	-0.921 (0.660)	0.023 (0.030)	3.130 (2.048)	-2.987* (1.614)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Product Service Code Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth (h, 1,000's)	500	500	500	1,000	1,000	1,000
Mean Outcome (Baseline, Below Threshold)	0.74	16.79	22.30	0.87	27.94	28.39
Std. Dev. Outcome (Baseline)	0.69	37.38	41.63	0.68	44.88	45.10
Observations						
Baseline	41,993	41,993	41,993	10,492	10,492	10,492
Cost or Pricing Data Not Required	34,565	34,565	34,565	8,467	8,467	8,467

Notes: Standard errors clustered by agency-contracting-office shown in parenthesis. All columns feature the coefficient α_2 on $Treat_{TINA}$ from equation 1 in from equation 1 in Section 3.3 for two types of samples: (1) the threshold-specific Baseline samples, and (2) the subset of contracts in each Baseline sample that did *not* require cost or pricing data. The coefficient on $Treat_{TINA}$ represents the discontinuity (i.e., change in level) in the outcome variable at the threshold indicated. The regressions in this table include the following controls: *Distance* is the difference (in dollars) between the contract price and the threshold value shown for each column; *Initial Duration* is the expected duration of the contract at signing; a vector of dummies controlling for (1) set asides for small businesses and (2) all other set asides (e.g., women and minority-owned businesses). The dependent variables are defined as follows: *Log(Number of Modifications)* is the natural logarithm of one plus the number of modifications; *Cost Overrun* equals 100 if the contract had a modification that resulted in an increase in the contract price and zero otherwise; *Cost-Plus* equals 100 when the contract is of cost-plus reimbursement type, and zero otherwise. Contracts are from the threshold-specific Baseline sample indicated (i.e., negotiated, non-commercial, prime contracts awarded by early adopter agencies in the threshold-period and within the bandwidth indicated) in each column. The \$750,000 threshold period is between October 1st, 2015 and June 30th, 2018. Early adopters are defined as agencies that deployed the \$2,000,000 TINA threshold in 2018. See Section 3.2 for the list of early adopter agencies and when the \$2,000,000 TINA threshold applied for each agency.