

# The Dark Side of Disclosure

## Evidence of Government Expropriation from Worldwide Firms

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## Abstract

This paper studies the effects of voluntary accounting information disclosure through auditing on firm access to finance, exposure to corruption, and sales growth. Relying on a data set of more than 70,000 firms in 121 countries, the analysis finds that disclosure can be a double-edged sword. On the one hand, audited firms exhibit a slightly lower level of financial constraints than unaudited firms. On the other hand, audited firms face a significantly higher level of corruption obstacles. The net effects of voluntary information disclosure on firm growth are negative, which can

largely be explained by the fact that most of the countries in the sample are developing countries where institutions are weak. The beneficial effect of disclosure increases as a country's property rights protection improves. The qualitative results are robust to considerations of the endogeneity of auditing and to alternative measures of corruption and financial constraints. The findings reveal the dark side of voluntary information disclosure: exposing firms to government expropriation where institutions are weak.

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# **The Dark Side of Disclosure: Evidence of Government Expropriation from Worldwide Firms**

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## I. Introduction

Information asymmetry has important implications in corporate decisions and as such, is among the most researched topics in the corporate finance literature (Meyer and Majluf, 1984; Stein, 2003). One particular effect of information asymmetry between the firm and its lenders is higher cost of external financing,<sup>1</sup> which limits a firm's investment opportunity set and retards firm growth. Firm management, therefore, is motivated to pursue disclosure policies that reduce the information asymmetry. An oft-used strategy is for firms to have their financial statements audited by external auditors and then disclose them to the relevant outside stakeholders.<sup>2</sup>

Many scholars have examined voluntary disclosure practices and their impact on corporate policies. A key finding is that higher level of disclosure is related to lower cost of external financing (Leuz and Verrecchia, 2000; Bushman and Smith, 2003; Hughes, Liu, and Liu, 2007; Lambert, Leuz and Verrecchia, 2007) and is therefore beneficial to firm growth (Verrecchia, 2001; Bushman and Smith, 2003; Khurana, Pereira, and Martin, 2006; Leuz and Wysocki, 2008). However, information disclosure is not without cost (Verrecchia, 1983; Elliot and Jacobson, 1994; Yosha, 1995; Leuz and Wysocki, 2008). In addition to the direct costs (such as audit and clerical fees), disclosure can incur indirect or strategic costs. For example, an extended disclosure may reveal a firm's detailed financial and operational information to interested parties, i.e. competitors, customers, suppliers, or bureaucrats. These parties may in turn use the disclosed information to compete against the firm or to extract rents, causing the firm's competitive advantage to erode (Admati and Pfleiderer, 2000). In light of these considerations, some predict that firms pursue an optimal level of disclosure after

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<sup>1</sup> Meyer and Majluf, 1984; Demirguc-Kunt and Maksimovic, 1998; Verrecchia, 2001; Bushman and Smith, 2001; Khurana, Pereira and Martin, 2006.

<sup>2</sup> Chow, Kramer, and Wallace (1988) hypothesize that firms have three incentives to have their financial statement audited by external auditors. The first is the information-signaling incentive (Dye, 1993): through auditing, a firm can transmit private information to external stakeholders concerning its future prospects. The second is the insurance incentive (Kellogg, 1984): through audit opinions, a firm provides a means for investors to recover investment losses. The third is the agency-cost-reduction incentive: auditing can ensure the accuracy of the reported financial statements and thereby reduce agency costs (DeFond, 1992; Beatty, 1989). The overall empirical evidence tends to support the existence of these incentives.

weighing the associated costs and benefits (Lang and Lundholm, 1993; Bamber and Cheon, 1998; Admati and Pfleiderer, 2000).

While there have been extensive empirical studies about the benefits of disclosure such as the effect of disclosure on the cost of external financing, there have been much fewer empirical studies on the costs associated with disclosure (Leuz and Wysocki, 2008). In addition, most existing studies are based on publicly traded firms in the U.S. where governance, markets, and institutions are more developed and efficient than those in developing countries. Thus, empirical evidence that directly examines both the benefits and costs of disclosure is scarce, while large-scale cross-country empirical evidence is almost non-existent. In this study, we employ a large cross-country firm level data set, which allows us to directly examine the benefits and costs, especially indirect political costs, of disclosure in a context where variations in institutions are substantial.

We analyze the World Bank Enterprise Survey (WBES) data from 2006 to 2014 for over 70,000 firms in 121 developing countries. We provide evidence that disclosure can be a double-edged sword: while audited firms exhibit a lower level of financial obstacles than unaudited firms, they also face a higher level of corruption obstacles. Furthermore, firms strategically disclose for higher net benefits: they are more likely to disclose if they have more growth opportunities measured by capital expenditure; they are less likely to disclose if they face a high level of competition. Perhaps surprisingly, auditing has an overall *negative* impact on firm growth. However, the negative effect can be largely explained by the fact that most of the countries in our sample are under-developed countries where institutions are weak. Thus disclosure may be detrimental to firm development if they operate in an unsound business environment with poor governance. This conjecture is supported by our further empirical analyses: the beneficial effect of disclosure indeed increases as a country's level of property rights protection improves.

We conduct extensive specification checks. In our empirical analysis, we recognize the potential endogenous nature of auditing and rely on two methods to address the non-random nature of auditing:

the matching method (through either direct or propensity score matching) and the two-stage least square (2SLS) method. Our results continue to hold after we deal with potential endogeneity of information disclosure. Our results also remain robust with various measurement issues. To alleviate the concern that the measures of financial obstacles are subjective responses to survey questions, we use two objective measures as our alternative proxies of financial constraints (i.e., the use of an overdraft facility and access to a line of credit) and obtain robust results. We also employ two detailed proxies of government expropriation—the obstacles in obtaining licenses and permits and the obstacles in paying taxes—and again obtain consistent results.

We contribute to two strands of literature. First, we contribute to the literature on voluntary information disclosure. Our study provides novel and comprehensive cross-country empirical evidence on the benefits and costs of disclosure. We capture the benefit of disclosure by a firm's access to finance, and the cost of disclosure by corruption obstacles faced by the firm; we further capture the overall effect of disclosure by firm growth (Khurana et al., 2006). We demonstrate in a novel way that disclosure has important costs in allowing exposure to government expropriation, and that the costs and benefits of disclosure depend on a country's institutions.<sup>3</sup> The finding of the dark side of exposing firms to government expropriation is novel, and not explored in the literature.<sup>4</sup> Moreover, the dependence of the information-disclosure effect on institutional background nicely illustrates the complementarity of information disclosure with the underlying institutional background, which is vastly under-explored in the literature but emphasized by Leuz and Wysocki (2008) in their survey.

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<sup>3</sup> The quality of governance and institutions has been shown to significantly impact on firm-level corporate policies and outcomes (La Porta, Lopez-de-Silanes, Shleifer and Vishny (LLSV), 2000; Lemmon and Lins, 2003; Doidge, Karolyi and Stulz, 2007; Barth, Lin, Lin and Song, 2009; Harrison, Lin and Xu, 2014, among others). However, the literature has not examined how it affects the costs and benefits of disclosure.

<sup>4</sup> For instance, in a comprehensive survey, Leuz and Wysocki (2008) have not mentioned any paper that explicitly addresses the costs of auditing in exposing the firm to government expropriation.

Second, we add new evidence to the corruption literature.<sup>5</sup> We show that accounting information disclosure can be detrimental to firm development if firms operate in a corrupt business environment with low institutional quality. Such disclosure allows corrupt bureaucrats to gain access to firm-level information and use it for endogenous harassment (Fisman and Svensson, 2007). Corruption can thus indirectly discourage the adoption of good policies (such as voluntary information disclosure) that would be efficient in economies with better institutions.

The rest of this paper is organized as follows. Section II describes data, variable definitions, and summary statistics. Section III examines the effect of disclosure on firm financial obstacles. Section IV examines its effect on firm corruption obstacles. Section V investigates the effect of voluntary disclosure on firm growth. Section VI analyzes how the costs and benefits of auditing hinge on property rights protection. Section VII concludes.

## **II. Data, Variables and Summary Statistics**

### **A. Data**

We construct firm-level variables from *World Bank Enterprise Survey (WBES)* collected for 71,677 firms in 121 countries from 2006 to 2014.<sup>6</sup> Of the 121 countries, most were surveyed once; a few, in two to three waves. See Table A1 in the Appendix for the total number of firm observations, and the number and percentage of audited and unaudited firms by country.

WBES relies on standardized survey instruments in collecting firm-level data. The survey respondents are mainly business owners and/or firm top managers. The surveys focus on assessing the critical obstacles in the business environment that hinder firm growth, including access to finance and obstacles related to corruption, political instability, infrastructure, crime, competition, the labor

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<sup>5</sup> For papers and surveys on the literature of corruption, see Bardhan (1997), Cai, Fang and Xu (2011), Clarke and Xu (2004), Li, Xu and Zou (2000), Mauro (1995), Shleifer and Vishny (1993), and Svensson (2003, 2005),

<sup>6</sup> For a literature survey of firm-level studies using the WBES data, see Xu (2011).

market and the legal system. The survey also contains information on firm ownership, sales, employees, top manager experience, whether a firm is an exporter, and firm age.

We start with all observations in WBES, and we proceed to delete firms that do not answer the audit question: “In the last fiscal year, did this establishment have its annual financial statement checked and certified by an external auditor?” We also delete (4,330) publicly listed firms because they are required to have their annual financial statements audited. Thus, auditing is not a choice that can be made by these firms. Our final sample consists of 71,677 firms in 121 countries from 2006 to 2014.<sup>7</sup> Among these, 47% of firms had their annual financial statements checked and certified by external auditors.

A common criticism of using survey data to conduct research related to firm performance and growth is that survey data are self-reported and therefore the findings may suffer from self-reporting bias. However, accounting data are more likely to be biased than survey data as the incentives to distort data are likely to be higher in financial statements because many firm-level decisions, such as tax, financing, and managerial compensations, are in part based on variables from financial statements (Beck Demirgüç-Kunt and Maksimovic, 2005). Furthermore, the self-reporting nature of the WBES data is not likely to be a significant source of bias. The survey aims to evaluate the business environment instead of firm performance and growth. Even though some firm performance and growth related questions were asked, the survey was specifically designed to ask those questions at the end of the interview. This reduces the respondents’ need to justify their own performance when answering the earlier questions about the business environment.

Throughout our analysis, we control for country level governance and macroeconomic variables. Country level financial development data are from *International Financial Statistics (IFS)*. Country-level governance indices (*Control of Corruption* and *Government Effectiveness*) are from the

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<sup>7</sup> The dataset includes firms from 15 different industries according to the international industry classification codes (ISIC).



*Worldwide Governance Indicators (WGI)* database by the World Bank. Country level macroeconomic variables, i.e. *GDP*, *GDP per capita*, *GDP growth rate* and *inflation*, come from the *World Development Indicators (WDI)* database by the World Bank. Our measure of property rights comes from the *Heritage Foundation*.

## **B. Variables and Summary Statistics**

We first describe our dependent variables.<sup>8</sup> The survey contains various indicators of obstacles to firm growth. We focus on two key obstacles to firm growth: financial obstacles (*FinancialObstacle*) and corruption obstacles (*CorruptionObstacle*). For additional analyses, we also examine two other firm-level obstacles, i.e. business licensing and permits-related obstacles and tax collection-related obstacles. All these firm-level obstacles take on a value based on the self-reported answers to the following WBES question: “How problematic is \_\_\_\_\_ for the current operations of a business?” The blank space represents one of the aforementioned growth obstacles. The obstacles are on the scale from 0 – 4: no obstacle (0), minor obstacle (1), moderate obstacle (2), major obstacle (3), and very severe obstacle (4). For robustness checks, we also create dummy variables for these obstacles, *FinancialObstacleDummy*, *CorruptionObstacleDummy*, *LicenseDummy*, and *TaxRateDummy*, which take a value of 1 if the respective obstacle scores equal 2 (moderate), 3 (major), or 4 (very severe), and 0 otherwise.

We employ two additional, objective measures to proxy a firm’s financial constraints: overdraft (*Overdraft*) and line of credit (*CreditLine*). Both are indicator variables. *Overdraft* equals 1 if a firm has an overdraft facility, and 0 otherwise. *CreditLine* equals 1 if a firm has a line of credit in a financial institution, and 0 otherwise. Firms with an overdraft facility or line of credit are found to be less financially constrained (Lins, Servaes and Tufano, 2010). As reported in Panel B of Table 1, univariate tests show that audited firms are more likely to have an overdraft facility and line of credit, compared to unaudited firms.

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<sup>8</sup> The details of the variables, their sources and the survey data items are provided in Table A2 in the Appendix.

Another key dependent variable is firm sales growth. It is computed as follows:

$$SalesGrowth = (Sales_t - Sales_{t-2}) / (Sales_t + Sales_{t-2}) \quad (1)$$

Here  $t$  is year. The growth rate thus constructed is bound by -1 and 1, which reduces the influence of outliers. To further reduce such influence, the growth rates are also winsorized at the top and bottom one percent.

Now we describe the explanatory variables. Our key variable, *Audit*, is an indicator variable that is 1 if a firm's annual financial statements were checked and certified by an external auditor, and 0 otherwise. As shown in Table 1, about 47% of the surveyed firms choose to have their financial statements audited.

Another variable is firm size. Large firms are likely less constrained by various firm-level obstacles than smaller firms, and small firms benefit more than large firms when growth obstacles are reduced (Schiffer and Weder, 2001; Beck, Demirgüç-Kunt and Maksimovic 2005; Cull and Xu, 2005; Knack and Xu, 2015). In our regressions, therefore, we control for firm size (*FirmSize*), measured as the natural logarithm of firm sales in constant US dollars. As shown in Panel A of Table 1, the mean and median sales in our sample are US\$18,653,000 and US\$409,000, respectively, which indicates the existence of extreme outliers in terms of firm size. We thus take the logarithm to alleviate the concern of extreme outliers.

An additional control variable is firm age, which is important because younger firms tend to grow faster than older firms (Dunne, Roberts and Samuelson, 1988), and are less likely to be harassed to pay bribes due to better relationships with bureaucrats and bank officers (Fisman and Svensson, 2007). We take the natural logarithm of firm age to reduce the influence of outliers. In our sample,

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<sup>9</sup> WBES does not contain information for (t-1) for sales.

the average firm has been in business for about 18 years and the oldest firm is 340 years old (Table 1 Panel A).<sup>10</sup>

We also control for work experience of top managers. *Ceteris paribus*, more experience working in the same sector entails better understanding of the business and the business environment. For instance, prior industry experience of the manager is positively related to firm performance measured by survival rate, profitability and sales growth (Bosma, van Praag, Thurik and de Wit, 2004).<sup>11</sup> Here managerial experience (*Experience*) is measured as the number of years that the top manager has been working in the same sector. In our sample, the average *Experience* for the top manager is 17 years (Table 1 Panel A).

We further control for two ownership variables. State ownership is believed and often shown to be associated with worse firm performance (Megginson and Netter, 2001; Beck, Demirguc-Kunt and Maksimovic, 2005; Harrison, Lin and Xu, 2004). We measure government ownership in our analysis with a dummy variable (*Government*) that equals 1 if the firm has government ownership stakes, 0 otherwise. In our sample, only 1% of all firms have government ownership stakes. In contrast, foreign ownership tends to be positively related to firm performance (Estrin, Hanousek, Kocenda and Svejnar, 2009; Harrison, Lin and Xu, 2014), partly because firms with foreign ownership have better access to markets and technical expertise than pure domestic firms (Fisman and Svensson, 2007). We therefore control for foreign ownership in our regressions with a dummy variable *Foreign* that equals 1 if any foreign companies or individuals have an ownership stake in the firm, and 0 otherwise. About 11% of all firms in our sample have foreign ownership.

Importantly, we also control for a key determinant of firm performance: competition. Competition increases the risk of forced exits from the market, thus spurring efforts. Though competition, according to Schumpeter, may also reduce the rent from innovation and thus reduces

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<sup>10</sup> For curiosity, we look it up and the oldest firm in our sample is a food-manufacturing firm in Jamaica.

<sup>11</sup> However, Robb and Watson (2012) find mixed effects of owner experience on firm performance.

the incentives for competition—there is evidence that the relationship between competition and innovation is non-linear (Aghion, Bloom, Blundell, Griffith and Howitt, 2005), and most economists remain positive about the role of competition for improving firm performance based on empirical evidence (Li, 1997; Xu, 2000; Li and Xu, 2004). There is also evidence that firms facing more fierce competition tend to experience greater financing obstacles and corruption (Beck, Demirgüç-Kunt, Maksimovic, 2005). We thus include a dummy variable (*Compete*) that equals 1 if the firm answered ‘Yes’ to the question: “Does this establishment compete against unregistered or informal firms?”<sup>12</sup> About 55 percent of our sample firms believe that they compete against informal firms (see Panel A of Table 1).

We now turn to measures of country-level financial and institutional development, which play important roles in how firm-level financial information is disseminated and used by various economic agents. As a control for country-level financial/credit market development, we use the ratio of domestic banking credit to the private sector over GDP (“*Priv*”). There are very wide variations in this variable in our sample countries, ranging from a low of 0.9 to a high of 121.5, with a mean of 33.9 (see Panel A of Table 1).

To control for country level corruption, we use corruption control (*CorruptionControl*) from the World Bank’s *World Governance Indicators* (WGI) database. This measure ranges from -2.5 (weak control) to +2.5 (strong control). In our robustness checks, we use alternative measures of corruption by controlling for a country’s government effectiveness (*GovernmentEffectiveness*), which measures the quality of a country’s public services, civil services, and policy formulation and implementation. *GovernmentEffectiveness* also ranges from -2.5 (weak) to +2.5 (strong). Both *CorruptionControl* and *GovernmentEffectiveness* vary widely across countries in our sample (see Panel A of Table 1).

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<sup>12</sup> Arguably this is not the best measure of competition since it does not capture competition from the formal sector. However, informal sector accounts for a large share of the economy in developing countries (La Porta and Shleifer, 2014); moreover, the WBES does not contain better measures.

We shall examine how the effect of disclosure depends on the quality of a country's institutional environment. To this end, we rely on an index from the Heritage Foundation: property rights (*PropertyRights*). There is a wide variation in *PropertyRights* across our sample countries (see Panel A, Table 1).

As the basic macroeconomic environment also influences firm performance, we control for key macro indicators including GDP, GDP growth rate, GDP per capita, and inflation (as in Beck Demirgüç-Kunt and Maksimovic, 2005; Knack and Xu, 2015). We in addition control for country, industry, and year fixed effects in all of our multivariate regressions. The country dummy holds constant all country-specific factors such as geography, culture, and the basic legal system. The inclusion of industry and year dummies further holds constant all industry-specific heterogeneity and worldwide common shocks. We thus have pushed quite far in reducing the extent of omitted variable bias.

### **C. Univariate Tests**

We first present univariate test results for our key variables between audited and unaudited firms. These two types of firms exhibit a similar level of corruption obstacles and similar sales growth rates. Relative to unaudited firms, audited ones face a significantly lower level of financial obstacles; they are larger, have been in business longer, and their top managers are more experienced; they are more likely to have foreign or government ownership stakes, to be exporters, and are less likely to have to compete with competitors in the informal sector. Thus, audited and unaudited firms differ greatly in basic characteristics, and it is important to control for such key characteristics.

### **D. Determinants of Audit**

To further shed light on how audited and unaudited firms differ in key characteristics, we now investigate how the decision of having financial statements audited is related to firm characteristics. Our regression model is specified as follows:

$$\begin{aligned} Audit_{ij} = & a + \beta_1 FirmSize_{ij} + \beta_2 FirmAge_{ij} + \beta_3 Experience_{ij} + \beta_4 Government_{ij} + \beta_5 Foreign_{ij} \\ & + \beta_6 Exporter_{ij} + \beta_7 Compete_{ij} + \beta_8 CapitalExpenditure_{ij} + \theta' Macro\ Controls_i + \varepsilon_{ij} \end{aligned} \quad (2)$$

The dependent variable is *Audit*, a dummy variable that equals 1 if the firm's annual financial statement is audited by external auditors. Subscript *i* and *j* represent firm and country, respectively. The independent variables include various firm characteristics and macro Controls (i.e., GDP, GDP per capita, GDP growth, and inflation). We also include country, industry, and year fixed effects in all specifications.

Since we have a binary dependent variable with a large number of dummy variables and adding a large number of fixed effects to a traditional probit model would induce incidental parameters bias (Lancaster 2000), we follow Angrist (2001) and use a linear probability model (LPM) to estimate marginal effects instead of relying on the Probit model--linear models are not typically subject to the incidental parameters bias (Lancaster 2000). Since LPM tends to introduce heteroskedastic residuals, we use heteroskedasticity-consistent robust standard errors.

Table 2 presents the OLS and the probit results. Overall, the qualitative results are similar under alternative model specifications. According to the results, auditing is more likely for firms that are larger, older, with government or foreign ownership, and for firms that export. Consistent with our expectation that disclosure is more likely where the demand for capital is higher, the coefficient of *CapitalExpenditure* is positive.<sup>13</sup> The negative coefficient on *Compete* implies that firms are less likely

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<sup>13</sup> However, this result is subject to reverse causality, that is, it is also possible that auditing leads to more capital expenditure.

to disclose information if they operate in a competitive environment, implying that, when making audit decisions, firms are mindful of the strategic costs of disclosure (Leuz and Wysocki, 2008).

### III. Audit and Financial Obstacles

We now examine how auditing affects *FinancialObstacle* to shed light on its impact on access to finance. We employ multivariate regressions controlling for relevant firm characteristics, the industry effect, the year effect, the country effect, and (time-varying) country credit market development and economic development. Our regression model is specified as follows:

$$\begin{aligned} FinancialObstacle_{ij} = & a + \beta_1 Audit_{i,i} + \beta_2 FirmSize_{ij} + \beta_3 FirmAge_{ij} + \beta_4 Experience_{ij} + \beta_5 Government_{ij} + \beta_6 Foreign_{ij} \\ & + \beta_7 Exporter_{ij} + \beta_8 Compete_{ij} + \beta_9 Priv_{ij} + \theta' Macro Controls_i + \varepsilon_{ij} \end{aligned} \quad (3)$$

The subscripts  $i$  and  $j$  represent firm and country, respectively. The dependent variable, *FinancialObstacle*, is the observed firm-level financial obstacles and is polychotomous with a natural order, i.e., from 0 (no obstacle) to 4 (severe obstacle). We mainly rely on OLS to estimate equation (3). We also report the ordered probit results and show them to be qualitatively similar. In robustness checks, we also create a dummy variable, *FinancialObstacleDummy*, that equals 1 if the level of financial obstacle is 2 (moderate) or above, and 0 otherwise. In all these models, we expect  $\beta_1$ , the coefficient of *Audit*, to be significant and negative, as our hypothesis is that audited firms face lower financial obstacles than unaudited firms.

#### A. OLS and Ordered Probit Regressions

Columns (1) to (4) of Table 3 report the results. Models (1), (2) and (3) report the OLS results and Model (4) reports the Ordered Probit results. As shown in Table 3, the coefficients of *Audit*,  $\beta_1$ , are negative and significant across all four models, consistent with our hypothesis that disclosure reduces financial obstacles. Our finding remains robust after controlling for country credit market

development, macroeconomic factors, industry effects, year effects and country effects. Based on column (2), firms changing from no auditing to auditing are associated with a drop in *FinancialObstacle* by 0.059, or 4% of its standard deviation (SD); the magnitude of the effect of auditing in terms of SDs of the dependent variable is similar when we use *FinancialObstacleDummy*.

The coefficients of other explanatory variables also make sense. Financing obstacles are lower for larger and older firms, for firms whose top manager have more work experience and for firms with foreign ownership. The coefficients of *Compete* are positive and highly significant across all models, indicating that financing obstacles are higher when firms have to compete with informal firms. One explanation is that a significant number of firms in our sample are small firms (with a median sales of less than half a million US dollars) and they have to compete for the limited funds with other unregistered small firms, especially through the informal financing channel (Beck, Demirguc-Kunt and Maksimovic, 2008).

So far we have assumed that a firm's audit decision is exogenous to financial obstacles. However, the audit decision could be endogenous due to reverse causality (i.e., financing need determines voluntary information disclosure) and/or omitted variables (i.e., some omitted variables that are related to auditing also determine financing obstacles). Since the decision is voluntary (as opposed to regulatory mandate), a firm takes into account many factors when deciding whether to have its financial statements audited. For example, some financially-constrained firms may opt not to apply for external financing (hence no need to have their books audited) because they do not believe their applications would be approved due to bad credit ratings or other characteristics. On the other hand, it could be that some firms apply for credit (hence have their financial statements audited) while they are still in relatively good financial health. Thus, we have to deal with potential endogeneity associated with self-selection involved in the auditing decision. We rely on two methods: two-stage least squares regressions (2SLS) and the matching method.



## B. 2SLS Regressions

A valid instrument for *Audit* must meet two criteria: a strong correlation with *Audit* and being orthogonal to the error term. Our instrumental variable is logarithm of *IndustryActivity* -- the ratio of the number of audited firms in a given industry in a given year to the total number of firms in that industry. Industry level instrumental variable, commonly used in the literature (Xu, 2012), can act as a reasonable instrument because some industries have strong need for auditing, and *IndustryActivity* captures such industry characteristics. Indeed, we expect a firm's audit decision to be positively related to industry-level audit activity: firms are more willing to disclose information if more firms in that industry disclose such information, for instance, due to lower strategic costs of disclosing. In the meantime, industry-year level auditing intensity is not likely to directly affect individual firm obstacles once we control for industry fixed effects and year fixed effects in the regressions.

The 2SLS regression results are presented in Models (5) (i.e., the first stage) and (6) (i.e., the second stage) of Table 3. Independent variables of both regressions include the same set of firm characteristics and macro controls. Our diagnostic tests suggest that our instrumental variable is strong. As pointed out by Bound, Jaeger, and Baker (1993; 1995), the “cure can be worse than the disease” when the excluded instruments are weakly correlated with the endogenous variable, in which case the IV estimates will be inconsistent and biased in the same direction as OLS. As we can see, the F statistic exceeds the conventional rule of thumb by a large margin.<sup>14</sup>

As shown in Model (6), once being instrumented, the 2SLS estimate of the effect of auditing on *FinanciaObstacleDummy* becomes statistically insignificant, though the sign remains negative and the magnitude becomes even more pronounced. From the change in magnitude, it seems that *Audit* is positively correlated with the error term, implying that firms facing more financing obstacle tend to resort to voluntary information disclosure to a greater extent. In light of the lack of statistical

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<sup>14</sup> Since we allow for heteroskedasticity for our error term, the relevant test statistic is the Kleibergen-Paap rk F statistics.

significance, the 2SLS results thus cast some doubt as to whether voluntary information disclosure reduces financing obstacles.

### C. Matching

As an alternative to 2SLS estimation, whose validity hinges on the validity of the IV, we also use two matching methods to shed light on the effect of *Audit* on financing obstacles: propensity score matching and direct matching. The advantage of these methods is that it is transparent, easier to understand, and intuitive; its disadvantages is that it does not handle the issue of selection on unobservables. To ensure that our key results do not rest on fragile identifying assumptions, we thus also provide the matching results; we shall draw our main conclusions based on the findings from both 2SLS and the matching results.<sup>15</sup>

To conduct propensity score matching analysis, we first use the full regression specification in Table 3 to estimate a propensity score, which is the probability that a given firm would have its financial statements audited. We then match the audited firm with an unaudited firm using the nearest neighbor method. We match with replacement (i.e., allow a control firm to be used multiple times as potential match for various treated firms) in the region of common support, which ensures that the matches do not fall outside of the range of propensity values given by the treated group.

The results of propensity score matching are reported in Table 4 Panel A. The second row, labeled 'Matched', compares the treated firms to their counterparts based on the nearest matched non-audited firms. The results show that audited firms experience a slightly lower level of financial obstacles (i.e., the average treatment effect on the treated, or ATT) and it is only marginally significant when measured by *FinancialObstacleDummy*.

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<sup>15</sup> In other words, we shall assign the weight of zero for the findings associated with the OLS results since the underlying selectivity of auditing is quite clear.

Although propensity score matching better controls for covariates that affect the probability of treatment, it does not require an explicit match on some important independent variables that affect both the likelihood of having financial statements audited and firm obstacles. For example, we have shown that firm size is the most important determinant of auditing decision, and that size is also significantly related to firm level obstacles.<sup>16</sup> Similarly, ‘*Government*’ status and ‘*Foreign*’ status also affect firm obstacles, growth, and the auditing decision. We thus also employ an alternative matching method: to explicitly match the treated group (audited firms) with the control group (unaudited firms) on some important aspects that affect both the decision of auditing and firm obstacles. We thus match the audited firms (the treated group) with unaudited firms (the control group) explicitly based on the following criteria. First, we require that they come from the same country, the same industry, and the same year to control for unobserved country, industry, and year factors. Second, they must have the same ‘*Government*’ status. Third, they have the same ‘*Foreign*’ status. Fourth, the size of the control firm is the closest to that of the treated firm, and it has to be within 15 percent of the size of the treated firm.<sup>17</sup>

As shown in Panel B of Table 4, the direct matching results show that audited firms experience slightly lower incidence of financing obstacles being moderate or more severe. The results are similar to those obtained through propensity score matching and are marginally significant (with a p-value of 8%).

#### **D. Alternative Measures of Financial Obstacles**

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<sup>16</sup> Beck Demirgüç - Kunt and Maksimovic, 2005 also show that size is significantly related to firm obstacles.

<sup>17</sup> A more precise match on firm size would make the treated group and the control group more comparable. However, a stricter size matching criterion also reduces the number of observations for our matching sample. For instance, if we restrict the size range of the control firm to be 85% to 115% of the treated firm, we have 11,380 pairs of firms. In untabulated results, we also require size range to be 90% to 110% of the treated firm, our sample decreases to only 9,566 pairs of firms. Our results hold when using the alternative size range.

The measures of financial obstacle in Table 3 are subjective responses to survey questions. What if the subjective measures do not accurately reflect reality? To guard against this possibility, we employ two alternative, objective measures of financial constraints, i.e. overdraft facilities (*Overdraft*) and lines of credit (*CreditLine*). These dummy variables equal to 1 if a firm, respectively, has an overdraft facility or a line of credit with a financial institution, and 0 otherwise. Firms with lines of credit or an overdraft facility are found to be significantly less financially constrained (Sufi, 2009; Lins, et al., 2010). We also construct a third measure, *FinancialIndex*, defined as the sum of *Overdraft* and *CreditLine*. We replace the dependent variable (*FinancialObstacle*) in equation (3) with *Overdraft*, *CreditLine* and *FinancialIndex*, and estimate with the OLS model with heteroskedasticity-robust standard errors. We further address the potential endogeneity of audit using 2SLS regression analysis; the IV is the same as before. Table 5 reports the results.

Since the OLS results may simply reflect selectivity, we focus on the 2SLS results. Auditing has positive effects on all three alternative, objective measures of financial constraints. The effect on *Overdraft* and *FinancialIndex* is positive and significant.

Combining the 2SLS/matching results on *FinancialObstacle*, *Financial Obstacle Dummy* and the results on the three objective measures of financial access, auditing seems to have marginally beneficial effect on financial access. However, the magnitude does not look large, and the effect is not robustly statistically significant. Our results thus render a weak support to the contention that voluntary information disclosure tends to improve financial access. We also note that firms facing higher financing obstacles tend to opt for voluntary information disclosure.

## **IV. Audit and Corruption Obstacles**

### **A. OLS and Ordered Probit Regressions**

We have found marginal benefits of auditing to firms in reducing financial constraints. Now we investigate the costs associated with auditing in terms of exposure to government expropriation. The specification is as follows:

$$\begin{aligned} \text{CorruptionObstacle}_{ij} = & a + \beta_1 \text{Audit}_{ij} + \beta_2 \text{FirmSize}_{ij} + \beta_3 \text{FirmAge}_{ij} + \beta_4 \text{Experience}_{ij} + \beta_5 \text{Government}_{ij} \\ & + \beta_6 \text{Foreign}_{ij} + \beta_7 \text{Exporter}_{ij} + \beta_8 \text{Compete}_{ij} + \beta_9 \text{CorruptionControl}_j + \theta' \text{Macro Controls}_j + \varepsilon_{ij} \end{aligned} \quad (4)$$

We expect  $\beta_1$ , the coefficient of *Audit*, to be positive and significant, as we hypothesize that disclosure increases the potential of government expropriation.

The first four columns of Table 6 present the regression results. Models (1), (2) and (3) report the OLS results and Model (4) reports the Ordered Probit results. Consistent with our hypothesis, the coefficients of *Audit*,  $\beta_1$ , are positive and significant at the conventional level. Our finding is robust after controlling for relevant firm characteristics, country corruption control, macroeconomic factors, industry effects, year effects, and country effects. Based on the estimate in Model (2), firms changing from no auditing to auditing are associated with an increase in *CorruptionObstacle* by 0.041, or 2.5% of one SD for the outcome variable.

How other variables affect corruption obstacles is also interesting. Perceived corruption obstacle is higher for larger firms, perhaps because of economy of scale in collecting bribes—bureaucrats save time costs and reduce the risk of being exposed when extracting the same amount of bribes from one large firm than from several small firms. Perceived corruption obstacle is lower for firms owned by the government, perhaps because state-owned enterprises tend to have stronger political support and are thus less vulnerable. Perceived corruption obstacle is higher for exporters, which is not surprising since in developing countries they have to go through a lot of bureaucratic red tape to obtain export licenses, which increases their vulnerability to government expropriation (Shleifer and Vishny, 1993). Particularly interestingly, perceived corruption obstacle is higher for firms competing with informal businesses. This is not surprising since informal firms are largely immune

from government expropriation; as a result, with more informal firms, bureaucrats focus more on expropriating formal ones.

## **B. 2SLS Regressions and Matching**

Reverse causality between *Audit* and the corruption obstacles is less of a concern than in the case of financing obstacles—due to the likely negative correlation of *Audit* and the prevailing level of corruption obstacles (i.e., firms would be less likely to voluntarily disclose information where corruption obstacles are more severe), the OLS estimate of the effect of Audit would be underestimated, and a positive OLS estimate of the auditing effect would thus imply an even more pronounced positive effect of Audit. Therefore, the potential reverse causality should strengthen our empirical findings. Nevertheless, the issue of omitted variables remains. We thus employ the 2SLS regressions and the matching method to address the potential endogeneity of *Audit*. We present the results below.

As shown in Model (6) of Table 6, after dealing with endogeneity, the coefficient of *Audit* remains positive and significant (at the 5% level) and much larger than in the OLS results. Based on this estimate, firms changing from no auditing to auditing are associated with an increase in *CorruptionObstacle* by 0.25, or about 15% of one SD for the outcome variable.

The matching results in Table 7 are largely consistent with the OLS regression results for corruption obstacles. In fact, the effect of auditing on corruption obstacles becomes larger under both matching methods. Propensity score matching results show that the coefficient of *Audit* becomes 0.074, almost double the original coefficient size of 0.041 in Model (2) Table 6. Similarly, direct matching results show an increase in the magnitude of the effect of audit on firm corruption obstacles.

## **C. Alternative Measures of Corruption Obstacles**

We have used *CorruptionObstacle* as a summary measure of perception of corruption. Our confidence on the results would be strengthened if this measure is supported by more detailed measures related to corruption or government expropriation. Indeed, if auditing leads to more exposure to government expropriation, we are likely to see more specific harassments in various areas, such as applying for licenses and permits and dealing with tax collectors. The harassment in these areas, fortunately, is covered in WBES. We thus construct two alternative firm-level corruption obstacle indicators: the firm perceives moderate-or-above obstacles in the areas of licenses and permits (*LicenseDummy*) and tax collections (*TaxRateDummy*). We also construct the third measure, *CorruptionIndex*, equal to the sum of *LicenseDummy* and *TaxRateDummy*.

The OLS results in Table 8 show that *Audit* is significantly related to higher levels of license-related obstacles and to *CorruptionIndex*. The 2SLS results show that after dealing with endogeneity, *Audit* significantly increases the level of license and tax-related obstacles. *Audit* is also significantly positively related to *CorruptionIndex*. These results lend further support for our hypothesis that information disclosure leads to higher level of corruption obstacles.

## V. Audit and Firm Growth

### A. OLS Regressions

We have shown that financial disclosure by firms through auditing entails both benefits (i.e., better access to finance) and costs (i.e., exposure to “grabbing hands”). What is the net effect of auditing? We shed light on this question by examining the effect of auditing on firm development, measured by sales growth, which can be interpreted as (roughly) the net effect of auditing. To this end, we estimate the following equation:

$$\begin{aligned} SalesGrowth_{ij} = & a + \beta_1 Audit_{ij} + \beta_2 FirmSize_{ij} + \beta_3 FirmAge_{ij} + \beta_4 Experience_{ij} + \beta_5 Government_{ij} + \beta_6 Foreign_{ij} \\ & + \beta_7 Exporter_{ij} + \beta_8 Compete_{ij} + \beta_9 CorruptionControl_{ij} + \beta_{10} Priv_{ij} + \theta' Macro Controls_j + \varepsilon_{ij} \end{aligned} \quad (5)$$

Subscript  $i$  and  $j$  represent firm and country, respectively. The dependent variable is sales growth (*SalesGrowth*), as defined in equation (1).

We report the results in Table 9, with the first three columns being the OLS results, and the next two being the 2SLS results. As before, we control for industry effect, year effect and country effect in all the models. Column (1) only controls for firm size and firm age, while Column (2) adds as additional controls top manager experience, government ownership, foreign ownership, exporter status, competition, and macroeconomic variables. Column (3) further adds *CorruptionControl* and financial market development (*Priv*).

The OLS results in Table 9 show that the coefficients for *Audit* are negative and significant (at the 1% level). This indicates that disclosure has an overall detrimental effect to firm growth. The significant detrimental effect of information disclosure on sales growth may be attributable to the fact that most of the countries surveyed in the WBES are developing countries where institutions and governance are weak and corruption is rampant. In corrupt business environments, the cost of financial disclosure may outweigh its benefit. We examine this point further in section VI.

We also observe that growth is faster for larger and younger firms. Growth is slower for exporters and firms with government or foreign ownership. Not related to top manager work experience, growth is faster for firms operating in competitive environments. Finally, growth is also positively related to financial depth.

## B. Endogeneity Checks

There are two potential sources of endogeneity. First, reverse causality between *Audit* and firm growth is a real possibility. In general, high-growth firms need more external financing and therefore, are likely to apply for more external credits (hence decide to have their financial statements audited). Since our OLS regression results in Table 9 has an overall negative effect on firm growth, the aforementioned reverse causality between firm growth and auditing thus actually strengthen our



results: the unbiased estimate of the effect of *Audit* should remain negative and even more pronounced. Second, there may still be issues related to omitted variables. As before, we address the endogeneity of *Audit* using 2SLS regressions and the direct matching method.

The 2SLS results in Model (5) of Table 9 show that the coefficient of *Audit* remains negative and significant. Moreover, the negative effect is much more pronounced than before, indicating a positive correlation between auditing and omitted factors affecting firm growth. Based on the 2SLS results, increasing *Audit* by one SD (0.50) is associated with a drop in sales growth by 15 percentage points, or half a SD of the outcome variable, which constitutes a large effect. The matching results in Table 10 show that auditing has a significant and negative effect on firm sales growth under both matching methods, consistent with the OLS and 2SLS results shown in Table 9.

## VI. The Role of Institutional Development

So far we have assumed homogeneous effect of *Audit* on financing and corruption obstacles and on firm growth. But the effect of disclosure likely hinges on the underlying institutions. In fact, a large volume of literature has documented a direct positive relation between a country's institutional development and economic growth at the country level as well as at the firm level (Knack and Keefer, 1995; La Porta et al. 2000; Beck, Levin and Loayza 2000; Acemoglu, Johnson and Robinson, 2001; Acemoglu and Johnson, 2005; Dyck and Zingales 2004; Beck et al. 2005, Doidge, Karolyi and Stulz 2007, Harrison, Lin and Xu, 2014, among others).

To measure institutional quality, we employ the Heritage Foundation's index of property rights protection (*PropertyRights*), which is an estimate of the legally protected freedom to accumulate private property and wealth by citizens of the country. Higher values for *PropertyRights* indicate better property rights protection and less government expropriation. As shown in Panel A of Table 1, *PropertyRights* varies widely in our sample countries, ranging from 0 to 90. We standardize *PropertyRights* for an easier interpretation of the coefficients.

We now examine how the effects of information disclosure on firms' financial obstacles, corruption obstacles, and growth depend on the level of institutional development of the country in which the firm resides. We thus add to the equation *PropertyRights* and its interactions with *Audit*, and re-estimate the equation with both OLS and 2SLS regressions. The results on all three outcome variables are reported in Table 11.

Since the 2SLS is more defensible in terms of filtering out selectivity, we focus on the 2SLS results. First, the negative effect of *Audit* on the incidence of moderate-and-more-severe financing obstacle is doubled when Property Rights increases by one SD. Thus, better property rights are associated with stronger benefits of information disclosure on access to finance. Second, the positive effect of *Audit* on the incidence of moderate-and-more-severe corruption obstacles is slightly smaller, though this effect is not statistically significant. Third, the negative effect of *Audit* on sales growth is significantly smaller. A one-SD improvement in the country's property rights protection leads to 12.3 percentage points increase in the effect of auditing on sales growth rate; or, it reduces the negative effect of auditing on sales growth by 43 percent. The effects of property rights protection on access to finance and on sales growth are thus substantial.

## **VII. Conclusions**

Using the WBES data from 2006 to 2014 for more than 70,000 firms in 121 countries, we study the effect of financial information disclosure through auditing on firm level financial and corruption obstacles and on firm growth. We find that disclosure is a double-edge sword. On the one hand, disclosure leads to a somewhat lower level of financial obstacles, though the results are not robust. On the other hand, disclosure also leads to a significantly higher level of corruption obstacles faced by the firm. Our explanation is that our sample countries surveyed are largely developing countries with underdeveloped markets and institutions, and that, once firm information is disclosed, the threat of government expropriation is widespread. Information disclosure thus allows rent-seeking

bureaucrats to gain access to the disclosed information and use it to extract bribes (Fisman and Svensson, 2007). In terms of the aggregate effect of auditing, we find that auditing has a negative, significant, and pronounced effect on sales growth. We further document that a country's property rights protection plays an important role in the effect of disclosure on firm obstacles. As a country's property rights protection improves, disclosure leads to bigger reduction in financial obstacles and less reduction in sales growth.

Our paper offers a vivid illustration that an important hindrance to institutional development—here in the form of adopting information disclosure—is government expropriation. With more information about firms available, government expropriations (i.e., corruption obstacle) become more severe, especially in countries with poor property rights protection. The results are thus supportive of Acemoglu and Johnson (2005) on the overwhelming importance of constraining government expropriation in facilitating economic development.<sup>18</sup>

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<sup>18</sup> Knack and Xu (2015) offer further evidence on the overwhelming importance of property rights institutions (i.e., containing government expropriation) relative to contracting institutions (i.e., facilitating exchange between private citizens) in facilitating external finance.

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**Table 1: Summary Statistics**

This table reports the summary statistics of our sample. Panel A presents the summary statistics for our full sample and Panel B reports the summary statistics for audited and unaudited firms in the sub-samples. *Audit* is a dummy variable that equals 1 if the firm's annual financial statements were audited by an external auditor, and 0 otherwise. *FinancialObstacle* and *CorruptionObstacle* are survey responses for firm-level obstacles as specified in the survey questionnaire. They take values between 0 and 4, where 0 indicates no obstacle and 4 indicates a very severe obstacle. *FinancialObstacleDummy* and *CorruptionObstacleDummy* are dummy variables that equals 1 if firm-level obstacles equal 2 (moderate), 3 (major), or 4 (very severe), and 0 otherwise. *SalesGrowth* is the average growth rate between year  $t$  and  $(t-2)$ , with  $t$  being the survey year. *Sales* is the sales at the end of year  $t$ . We convert the sales in local currency into U.S. Dollars. *FirmAge* is the firm's actual age. *Experience* is the firm's top manager's years of working experience in this sector. *Government* and *Foreign* are dummies that equal 1 if the firm has government or foreign ownership, respectively, and 0 otherwise. *Exporter* is a dummy variable that equals 1 if the firm is an exporter, 0 otherwise. *Compete* is a dummy variable that equals 1 if the firm answered 'Yes' to the question: "Does this establishment compete against unregistered or informal firms?" *CapitalExpenditure* is a dummy variable that equals 1 if the firm purchased fixed assets, such as machinery, vehicles, equipment, land or buildings at year  $t$ , and 0 otherwise. *Overdraft* is a dummy variable that equals 1 if the firm has an overdraft facility, and 0 otherwise. *CreditLine* is a dummy variable that equals 1 if the firm has a line of credit or loan from a financial institution, and 0 otherwise. *Priv* is the ratio of domestic banking credit to the private sector divided by GDP. *CorruptionControl* and *GovernmentEffectiveness* are country-level governance estimates by World Bank's Worldwide Governance Indicators (WGI), and range from -2.5 (weak) to 2.5 (strong governance). *GDP* is the log of GDP in current millions of U.S. dollars. *GDPperCapita* is the log of real GDP per capita in U.S. dollars. *GDPGrowth* is the real GDP growth rate. *Inflation* is log difference of consumer price indices. The Heritage Foundation freedom index, *PropertyRights*, is the foundation's estimates of a country's property rights protection. The column "T-test" reports the two-tail t-statistics of two-sample t-tests comparing the means of audited and unaudited firms. Detailed variable definitions and sources are given in Table A2 in the Appendix. \*\*\*, \*\*, and \* indicate statistical significances at the 1%, 5%, and 10% levels, respectively.

**Panel A: Summary Statistics for Full Sample**

	<i>N</i>	Mean	Median	<i>SD</i>	Min	Max
<b>Firm level variables</b>						
<i>Audit</i>	71,677	0.47	0	0.50	0	1
<i>FinancialObstacle</i>	68,377	1.61	2	1.36	0	4
<i>FinancialObstacleDummy</i>	68,377	0.51	1	0.50	0	1
<i>CorruptionObstacle</i>	69,446	1.77	2	1.51	0	4
<i>CorruptionObstacleDummy</i>	69,446	0.53	1	0.50	0	1
<i>SalesGrowth (%)</i>	53,504	0.14	0.11	0.30	-0.76	0.98
<i>Sales (US Dollar in thousands)</i>	63,828	18,653	409	119,048	0.024	1,363,314
<i>FirmAge (years)</i>	68,279	17.87	13	15.65	3	340
<i>Experience (years)</i>	70,217	17.24	15	11.11	0	75
<i>Government</i>	70,340	0.01	0	0.10	0	1
<i>Foreign</i>	70,325	0.11	0	0.31	0	1
<i>Compete</i>	55,083	0.55	1	0.50	0	1
<i>Exporter</i>	71,491	0.21	0	0.41	0	1
<i>CapitalExpenditure</i>	71,336	0.50	1	0.50	0	1
<i>Overdraft</i>	67,745	0.42	0	0.49	0	1
<i>CreditLine</i>	69,344	0.39	0	0.49	0	1



	<i>N</i>	Mean	Median	<i>SD</i>	Min	Max
<b>Country level variables</b>						
<i>Priv</i>	149	33.90	25.92	26.41	0.92	121.49
<i>CorruptionControl</i>	152	-0.48	-0.61	0.65	-1.53	1.38
<i>GovernmentEffectiveness</i>	152	-0.31	-0.39	0.60	-1.72	1.48
<i>GDP</i>	152	24.23	23.97	1.99	19.14	28.36
<i>GDPperCapita</i>	152	7.30	7.39	1.12	4.49	9.94
<i>GDPGrowth</i>	152	0.05	0.05	0.03	-0.06	0.23
<i>Inflation</i>	152	0.09	0.07	0.17	0.00	1.91
<b>Heritage freedom index:</b>						
<i>PropertyRights</i>	136	36.95	30	17.55	0	90
<b>Panel B: Summary Statistics for Audited versus Unaudited Firms</b>						
	(1) Audited		(2) Unaudited		T-test	
	<i>N</i>	Mean	<i>N</i>	Mean	Difference (1-2)	T-value
<i>FinancialObstacle</i>	33,115	1.49	35,262	1.72	-0.23***	-22.31
<i>FinancialObstacleDummy</i>	33,115	0.48	35,262	0.55	-0.07***	-19.35
<i>CorruptionObstacle</i>	32,980	1.77	36,466	1.77	0.00	0.08
<i>CorruptionObstacleDummy</i>	32,980	0.53	36,466	0.53	0.00	-0.40
<i>SalesGrowth (%)</i>	25,885	0.14	27,619	0.14	0.00	-1.01
<i>Sales (US Dollar in thousands)</i>	30,388	20,209	33,440	6,145	14,064***	28.51
<i>FirmAge (years)</i>	32,555	20.44	35,724	15.53	4.91***	41.46
<i>Experience (years)</i>	33,067	18.23	37,150	16.35	1.88***	22.45
<i>Government</i>	33,231	0.02	37,109	0.01	0.01***	13.63
<i>Foreign</i>	33,220	0.16	37,105	0.06	0.11***	45.70
<i>Compete</i>	26,452	0.53	28,631	0.56	-0.03***	-6.55
<i>Exporter</i>	33,790	0.29	37,701	0.14	0.16***	51.80
<i>CapitalExpenditure</i>	33,697	0.57	37,639	0.43	0.14***	37.45
<i>Overdraft</i>	32,121	0.54	35,624	0.32	0.22***	60.09
<i>CreditLine</i>	32,749	0.48	36,595	0.31	0.17***	47.13

**Table 2: Determinants of Audit**

This table reports OLS and Probit analyses of the determinants of audit. The dependent variable, *Audit*, is a dummy variable that equals 1 if the firm's annual financial statements were audited by an external auditor, and 0 otherwise. Model (1) reports coefficients estimated by OLS/Linear Probability Model (LPM). Models (2) and (3) present coefficients and marginal effects estimated by Probit regressions. The independent variables include various firm characteristics. *FirmSize* is the natural logarithm of the firm's sales in U.S. Dollars. *FirmAge* is the firm's actual age. *Experience* is the firm's top manager's years of working experience in this sector. *Government* and *Foreign* are dummies that equal 1 if the firm has government or foreign ownership, respectively, and 0 otherwise. *Exporter* is a dummy variable that equals 1 if the firm is an exporter, 0 otherwise. *Compete* is a dummy variable that equals 1 if the firm answered 'Yes' to the question: "Does this establishment compete against unregistered or informal firms?" *CapitalExpenditure* is a dummy variable that equals 1 if the firm purchased fixed assets, such as machinery, vehicles, equipment, land or buildings at year t, and 0 otherwise. Macro Controls include GDP, GDP per capita, GDP growth, and inflation. Each regression includes a separate (unreported) intercept. Industry, year, and country fixed effects are included in all specifications. Heteroskedasticity-robust standard errors are reported in parentheses. Detailed variable definitions and sources are given in Table A2 in the Appendix. \*\*\*, \*\*, and \* indicate statistical significances at the 1%, 5%, and 10% levels, respectively.

Dep. Variable: <i>Audit</i>			
	OLS/LPM	Probit	
	(1)	(2)	(3)
	Coefficient	Coefficient	Marginal Effect
<i>FirmSize</i>	0.064*** (0.001)	0.217*** (0.004)	0.046
<i>FirmAge</i>	0.031*** (0.003)	0.103*** (0.011)	0.022
<i>Experience</i>	-0.000 (0.000)	-0.001 (0.001)	-0.000
<i>Government</i>	0.180*** (0.018)	0.593*** (0.068)	0.167
<i>Foreign</i>	0.099*** (0.007)	0.367*** (0.025)	0.091
<i>Exporter</i>	0.061*** (0.006)	0.191*** (0.019)	0.043
<i>Compete</i>	-0.016*** (0.004)	-0.052*** (0.014)	-0.011
<i>CapitalExpenditure</i>	0.046*** (0.004)	0.150*** (0.014)	0.032
Macro Controls	Yes	Yes	
Industry Fixed Effects	Yes	Yes	
Year Fixed Effects	Yes	Yes	
Country Fixed Effects	Yes	Yes	
Observations	44,684	44,684	
R2/Pseudo R2	0.297	0.250	

**Table 3: Audit and Firm Financial Obstacle**

This table reports the impact of audit on a firm's financial obstacles. The dependent variable for Model (1), (2), and (4) is *FinancialObstacle*, which takes values between 0 and 4, where 0 indicates no financial obstacle and 4 indicates a very severe financial obstacle. The dependent variable for Model (3) and (6) is *FinancialObstacleDummy*, a dummy variable that equals 1 if firm-level obstacles equal 2 (moderate), 3 (major), or 4 (very severe), and 0 otherwise. Model (1), (2), and (3) report OLS regression results. Model (4) reports Ordered Probit regression results. Model (5) and (6) report 2SLS regression using an instrumental variable to address the endogeneity concern. Model (5) is the first stage regression where the dependent variable is *Audit*. Model (6) is the second-stage regression of financial obstacle on the fitted value of *Audit* and the control variables. *Audit* is a dummy variable that equals 1 if the firm's annual financial statements were audited by an external auditor, and 0 otherwise. The independent variables also include various firm characteristics. *FirmSize* is the natural logarithm of the firm's sales in U.S. Dollars. *FirmAge* is the firm's actual age. *Experience* is the firm's top manager's years of working experience in this sector. *Government* and *Foreign* are dummies that equal 1 if the firm has government or foreign ownership, respectively, and 0 otherwise. *Exporter* is a dummy variable that equals 1 if the firm is an exporter, 0 otherwise. *Compete* is a dummy variable that equals 1 if the firm answered 'Yes' to the question: "Does this establishment compete against unregistered or informal firms?" *Priv* is the ratio of domestic banking credit to the private sector divided by GDP. Our instrumental variable is *IndustryActivity*, the ratio of the number of audited firms in a given industry in a given year to the total number of firms in that industry. Macro Controls include GDP, GDP per capita, GDP growth, and inflation. Each regression includes a separate (unreported) intercept. Industry, year, and country fixed effects are included in all specifications. Heteroskedasticity-robust standard errors are reported in parentheses. Detailed variable definitions and sources are given in Table A2 in the Appendix. \*\*\*, \*\*, and \* indicate statistical significances at the 1%, 5%, and 10% levels, respectively.

Dep. Var.	OLS/LPM		Financial Obstacle Dummy	Ordered Probit	2SLS	
	Financial Obstacle	Financial Obstacle		Financial Obstacle	First Stage	Second Stage
					Audit	Financial Obstacle Dummy
	(1)	(2)	(3)	(4)	(5)	(6)
Audit	-0.151*** (0.011)	-0.059*** (0.014)	-0.025*** (0.005)	-0.048*** (0.012)		-0.082 (0.122)
FirmSize		-0.049*** (0.003)	-0.014*** (0.001)	-0.042*** (0.003)	0.065*** (0.001)	-0.010 (0.008)
FirmAge		-0.058*** (0.010)	-0.023*** (0.004)	-0.048*** (0.009)	0.029*** (0.003)	-0.021*** (0.005)
Experience		-0.001* (0.001)	-0.001** (0.000)	-0.001** (0.001)	-0.000 (0.000)	-0.001** (0.000)
Government		-0.040 (0.056)	-0.007 (0.021)	-0.058 (0.052)	0.172*** (0.020)	0.003 (0.030)
Foreign		-0.210*** (0.021)	-0.071*** (0.008)	-0.188*** (0.019)	0.097*** (0.007)	-0.065*** (0.014)
Exporter		0.040** (0.016)	0.006 (0.006)	0.039*** (0.014)	0.065*** (0.006)	0.010 (0.010)
Compete		0.242*** (0.013)	0.074*** (0.005)	0.215*** (0.011)	-0.012*** (0.004)	0.074*** (0.005)
Priv		0.009* (0.005)	0.001 (0.002)	0.008** (0.004)	0.005*** (0.002)	0.001 (0.002)
Log(IndustryActivity)					0.118*** (0.013)	
Macro Controls	No	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	68,346	42,389	42,389	42,389	42,361	42,361
R2/Pseudo R2	0.131	0.170	0.130	0.0588	0.285	0.127
Weak identification test:						
Kleibergen-Paap rk Wald F statistic					81.53	
Stock-Yogo weak ID test critical values: 10% maximal IV size					16.38	

**Table 4: Audit and Firm Financial Obstacle: Matching Analysis**

This table reports the results of matching analysis to address the endogeneity concern. The outcome variables are *FinancialObstacle* and *FinancialObstacleDummy*. Panel A reports the results of propensity score matching analysis and Panel B reports the results of direct matching analysis. The first stage in the propensity score matching computes a propensity score which is the probability that a given sample firm would have its financial statements audited. The second stage matches the firm that have its financial statements audited (the treated group) with a sample firm that did not have its financial statements audited (the control group). This process is followed for every firm with replacement to ensure the closest possible characteristic match. In the results below, the Unmatched sample computes the simple average of financial obstacles for audited firms versus all other firms. The Matched sample compares the treated firms to their counterparts based on the nearest matched non-audited firms who are in the region of common support. The direct matching process matches the audited firms (the treated group) with unaudited firms (the control group) explicitly on the following criteria: (1) the treated firm and matched firm are from the same country, the same industry, and the same year, and (2) the treated firm and control firm must have the same ‘*Government*’ status, and (3) the treated firm and control firm must have the same ‘*Foreign*’ status, and (4) the control firm size is the closest compared to the treated firm size and has to be within a range of 0.85\*treated size and 1.15\*treated size. *FinancialObstacle* is a survey response for firm-level obstacles as specified in the survey questionnaire. It takes values between 0 and 4, where 0 indicates no obstacle and 4 indicates a very severe obstacle. *FinancialObstacleDummy* is a dummy variable that equals 1 if firm-level obstacles equal 2 (moderate), 3 (major), or 4 (very severe), and 0 otherwise. *Government* and *Foreign* are dummies that equal 1 if the firm has government or foreign ownership, respectively, and 0 otherwise. Size is proxied by *Sales*, which is the sales revenue in U.S. Dollars. Detailed variable definitions and sources are given in Table A2 in the Appendix. \*\*\*, \*\*, and \* indicate statistical significances at the 1%, 5%, and 10% levels, respectively.

<b>Panel A: Propensity Score Matching</b>						
	Sample	Treated	Controls	Difference	S.E.	T-Value
<i>FinancialObstacle</i>	Unmatched	1.480	1.736	-0.255	0.013	-19.82
	Matched	1.480	1.520	-0.039	0.029	-1.38
<i>FinancialObstacleDummy</i>	Unmatched	0.471	0.555	-0.084	0.005	-17.67
	Matched	0.471	0.489	-0.018*	0.011	-1.69

  

<b>Panel B: Direct Matching</b>						
	N	Treated	Control	Difference	T-value	P-value
<i>FinancialObstacle</i>	11,380	1.569	1.575	-0.003	-0.18	0.86
<i>FinancialObstacleDummy</i>	11,380	0.493	0.505	-0.011*	-1.74	0.08

**Table 5: Audit and Firm Financial Obstacle: Alternative Measures**

This table reports the impact of audit on a firm's financial obstacles using alternative measures. The dependent variables are *Overdraft*, *CreditLine*, and *FinancialIndex*. *Overdraft* is a dummy variable that equals 1 if the firm has an overdraft facility, and 0 otherwise. *CreditLine* is a dummy variable that equals 1 if the firm has a line of credit or loan from a financial institution, and 0 otherwise. *FinancialIndex* is the sum of *Overdraft* and *CreditLine*. Models (1) - (3) report OLS regression results. The main independent variable is *Audit*, a dummy variable that equals 1 if the firm's annual financial statements were audited by an external auditor, and 0 otherwise. The independent variables include various firm characteristics. *FirmSize* is the natural logarithm of the firm's sales in U.S. Dollars. *FirmAge* is the firm's actual age. *Experience* is the firm's top manager's years of working experience in this sector. *Government* and *Foreign* are dummies that equal 1 if the firm has government or foreign ownership, respectively, and 0 otherwise. *Exporter* is a dummy variable that equals 1 if the firm is an exporter, 0 otherwise. *Compete* is a dummy variable that equals 1 if the firm answered 'Yes' to the question: "Does this establishment compete against unregistered or informal firms?" *Priv* is the ratio of domestic banking credit to the private sector divided by GDP. Models (4) - (6) report 2SLS regressions using *IndustryActivity* as an instrumental variable. *IndustryActivity* is the ratio of the number of audited firms in a given industry in a given year to the total number of firms in that industry. The dependent variable of the first stage regressions is *Audit*, a dummy variable that equals 1 if the firm's annual financial statements were audited by an external auditor, and 0 otherwise. The first stage regressions also control for all of the second-stage variables (except for *Audit*). For brevity, first stage regression results are not reported. Models (4) - (6) are the second-stage regressions of financial obstacles (measured by *Overdraft*, *CreditLine*, and *FinancialIndex*) on the fitted value of *Audit* and the control variables. Macro Controls include GDP, GDP per capita, GDP growth, and inflation. Each regression includes a separate (unreported) intercept. Industry, year, and country fixed effects are included in all specifications. Heteroskedasticity-robust standard errors are reported in parentheses. Detailed variable definitions and sources are given in Table A2 in the Appendix. \*\*\*, \*\*, and \* indicate statistical significances at the 1%, 5%, and 10% levels, respectively.

Dep. Var.	OLS			2SLS		
	<i>Overdraft</i>	<i>CreditLine</i>	<i>FincialIndex</i>	<i>Overdraft</i>	<i>CreditLine</i>	<i>FincialIndex</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Audit</i>	0.080*** (0.005)	0.062*** (0.005)	0.139*** (0.008)	0.429*** (0.116)	0.064 (0.107)	0.477*** (0.180)
<i>FirmSize</i>	0.044*** (0.001)	0.049*** (0.001)	0.093*** (0.002)	0.021*** (0.008)	0.049*** (0.007)	0.070*** (0.012)
<i>FirmAge</i>	0.022*** (0.003)	0.004 (0.003)	0.025*** (0.005)	0.012*** (0.005)	0.004 (0.005)	0.016** (0.007)
<i>Experience</i>	0.000 (0.000)	0.000** (0.000)	0.001 (0.000)	0.000 (0.000)	0.000** (0.000)	0.001 (0.000)
<i>Government</i>	-0.040** (0.020)	-0.045** (0.020)	-0.080** (0.032)	-0.101*** (0.029)	-0.045* (0.027)	-0.141*** (0.045)
<i>Foreign</i>	-0.025*** (0.007)	-0.107*** (0.008)	-0.130*** (0.012)	-0.059*** (0.014)	-0.107*** (0.013)	-0.163*** (0.021)
<i>Exporter</i>	0.048*** (0.006)	0.062*** (0.006)	0.111*** (0.009)	0.026*** (0.009)	0.062*** (0.009)	0.089*** (0.015)
<i>Compete</i>	0.012*** (0.004)	0.032*** (0.004)	0.041*** (0.007)	0.017*** (0.005)	0.032*** (0.005)	0.046*** (0.007)
<i>Priv</i>	-0.008*** (0.002)	-0.002 (0.002)	-0.015*** (0.003)	-0.008*** (0.002)	-0.002 (0.002)	-0.015*** (0.003)
Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry/Yes/Country Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	43,640	44,324	43,332	43,611	44,295	43,303
R-squared	0.311	0.236	0.352	0.223	0.235	0.322

**Table 6: Audit and Firm Corruption Obstacle**

This table reports the impact of audit on a firm's corruption obstacles. The dependent variable for Model (1), (2), and (4) is *CorruptionObstacle*, which takes values between 0 and 4, where 0 indicates no corruption obstacle and 4 indicates a very severe corruption obstacle. The dependent variable for Model (3) and (6) is *CorruptionObstacleDummy*, a dummy variable that equals 1 if firm-level obstacles equal 2 (moderate), 3 (major), or 4 (very severe), and 0 otherwise. Model (1), (2), and (3) report OLS regression results. Model (4) reports Ordered Probit regression results. Model (5) and (6) report 2SLS regression using an instrumental variable to address the endogeneity concern. Model (5) is the first stage regression where the dependent variable is *Audit*. Model (6) is the second-stage regression of corruption obstacle on the fitted value of *Audit* and the control variables. *Audit* is a dummy variable that equals 1 if the firm's annual financial statements were audited by an external auditor, and 0 otherwise. The independent variables also include various firm characteristics. *FirmSize* is the natural logarithm of the firm's sales in U.S. Dollars. *FirmAge* is the firm's actual age. *Experience* is the firm's top manager's years of working experience in this sector. *Government* and *Foreign* are dummies that equal 1 if the firm has government or foreign ownership, respectively, and 0 otherwise. *Exporter* is a dummy variable that equals 1 if the firm is an exporter, 0 otherwise. *Compete* is a dummy variable that equals 1 if the firm answered 'Yes' to the question: "Does this establishment compete against unregistered or informal firms?" *CorruptionControl* is a country-level governance estimate by World Bank's Worldwide Governance Indicators (WGI), and ranges from -2.5 (weak) to 2.5 (strong governance). Our instrumental variable is *IndustryActivity*, the ratio of the number of audited firms in a given industry in a given year to the total number of firms in that industry. Macro Controls include GDP, GDP per capita, GDP growth, and inflation. Each regression includes a separate (unreported) intercept. Industry, year, and country fixed effects are included in all specifications. Heteroskedasticity-robust standard errors are reported in parentheses. Detailed variable definitions and sources are given in Table A2 in the Appendix. \*\*\*, \*\*, and \* indicate statistical significances at the 1%, 5%, and 10% levels, respectively.

Dep. Var.	OLS/LPM			Ordered Probit	2SLS	
	<i>Corruption Obstacle</i>		<i>Corruption Obstacle Dummy</i>	<i>Corruption Obstacle</i>	First Stage	Second Stage
	(1)	(2)	(3)	(4)	<i>Audit</i>	<i>Corruption Obstacle Dummy</i>
<i>Audit</i>	0.064*** (0.011)	0.041*** (0.015)	0.012** (0.005)	0.036*** (0.013)		0.251** (0.116)
<i>FirmSize</i>		0.010*** (0.004)	0.004*** (0.001)	0.010*** (0.003)	0.066*** (0.001)	-0.012 (0.008)
<i>FirmAge</i>		0.001 (0.010)	-0.001 (0.004)	0.002 (0.009)	0.029*** (0.003)	-0.008 (0.005)
<i>Experience</i>		0.001 (0.001)	0.000 (0.000)	0.001 (0.001)	-0.000 (0.000)	0.000 (0.000)
<i>Government</i>		-0.128** (0.059)	-0.050** (0.020)	-0.118** (0.058)	0.185*** (0.019)	-0.095*** (0.030)
<i>Foreign</i>		-0.020 (0.022)	-0.012* (0.007)	-0.008 (0.018)	0.098*** (0.007)	-0.036*** (0.014)
<i>Exporter</i>		0.053*** (0.017)	0.014** (0.006)	0.050*** (0.014)	0.064*** (0.006)	-0.001 (0.010)
<i>Compete</i>		0.312*** (0.013)	0.090*** (0.005)	0.270*** (0.011)	-0.013*** (0.004)	0.094*** (0.005)
<i>CorruptionControl</i>		-0.449** (0.196)	-0.187*** (0.064)	-0.357** (0.155)	0.229*** (0.062)	-0.243*** (0.072)
<i>Log(IndustryActivity)</i>					0.116*** (0.012)	
Macro Controls	No	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	69,420	43,855	43,855	43,855	43,825	43,825
R2/Pseudo R2	0.225	0.253	0.216	0.0949	0.295	0.176
Weak identification test:						
Kleibergen-Paap rk Wald F statistic					88.65	
Stock-Yogo weak ID test critical values: 10% maximal IV size					16.38	



**Table 7: Audit and Firm Corruption Obstacle: Matching Analysis**

This table reports the results of matching analysis to address the endogeneity concern. The outcome variables are *CorruptionObstacle* and *CorruptionObstacleDummy*. Panel A reports the results of propensity score matching analysis and Panel B reports the results of direct matching analysis. The first stage in the propensity score matching computes a propensity score which is the probability that a given sample firm would have its financial statements audited. The second stage matches the firm that have its financial statements audited (the treated group) with a sample firm that did not have its financial statements audited (the control group). This process is followed for every firm with replacement to ensure the closest possible characteristic match. In the results below, the Unmatched sample computes the simple average of corruption obstacles for audited firms versus all other firms. The Matched sample compares the treated firms to their counterparts based on the nearest matched non-audited firms who are in the region of common support. The direct matching process matches the audited firms (the treated group) with unaudited firms (the control group) explicitly on the following criteria: (1) the treated firm and matched firm are from the same country, the same industry, and the same year, and (2) the treated firm and control firm must have the same '*Government*' status, and (3) the treated firm and control firm must have the same '*Foreign*' status, and (4) the control firm size is the closest compared to the treated firm size and has to be within a range of 0.85\*treated size and 1.15\*treated size. *CorruptionObstacle* is a survey response for firm-level obstacles as specified in the survey questionnaire. It takes values between 0 and 4, where 0 indicates no obstacle and 4 indicates a very severe obstacle. *CorruptionObstacleDummy* is a dummy variable that equals 1 if firm-level obstacles equal 2 (moderate), 3 (major), or 4 (very severe), and 0 otherwise. *Government* and *Foreign* are dummies that equal 1 if the firm has government or foreign ownership, respectively, and 0 otherwise. Size is proxied by *Sales*, which is the sales revenue in U.S. Dollars. Detailed variable definitions and sources are given in Table A2 in the Appendix. \*\*\*, \*\*, and \* indicate statistical significances at the 1%, 5%, and 10% levels, respectively.

<b>Panel A: Propensity Score Matching</b>						
	Sample	Treated	Controls	Difference	S.E.	T-Value
<i>CorruptionObstacle</i>	Unmatched	1.674	1.678	-0.004	0.014	-0.26
	Matched	1.674	1.600	0.074**	0.032	2.33
<i>CorruptionObstacleDummy</i>	Unmatched	0.500	0.505	-0.004	0.005	-0.86
	Matched	0.500	0.480	0.021**	0.011	1.96

  

<b>Panel B: Direct Matching</b>						
	N	Treated	Control	Difference	T-value	P-value
<i>CorruptionObstacle</i>	11,374	1.747	1.688	0.060***	3.55	0.00
<i>CorruptionObstacleDummy</i>	11,374	0.519	0.500	0.019***	3.35	0.00

**Table 8: Audit and Corruption Obstacle: Alternative Measures**

This table reports the impact of audit on a firm's corruption obstacles using alternative measures. The dependent variables are *LicenseDummy*, *TaxRateDummy*, and *CorruptionIndex*. *LicenseDummy* and *TaxRateDummy* are dummy variables that equal 1 if firm-level obstacles equal to 2 (moderate), 3 (major), or 4 (very severe), and 0 otherwise. *CorruptionIndex* is the sum of *LicenseDummy* and *TaxRateDummy*. Models (1) - (3) report OLS regression results. The main independent variable is *Audit*, a dummy variable that equals 1 if the firm's annual financial statements were audited by an external auditor, and 0 otherwise. The independent variables include various firm characteristics. *FirmSize* is the natural logarithm of the firm's sales in U.S. Dollars. *FirmAge* is the firm's actual age. *Experience* is the firm's top manager's years of working experience in this sector. *Government* and *Foreign* are dummies that equal 1 if the firm has government or foreign ownership, respectively, and 0 otherwise. *Exporter* is a dummy variable that equals 1 if the firm is an exporter, 0 otherwise. *Compete* is a dummy variable that equals 1 if the firm answered 'Yes' to the question: "Does this establishment compete against unregistered or informal firms?" *GovernmentEffectiveness* is a country-level governance estimate by World Bank's Worldwide Governance Indicators (WGI), and ranges from -2.5 (weak) to 2.5 (strong governance). Models (4) - (6) report 2SLS regressions using *IndustryActivity* as an instrumental variable. *IndustryActivity* is the ratio of the number of audited firms in a given industry in a given year to the total number of firms in that industry. The dependent variable of the first stage regressions is *Audit*, a dummy variable that equals 1 if the firm's annual financial statements were audited by an external auditor, and 0 otherwise. The first stage regressions also control for all of the second-stage variables (except for *Audit*). For brevity, first stage regression results are not reported. Models (4) - (6) are the second-stage regressions of financial obstacles (measured by *LicenseDummy*, *TaxRateDummy*, and *CorruptionIndex*) on the fitted value of *Audit* and the control variables. Macro Controls include GDP, GDP per capita, GDP growth, and inflation. Each regression includes a separate (unreported) intercept. Industry, year, and country fixed effects are included in all specifications. Heteroskedasticity-robust standard errors are reported in parentheses. Detailed variable definitions and sources are given in Table A2 in the Appendix. \*\*\*, \*\*, and \* indicate statistical significances at the 1%, 5%, and 10% levels, respectively.

Dep. Var.	OLS			2SLS		
	<i>License Dummy</i>	<i>TaxRate Dummy</i>	<i>Corruption Index</i>	<i>License Dummy</i>	<i>TaxRate Dummy</i>	<i>Corruption Index</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Audit</i>	0.011** (0.005)	0.003 (0.005)	0.015* (0.008)	0.270** (0.114)	0.367*** (0.116)	0.642*** (0.187)
<i>FirmSize</i>	0.006*** (0.001)	0.008*** (0.001)	0.014*** (0.002)	-0.011 (0.008)	-0.016** (0.008)	-0.028** (0.013)
<i>FirmAge</i>	-0.007* (0.004)	-0.000 (0.004)	-0.007 (0.006)	-0.014*** (0.005)	-0.011** (0.005)	-0.025*** (0.008)
<i>Experience</i>	-0.001*** (0.000)	0.001*** (0.000)	-0.000 (0.000)	-0.001*** (0.000)	0.001*** (0.000)	-0.000 (0.000)
<i>Government</i>	-0.032* (0.018)	-0.104*** (0.020)	-0.130*** (0.029)	-0.080*** (0.030)	-0.172*** (0.030)	-0.249*** (0.049)
<i>Foreign</i>	-0.003 (0.007)	-0.032*** (0.008)	-0.032*** (0.012)	-0.028** (0.013)	-0.068*** (0.014)	-0.093*** (0.022)
<i>Exporter</i>	0.014** (0.006)	0.004 (0.006)	0.018* (0.009)	-0.003 (0.010)	-0.020** (0.010)	-0.024 (0.016)
<i>Compete</i>	0.067*** (0.005)	0.062*** (0.005)	0.131*** (0.007)	0.071*** (0.005)	0.067*** (0.005)	0.140*** (0.008)
<i>GovernmentEffectiveness</i>	-0.501*** (0.104)	-0.356*** (0.102)	-0.839*** (0.168)	-0.361*** (0.118)	-0.169 (0.120)	-0.503*** (0.194)
Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry/Year/Country Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	43,837	44,755	43,607	43,808	44,725	43,578
R-squared	0.125	0.180	0.193	0.072	0.083	0.078

**Table 9: Audit and Firm Growth**

This table reports the impact of audit on firm growth. The dependent variable is *SalesGrowth*, the average growth rate between year  $t$  and  $(t-2)$ , with  $t$  being the survey year. Model (1), (2), and (3) report OLS regression results. Model (4) and (5) report 2SLS regression using an instrumental variable to address the endogeneity concern. Model (4) is the first stage regression where the dependent variable is *Audit*. Model (5) is the second-stage regression of firm sales growth on the fitted value of *Audit* and the control variables. *Audit* is a dummy variable that equals 1 if the firm's annual financial statements were audited by an external auditor, and 0 otherwise. The independent variables also include various firm characteristics. *FirmSize* is the natural logarithm of the firm's sales in U.S. Dollars. *FirmAge* is the firm's actual age. *Experience* is the firm's top manager's years of working experience in this sector. *Government* and *Foreign* are dummies that equal 1 if the firm has government or foreign ownership, respectively, and 0 otherwise. *Exporter* is a dummy variable that equals 1 if the firm is an exporter, 0 otherwise. *Compete* is a dummy variable that equals 1 if the firm answered 'Yes' to the question: "Does this establishment compete against unregistered or informal firms?" *CorruptionControl* is a country-level governance estimate by World Bank's Worldwide Governance Indicators (WGI), and ranges from -2.5 (weak) to 2.5 (strong governance). *Priv* is the ratio of domestic banking credit to the private sector divided by GDP. Our instrumental variable is *IndustryActivity*, the ratio of the number of audited firms in a given industry in a given year to the total number of firms in that industry. Macro Controls include GDP, GDP per capita, GDP growth, and inflation. Each regression includes a separate (unreported) intercept. Industry, year, and country fixed effects are included in all specifications. Heteroskedasticity-robust standard errors are reported in parentheses. Detailed variable definitions and sources are given in Table A2 in the Appendix. \*\*\*, \*\*, and \* indicate statistical significances at the 1%, 5%, and 10% levels, respectively.

	OLS			2SLS	
Dep. Var.	<i>SalesGrowth</i>			First Stage <i>Audit</i>	Second Stage <i>SalesGrowth</i>
	(1)	(2)	(3)	(4)	(5)
<i>Audit</i>	-0.028*** (0.003)	-0.025*** (0.003)	-0.024*** (0.003)		-0.309*** (0.078)
<i>FirmSize</i>	0.028*** (0.001)	0.029*** (0.001)	0.029*** (0.001)	0.067*** (0.001)	0.048*** (0.005)
<i>FirmAge</i>	-0.053*** (0.002)	-0.050*** (0.003)	-0.051*** (0.002)	0.031*** (0.004)	-0.043*** (0.003)
<i>Experience</i>		-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
<i>Government</i>		-0.040*** (0.013)	-0.040*** (0.013)	0.178*** (0.020)	0.011 (0.020)
<i>Foreign</i>		-0.031*** (0.005)	-0.030*** (0.005)	0.096*** (0.007)	-0.003 (0.009)
<i>Exporter</i>		-0.019*** (0.004)	-0.018*** (0.004)	0.066*** (0.006)	0.001 (0.006)
<i>Compete</i>		0.004 (0.003)	0.005* (0.003)	-0.012*** (0.005)	0.002 (0.003)
<i>CorruptionControl</i>			0.188*** (0.052)	0.175** (0.069)	0.240*** (0.051)
<i>Priv</i>			0.006*** (0.001)	0.003** (0.002)	0.007*** (0.001)
<i>Log(IndustryActivity)</i>				0.121*** (0.013)	
Macro Controls	No	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	52,865	39,364	38,988	38,970	38,970
R2/Pseudo R2	0.160	0.179	0.182	0.304	0.024
Weak identification test:					
Kleibergen-Paap rk Wald F statistic				90.22	
Stock-Yogo weak ID test critical values: 10% maximal IV size				16.38	

**Table 10: Audit and Firm Growth: Direct Matching Analysis**

This table reports the results of matching analysis to address the endogeneity concern. The outcome variable is *SalesGrowth*. Panel A reports the results of propensity score matching analysis and Panel B reports the results of direct matching analysis. The first stage in the propensity score matching computes a propensity score which is the probability that a given sample firm would have its financial statements audited. The second stage matches the firm that have its financial statements audited (the treated group) with a sample firm that did not have its financial statements audited (the control group). This process is followed for every firm with replacement to ensure the closest possible characteristic match. In the results below, the Unmatched sample computes the simple average of sales growth for audited firms versus all other firms. The Matched sample compares the treated firms to their counterparts based on the nearest matched non-audited firms who are in the region of common support. The direct matching process matches the audited firms (the treated group) with unaudited firms (the control group) explicitly on the following criteria: (1) the treated firm and matched firm are from the same country, the same industry, and the same year, and (2) the treated firm and control firm must have the same ‘*Government*’ status, and (3) the treated firm and control firm must have the same ‘*Foreign*’ status, and (4) the control firm size is the closest compared to the treated firm size and has to be within a range of 0.85\*treated size and 1.15\*treated size. *SalesGrowth* is the average growth rate between year t and (t-2), with t being the survey year. *Government* and *Foreign* are dummies that equal 1 if the firm has government or foreign ownership, respectively, and 0 otherwise. Size is proxied by *Sales*, which is the sales revenue in U.S. Dollars. Detailed variable definitions and sources are given in Table A2 in the Appendix. \*\*\*, \*\*, and \* indicate statistical significances at the 1%, 5%, and 10% levels, respectively.

<b>Panel A: Propensity Score Matching</b>						
	Sample	Treated	Controls	Difference	S.E.	T-Value
<i>SalesGrowth</i>	Unmatched	0.127	0.141	-0.014***	0.003	-4.56
	Matched	0.127	0.161	-0.033***	0.007	-4.82

  

<b>Panel B: Direct Matching</b>						
	N	Treated	Control	Difference	T-value	P-value
<i>SalesGrowth</i>	8,689	0.151	0.170	-0.024***	-4.56	0.00

**Table 11: Audit, Obstacles, Growth, and Institutional Developments**

This table reports regressions analyzing how audit affects a firm's financial obstacle, corruption obstacle, and firm growth under different levels of institutional development. The dependent variable for Model (1) and (4) is *FinancialObstacleDummy*, a dummy variable that equals 1 if firm-level obstacles equal 2 (moderate), 3 (major), or 4 (very severe), and 0 otherwise. The dependent variable for Model (2) and (5) is *CorruptionObstacleDummy*, a dummy variable that equals 1 if firm-level obstacles equal 2 (moderate), 3 (major), or 4 (very severe), and 0 otherwise. The dependent variable for Model (3) and (6) is *SalesGrowth*, the average growth rate between year  $t$  and  $(t-2)$ , with  $t$  being the survey year. The main independent variable is *Audit*, a dummy variable that equals 1 if the firm's annual financial statements were audited by an external auditor, and 0 otherwise. It is interacted with the institutional variable: *PropertyRights*. *PropertyRights* is an estimate of the legally protected freedom to accumulate private property and wealth by workers and investors. We standardize *PropertyRights* for an easier interpretation of the coefficients. Models (1) - (3) report OLS regression results. Firm Level Controls include *FirmSize*, *FirmAge*, *Experience*, *Government*, *Foreign*, *Exporter*, and *Compete*. *FirmSize* is the natural logarithm of the firm's sales in U.S. Dollars. *FirmAge* is the firm's actual age. *Experience* is the firm's top manager's years of working experience in this sector. *Government* and *Foreign* are dummies that equal 1 if the firm has government or foreign ownership, respectively, and 0 otherwise. *Exporter* is a dummy variable that equals 1 if the firm is an exporter, 0 otherwise. *Compete* is a dummy variable that equals 1 if the firm answered 'Yes' to the question: "Does this establishment compete against unregistered or informal firms?" Models (4) - (6) report 2SLS regressions. *Audit* is instrumented by *IndustryActivity*. *Audit* interacted with the institutional variable is instrumented by *IndustryActivity* interacted with the institutional variable. *IndustryActivity* is the ratio of the number of audited firms in a given industry in a given year to the total number of firms in that industry. For brevity, first stage regression results are not reported. Macro Controls include GDP, GDP per capita, GDP growth, and inflation. Each regression includes a separate (unreported) intercept. Industry, year, and country fixed effects are included in all specifications. Heteroskedasticity-robust standard errors are reported in parentheses. Detailed variable definitions and sources are given in Table A2 in the Appendix. \*\*\*, \*\*, and \* indicate statistical significances at the 1%, 5%, and 10% levels, respectively.

	OLS			2SLS		
Dep. Var.	<i>Financial Obstacle Dummy</i>	<i>Corruption Obstacle Dummy</i>	<i>Sales Growth</i>	<i>Financial Obstacle Dummy</i>	<i>Corruption Obstacle Dummy</i>	<i>Sales Growth</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Audit</i>	-0.035*** (0.006)	0.007 (0.005)	-0.024*** (0.004)	-0.096 (0.130)	0.252** (0.126)	-0.286*** (0.083)
<i>Audit</i> $\times$ <i>PropertyRights</i>	0.013*** (0.005)	-0.005 (0.005)	0.003 (0.003)	-0.082* (0.047)	-0.065 (0.046)	0.123*** (0.033)
<i>PropertyRights</i>	-0.055** (0.023)	0.035* (0.020)	-0.045*** (0.015)	0.010 (0.042)	0.087** (0.039)	-0.138*** (0.029)
Firm Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	39,867	40,990	36,777	39,855	40,978	36,766
R-squared	0.132	0.217	0.130	0.121	0.172	-0.044

**Appendix:**

**Table A1: Audited and Unaudited Firms by Country**

Country	N Observations	Audited		Unaudited		Country	N Observations	Audited		Unaudited	
		N	%	N	%			N	%	N	%
Afghanistan	790	293	37	497	63	Croatia	545	237	43	308	57
Albania	276	90	33	186	67	Czech Republic	226	119	53	107	47
Angola	718	87	12	631	88	DRC	687	156	23	531	77
Antigua and Barbuda	150	79	53	71	47	Dominica	150	72	48	78	52
Argentina	2,037	1,434	70	603	30	Dominican Republic	353	320	91	33	9
Armenia	342	62	18	280	82	Ecuador	950	501	53	449	47
Azerbaijan	292	112	38	180	62	El Salvador	991	892	90	99	10
Bahamas	143	85	59	58	41	Eritrea	171	142	83	29	17
Bangladesh	2,839	1,171	41	1,668	59	Estonia	210	159	76	51	24
Barbados	148	123	83	25	17	Ethiopia	625	446	71	179	29
Belarus	511	208	41	303	59	Fiji	150	135	90	15	10
Belize	150	103	69	47	31	FYR Macedonia	341	218	64	123	36
Benin	141	81	57	60	43	Gabon	150	60	40	90	60
Bhutan	240	124	52	116	48	Gambia	173	55	32	118	68
Bolivia	916	702	77	214	23	Georgia	650	228	35	422	65
Bosnia and Herzegovina	274	133	49	141	51	Ghana	491	194	40	297	60
Botswana	582	407	70	175	30	Grenada	152	92	61	60	39
Brazil	1,723	368	21	1,355	79	Guatemala	1,001	626	63	375	37
Bulgaria	1,250	505	40	745	60	Guinea	223	16	7	207	93
Burkina Faso	364	180	49	184	51	Guinea Bissau	158	13	8	145	92
Burundi	270	36	13	234	87	Guyana	158	144	91	14	9
Cameroon	352	240	68	112	32	Honduras	707	428	61	279	39
Cape Verde	117	36	31	81	69	Hungary	289	217	75	72	25
Central African Republic	147	79	54	68	46	Indonesia	1,383	195	14	1,188	86
Chad	134	77	57	57	43	Iraq	736	309	42	427	58
Chile	1,928	959	50	969	50	Ivory Coast	499	104	21	395	79
China	2,603	1,838	71	765	29	Jamaica	348	264	76	84	24
Colombia	1,903	1,095	58	808	42	Kazakhstan	492	137	28	355	72
Congo	126	76	60	50	40	Kenya	650	452	70	198	30
Costa Rica	512	308	60	204	40	Kosovo	256	48	19	208	81

Country	N Observations	Audited		Unaudited		Country	N Observations	Audited		Unaudited	
		N	%	N	%			N	%	N	%
Kyrgyz Republic	354	107	30	247	70	Samoa	102	73	72	29	28
Lao PDR	625	124	20	501	80	Senegal	506	124	25	382	75
Latvia	267	191	72	76	28	Serbia	297	173	58	124	42
Lesotho	140	94	67	46	33	Sierra Leone	146	40	27	106	73
Liberia	139	30	22	109	78	Slovak Republic	261	141	54	120	46
Lithuania	267	92	34	175	66	Slovenia	240	94	39	146	61
Madagascar	443	229	52	214	48	South Africa	930	697	75	233	25
Malawi	141	102	72	39	28	Sri Lanka	567	365	64	202	36
Mali	804	260	32	544	68	St. Kitts and Nevis	146	100	68	46	32
Mauritania	237	40	17	197	83	St. Lucia	150	71	47	79	53
Mauritius	386	241	62	145	38	St. Vincent and Grenadines	150	118	79	32	21
Mexico	2,646	1,188	45	1,458	55	Suriname	152	79	52	73	48
Micronesia	67	17	25	50	75	Swaziland	286	209	73	77	27
Moldova	276	53	19	223	81	Tajikistan	275	57	21	218	79
Mongolia	332	263	79	69	21	Tanzania	414	220	53	194	47
Montenegro	102	52	51	50	49	Timor Leste	146	29	20	117	80
Mozambique	479	195	41	284	59	Togo	148	78	53	70	47
Namibia	324	269	83	55	17	Tonga	147	75	51	72	49
Nepal	843	674	80	169	20	Trinidad and Tobago	364	298	82	66	18
Nicaragua	705	292	41	413	59	Turkey	1,117	689	62	428	38
Niger	146	75	51	71	49	Uganda	1,152	536	47	616	53
Nigeria	1,887	305	16	1,582	84	Ukraine	705	207	29	498	71
Pakistan	869	220	25	649	75	Uruguay	1,176	434	37	742	63
Panama	771	600	78	171	22	Uzbekistan	273	98	36	175	64
Paraguay	934	284	30	650	70	Vanuatu	126	55	44	71	56
Peru	1,473	485	33	988	67	Venezuela	678	523	77	155	23
Philippines	1,171	1,067	91	104	9	Vietnam	1,005	343	34	662	66
Poland	405	136	34	269	66	Yemen	469	149	32	320	68
Romania	467	170	36	297	64	Zambia	481	341	71	140	29
Russia	4,497	1,058	24	3,439	76	Zimbabwe	532	285	54	247	46
Rwanda	446	214	48	232	52						



**Table A2: Variables and Sources**

Variable	Definition - t is the survey year	Original Source
<i>Audit</i>	Dummy variable that equals 1 if firm's annual financial statement was checked and certified by an external auditor (WBES data item 'k21'), 0 otherwise.	WBES
<i>Financial Obstacle</i>	"How problematic is access to finance for the current operations of a business?" No Obstacle =0, Minor Obstacle =1, Moderate Obstacle=2, Major Obstacle =3, and Very Severe Obstacle=4 (WBES data item 'k30').	WBES
<i>Financial ObstacleDummy</i>	Dummy variable that equals 1 if financial obstacles equal to 2 (moderate), 3 (major), or 4 (very severe), and 0 otherwise.	WBES
<i>Corruption Obstacle</i>	"How problematic is corruption for the current operations of a business?" No Obstacle =0, Minor Obstacle =1, Moderate Obstacle=2, Major Obstacle =3, and Very Severe Obstacle=4 (WBES data item 'j30f').	WBES
<i>Corruption ObstacleDummy</i>	Dummy variable that equals 1 if corruption obstacles equal to 2 (moderate), 3 (major), or 4 (very severe), and 0 otherwise.	WBES
<i>SalesGrowth</i>	The average difference of sales in year (t) (WBES data item 'd2') and sales in year (t-2) (WBES data item 'n3').	WBES
<i>FirmSize</i>	Logarithm of firm's sales at the end of year (t-1) (WBES data item 'd2').	WBES
<i>FirmAge</i>	Logarithm of a firm's actual age, age=survey year – firm founding year (WBES data item 'b5').	WBES
<i>Experience</i>	"How many years of experience working in this sector does the top manager have?" (WBES data item 'b7')	WBES
<i>Government</i>	Dummy variable that equals 1 if firm is owned by government/ state (WBES data item 'b2c'), 0 otherwise.	WBES
<i>Foreign</i>	Dummy variable that equals 1 if any foreign company or individual has a financial stake in the ownership of the firm (WBES data item 'b2b'), 0 otherwise.	WBES
<i>Compete</i>	Dummy variable that equals 1 if the firm answered 'Yes' to the question: "Does this establishment compete against unregistered or informal firms?"	WBES
<i>Exporter</i>	Dummy variable that equals 1 if the firm is an exporter, 0 otherwise.	WBES

*(continued)*

**Table A2-Continued**

Variable	Definition - t is the survey year	Original Source
<i>Priv</i>	Private credit by deposit money banks to GDP, calculated using the following deflation method: $\{(0.5) \cdot [F_t/P_{et} + F_{t-1}/P_{et-1}]\} / [GDP_t/P_{at}]$ where F is credit to the private sector, P_e is end-of period CPI, and P_a is average annual CPI.	IFS
<i>Corruption Control</i>	Country-level corruption estimate of <i>Worldwide Governance Indicators (WGI)</i> and ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance	WGI
<i>Government Effectiveness</i>	Country-level estimate of <i>Worldwide Governance Indicators (WGI)</i> for the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. It ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance	WGI
<i>GDP</i>	Logarithm of GDP in current US\$, the average over year (t-3), (t-2) and (t-1).	WDI
<i>GDP per capita</i>	Logarithm of per capita in US\$, the average real GDP per capita over year (t-3), (t-2) and (t-1).	WDI
<i>GDPGrowth</i>	Real growth rate of GDP, the average over year (t-3), (t-2) and (t-1).	WDI
<i>Inflation</i>	Log difference of consumer prices, the average over year (t-3), (t-2) and (t-1).	WDI
<i>Overdraft</i>	Dummy variable equal to 1 if firm has an overdraft facility at year t (WBES data item 'k7'), and 0 otherwise.	WBES
<i>Line of Credit</i>	Dummy variable equal to 1 if firm has a line of credit or loan from a financial institution at year t (WBES data item 'k8'), and 0 otherwise.	WBES
<i>Capital Expenditure</i>	Dummy variable that equals 1 if firm purchased fixed assets, such as machinery, vehicles, equipment, land or buildings at year (t-1), (WBES data item 'k4') and 0 otherwise.	WBES
<i>License</i>	"How problematic are business licensing and permits for the current operations of a business?" No Obstacle =0, Minor Obstacle =1, Moderate Obstacle=2, Major Obstacle =3, and Very Severe Obstacle=4 (WBES data item 'j30c').	WBES
<i>Tax</i>	"How problematic are tax rates for the current operations of a business?" No Obstacle =0, Minor Obstacle =1, Moderate Obstacle=2, Major Obstacle =3, and Very Severe Obstacle=4 (WBES data item 'j30b').	WBES
<i>Property Rights</i>	An estimate of the legally protected freedom to accumulate private property and wealth by workers and investors.	The Heritage Foundation

\* *Sources of Data:* **WBES** = World Bank Enterprise Survey (WBES); **WDI** = World Development Indicators, World Bank; **WGI** = Worldwide Governance Indicators, World Bank; **IFS** = International Financial Statistics.