

**Government Procurement and Financial Statements Certification:
Evidence from Private Firms in Emerging Economies**

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Abstract

In this paper, we examine the monitoring role of government customers in emerging markets, a setting where public procurement is significant but the procurement institutions are weak. In these countries, financial statements certification could be an important mechanism for a private firm to facilitate contracting with governments. Employing a sample of private firms across 111 emerging economies, we find that firms are more likely to have financial statements certified by an external auditor when they have government contracts. We further find that the association is less profound when governments have weaker monitoring incentives — when suppliers are subject to monitoring from tax authorities or creditors, when government contracting officials receive bribes, and when government spending is less transparent. Additional analyses show that financial statements certification serves as a substitute for governments' internal assurance procedures. We corroborate our inferences using different identification checks such as controlling for voluntary assurance services choices and firm fixed effects, propensity-score matching, a changes specification, and an instrumental-variable approach.

Keywords: Government Procurement; Financial Statements Certification; Private Firms; Emerging Economies; Auditing; Corruption; Transparency; International

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1. Introduction

Governments are significant purchasers of goods and services around the world. Global procurement by government agencies is approximately 9.5 trillion U.S. dollars each year, accounting for around one-fifth of total GDP (World Bank, 2017). Recent studies have documented the active monitoring role of government customers by examining the U.S. federal government procurement (Cohen, Li, Li, and Lou, 2017; Heese and Cavazos, 2018; Samuels, 2018), a setting where public procurement institutions are strong and government accountability is high. However, in countries with weaker public procurement institutions and lower government accountability, governments' monitoring incentives and governance mechanisms that facilitate contracting between a firm and its government customers remain unclear. This paper intends to fill this gap in the literature by studying one specific governance mechanism for government contracting in developing countries – financial statements certification.

Government procurement represents a large marketplace in emerging economies. Developing countries spend an estimated 820 billion U.S. dollars a year on public procurement.¹ Low-income countries have the highest share of government procurement in their economies, at 14.5% of GDP.² In emerging economies, the participation of private firms is particularly pervasive. For example, in Latin America, they are the leading bidders and take an average 50% of the market share (SELA, 2015). Consequently, we study how private firms in emerging markets reduce the information asymmetry faced by their government customers.

¹ <http://www.worldbank.org/en/news/press-release/2016/12/05/despite-progress-transparent-and-efficient-government-procurement-rules-remain-a-global-challenge-wbg-report>

² <https://blogs.worldbank.org/governance/public-procurement-rich-country-s-policy>

In developing countries with relatively weak institutions, financial statements certification is an important mechanism to reduce information asymmetry between contracting parties (Francis, Khurana, Martin, and Pereira, 2011). The voluntary use of auditors' assurance services can facilitate government contracting in the following ways. First, certification from auditors enhances financial reporting credibility. Governments may find certified financial statements more desirable to assess the financial performance and operational risks of a private firm supplier than a public firm supplier, primarily because private firms generally have lower financial reporting quality and fewer competing information sources (Chen, Hope, Li, and Wang, 2011). Second, external auditors provide an independent and professional evaluation of the quality of internal control systems. The evaluation is particularly important for private firms that lack sufficient investments in internal control systems (Abdel-Khalik, 1993). Third, external assurance services help deter accounting fraud and corporate misconduct (Ball 2001), thereby reducing the likelihood that governments engage in suppliers with bad corporate reputation.

We argue that firms with government contracting are more likely to have an external audit. Our prediction is a joint test on whether governments have a monitoring incentive and whether financial statements certification can serve as a governance mechanism. Whether private firms use voluntary assurance services to facilitate government contracting is an empirical question. First, the prevalence of contract corruption may undermine governments' monitoring incentives. Second, governments may not use financial statements certification as a monitoring mechanism when they have alternative monitoring mechanisms such as performance guarantees.³

To empirically test governments' demand for financial statements certification, we utilize data from the World Bank Enterprise Surveys (ES) that were conducted in 111 emerging

³ A performance guarantee is the security against the breach of a government contract by suppliers. Performance guarantees are widely used as a monitoring device throughout the developing countries (World Bank, 2017).

economies from 2006 to 2018. We construct a government contracting indicator based on responses to question J.6 in the surveys: “Over the last 12 months, has this establishment secured a government contract or attempted to secure a contract with the government?” The financial statements certification indicator is based on responses to question K.21: “In the last fiscal year, did this establishment have its annual financial statements checked and certified by an external auditor?” To identify *voluntary* assurance decisions, we collect in-depth private-firm audit regulations for each country. Although some developing countries have certain mandatory audit requirements for large private firms, smaller private companies are typically exempted from statutory audits. The advantage of the ES dataset is two-fold. First, most private firms in the ES dataset are small- and medium-sized and thus, likely exempted from statutory audit requirements, allowing us to examine voluntary audit choices. Second, a comprehensive international dataset provides rich institutional variation in governments’ incentives in public procurement.

Consistent with governments demanding financial statements certification, we find that securing or attempting to secure a government contract is positively associated with an 8.6% increase in the probability that a private firm will voluntarily have external assurance services. Our findings are robust to the inclusion of an extensive set of control variables, different voluntary audit samples, a propensity-score matched sample, a changes specification, as well as firm fixed effects in a panel sample. While these tests mitigate concerns related to correlated omitted observable and time-invariant unobservable variables, a potentially important issue is that government contracting captures omitted time-varying unobservable variables that are correlated with auditor appointments.

To further reduce concerns from omitted time-varying variables and reverse causality, we use the country-year level of annual investment project financing (IPF) from the World Bank as

an instrumental variable. Borrowing countries commit to increase spending on public procurement, from complex infrastructure projects to routine goods and services. The significant association of government contracting and external audits in the second stage indicates that our findings are not likely driven by omitted time-varying variables.

Next, we examine how the association between government contracting and financial statements certification varies with governments' monitoring incentives. Three factors are closely relevant to governments' monitoring incentives — availability of alternative monitoring mechanisms, potential corruption in government contracting, and lack of government spending transparency. We argue that alternative monitoring from tax authorities or creditors reduces governments' demand for financial statements certification, as governments are likely to delegate costly monitoring to these more incentivized external monitors. We also hypothesize that receiving bribes from suppliers undermines government contracting officials' monitoring incentives. In contrast, government spending transparency increases governments' reputation concerns and therefore their monitoring incentives. In line with these arguments, we find evidence that government contracting is less positively associated with financial statements certification for firms that are subject to tax inspections or obtain debt financing, in firms that pay bribes to secure government contracts, and in countries where government spending information is less transparent.

We also perform additional analyses to further explore the role of financial statements certification as a monitoring mechanism in government contracting. We first investigate whether external assurance services serve as a complement or substitute for governments' internal assurance procedures. A common assurance practice is the requirement for a performance guarantee – the security against the breach of a contract by government suppliers (World Bank, 2017). An efficient guarantee protects the procuring entity from poor performance and incentivizes

the supplier to deliver good performance. Our empirical evidence reveals a negative effect of an efficient guarantee system on the association between government contracting and financial statements certification, suggesting a substitute role of external assurance services.

Second, we test the potential mitigating effect of the number of competitors a government supplier faces. More competitors for suppliers imply more alternatives for governments to choose from. Consequently, governments will be less concerned about the interruption of supply. As expected, our result shows that governments' demand for external assurance services is lower when contractors have more competitors.

Our study contributes to several strands of literature. First, our paper extends the *private firm auditing* literature (e.g., Francis et al., 2011; Hope et al., 2011) by focusing on an underexplored stakeholder — *government customers*. Samuels (2018) finds that the U.S. federal government's monitoring improves suppliers' internal information process, which leads to higher quality external reporting. Our study differs from Samuels (2018) in suggesting that governments demand external financial statements certification despite potentially having their own agencies performing monitoring activities. The association between government contracting and financial statements certification is significantly positive after controlling for overall supply-chain financing, suggesting that our results cannot be explained by the general effect of having a powerful private customer or supplier as found in prior studies (Hui, Klasa, and Yeung, 2012; Cen, Chen, Hou, and Richardson, 2018).

Second, our paper advances the understanding of the influences governments have on their suppliers in *emerging economies*, where public procurement accounts for a significant amount of total government expenditure. Our findings suggest that despite weak procurement institutions, governments in these countries do monitor their private-sector suppliers. Our study also

contributes to the nascent *government contracting* literature by showing that country-level institutions significantly affect governments' contracting incentives.

Finally, our research adds new evidence to the debate over *voluntary versus mandatory* audit regulations in private firms. While the prior literature on private firm audit regulations is primarily about developed countries (e.g., Bernard, Burgstahler, and Kaya, 2018), we provide a comprehensive overview of private firm audit regulations in 111 developing economies. The evidence that private firms voluntarily have financial statements certified by auditors when there is a high demand from stakeholders sheds light on the costs and benefits of voluntary audits. Our results support the view that mandating the audit for all private firms may impose additional costs for those with a low demand (e.g., firms without government contracting) and may not necessarily be an optimal solution (Vanstraelen and Schelleman, 2017).

2. Hypotheses Development

2.1. Government Procurement and Financial Statements Certification

There is a growing literature documenting the monitoring role of government customers (Cohen et al., 2017; Samuels, 2018). To date, most research has focused on the U.S. federal government procurement that is supported by strong procurement institutions. The U.S. federal government conducts a detailed assessment of its contractors' accounting systems and operational risks before rewarding a contract, and many contractors are subject to further periodic reviews (Samuels, 2018). Two factors contribute to government customers' monitoring incentives. First, government contracts are typically long-term due to the specialized nature (non-commercial) of many of the goods and services required by governments (Berrios, 2006; Goldman, Rocholl, and

So, 2013).⁴ Therefore, governments are particularly concerned about risks related to the continuous supply. Second, government customers value socially responsible suppliers as government spending is subject to public monitoring (Green, Tian, and Xia, 2017).

In emerging economies, governments may lack both the resources and accountability to conduct extensive monitoring activities. Many governments in developing countries experience various institutional capacity constraints such as a paucity of trained procurement staff (Dawar and Evenett, 2011). The U.S federal government suffers a significant backlog of cost audits even though it has a professional workforce (Samuels, 2018), not to mention the developing-country governments with limited resources. Additionally, procurement accountability is undermined by the corruption prevalent in many developing countries (DeAses, 2005). To mitigate the negative effect of weak procurement institutions, a firm can commit to the use of assurance services (Fan and Wong, 2005; Hope et al., 2011; Francis et al., 2011). With financial statements certification facilitating procurement to some extent, governments are more likely to engage in cost-efficient transactions.⁵

Financial statements certification can reduce information asymmetry and facilitate ex post monitoring in government contracting in the following ways. First, external assurance services enhance financial reporting credibility, increasing the usefulness of financial information in government contracting. While many studies find that in developed countries, external audits facilitate decision makers' use of financial information, some studies extend the conclusion to

⁴ Samuels (2018) reports that the value of non-commercial contracts account for around 86% of total government contracts.

⁵ For example, Article 22 of the Chinese Government Procurement Law suggests that a supplier shall have a good business reputation and sound financial and accounting systems. Interpretations of Article 22 (Treasury Department of the Ministry of Finance of the People's Republic of China, 2015) indicate that a contractor shall provide credible financial documents to reflect the quality of its financial and accounting systems. However, Article 22 does not specify whether the supplier's financial statements need to be audited.

emerging economies.⁶ For example, Hope et al. (2011) find that financial statements certification reduces the information asymmetry between private firms and external creditors, and that the effect is more profound in countries with a weaker institutional environment.

Second, external auditors provide an independent and professional evaluation of the quality of internal control systems. The external assurance services are particularly important for smaller private firms as they may find it less economically beneficial to make large investments in internal control systems (Abdel-Khalik, 1993). In practice, external accountants' advice is heavily valued by management in small companies (Collis, 2012). Even though governments may have their own auditors to evaluate contractors, the focus is on verifying the costs and pricing of procurement transactions (Samuels, 2018). In contrast, external financial auditors tend to have the expertise to provide certification on the overall soundness of accounting systems.

Third, external assurance services can deter fraud and corporate misconduct (Ball, 2001). The International Standards on Auditing 240 requires auditors to recognize the possibility that a material misstatement due to fraud could exist. Even in countries with low litigation risks, there is evidence on the monitoring role of auditors. For instance, using a sample of Chinese firms, Jiang, Lee, and Yue (2010) find that firms with severe tunneling are more likely to receive modified audit opinions. To the extent that governments are concerned about suppliers' alleged fraudulent behavior (Heese and Cavazos, 2018), external audits can facilitate government contracting.

While the above discussion suggests that financial statements certification can be helpful in government contracting, whether governments demand or value such certification is unclear. First, governments in emerging economies may not have sufficient incentives to monitor their

⁶ Using data from U.S. or Europe, many studies have found that mitigating agency costs arising from external financing and obtaining business advice to improve operational efficiency are the main drivers for the audit demand in private companies (e.g., Collis, 2012; Dedman, Kausar, and Lennox, 2014; Hope, Langli, and Thomas, 2012; Hope, Thomas, and Vyas, 2017; Vanstraelen and Schelleman, 2017).

contractors. In many countries, governments do not disclose necessary information for the public to evaluate the outcomes of government spending. When governments are not disciplined over wasting taxpayers' money, they may not be motivated to monitor their contractors. Second, governments have alternative access to financial information such as through tax returns. Third, governments may not want to use financial statements certification as a monitoring tool because requiring external auditing can impose barriers for private firms to enter the government procurement market. Our main hypothesis, stated in the alternative form, is:

H1. Firms with government contracting are more likely to hire external auditors to certify annual financial statements.

2.2. The Role of Alternative Monitoring

2.2.1. Tax Authority Monitoring

The government is an important stakeholder due to its tax claims on firms' profits. Both theoretical and empirical studies have documented the monitoring role of tax authorities (e.g., Desai, Dyck, and Zingales, 2007). It is not surprising that tax authorities are likely to take on a more prominent monitoring role in private firms than in public firms (Tendeloo and Vanstraelen, 2008). Tax enforcement can increase government contracting agencies' confidence in either contractors' tax-avoidance level (Desai et al., 2007) or financial reporting quality (Hanlon et al., 2014). Accordingly, we argue that monitoring by tax authorities reduces governments' demand for auditor assurance services.

The intensity of tax authority monitoring can vary across countries (Chen et al., 2011). In our empirical tests, we use ex-post tax inspections to proxy for tax authority monitoring, which

takes into account both firm-level and country-level tax enforcement variations. *H2a* is stated as follows (in the alternative form):

H2a: The association between government contracting and external financial statements certification is weaker when firms are inspected by tax authorities.

2.2.2. Creditor Monitoring

Among stakeholders, creditors have a particularly strong monitoring incentive because of their desire to ensure timely payment. Debt financing is an especially important financing source for private firms (Hope and Vyas, 2017). We extend the arguments in prior literature on delegation of monitoring to banks by shareholders that argues that banks (due to their monitoring incentives, lending relationships, contracting provisions, and potential access to private inside information) are highly efficient monitors of borrowers corporate financial policies (e.g., Diamond, 1984; Ramakrishnan and Thakor, 1984; Fama, 1985; Shleifer and Vishny, 1997). We argue that governments can also similarly benefit from delegation of monitoring to lenders. This delegation of monitoring to lenders, in turn, is likely to reduce governments' reliance on contractors' financial statements certification. *H2b* is thus stated as follows (in the alternative form):

H2b: The association between government contracting and external financial statements certification is weaker when firms have debt financing.

2.3. The Role of Government Contract Corruption

Government contract corruption represents a large share of worldwide corruption (OECD, 2007). In emerging markets, governments tend to lack transparency or accountability and have wide discretion, creating more opportunities for procurement corruption (OECD, 2007). Recently,

some governments have stepped up their efforts to curb corruption.⁷ However, in many developing countries, firms still face severe corruption obstacles.⁸

Corruption imposes a great threat to government procurement efficiency (Olken and Pande, 2012). First, corrupt officials are less likely to select contractors that are in the best interests of governments. Accordingly, supposedly important qualifications such as providing credible financial information may not be strictly implemented. Next, to help hide the collusion with bribing firms, the corrupt officials (the agent) may increase governments' (the principal) cost of obtaining information about bribing contractors (Tirole, 1986). Thus, we predict that contract corruption undermines government officials' monitoring incentives. Our third hypothesis is (in the alternative form):

H3: The association between government contracting and external financial statements certification is weaker when firms pay bribes to secure government contracts.

2.4. The Role of Government Spending Transparency

Recent years have seen an increased awareness and focus on enhancing government transparency (Olken and Pande, 2012). Several studies suggest that even in countries with a less educated population and weaker institutions, public access to information about politicians' performance is associated with a better government. Using local government election data in

⁷ In addition to governments' anticorruption efforts, country-level institutions or firm-level incentives can also impact government contract corruption. Khali, Saffar, and Trabelsi (2015) find that country-level disclosure requirements and investor protection curb government contract corruption. They also report that firms are less likely to involve in contract corruption when financial statements are reviewed by an external auditor.

⁸ For example, in Nigeria, bribery is "essential" to secure a government contract. Ufere, Perelli, Boland, and Carlsson (2012, p. 2445) provide an example of how contract bribery works in Nigeria: "When I lost three contracts I thought I was going to win in the Ministry of Works, I realized I was doing things wrong... Then a good friend told me never to submit a public tender, it was a waste of time and money since someone else already had the job... I have learned to create my own projects and work with Ministers and Perm Secs (Permanent Secretaries) and DGs (Director Generals) to fund the project in their budget... I win, they win."

Brazil, Ferraz and Finan (2008) find that the public dissemination of corruption audit reports is negatively associated with corrupt incumbents' electoral performance. Employing a cross-country sample, Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2010) report that public disclosure, but not internal government disclosure, has a positive effect on government accountability.

Recently, regulators in developing countries have realized the importance of “open” (or more transparent) governments. Since 2012, the World Bank has assisted low- and middle-income countries in making government data publicly available. A critical part of open-government initiatives is to disclose government spending data. A transparent government spending disclosure system empowers taxpayers and the media to easily track how governments spend taxpayers' money, and increases governments' reputation risk when they waste taxpayers' money. We argue that when government spending is less transparent, government officials' incentives to monitor government contractors are weaker. Our final hypothesis is (in the alternative form):

H4: The association between government contracting and external financial statements certification is stronger when government spending is more transparent.

3. Data and Research Design

3.1. Sample Selection

We obtain our data from the Enterprise Surveys (ES) conducted in developing countries by the World Bank.⁹ A number of prior studies have used the ES data, including Chen et al. (2011), Hope et al. (2011), and Francis et al. (2011).¹⁰ The goal of the World Bank is to provide representative firm-level data that help to assess business environment and economic development

⁹ We follow the United Nations classifications to identify developing countries: <https://unstats.un.org/unsd/methodology/m49/>

¹⁰ More research papers that use the ES data are listed in: <http://www.enterprisesurveys.org/research>

around the world. The number of firms interviewed in an economy is determined by the size of the economy. A stratified random sampling method is used to ensure that samples are representative in terms of firm size, business sector, and geographic region. The data are collected through face-to-face interviews with business owners, top managers, and other relevant staff. Although the ES started in 2002, they were conducted by different units of the World Bank. Since 2006, a focused unit—the Enterprise Analysis Unit—has been in charge of collecting ES data using a consistent survey methodology and a unified set of survey questions, which gives researchers a better comparison of survey data across countries and over years.¹¹ Therefore, our sample starts from 2006 and ends in 2018.¹² We begin with 115,686 observations, delete publicly listed firms and firms with legal status of “Other” or missing data on legal status, and then delete observations with missing data on government contracting or audit choices.^{13,14} The preliminary sample consists of 85,292 firm-year observations.

In order to identify voluntary audits, we collect private firm audit regulations from the International Federation of Accountants (IFAC).¹⁵ For countries about which the IFAC does not provide sufficient information, we collect regulation requirements from each country’s Companies Act, the World Bank’s Doing Business reports, Thomson Reuters Practice Law, and Healy Consultants Group PLC. We classify non-financial private-firm audit regulations into four categories: completely voluntary, completely mandatory for limited liability corporations (LLCs),

¹¹ <http://www.enterprisesurveys.org/methodology>

¹² The data used in our sample are from the combined ES dataset updated on July 23, 2018.

¹³ We exclude the “Other” category as it is not clear what type of organizational form these firms have. However, in untabulated analyses we include these observations and our inferences are unaffected.

¹⁴ The primary business sectors in the ES dataset are manufacturing and services, which corresponds to firm classified with ISIC codes 15-37, 45, 50-52, 55, 60-64, and 72 (ISIC Rev.3.1). This implies that ES dataset does not include financial firms. See: <http://www.enterprisesurveys.org/methodology>

¹⁵ IFAC is a global organization with an aim to develop, promote, and enforce high-quality accounting and auditing standards. Detailed auditing regulations for around 130 economies can be found: <https://www.ifac.org/about-ifac/membership/member-organizations-and-country-profiles>

mandatory for LLCs that meet specific size criteria, and other mandatory situations.¹⁶ Table 1 lists the countries in each category. 27 countries adopt a completely voluntary regime. 21 countries impose mandatory audit requirements for all LLCs. 48 countries only require mandatory audits for LLCs that meet specific size criteria. The most commonly used size criteria are based on total assets, sales, and number of employees.

Statutory audits are generally used to regulate limited liability corporations (Francis et al, 2011). For our main analyses, following Francis et al. (2011), we construct a voluntary audit sample by using all private firms in countries with a completely voluntary regime as well as all non-limited-liability private entities (sole proprietorships and limited partnerships) that are exempted from statutory audits in other countries.¹⁷ We also require that for each country, year, organizational form, and industry, the voluntary audit sample has at least 15 observations.^{18,19} The main voluntary audit sample consists of 51,417 firm-year observations from 111 emerging economies.²⁰

¹⁶ Other mandatory situations include statutory audits for state-owned firms, foreign-owned firms, and subsidiary firms.

¹⁷ Four countries (Jordan, Lesotho, Mauritania, and Thailand) also impose statutory audit requirements on partnerships. We exclude partnerships in these countries. We also exclude government-owned and foreign-owned firms in countries where statutory audit requirements are required for these firms.

¹⁸ Requiring a minimum number of observations allows us to estimate meaningful coefficients in a model with country, year, legal (organization form), and industry fixed effects. See Section 3.3 for details. Our conclusions are not affected if we require at least 10 or 20 observations for each country, year, organizational form, and industry.

¹⁹ Five countries (Armenia, Lebanon, Panama, Papua New Guinea, and the Solomon Islands) are excluded from our sample due to insufficient voluntary audit observations. Therefore, we do not present regulations for these countries in Table 1.

²⁰ We do not include firms that meet size criteria on statutory audit requirements in our main sample because data on a key size dimension – total assets – are not available. Excluding these firms ensures a clean voluntary audit sample, but reduces the representativeness of the sample. In additional analyses, we construct a second voluntary audit sample with firms that meet exemption criteria on sales and number of employees. We also provide results with a third sample comprising of only firms from completely voluntary regime countries. Finally, considering that sole proprietorships and partnerships may be subject to a different basis of accounting, we restrict the main sample to limited liability corporations to get a fourth sample.

3.2. Key Variables

Financial statements certification is identified by firms' responses to question K.21: "In fiscal year [insert last complete fiscal year], did this establishment have its annual financial statements checked and certified by an external auditor?" The possible responses are "1 – Yes," "2 – No," and "9 – Don't know."²¹ In the 2002 ES, each entity was asked a slightly different question: "Does your firm provide its shareholders with annual financial statements that have been reviewed by an external auditor?" Francis et al. (2011) caution that the question in 2002 Survey may encompass not only independent audits but also other limited forms of external assurance such as a review. Although the question in surveys carried out after 2006 clearly mentions financial statements certification, services provided by auditors may also refer to both audits and other forms of assurance such as reviews. Therefore, we use the term financial statements certification instead of a stronger term financial statements verification.²²

Government procurement is from firms' responses to question J.6a: "Over the last 12 months, has this establishment secured a government contract or attempted to secure a contract with the government?"²³ The possible firms' responses are "1 – Yes," "2 – No," and "9 – Don't know." Because no further explanation is provided, it is possible that a firm attempted to secure a government contract but was not successful, in which case any effect from the government involvement is in the contract-granting stage.²⁴ It is common that suppliers respond to

²¹ All answers with "9 – Don't know" are treated as missing values.

²² We use financial statements certification, assurance services, and voluntary audit interchangeably throughout the paper.

²³ It is possible that the "Last fiscal year" cycle starts earlier than the "Last 12 months" cycle. In that case, the audit choice is associated with the anticipation of future government contracting. Given the importance of establishing a business relationship with governments, it is reasonable to assume that firms have plans to meet governments' demand in advance.

²⁴ In this paper, the term "firms with/having government contracting" refers to firms that have secured or have attempted to secure a government contract.

governments' audit demand when preparing to secure a contract.²⁵ Therefore, our results capture the association between government contracting and audit choices either at the contract-granting stage, or at both the contract-granting stage and the subsequent ongoing monitoring stage.

3.3. Research Design

H1 predicts that government contracting is positively associated with a private firm's external assurance services choice. To test H1, we estimate the following regression:²⁶

$$\begin{aligned}
 Audit_{i,j,t} = & \alpha + \beta_1 GovernmentContract_{i,j,t} + \beta_2 TaxInspect_{i,j,t} \\
 & + \beta_3 Loan_{i,j,t} + \beta_4 CustomerSupplierFinancing_{i,j,t} + \beta_5 Size_{i,j,t} \\
 & + \beta_6 GovernmentOwned_{i,j,t} + \beta_7 ForeignOwned_{i,j,t} + \beta_8 Age_{i,j,t} + \beta_9 Export_{i,j,t} \\
 & + \beta_{10} GDP_{j,t} + \beta_{11} Inflation_{j,t} + \beta_{12} CountryImport_{j,t} + \beta_{13} FinConstraints_{j,t} \\
 & + \beta_{14} CourtEnforcement_{j,t} + Fixed Effects + \varepsilon
 \end{aligned} \tag{1}$$

where i , j , and t denote firm i , country j , and year t , respectively. *GovernmentContract* is an indicator variable denoting whether the firm has secured or attempted to secure a government contract. *Audit* is an indicator of whether an auditor certified the firm's financial statements. If governments demand financial statements certification by auditors from suppliers, we expect to find a significantly positive β_1 .

Tax scrutiny and debt financing are two important drivers in private firms' audit choices (Hope et al, 2011; Tendeloo and Vanstraelen, 2008). Therefore, we include *TaxInspect* and *Loan* to control for the information demand from tax authorities and debt holders, respectively. Tax

²⁵ A conversation with a senior KPMG consultant who is an expert in government procurement cases also suggests that it is common for private firms to provide audited financial information when bidding for a government contract.

²⁶ To facilitate the interpretation of the coefficients on interaction terms in non-linear models, we use OLS as the main specification. However, we also present results using probit.

inspection is from firms' responses to question J.3: "Over the last 12 months, was this establishment visited and or inspected by tax officials?" Debt financing (*Loan*) is from firms' responses to question K.8: "At this time, does this establishment have a line of credit or loan from a financial institution?" The possible firms' responses to both questions were "1 – Yes," "2 – No," and "9 – Don't know."

Other firm-level factors that can affect audit choices are included as well. To separate the effect of government contracting from that of general supply-chain relationships, we control for the percentage of working capital financed from customers and suppliers (*CustomerSupplierFinancing*). We use government ownership (*GovernmentOwned*) and foreign ownership (*ForeignOwned*) to control for ownership structures. We also include an indicator variable for export sales (*Export*) to control for the certification effect of foreign customers (Francis et al., 2011). To control for general firm characteristics, we add firm size (*Size*) and age (*Age*). *Size* is measured as the natural log of sales in local currency.

We further include a set of *time-varying* country-level variables to control for the effects of the institutional environment (beyond what is captured by country fixed effects). Specifically, we include financing constraints (*FinConstraints*) and court enforcement constraints (*CourtEnforcement*) (Francis et al., 2011) to control for the contracting environment. We also control for other general country-level characteristics: GDP per capita (*GDP*), inflation (*Inflation*), and imports as a percentage of GDP (*CountryImport*). Appendix A provides detailed variable definitions and data sources. All continuous variables are winsorized at the 1% and 99% levels.

Finally, we include industry, legal status,²⁷ year, and country fixed effects, unless otherwise stated. Standard errors are clustered by country.²⁸

3.4. Summary Statistics

Table 2 shows the distribution of the 51,417 observations by country. About 15% of private firms report having secured or attempted to secure a government contract. There is a considerable variation of *GovernmentContract* across countries, from 3% in Myanmar to 59% in Botswana.²⁹ 48% of sample firms report having voluntary external financial statements audits, compared to 51% in Hope et al. (2011) and 55% in Francis et al. (2011). Cote d'Ivoire has the lowest percentage of private firms voluntarily having an external financial audit (16%), while Fiji has the highest percentage (93%).

Table 3 displays the descriptive statistics. 59% of firms have been inspected by tax authorities at least once. 27% of private firms have debt financing. 9% of firms have working capital financing from customers or suppliers. Table 4 provides Pearson correlations among the main variables. As predicted, *GovernmentContract* is positively correlated with *Audit*, with a correlation coefficient of 0.11, significant at the 1% level. We also observe *Loan* and *TaxInspect* to be positively correlated with *Audit*.

²⁷ Legal refers to indicators for the firms' organizational form: sole-proprietorship, limited partnership, partnership, and limited liability. In Section 5.3, we report results of only including limited-liability firms.

²⁸ Our conclusions are not affected if we cluster standard errors by country-year.

²⁹ Recall that we employ country fixed effects in our primary analyses.

4. Empirical results

4.1. Main Results

Table 5 presents regression results of the association between government contracting and financial statements audits using different specifications. Column 1 (column 2) presents the results without control variables and without (with) industry, legal status, year, and country fixed effects. Column 3 presents the results with fixed effects and firm-level controls. Column 4 presents the results of the main specification – fixed effects together with both firm-level and country-level controls. While columns 1-4 presents results using OLS, column 5 presents results using probit.

Across all five test specifications, the conclusion is the same: government contracting increases the probability of having financial statements certification. *GovernmentContract* is significantly positive (at the 1% significance level using two-sided tests) in all columns. The effect of government contracting on voluntary audits appears to be economically meaningful as well. In column 4, the coefficient on *GovernmentContract* is 0.086 (two-tailed p-value<0.001). Securing or attempting to secure a government contract is associated with an 8.6% increase in the probability that a firm will have an external financial audit, an increase of 18% relative to the sample mean (=8.6%/48%).³⁰

TaxInspect has the largest magnitude: having a tax inspection is associated with a 16.7% increase in the probability of having an external financial audit. *Loan* is associated with a 6.4% increase in the probability of having an external audit.³¹ The significant coefficients on *Loan* and *TaxInspect* reflect the idea that creditors and tax authorities are important drivers of financial statements certification in private firms. For other firm-level covariates, we report significantly

³⁰ The average marginal effect of *GovernmentContract* in the probit regression (Table 5, Column 5) is 8.4%.

³¹ As an alternative to controlling for *Loan*, in an untabulated analysis we use only firms with no debt (N = 28,799). *GovernmentContract* is significant at the 1% level and no conclusions are altered.

positive coefficients on *Size*, *GovernmentOwned*, *ForeignOwned*, *Age*, and *Export*.³² For country-level controls, we find a significantly positive effect of *GDP*, and a significantly negative effect of *Inflation* and *CourtEnforcement*.³³

Taken together, the results in Table 5 suggest that, even in developing countries where public procurement institutions are weak and government accountability is low, governments do have an incentive to monitor suppliers and suppliers meet governments' monitoring demand by committing to external assurance services. Our results support H1 and are consistent with Francis et al. (2011) that financial statements certification is an important governance mechanism for private firms in countries with weak institutions.

4.2. *The Role of Alternative Monitoring*

In this section, we empirically test the conditional effect of alternative monitoring. Specifically, we focus on two important monitors in private firms: tax authorities and creditors. H2a predicts that strong scrutiny from tax authorities reduces governments' monitoring incentives. To proxy for tax scrutiny, we use the existence of a tax inspection (*TaxInspect*). Likewise, H2b predicts that monitoring from creditors mitigates the positive association between government contracting and financial audits. To proxy for creditor monitoring, we use the existence of a line of credit or loan (*Loan*). As an alternative we identify situations where creditors have a stronger incentive to monitor borrowers — firms that borrow money from banks to finance *long-term* investments. We construct an indicator variable (*InvestLoan*) based on responses to question K.5bc: “Over the fiscal year, please estimate the proportion of this establishment’s total purchase

³² Our results are unlikely driven by government ownership as only 259 firms have government ownership. No conclusions are affected if we drop these firms.

³³ *CustomerSupplierFinancing*, *CountryImport* and *FinConstraints* are not significant.

of fixed assets that was financed from banks.” Both *TaxInspect* and *Loan* are already included in Eq. (1) as control variables. To examine H2, we modify Eq. (1) as follows:

$$\begin{aligned}
 \text{Audit}_{i,j,t} = & \alpha + \beta_1 \text{GovernmentContract}_{i,j,t} + \beta_2 \text{GovernmentContract}_{i,j,t} \\
 & \times \text{Alternative Monitoring}_{i,j,t} + \beta_3 \text{Alternative Monitoring}_{i,j,t} + \text{Controls} + \varepsilon \quad (2)
 \end{aligned}$$

where *Alternative Monitoring* is *TaxInspect*, *Loan*, or *InvestLoan*. If alternative monitoring reduces governments’ monitoring incentives, we expect to find a significantly negative β_2 .

Table 6 presents the results. We first note that the coefficient on *GovernmentContract* continues to load positively and significantly (at the 1% level) in each column. Our focus is on *GovernmentContract* \times *Alternative Monitoring*. Column 1 shows the mitigating effect of tax authority monitoring. The coefficient on *GovernmentContract* \times *TaxInspect* is significantly negative at the 10% level (two-sided test). In terms of the economic magnitude, having a tax inspection reduces the effect of government contracting on voluntary assurance choices by 38% (0.044/0.115).

Column 2 presents the mitigating effect of debt financing. The coefficient on *GovernmentContract* \times *Loan* is not significant. However, when we separate long-term bank financing from total debt financing, we find that the coefficient on *GovernmentContract* \times *InvestLoan* is significantly negative: -0.078 (two-tailed p-value = 0.002) as reported in column 3.³⁴ The results imply that governments are less likely to require external assurance services when suppliers have long-term financing from banks. The findings in Table 6 add to the literature regarding how government customers can benefit from alternative monitoring by tax authorities and creditors.

³⁴ As *InvestLoan* is a subset of *Loan* we report the results with *Loan* for brevity. We have also run the analysis after replacing the main effect *Loan* with *InvestLoan* and no inferences are affected (i.e., the coefficient estimates are almost identical and the significance levels are the same).

4.3. The Role of Government Contract Corruption

H3 studies the effect of corruption on government contracting officials' monitoring incentives. We argue that corruption will undermine government officials' incentives to demand financial statements certification. Corruption is usually hidden and difficult to measure (Olken and Pande, 2012). However, firm-level government contract-bribery data in the ES dataset allow us to have a direct measure of government contract corruption. Specifically, when a firm answers "Yes" to question J.6a ("Has this establishment secured a government contract or attempted to secure a contract with the government?"), it is asked to answer question J.6: "When establishments like this one do business with the government, what percent of the contract value would be typically paid in informal payments or gifts to secure the contract?"³⁵ Possible responses range from 0 to 100. As shown in Table 3, within firms that have attempted to secure or secured government contracts, 22% reported having to pay bribes to secure government contracts. Only firms *with* government contracting are included to test H3. The estimation model is as follows:

$$Audit_{i,j,t} = \alpha + \beta_1 GovernmentContractPay_{i,j,t} + Controls + \varepsilon \quad (3)$$

GovernmentContractPay is an indicator variable that equals to 1 if a firm reports a positive value to J.6 (firms expect to pay at least some informal payments or gifts to secure a government contract) and equals to 0 if a firm reports a zero value. A negative β_1 will provide evidence consistent with H3. All control variables and fixed effects are the same as Equation (1). As shown in Table 7, *GovernmentContractPay* is significantly negative at the 5% level. The magnitude of *GovernmentContractPay* is also economically significant: within firms having secured or attempting to secure a government contract, *GovernmentContractPay* reduces the probability of

³⁵ We assume managers are implicitly asked how much their own firms pay to secure the government contract. This method is also used in prior research (Desai and Olofsgård, 2011).

having an external financial audit by 4.1% (a 47.7% (4.1%/8.6%) reduction of the effect of government contracting). The analysis indicates that contract corruption significantly undermines government contracting officials' monitoring incentives.

4.4. *The Role of Government Spending Transparency*

To further explore governments' monitoring incentive, we examine the role of government spending transparency. In H4, we argue that transparency incentivizes governments to select suppliers more carefully and perform monitoring activities more intensively because transparency empowers the public to monitor the spending of tax payers' money. We employ the following estimation model:

$$\begin{aligned}
 \text{Audit}_{i,j,t} = & \alpha + \beta_1 \text{GovernmentContract}_{i,j,t} + \beta_2 \text{GovernmentContract}_{i,j,t} \times \text{Transparency}_{j,t} \\
 & + \text{Transparency}_{j,t} + \text{Controls} + \varepsilon
 \end{aligned} \tag{4}$$

To measure government spending transparency, we use the Open Data Barometer (ODB) dataset that is provided by the World Wide Web Foundation. Since 2013, the ODB has assigned comparative scores for 115 countries on the extent to which governments open up spending information to the public.³⁶ We match the government spending data with the ES data by fiscal year and country. All control variables are the same as Equation (1).

The additional data requirement for ODB government spending transparency results in a reduced sample size, with 6,713 observations. Table 8 presents the regression results for H4. The coefficients on *GovernmentContract* \times *Transparency* in the first column (without country fixed effects) and second column (with country fixed effects) column are 0.098 and 0.103, respectively

³⁶ The scores are based on three types of data: a peer-reviewed expert survey with questions about open data contexts, policy, implementation, and impacts, a government self-assessment data, and secondary data from World Economic Forum, International Telecommunications Union, United Nations e-Government Survey, and Freedom House. See: <https://opendatabarometer.org/barometer/>

(and significantly positive at the 10% and 5% levels). Hence, consistent with H4, there is evidence that the more transparent government spending is, the stronger association between government contracting and financial statements certification we observe. Our findings should be relevant to regulators that aim to improve public procurement efficiency by increasing government transparency.

5. Additional Analyses

5.1. Governments' Own Assurance Mechanisms

In some developing countries, governments have their own agencies performing monitoring activities directly. In this section, we discuss whether external assurance services are substitutes or complements to the assurance mechanisms that are carried out directly by government agencies. If external audits are substitutes to governments' own assurance mechanisms, then governments' demand for external audits will be higher when governments have less effective assurance mechanisms. In contrast, if external audits are complementary to governments' own assurance mechanisms, the demand for external assurance will be higher when governments have more effective assurance mechanisms.

One common assurance practice (for which data are available) is requiring performance guarantees.³⁷ An efficient performance guarantee protects the procuring entity from poor contract performance and incentivizes the supplier to deliver better contract performance. It is worth mentioning that a strict performance guarantee is not always favorable to governments because more security creates a burden to suppliers and discourages competition (World Bank, 2017).

³⁷ Performance guarantee options can be cash, a bank guarantee, a certified check, a certificate of deposit, a performance bond, an insurance guarantee, a letter of credit, and so on, depending on the public procurement regulations in each country (World Bank, 2017).

Instead, a reasonable performance guarantee serves as an efficient mechanism to protect governments' interests.

The *Benching Public Procurement 2017* presents comparable data on public procurement laws and regulations across 180 economies.³⁸ The World Bank gives a score to each country based on the existence and requirements of performance guarantee, with a higher score indicating more effective protection for both procuring entities and suppliers.³⁹ To match the scores with observations in our sample, we only include data from surveys conducted in 2016 and 2017, which leaves us 5,442 observations in 28 countries.⁴⁰ As shown in Table 9, the coefficient on $GovernmentContract \times PerformanceGuarantee$ is significantly negative at the 1% level. We also note that *PerformanceGuarantee* is positively associated with *Audit*.

5.2. The Number of Alternative Suppliers

The specialized nature of the goods and services governments procure is one important driver for governments' concerns over suppliers' financial conditions. The specialized nature gives rise to the concentration of contractors (Berrios, 2006), limiting governments' alternatives. Consequently, governments are more concerned about uninterrupted supply when they have fewer alternative contractors (which implies fewer competitors for government suppliers). We cannot

³⁸ The World Bank started to provide an assessment on government performance guarantees in 2017.

³⁹ The performance guarantee score is based on an assessment of the following dimensions: the existence of performance guarantee deposit, amount of performance guarantee as a percentage of the contract value, choice for suppliers on form of the performance guarantee, forms of performance guarantee, timeframe for purchasing entity to return performance guarantee, circumstances where purchasing entity can collect performance guarantee, and the existence of a separate entity to oversee decisions to withhold the performance guarantee (World Bank, 2017). The dataset was collected from March 1, 2016 to June 1, 2016, using questionnaires completed by local practitioners who have sufficient knowledge about public procurement system, such as lawyers, public contracting officials, and firm managers.

⁴⁰ The mean (median) of the performance guarantee score (*PerformanceGuarantee*) is 53 (58). Laos and Lesotho have the lowest score of 0, while Ecuador has the highest score of 86. In surveys conducted from 2016 to 2017, each country only has one year of observations. Therefore, we do not include country fixed effects in the regression presented in Table 9.

directly observe the number of potential government contractors but the number of a firm's *main* competitors is available.

Specifically, manufacturing firms (only) were asked question E.2: “For the last fiscal year, for the main market in which this establishment sold its main product, how many competitors did this establishment’s main product/product line face?” *CompetitorNumber* is the natural log of firms’ responses to E.2. As shown in Table 10, the coefficient on *GovernmentContract* × *CompetitorNumber* is significantly negative at the 10% level (two-tailed p-value = 0.054), suggesting that government contractors are less likely to appoint external financial auditors when they have more competitors. The results support that governments’ incentives to demand supplier’s financial statements certification decrease when they have more alternative suppliers.

5.3. Different Identifications of Voluntary Assurance

We provide further evidence using three alternative voluntary assurance samples. Table 11 shows the results for the main hypothesis in these additional samples: column 1 presents results with a voluntary sample including firms meeting audit exemptions based on size criteria, column 2 presents results with observations only from completely voluntary audit countries, and column 3 presents results with only limited-liability corporations from the main voluntary sample. The positive association between *GovernmentContract* and *Audit* holds in all columns, indicating that our findings are not sensitive to different identifications of voluntary assurance services.

5.4. Foreign Capital as Alternative Explanation

A potential alternative explanation is that an increase in government procurement spending reflects higher economic development that encourages private firms to attract foreign capital by

having an external audit. In addition to controlling for multiple country-level economic factors, we conduct the following tests to rule out the foreign capital explanation. First, we examine how the association between *GovernmentContract* and *Audit* varies with foreign capital inflows (proxied by *FDI*). Table 12 shows that the coefficients of the interaction term *GovernmentContract* \times *FDI* is not significant. Second, our findings still hold in a subsample without foreign ownership or foreign export.⁴¹ Therefore, our main findings are not likely to be driven by foreign capital.

6. Empirical Strategies to Mitigate Endogeneity Threats

We find that government contracting is positively associated with the probability of having financial statements certification. However, the conclusion is potentially limited because of endogeneity concerns — it could reflect the effect of correlated omitted variables. In this section, we first use a propensity-score matched sample to address endogeneity concerns from observables, then adopt a changes specification as well as firm fixed-effects model to reduce biases from time-invariant unobservables, and finally employ an instrumental-variable approach to mitigate concerns from omitted time-varying variables.

6.1. Propensity-Score Matching

To improve the comparability between firms with government contracting and firms without government contracting, we construct a sample using PSM. We estimate the propensity score from a probit regression with the *GovernmentContract* as the dependent variable and the same set of controls in Eq. (1) (Shipman, Swanquist, and Whited, 2017). For each firm with government contracting, we select a firm without government contracting with the closet

⁴¹ *GovernmentContract* is significant at the 1% level when we use only firms with no foreign ownership (N = 37,136) or firms with no export (N = 36,244)

propensity score as a control.⁴² Our PSM achieves a strong covariate balance as none of the control variables are significantly different at the 10% level between the treatment and control samples in Panel A of Table 13. As shown in Panel B, *GovernmentContract* continues to load positively in both samples (two-tailed p-value < 0.001), which suggests that our primary results are not driven by observable differences between firms with government contracts and firms without government contracts.

6.2. Changes Specification

PSM mitigates the selection bias due to observable variables but does not address the bias due to unobservable variables (Tucker, 2010). To control for potential firm-level time-invariant omitted variables, we employ a changes specification. We essentially keep the *firm* constant and explore the impact of the changes in securing government contracts on the changes of auditor appointment. In order to do so, we construct a panel dataset by combining individual panel dataset for each country. Although constructing panel data is a priority in current World Bank surveys, the existing panel dataset is limited.⁴³ To capture the average change over years, all change variables are scaled by the years between the two rounds of surveys. The dependent variables in Table 14 Panel A is $\Delta Audit$, the test variable is $\Delta GovernmentContract$, and the control variables are also in the changes form.⁴⁴ $\Delta GovernmentContract$ is positive and significant at the 1% level, indicating that the effect of government contracts is less likely due to time-invariant omitted variables.

⁴² We use a caliper distance of 0.001 and match with replacement. Lower caliper gives a stronger covariate balance, but also increases the probability that the matching sample over-represents observations (Shipman et al., 2017). Our inferences do not change if we instead use a caliper distance of 0.01 or 0.1.

⁴³ The availability of the panel dataset varies with each country. Within the sample of firms that appear in at least two rounds of surveys, 85.89% of firms have two observations, 14.03% have three, and 0.08% have four.

⁴⁴ We use OLS and include legal status and year fixed effects. Country and industry fixed effects are not included as they do not change.

6.3. Firm Fixed Effects

Similar to a changes specification, a fixed-effects model deals with firm-level time-invariant omitted variables. We use an OLS model with firm fixed effects and cluster standard errors at the firm level.⁴⁵ As Table 14 Panel B shows, *GovernmentContract* continues to load significantly. The results provide comfort that the findings in this paper are unlikely to be driven by time-invariant omitted variables.

6.4. Instrumental-Variable Approach

To address potential reverse causality and the possibility that potential time-varying unobservable variables are correlated with both *GovernmentContract* and *Audit*, we employ an IV approach.⁴⁶ The instrument we use is the country-level annual amount of investment project financing (IPF) from the World Bank.⁴⁷ IPF is used by the World Bank to support countries in sustainable development. Borrowing countries commit to increase public procurements, ranging from complex infrastructure to simple goods and services. The relevance condition is met because governments have more money to spend in procuring services and goods from suppliers if they obtain IPF. Additionally, the IPF-supported projects are subject to the scrutiny from the World Bank. The exclusion restriction requires that the only role that *IPF* influences *Audit* is through *GovernmentContract* (Roberts and Whited, 2012). *IPF* is a continuous variable that varies across countries and over years while statutory audit requirements are relatively stable. Therefore, it is

⁴⁵ We use OLS because adding such a large number of fixed effects to a nonlinear model can add biases due to the incidental parameter problem (Angrist and Pischke, 2009).

⁴⁶ We do not use the Heckman two-stage approach here because it is only appropriate if the second-stage outcome is modeled in a linear regression and if the unobservables in the two stages are binomially distributed (Tucker, 2010).

⁴⁷ From 2000 to 2017, 219 economies received investment project financing from the World Bank. See: <http://www.worldbank.org/en/projects-operations/products-and-services/procurement-projects-programs>

unlikely that *IPF* will affect a country's statutory audit requirements. Moreover, we do not find any significant correlation between country-level *IPF* and current and future economic factors (GDP, foreign investment inflows, and country import).⁴⁸ We thus conclude that it is unlikely that *IPF* affects *Audit* other than through *GovernmentContract*.

To avoid the forbidden regression problem due to incorrect nonlinear first stage, we use both the nonlinear fitted values ($\widehat{GovernmentContract}$) and *IPF* as instrumental variables in the 2SLS IV regression.⁴⁹ Column 1 of Table 15 reports the result on a probit model where the dependent variable is *GovernmentContract* and the test variable is *IPF*. The coefficient on *IPF* is significantly positive. Columns 2 and 3 present the results of 2SLS IV regressions. In the first stage, we have $\widehat{GovernmentContract}$ and *IPF* as IVs. $\widehat{GovernmentContract}$ has a positive and significant coefficient while *IPF* is insignificant. The Kleibergen-Paap Wald F-statistic is 35.29 (and exceeds the Stock-Yogo 10% critical value), supporting the idea that our 2SLS regression is unlikely to suffer from a weak IV problem. In the second stage, the coefficient on *GovernmentContract* is significantly positive at the 10% level, lending additional support to our primary hypothesis.⁵⁰

7. Conclusion

In this paper, we seek to better understand how governments affect their suppliers' governance choices in emerging economies, where government procurement is economically

⁴⁸ The correlation between *IPF* and GDP or FDI is significant in Table 2 because Table 2 presents correlations at the full firm-year sample.

⁴⁹ As discussed in Angrist and Pischke (2009), the forbidden regression refers to the problem that the 2SLS estimator is incorrect when the nonlinear model used in the first stage is not correctly specified. One solution proposed by Angrist and Pischke (2009) is to use a nonlinear model (e.g., probit) to regress the endogenous variable on the IV first, and then use both the nonlinear fitted values and the IV as IVs in a standard 2SLS IV regression. Nevertheless, we also use 2SLS for robustness check and conclusions are unaltered.

⁵⁰ Although we employ PSM, a changes specification, firm fixed effects, and an IV approach, readers should be cautious about making strong causal inferences from this paper.

significant but procurement institutions are weak. To the best of our knowledge, this paper is the one of the first studies to examine the effect of government contracting on private firms' information environment in an international setting. While prior literature has shown that governments play a monitoring role by performing extensive monitoring activities, this article examines whether governments demand external assurance services as a monitoring mechanism to facilitate public procurement.

Using data on private firms across 111 emerging economies from the World Bank Enterprise Surveys, we find that government customers in emerging markets do have monitoring incentives, and suppliers meet governments' monitoring demand by providing financial statements certification. We provide additional evidence based on governments' ex-ante monitoring incentives. Specifically, we find that the association between government contracting and financial statements certification is stronger when government procurement agencies cannot delegate monitoring to external monitors (such as tax authorities and creditors), and when governments or government officials have stronger reputation concerns.

Our findings have implications for regulators who are weighting the costs and benefits of mandatory audits for private firms. Our results suggest that private firms will voluntarily choose financial audits when the demand for financial statements certification is high, supporting the idea that mandating external audits for all firms may not be an optimal solution. Our paper also highlights the importance of government transparency and anti-corruption movements in public procurement.

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Appendix A

Variable Definitions

Variable	Definition (data items in the World Bank dataset in parentheses, if applicable)	Original Source
<i>Audit</i>	A firm-level survey indicator (k21) that equals to one if the firm has its annual financial statements checked and certified by an external auditor, zero otherwise	World Bank Enterprises Surveys (ES)
<i>Government-Contract</i>	A firm-level indicator (j6a) that equals to one if the firm has secured or attempted to secure a government contract, zero otherwise	ES
<i>Government-ContractPay</i>	A firm-level indicator (j6) that equals to one if the firm reports a positive value paid in informal payments or gifts to secure the government contract, zero otherwise	ES
<i>TaxInspect</i>	A firm-level indicator (j3) that equals to one if the firm reports to be visited or inspected by tax officials, zero otherwise	ES
<i>Loan</i>	A firm-level indicator (k8) that equals to one if the firm reports to have a line of credit or loan from a financial institution, zero otherwise	ES
<i>InvestLoan</i>	A firm-level indicator (k5bc) that equals to one if the firm reports to finance the purchase of fixed assets by borrowing from banks	ES
<i>CustomerSupplier-Financing</i>	A firm-level measure (k3f) defined as the proportion of this establishment's working capital that was financed from purchases on credit from suppliers and advances from customers	ES
<i>Size</i>	Natural log of firm sales (d2) in local currency	ES
<i>Government-Owned</i>	A firm-level indicator (b2c) that equals to one if any government agency or state body has a financial stake in the ownership of the firm, zero otherwise	ES
<i>ForeignOwned</i>	A firm-level indicator (b2b) that equals to one if any private foreign individuals, companies, or organizations have a financial stake in the ownership of the firm, zero otherwise	ES
<i>Age</i>	A firm-level measure defined as the natural log of one plus the number of years from the firm began operations in this country (b5)	ES
<i>Export</i>	A firm-level indicator (d3) that equals to one if at least 10 percent of a firm's annual sales is derived from direct exports	ES
<i>Industry Categories</i>	Manufacturing, Services, and Other Sector	ES
<i>GDP</i>	Country-level natural log of gross national product per capita	World Bank website

<i>Inflation</i>	Country-level annual inflation, GDP deflation (%)	World Bank website
<i>CountryImport</i>	Country-level imports as a share of GDP (%)	World Bank website
<i>FinConstraints</i>	A country-level average of firm responses (k30) to "In access to financing, which includes availability and cost (interest rates, fees, collateral requirements), 0-No Obstacle, 1--a Minor Obstacle, 2--a Major Obstacle, 3--a Moderate Obstacle, or 4--a Very Severe Obstacle to the current operations of this establishment?"	ES
<i>CourtEnforcement</i>	A country-level average of firm responses (h7a) to "Do you 1--Strongly disagree, 2--Tend to disagree, 3--Tend to agree, or 4--Strongly agree "	ES
<i>Transparency</i>	A country-level measure (ODB.D6) of government spending transparency	Open Data Barometer website
<i>Performance-Guarantee</i>	A country-level score assigned by the World Bank to each country based on the existence and requirements of performance guarantee	World Bank Benchmarking Public Procurement
<i>Competitor-Number</i>	A firm-level measure defined as the natural log of one plus the number of competitors did the firm's main product/product line face for the main market in which the firm sold its main product	ES
<i>FDI</i>	A country-level measure defined as the percentage of net foreign direct investment inflows of GDP	World Bank website
<i>IPF</i>	A country-level measure defined as the natural log of annual investment project financing from the World Bank in local currency	World Bank website

Table 1

Private firm audit regulations for 111 economies.

<i>Complete Voluntary</i>		<i>Mandatory for all LLCs</i>		<i>Mandatory for LLCs that meet specific size criteria</i>	
Angola	St Vincent and Grenadines	Bahamas	Zambia	Afghanistan	Gabon Rwanda
Belize	Sudan	Bangladesh		Antigua and Barbuda	Georgia Philippines
Cape Verde	Suriname	Bhutan		Argentina	Grenada Senegal South Africa
Costa Rica	Swaziland	Burundi		Azerbaijan	Guatemala Sri Lanka
Djibouti	Tonga	Chile		Barbados	Guinea Tanzania
Ecuador	Uruguay	Egypt		Benin	Jamaica Togo
Eritrea	Zimbabwe	El Salvador		Bolivia	Kenya Turkey
Ethiopia		Gambia		Botswana	Kosovo
Honduras		Ghana		Brazil	Madagascar
Iraq		Guyana		Burkina Faso	Malawi
Kazakhstan		India		Cambodia	Malaysia
Kyrgyz Republic		Namibia		Cameroon	Mali
Laos		Nicaragua		Central African Republic	Mauritius
Liberia		Nigeria		Chad	Mexico
Micronesia		Samoa		Congo	Morocco
Mozambique		South Sudan		Cote d'Ivoire	Nepal
Myanmar		Timor-Leste		Dominica	Niger
Sierra Leone		Trinidad and Tobago		Dominican Republic	Pakistan
St Kitts and Nevis		Uganda		DRC (Republic of the Congo)	Paraguay
St Lucia		West Bank And Gaza		Fiji	Peru

Table 1

Audit requirements – Continued

Other Mandatory Situations	
<i>Mandatory for foreign-owned firms</i> Venezuela	<i>Mandatory for LLCs that meet size criteria and government-owned firms</i> Indonesia Vanuatu Tunisia
<i>Mandatory for government-owned firms</i> Tajikistan Uzbekistan Vietnam	<i>Mandatory for LLCs and partnerships that meet size criteria</i> Jordan
<i>Mandatory for foreign-owned firms and government-owned firms</i> Mongolia	<i>Mandatory for all LLCs and partnerships</i> Lesotho Mauritania
<i>Mandatory for all LLCs and foreign-owned firms</i> China Yemen	<i>Mandatory for LLCs and partnerships that meet size criteria and foreign-owned firms</i> Thailand
<i>Mandatory for all LLCs that meet size criteria and foreign owned firms</i> Colombia	

Table 2

Sample distribution of government contracting (*GovernmentContract*) and voluntary assurance (*Audit*) by country.

Country	N	<i>GovernmentContract</i>	<i>Audit</i>
Afghanistan	759	0.18	0.31
Angola	278	0.06	0.18
Antigua and Barbuda	53	0.17	0.51
Argentina	167	0.13	0.32
Azerbaijan	177	0.14	0.39
Bahamas	27	0.22	0.44
Bangladesh	1,956	0.09	0.29
Barbados	45	0.20	0.80
Belize	93	0.24	0.66
Benin	133	0.33	0.55
Bhutan	395	0.39	0.40
Bolivia	387	0.24	0.76
Botswana	110	0.59	0.74
Brazil	89	0.09	0.18
Burkina Faso	216	0.38	0.42
Burundi	84	0.35	0.46
Cambodia	291	0.12	0.23
Cameroon	484	0.14	0.57
Cape Verde	63	0.06	0.27
Central African Republic	80	0.20	0.49
Chad	178	0.13	0.35
Chile	159	0.19	0.35
China	1,417	0.12	0.71
Colombia	80	0.16	0.44
Congo	73	0.22	0.48
Costa Rica	454	0.26	0.61
Cote d'Ivoire	536	0.09	0.16
DRC	608	0.12	0.23
Djibouti	189	0.10	0.38
Dominica	69	0.16	0.51
Dominican Republic	459	0.11	0.69
Ecuador	671	0.30	0.58
Egypt	2,631	0.07	0.74
El Salvador	999	0.22	0.86
Eritrea	140	0.09	0.84
Eswatini (Swaziland)	64	0.17	0.81
Ethiopia	1,209	0.28	0.68

Fiji	58	0.19	0.93
Gabon	87	0.11	0.29
Gambia	103	0.33	0.23
Georgia	61	0.07	0.30
Ghana	850	0.16	0.37
Grenada	64	0.25	0.47
Guatemala	337	0.14	0.60
Guinea	87	0.28	0.41
Guyana	59	0.41	0.90
Honduras	539	0.14	0.65
India	5,957	0.15	0.79
Indonesia	2,602	0.05	0.19
Iraq	694	0.19	0.40
Jamaica	142	0.11	0.59
Jordan	200	0.07	0.33
Kazakhstan	959	0.23	0.22
Kenya	319	0.12	0.75
Kosovo	273	0.16	0.17
Kyrgyz Republic	389	0.26	0.35
Laos	900	0.10	0.24
Lesotho	136	0.26	0.54
Liberia	203	0.16	0.23
Madagascar	456	0.10	0.35
Malawi	347	0.24	0.42
Malaysia	613	0.20	0.46
Mali	703	0.17	0.31
Mauritania	19	0.21	0.26
Mauritius	194	0.13	0.50
Mexico	319	0.09	0.30
Micronesia	25	0.16	0.20
Mongolia	596	0.36	0.79
Morocco	105	0.21	0.46
Mozambique	473	0.15	0.40
Myanmar	1,087	0.03	0.21
Namibia	228	0.21	0.60
Nepal	347	0.05	0.69
Nicaragua	300	0.13	0.44
Niger	164	0.31	0.38
Nigeria	973	0.18	0.18
Pakistan	987	0.08	0.35
Paraguay	35	0.11	0.17

Peru	207	0.22	0.16
Philippines	779	0.10	0.79
Rwanda	142	0.54	0.44
Samoa	28	0.39	0.64
Senegal	785	0.08	0.16
Sierra Leone	237	0.17	0.25
South Africa	275	0.07	0.58
South Sudan	437	0.11	0.22
Sri Lanka	412	0.08	0.56
St Kitts and Nevis	65	0.25	0.71
St Lucia	107	0.14	0.46
St Vincent and Grenadines	109	0.23	0.78
Sudan	434	0.19	0.55
Suriname	89	0.10	0.46
Tajikistan	502	0.27	0.32
Tanzania	614	0.04	0.34
Thailand	167	0.05	0.27
Timor-Leste	227	0.41	0.31
Togo	139	0.24	0.42
Tonga	90	0.16	0.33
Trinidad and Tobago	125	0.16	0.77
Tunisia	158	0.37	0.49
Turkey	272	0.08	0.46
Uganda	494	0.11	0.34
Uruguay	837	0.19	0.47
Uzbekistan	447	0.12	0.31
Vanuatu	74	0.16	0.30
Venezuela	204	0.15	0.65
Vietnam	1,680	0.17	0.29
West Bank And Gaza	279	0.10	0.68
Yemen	677	0.11	0.25
Zambia	504	0.11	0.44
Zimbabwe	1,008	0.21	0.57
Total	51,417	0.15	0.48

Table 3
Descriptive statistics

Variable	N	Mean	Min	25%	Median	75%	Max	StdDev
Audit	51,417	0.48	0.00	0.00	0.00	1.00	1.00	0.50
GovernmentContractPay	51,417	0.15	0.00	0.00	0.00	0.00	1.00	0.36
GovernmentContract	6,216	0.22	0.00	0.00	0.00	0.00	1.00	0.42
TaxInspect	51,087	0.59	0.00	0.00	1.00	1.00	1.00	0.49
Loan	49,626	0.27	0.00	0.00	0.00	1.00	1.00	0.44
InvestLoan	17,659	0.13	0.00	0.00	0.00	0.00	1.00	0.28
CustomerSupplierFinancing	48,054	0.09	0.00	0.00	0.00	0.05	1.00	0.20
CompetitionNum	8,486	2.12	0.00	1.39	1.95	2.57	5.86	1.14
Size	45,208	16.79	10.31	14.51	16.52	18.83	25.28	3.20
GovernmentOwned	51,179	0.05	0.00	0.00	0.00	0.00	10.00	0.69
ForeignOwned	51,164	5.12	0.00	0.00	0.00	0.00	100.00	20.90
Age	50,462	2.64	1.10	2.20	2.64	3.14	4.30	0.71
Export	50,876	0.09	0.00	0.00	0.00	0.00	1.00	0.28
GDP	51,417	7.51	5.70	6.94	7.29	8.19	9.56	0.92
Inflation	51,228	9.21	-7.42	4.50	7.93	11.70	40.08	8.06
CountryImport	50,996	37.69	11.97	26.65	31.26	46.02	83.98	16.76
FinConstraints	51,417	1.55	0.60	1.18	1.48	1.85	2.81	0.51
CountryCourt	51,139	2.38	1.42	2.07	2.49	2.75	3.12	0.42
Transparency	8,456	0.14	0.00	0.05	0.05	0.15	0.95	0.21
PerformanceGuarantee	6,393	53.85	0.00	34.00	58.00	74.00	86.00	23.53
FDI	51,417	3.28	-2.41	1.19	2.14	4.18	16.33	3.24
IPF	47,952	20.85	11.88	17.73	20.77	23.23	30.61	4.38

Variables are defined in Appendix A.

Table 4
Pearson correlations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) Audit													
(2) GovernmentContract	0.11*												
(3) TaxInspect	0.17*	0.08*											
(4) Loan	0.13*	0.13*	0.01*										
(5) InvestLoan	0.11*	0.05*	-0.04*	0.42*									
(6) CustomerSupplierFinancing	0.02*	0.03*	-0.03*	0.07*	0.07*								
(7) CompetitionNum	0.12*	0.02	-0.04*	0.05*	0.07*	-0.02*							
(8) Size	0.02*	0.01*	0.00	0.15*	0.03*	-0.04*	0.03*						
(9) GovernmentOwned	0.01*	0.02*	0.00	-0.01	-0.01	0.01	-0.02*	-0.02*					
(10) ForeignOwned	0.07*	0.01	0.04*	0.00	-0.02*	0.01*	-0.07*	0.11*	0.03*				
(11) Age	0.13*	0.04*	-0.01*	0.10*	0.08*	0.08*	0.08*	0.05*	0.01*	-0.03*			
(12) Export	0.11*	0.00	0.01*	0.10*	0.05*	0.02*	-0.03*	0.15*	0.07*	0.15*	0.07*		
(13) GDP	0.08*	0.00	-0.16*	0.14*	0.14*	0.15*	-0.07*	-0.06*	0.02*	-0.01	0.13*	0.06*	
(14) Inflation	-0.03*	-0.01	0.06*	-0.08*	-0.07*	-0.05*	-0.04*	0.14*	-0.01	-0.02*	-0.11*	-0.03*	-0.15*
(15) CountryImport	-0.04*	0.07*	0.03*	0.10*	0.06*	-0.04*	-0.06*	0.11*	-0.02*	0.07*	-0.10*	0.05*	-0.11*
(16) FinConstraints	-0.1*	0.03*	0.15*	-0.10*	-0.07*	0.02*	-0.08*	-0.19*	0.01	0.05*	-0.08*	-0.07*	-0.33*
(17) CountryCourt	0.07*	-0.02*	-0.03*	-0.09*	-0.01	-0.10*	0.08*	0.08*	0.01*	-0.03*	-0.03*	0.04*	0.11*
(18) Transparency	0.08*	0.00	-0.12*	0.20*	0.13*	0.07*	0.08*	0.18*	-0.06*	0.07*	0.12*	0.02*	0.28*
(19) PerformanceGuarantee	0.23*	0.03*	-0.04*	-0.02	0.05*	0.07*	-0.01	-0.52*	0.04*	0.00*	0.12*	0.02	0.22*
(20) FDI	-0.08*	0.05*	0.03*	0.10*	0.04*	-0.02*	-0.08*	0.18*	-0.01*	0.05*	-0.10*	0.02*	0.07*
(21) IPF	-0.27*	-0.06*	0.01	-0.01*	-0.11*	-0.07*	-0.18*	0.53*	0.02*	0.02*	-0.05*	0.03*	-0.11*
	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)					
(14) Inflation													
(15) CountryImport	-0.05*												
(16) FinConstraints	-0.01	0.12*											
(17) CountryCourt	0.21*	-0.07*	-0.32*										
(18) Transparency	0.00	-0.04*	-0.32*	0.17*									
(19) PerformanceGuarantee	0.08*	-0.35*	0.35*	0.03*	-0.14*								
(20) FDI	0.09*	0.51*	-0.04*	-0.09*	-0.30*	-0.67*							
(21) IPF	0.12*	0.06*	0.00	-0.08*	0.03*	-0.54*	0.11*						

Variables are defined in Appendix. * Indicates significance at the 5% level.

Table 5

Government contracting and financial statements certification

	Dependent variable = <i>Audit</i>				
	(1)	(2)	(3)	(4)	(5)
<i>GovernmentContract</i>	0.156*** (0.024)	0.123*** (0.015)	0.087*** (0.014)	0.086*** (0.014)	0.293*** (0.059)
<i>TaxInspect</i>			0.171*** (0.022)	0.167*** (0.022)	0.581*** (0.091)
<i>Loan</i>			0.066*** (0.010)	0.064*** (0.010)	0.222*** (0.037)
<i>CustomerSupplierFinancing</i>			-0.047 (0.043)	-0.045 (0.043)	-0.153 (0.148)
<i>Size</i>			0.048*** (0.004)	0.050*** (0.004)	0.175*** (0.012)
<i>GovernmentOwned</i>			0.011* (0.006)	0.011* (0.006)	0.036 (0.023)
<i>ForeignOwned</i>			0.001*** (0.000)	0.001*** (0.000)	0.004*** (0.001)
<i>Age</i>			0.019** (0.007)	0.018** (0.008)	0.057** (0.025)
<i>Export</i>			0.079*** (0.017)	0.075*** (0.016)	0.254*** (0.050)
<i>GDP</i>				0.209** (0.096)	0.925** (0.391)
<i>Inflation</i>				-0.006*** (0.002)	-0.023*** (0.007)
<i>CountryImport</i>				0.004 (0.003)	0.014 (0.010)
<i>FinConstraints</i>				-0.070 (0.082)	-0.190 (0.295)
<i>CourtEnforcement</i>				-0.304*** (0.111)	-1.132*** (0.393)
Constant	0.156*** (0.024)	0.123*** (0.015)	0.087*** (0.014)	0.086*** (0.014)	0.293*** (0.059)
Industry, Legal, Year, Country FE	No	Yes	Yes	Yes	Yes
Model	OLS	OLS	OLS	OLS	Probit
Observations	51,417	51,417	40,324	39,802	39,802
Adjusted / Pseudo R ²	0.013	0.228	0.310	0.313	0.266

This table reports regression results of estimating Equation (1). All variables are defined in Appendix A. The robust standard errors are presented beneath the coefficients within parentheses. Continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors are clustered by country. Significance at the 0.10, 0.05, and 0.01 level for two-sided tests is denoted by *, **, and ***, respectively.

Table 6

The role of alternative monitoring

<i>Alternative Monitoring =</i>	Dependent variable = <i>Audit</i>		
	<i>TaxInspect</i>	<i>Loan</i>	<i>InvestLoan</i>
	(1)	(2)	(3)
<i>GovernmentContract</i>	0.115*** (0.023)	0.097*** (0.021)	0.081*** (0.015)
<i>GovernmentContract</i> × <i>Alternative Monitoring</i>	-0.044* (0.024)	-0.029 (0.022)	-0.078*** (0.025)
<i>TaxInspect</i>	0.174*** (0.025)	0.167*** (0.022)	0.123*** (0.012)
<i>Loan</i>	0.064*** (0.010)	0.070*** (0.012)	
<i>InvestLoan</i>			0.073*** (0.023)
<i>CustomerSupplierFinancing</i>	-0.045 (0.044)	-0.045 (0.043)	0.016 (0.026)
<i>Size</i>	0.050*** (0.004)	0.050*** (0.004)	0.053*** (0.004)
<i>GovernmentOwned</i>	0.011* (0.006)	0.011* (0.006)	0.003 (0.005)
<i>ForeignOwned</i>	0.001*** (0.000)	0.001*** (0.000)	0.002*** (0.000)
<i>Age</i>	0.018** (0.007)	0.018** (0.007)	0.028*** (0.007)
<i>Export</i>	0.075*** (0.016)	0.074*** (0.016)	0.075*** (0.021)
<i>GDP</i>	0.209** (0.096)	0.207** (0.096)	0.095 (0.124)
<i>Inflation</i>	-0.006*** (0.002)	-0.006*** (0.002)	-0.011*** (0.002)
<i>CountryImport</i>	0.004 (0.003)	0.004 (0.003)	0.002 (0.004)
<i>FinConstraints</i>	-0.069 (0.082)	-0.070 (0.082)	-0.018 (0.097)
<i>CourtEnforcement</i>	-0.304*** (0.111)	-0.304*** (0.111)	-0.345** (0.145)
Constant	-0.336 (0.660)	-0.327 (0.660)	-0.909 (1.222)
Industry, Legal, Year, Country FE	Yes	Yes	Yes
Observations	39,802	39,802	14,543
Adjusted R ²	0.314	0.313	0.332

This table reports regression results of estimating Equation (2). All variables are defined in Appendix A. The robust standard errors are presented beneath the coefficients within parentheses. Continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors are clustered by country. Significance at the 0.10, 0.05, and 0.01 level for two-sided tests is denoted by *, **, and ***, respectively.

Table 7

The role of government contract corruption

	Dependent variable = <i>Audit</i>
<i>GovernmentContractPay</i>	-0.041** (0.019)
<i>TaxInspect</i>	0.123*** (0.020)
<i>Loan</i>	0.043*** (0.014)
<i>CustomerSupplierFinancing</i>	-0.031 (0.033)
<i>Size</i>	0.043*** (0.006)
<i>GovernmentOwned</i>	0.013** (0.005)
<i>ForeignOwned</i>	0.001*** (0.000)
<i>Age</i>	0.040*** (0.009)
<i>Export</i>	0.087*** (0.026)
<i>GDP</i>	0.003 (0.206)
<i>Inflation</i>	-0.009*** (0.003)
<i>CountryImport</i>	0.006 (0.005)
<i>FinConstraints</i>	0.156 (0.141)
<i>CourtEnforcement</i>	-0.351 (0.216)
Constant	0.942 (1.091)
Industry, Legal, Year, Country FE	Yes
Observations	4,953
Adjusted R ²	0.293

This table reports regression results of estimating Equation (3). All variables are defined in Appendix A. The robust standard errors are presented beneath the coefficients within parentheses. Continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors are clustered by country. Significance at the 0.10, 0.05, and 0.01 for two-sided tests is denoted by *, **, and ***, respectively.

Table 8

The role of government spending transparency

	Dependent variable = <i>Audit</i>	
	(1)	(2)
<i>GovernmentContract</i>	0.126*** (0.035)	0.074** (0.030)
<i>GovernmentContract</i> × <i>Transparency</i>	0.098* (0.052)	0.103** (0.049)
<i>Transparency</i>	0.422** (0.198)	0.142*** (0.050)
<i>TaxInspect</i>	0.201*** (0.036)	0.136*** (0.036)
<i>Loan</i>	0.107*** (0.024)	0.047*** (0.016)
<i>CustomerSupplierFinancing</i>	0.035 (0.056)	0.071** (0.033)
<i>Size</i>	-0.008 (0.007)	0.058*** (0.007)
<i>GovernmentOwned</i>	-0.007 (0.008)	0.006 (0.004)
<i>ForeignOwned</i>	0.002*** (0.000)	0.001*** (0.000)
<i>Age</i>	0.038*** (0.013)	0.014 (0.011)
<i>Export</i>	0.113** (0.047)	0.078* (0.041)
<i>GDP</i>	0.038 (0.092)	0.178*** (0.009)
<i>Inflation</i>	0.005 (0.007)	0.002*** (0.001)
<i>CountryImport</i>	0.002 (0.004)	0.010*** (0.000)
<i>FinConstraints</i>	0.016 (0.140)	0.133*** (0.017)
<i>CourtEnforcement</i>	-0.340*** (0.115)	-0.031 (0.028)
Constant	0.529 (0.926)	-2.885*** (0.257)
Industry, Legal, Year FE	Yes	Yes
Country FE	No	Yes
Observations	6,713	6,713
Adjusted R ²	0.206	0.364

This table reports regression results of estimating Equation (4). Columns 1 (2) report results without (with) country fixed effects. All variables are defined in Appendix A. The robust standard errors are presented beneath the coefficients within parentheses. Continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors are clustered by country. Significance at the 0.10, 0.05, and 0.01 level for two-sided tests is denoted by *, **, and ***, respectively.

Table 9

The substitution between governments' own assurance and external assurance services

	Dependent variable = <i>Audit</i>
<i>GovernmentContract</i>	0.384*** (0.073)
<i>GovernmentContract</i> × <i>PerformanceGuarantee</i>	-0.004*** (0.001)
<i>PerformanceGuarantee</i>	0.006*** (0.002)
<i>TaxInspect</i>	0.157*** (0.022)
<i>Loan</i>	0.047** (0.021)
<i>CustomerSupplierFinancing</i>	0.030 (0.036)
<i>Size</i>	0.011 (0.007)
<i>GovernmentOwned</i>	0.014* (0.007)
<i>ForeignOwned</i>	0.001** (0.000)
<i>Age</i>	0.021 (0.018)
<i>Export</i>	0.101* (0.055)
<i>GDP</i>	0.179*** (0.052)
<i>Inflation</i>	-0.001 (0.008)
<i>CountryImport</i>	0.004* (0.002)
<i>FinConstraints</i>	0.034 (0.092)
<i>CourtEnforcement</i>	-0.054 (0.070)
Constant	-2.245*** (0.793)
Industry, Legal, Year FE	Yes
Observations	5,442
Adjusted R ²	0.218

This table reports coefficient estimates from a regression of *Audit* on governments' own assurance (*PerformanceGuarantee*), the interaction term between *PerformanceGuarantee* and *GovernmentContract*. All variables are defined in Appendix A. The robust standard errors are presented beneath the coefficients within parentheses. Continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors are clustered by country. Significance at the 0.10, 0.05, and 0.01 level for two-sided tests is denoted by *, **, and ***, respectively.

Table 10
The role of alternative suppliers

	Dependent variable = <i>Audit</i>
<i>GovernmentContract</i>	0.129*** (0.036)
<i>GovernmentContract</i> × <i>CompetitorNumber</i>	-0.022* (0.011)
<i>CompetitorNumber</i>	0.012 (0.011)
<i>TaxInspect</i>	0.167*** (0.018)
<i>Loan</i>	0.040*** (0.011)
<i>CustomerSupplierFinancing</i>	-0.046 (0.036)
<i>Size</i>	0.055*** (0.008)
<i>GovernmentOwned</i>	0.003 (0.008)
<i>ForeignOwned</i>	0.002*** (0.000)
<i>Age</i>	0.024* (0.014)
<i>Export</i>	-0.019 (0.029)
<i>GDP</i>	-0.112*** (0.011)
<i>Inflation</i>	0.005*** (0.001)
<i>CountryImport</i>	-0.013*** (0.001)
<i>FinConstraints</i>	-0.204*** (0.023)
<i>CourtEnforcement</i>	0.025* (0.014)
Constant	0.959*** (0.189)
Industry, Legal, Year, Country FE	Yes
Observations	7,204
Adjusted R ²	0.398

This table reports coefficient estimates from a regression of *Audit* on the number of main competitors a firm faces (*CompetitorNumber*), the interaction term between *CompetitorNumber* and *GovernmentContract*, and other control variables. All variables are defined in Appendix A. The robust standard errors are presented beneath the coefficients within parentheses. Continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors are clustered by country. Significance at the 0.10, 0.05, and 0.01 level for two-sided tests is denoted by *, **, and ***, respectively.

Table 11
Different identifications of voluntary assurance

<i>Mandatory requirement partition =</i>	Dependent variable = <i>Audit</i>		
	Include Size Exemption	Complete Voluntary Only	LLC Only
	(1)	(2)	(3)
<i>GovernmentContract</i>	0.078*** (0.013)	0.076*** (0.025)	0.045*** (0.016)
<i>TaxInspect</i>	0.164*** (0.021)	0.113*** (0.024)	0.089*** (0.019)
<i>Loan</i>	0.060*** (0.009)	0.062*** (0.021)	0.062*** (0.021)
<i>CustomerSupplierFinancing</i>	-0.046 (0.035)	-0.052 (0.045)	-0.074 (0.048)
<i>Size</i>	0.050*** (0.004)	0.053*** (0.010)	0.057*** (0.009)
<i>GovernmentOwned</i>	0.012** (0.005)	0.017** (0.008)	0.011* (0.006)
<i>ForeignOwned</i>	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
<i>Age</i>	0.017** (0.007)	0.026** (0.012)	0.037*** (0.010)
<i>Export</i>	0.063*** (0.015)	0.096** (0.043)	0.040* (0.023)
<i>GDP</i>	0.212** (0.088)	-0.139*** (0.048)	0.109*** (0.025)
<i>Inflation</i>	-0.006*** (0.002)	-0.006*** (0.002)	0.006 (0.007)
<i>CountryImport</i>	0.003 (0.003)	-0.005*** (0.001)	0.001 (0.003)
<i>FinConstraints</i>	-0.086 (0.080)	-0.078 (0.059)	0.016 (0.029)
<i>CourtEnforcement</i>	-0.237** (0.100)	-0.118 (0.087)	0.177* (0.101)
Constant	-1.957** (0.843)	1.851** (0.691)	-1.968*** (0.528)
Industry, Legal, Year, Country FE	Yes	Yes	Yes
Observations	45,037	9,775	6,178
Adjusted R ²	0.305	0.305	0.310

This table reports regression results of Equation (1) in different voluntary audit samples. Column 1 presents results with a voluntary sample including firms meeting audit exemptions based on size criteria, column 2 presents results with observations only from completely voluntary audit countries, and column 3 presents results with only limited liability corporations from the main voluntary sample. All variables are defined in Appendix A. The robust standard errors are presented beneath the coefficients within parentheses. Continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors are clustered by country. Significance at the 0.10, 0.05, and 0.01 level for two-sided tests is denoted by *, **, and ***, respectively.

Table 12

The interaction effect of foreign capital

	Dependent variable = <i>Audit</i>
<i>GovernmentContract</i>	0.089*** (0.000)
<i>GovernmentContract</i> × <i>FDI</i>	-0.001 (0.714)
<i>FDI</i>	-0.000 (0.985)
<i>TaxInspect</i>	0.167*** (0.000)
<i>Loan</i>	0.064*** (0.000)
<i>CustomerSupplierFinancing</i>	-0.045 (0.300)
<i>Size</i>	0.050*** (0.000)
<i>GovernmentOwned</i>	0.011* (0.074)
<i>ForeignOwned</i>	0.001*** (0.000)
<i>Age</i>	0.018** (0.021)
<i>Export</i>	0.075*** (0.000)
<i>GDP</i>	0.209** (0.030)
<i>Inflation</i>	-0.006*** (0.002)
<i>CountryImport</i>	0.004 (0.157)
<i>FinConstraints</i>	-0.071 (0.388)
<i>CourtEnforcement</i>	-0.305*** (0.007)
Constant	-0.332 (0.612)
Industry, Legal, Year, Country FE	Yes
Observations	39,802
Adjusted R ²	0.313

This table reports the OLS regression results of adding *FDI* and the interaction term between *GovernmentContract* and *FDI* in Equation (1). All variables are defined in Appendix A. The robust standard errors presented beneath the coefficients within parentheses. Continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors are clustered by country. Significance at the 0.10, 0.05, and 0.01 level for two-sided tests is denoted by *, **, and ***, respectively.

Table 13

Propensity-Score Matching

Panel A

Covariate balance after matching

	GovernmentContract =1	GovernmentContract =0	Difference	P-Value
<i>CustomerSupplierFinancing</i>	0.683	0.696	-0.014	0.108
<i>TaxInspect</i>	0.414	0.416	-0.002	0.811
<i>Loan</i>	0.104	0.110	-0.006	0.141
<i>Size</i>	16.894	16.922	-0.028	0.64
<i>GovernmentOwned</i>	0.072	0.064	0.009	0.56
<i>ForeignOwned</i>	5.450	6.045	-0.595	0.134
<i>Age</i>	2.719	2.715	0.004	0.758
<i>Export</i>	0.091	0.092	-0.002	0.753

Panel B

Regression results using the propensity-score matched sample

	Dependent variable = <i>Audit</i>
<i>GovernmentContract</i>	0.087*** (0.014)
<i>TaxInspect</i>	0.145*** (0.019)
<i>Loan</i>	0.056*** (0.012)
<i>CustomerSupplierFinancing</i>	-0.047 (0.034)
<i>Size</i>	0.048*** (0.005)
<i>GovernmentOwned</i>	0.011* (0.006)
<i>ForeignOwned</i>	0.001*** (0.000)
<i>Age</i>	0.029*** (0.008)
<i>Export</i>	0.052*** (0.019)
<i>GDP</i>	0.139 (0.154)
<i>Inflation</i>	-0.007*** (0.002)
<i>CountryImport</i>	0.005 (0.004)

<i>FinConstraints</i>	0.056 (0.088)
<i>CourtEnforcement</i>	-0.229 (0.158)
Constant	-1.985 (1.413)
Industry, Legal, Year, Country FE	Yes
Observations	12,030
Adjusted R ²	0.292

This table presents OLS regression results of Equation (1) using a propensity-score matched sample. For each firm with a government contract (Treatment), we select a firm without a government contract with the closet propensity score imposing a 0.001 caliper (Control). We match without replacement to get a propensity-score matching sample. Panel A presents the comparison of descriptive statistics between the treatment (firm with government contracting) and control sample (firms without government contracting). Panel B presents OLS regression estimating equation (1) using the matched sample. All variables are defined in Appendix A. The robust standard errors are presented beneath the coefficients within parentheses. Continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors are clustered by country. Significance at the 0.10, 0.05, and 0.01 level for two-sided tests is denoted by *, **, and ***, respectively.

Table 14

Changes specification and firm fixed effects

Panel A: Changes specification		Panel B: Firm fixed effects	
	Dependent variable = $\Delta Audit$		Dependent variable = $Audit$
	(1)		(2)
<i>$\Delta GovernmentContract$</i>	0.137*** (0.042)	<i>$GovernmentContract$</i>	0.059** (0.029)
<i>$\Delta TaxInspect$</i>	0.125*** (0.022)	<i>$TaxInspect$</i>	0.136*** (0.019)
<i>$\Delta Loan$</i>	0.077* (0.042)	<i>$Loan$</i>	0.013 (0.021)
<i>$\Delta CustomerSupplierFinancing$</i>	-0.005 (0.065)	<i>$CustomerSupplierFinancing$</i>	-0.012 (0.042)
<i>$\Delta Size$</i>	0.011* (0.006)	<i>$Size$</i>	0.015** (0.006)
<i>$\Delta GovernmentOwned$</i>	0.027* (0.016)	<i>$GovernmentOwned$</i>	0.025** (0.011)
<i>$\Delta ForeignOwned$</i>	0.001 (0.000)	<i>$ForeignOwned$</i>	0.000 (0.001)
<i>ΔAge</i>	-0.001 (0.015)	<i>Age</i>	0.013 (0.010)
<i>$\Delta Export$</i>	-0.044 (0.039)	<i>$Export$</i>	-0.005 (0.032)
<i>ΔGDP</i>	-0.511*** (0.133)	<i>GDP</i>	0.126 (0.078)
<i>$\Delta Inflation$</i>	-0.001 (0.003)	<i>$Inflation$</i>	-0.006** (0.002)
<i>$\Delta CountryImport$</i>	-0.001 (0.003)	<i>$CountryImport$</i>	0.001 (0.002)
<i>$\Delta FinConstraints$</i>	-0.011 (0.076)	<i>$FinConstraints$</i>	0.061 (0.053)
<i>$\Delta CourtEnforcement$</i>	-0.319*** (0.098)	<i>$CourtEnforcement$</i>	-0.137 (0.087)
Constant	0.268*** (0.046)	Constant	-0.672 (0.534)
Legal, Year FE	Yes	Year, Firm FE	Yes
Observations	2,311	Observations	4,463
Adjusted R ²	0.097	Adjusted R ²	0.070

This table presents OLS regression results with changes specification and firm fixed effects using a panel sample. This panel sample is constructed by combining individual panel dataset for each country. All variables are defined in Appendix A. The robust standard errors are presented beneath the coefficients within parentheses. Continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors are clustered by country. Significance at the 0.10, 0.05, and 0.01 level for two-sided tests is denoted by *, **, and ***, respectively.

Table 15
Instrumental-Variable Test

	Dependent variable = <i>GovernmentContract</i>		Dependent variable = <i>Audit</i>
	Preparing Stage (1)	2SLS First Stage (2)	2SLS Second Stage (3)
<i>GovernmentContract</i>			0.279* (0.097)
<i>IPF</i>	0.073* (0.043)	0.006 (0.788)	
$\widehat{GovernmentContract}$		1.110*** (0.000)	
<i>TaxInspect</i>	0.278*** (0.103)	0.003 (0.890)	0.157*** (0.000)
<i>Loan</i>	0.315*** (0.043)	-0.003 (0.708)	0.047*** (0.003)
<i>CustomerSupplierFinancing</i>	0.139*** (0.050)	0.003 (0.867)	-0.043 (0.296)
<i>Size</i>	0.039*** (0.013)	-0.002 (0.757)	0.049*** (0.000)
<i>GovernmentOwned</i>	0.019* (0.010)	-0.001 (0.767)	0.010 (0.172)
<i>ForeignOwned</i>	-0.001*** (0.000)	-0.000 (0.792)	0.001*** (0.000)
<i>Age</i>	0.094*** (0.011)	-0.005 (0.123)	0.013* (0.076)
<i>Export</i>	-0.125*** (0.037)	-0.002 (0.833)	0.081*** (0.000)
<i>GDP</i>	0.584** (0.294)	0.024 (0.763)	0.187** (0.025)
<i>Inflation</i>	0.001 (0.003)	0.001 (0.455)	-0.007** (0.012)
<i>CountryImport</i>	0.012* (0.007)	-0.000 (0.883)	0.005 (0.170)
<i>FinConstraints</i>	-0.158 (0.176)	0.003 (0.951)	-0.080 (0.354)
<i>CourtEnforcement</i>	0.372** (0.183)	-0.027 (0.687)	-0.260** (0.032)
Constant	-8.340*** (2.930)	-0.294 (0.805)	-1.548** (0.028)

Industry, Legal, Year, and Country FE	Yes	Yes	Yes
Observations	61,706	37,046	37,046
Adjusted / Pseudo R ²	0.096	0.097	0.302

This table presents 2SLS IV regression results. Column 1 reports coefficient estimates from probit regression of investment project financing (*IPF*) from the World Bank on *GovernmentContract* and other control variables. $\widehat{GovernmentContract}$ is the fitted value from the preparing stage using all observations, regardless of the nature of audit (including both the mandatory audit sample and the voluntary audit sample). Columns 2 and 3 report 2SLS regression results with both $\widehat{GovernmentContract}$ and *IPF* as instrumental variables, using the main voluntary audit sample. Columns 2 and 3 report coefficients from the first stage and second stage, respectively. All variables are defined in Appendix A. The robust standard errors are presented beneath the coefficients within parentheses. Continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors are clustered by country. Significance at the 0.10, 0.05, and 0.01 level for two-sided tests is denoted by *, **, and ***, respectively.