

Transparency, Ownership, and Financing Constraints in Private Firms

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Abstract

The role that accounting information plays in facilitating the flow of capital between external providers of financing and the firm is less obvious for private firms compared with public firms. We find that private firms that choose to have their financial statements audited by an independent external auditor (our proxy for financial reporting transparency) experience significantly lower problems with gaining access to external finance (and obtain those funds at a lower cost) than do other private firms. We further find that the effect of financial transparency in reducing financing constraints increases with ownership concentration, and that this joint effect is more pronounced in poorer countries with weaker institutional environments. We thus provide unique evidence on the joint role of financial transparency and ownership in a private firm setting. Our results are robust to controlling for firm-level characteristics, industry effects, and country-level variables, as well as controlling for self-selection biases related to the choice of having the financial statements audited. Given the predominance of private firms around the world and the relatively scarce amount of research in this area, we add to the literature on the role of accounting information for an important and interesting group of firms.

Keywords: Financing constraints, financial transparency, ownership concentration, private companies, institutional environment

F3, G30, G32, M16, M41, M42

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1. Introduction

An intended purpose of financial accounting information is to reduce information asymmetry by allowing external providers of capital to better assess the firm's investment opportunities and monitor managerial actions (e.g., Fama and Jensen 1983; Diamond and Verrecchia 1991; Bushman and Smith 2001; Healy and Palepu 2001; Beatty, Liao, and Weber 2008). In other words, financial accounting transparency should ease financing constraints by reducing the adverse selection or moral hazard costs associated with information asymmetry. However, in certain settings, financial accounting may serve a limited role in reducing information costs. This could occur for a variety of reasons, such as alternative sources of information being available, weak institutional features protecting external providers of capital, close relations between managers and external providers of financing, and lower-quality financial information.¹ We examine the association between the firm's financial reporting transparency (i.e., firms that subject their financial statements to an external audit) and financing constraints (i.e., more difficult access to external financing and higher financing cost), as well as the mediating role of ownership concentration, for an extensive sample of private firms from 68 countries.²

Private firms make up the vast majority of economic activity around the world, yet they have received limited attention in academic research. Thus, examining the role of accounting

¹ As examples, Beatty, Liao, and Weber (2008) find that financial reporting quality is less important to lenders when their due diligence and monitoring efforts are higher; Biddle and Hillary (2006) show that accounting quality does not affect firms' investment-cash flow sensitivity in Japan where close banking relationships are common; and Li (2008) reports no reduction in cost of capital for firms adopting IFRS in countries with weak legal enforcement.

² One could argue that having the financial statements reviewed by an external auditor enhances not only transparency, but also the *credibility* of reported numbers. For simplicity, we refer to this enhanced credibility as a signal of financial accounting transparency (see also Section 2 for further discussion).

information for private firms is economically important in its own right. An interesting feature of a sample of private firms is that these firms have a limited information environment compared with the relatively richer disclosure environment of public firms (e.g., Burgstahler, Hail, and Leuz 2006). In general, private firms have chosen to remain private because presumably the benefits of being a public company (e.g., increased access to external financing, lower cost of capital) may not outweigh the costs (e.g., higher reporting costs, increased regulation, greater public scrutiny, reduced managerial discretion). Therefore, these firms may have reasons for being private, and these reasons may reduce or make unnecessary the role of public accounting information in facilitating the relation between external providers of finance and the firm. As discussed in footnote 1, accounting researchers are interested in understanding settings in which the role of accounting information is not obvious. Equally importantly, public firms are generally subject to mandatory audit requirements. Hence, using a sample of private firms makes it possible to observe variation in external audit choice.³

Financial transparency is not the only signal of interest to providers of external capital. Also of interest to our sample of private firms is their relatively high ownership concentration. For our sample of firms, the largest shareholder owns on average 74% of the shares. When thinking about the effect of a controlling shareholder on agency costs (and therefore financing constraints) of the firm, there are two competing views (Morck, Shleifer, and Vishny 1988). On the one hand, a controlling shareholder is more likely to monitor managerial actions, limiting the extent of agency costs through incentive alignment. On the other hand, a controlling shareholder can take advantage of her controlling position and direct private benefits for personal

³ It is not obvious whether external auditors play a lesser or a stronger role in private firms than in public firms. On the one hand, Coffee (2005) discusses how the existence of controlling shareholders can affect auditor independence. That is, Coffee argues that it is difficult for the auditor to escape the control of the party that she is expected to monitor. On the other hand, the monitoring value of auditing may be higher in private firms because they are less vulnerable to takeovers and because they are required to disclose less non-accounting information.

consumption (i.e., the typical problem of expropriation of minority shareholders and potentially creditors). If the first agency effect dominates, a controlling shareholder will have the effect of greater incentive alignment between managers and outside investors, reducing financing constraints. On the other hand, a controlling shareholder could exacerbate information problems and potentially increase the owner's private benefits of control – thereby increasing financing constraints. Our research setting provides us with an opportunity to help understand the relation between these competing economic forces and, consequently, the ability of financial transparency to affect external financing in the presence of these forces.

We obtain our data from a World Bank survey covering almost 50,000 manufacturing and service firms. This database has detailed information on firms' perceived financing constraints and financing costs, whether the financial statements are audited or not, ownership concentration, as well as other data that we use in our empirical tests. The World Bank data have been used in prior economics studies (e.g., Carlin, Shaffer, and Seabright 2007). In addition, we provide a validity test of our measure of financing constraints in Section.3.

We find that firm-level transparency (i.e., audited financial statements) is associated with lower financing constraints. While this finding is not obvious for private companies in countries covered by the World Bank survey, it is consistent with theory, which suggests that information and incentive problems impede firms' access to external capital (e.g., Jensen and Meckling 1976). Enhanced transparency alleviates information problems and can also make managers more accountable to outsiders (i.e., reduce incentive problems). Our result is robust to the inclusion of firm-level control variables as well as country, industry, and year fixed effects. The finding is also robust to a self-selection model, in which the first stage models firms' choice to

have their financial statements audited. Other sensitivity analyses, including using an alternative measure of financing constraints (i.e., the cost of financing), also yield consistent results.

With respect to controlling owners, we find that ownership and financial transparency have an interactive effect. Specifically, the ability of financial transparency to reduce financing constraints *increases* with a controlling shareholder. This result is far from obvious and goes beyond the straight-forward explanations offered in extant literature. While increased ownership may better align incentives of controlling shareholders and managers, it also increases the ability of controlling shareholders to expropriate private benefits. Thus, a tradeoff exists, and this is where financial transparency can play a more substantive role. Financial transparency can limit the ability of controlling shareholders to consume private benefits, making the incentive alignment effect stronger. In support of these arguments, we further find that the interaction effect is primarily evident only in poorer countries with weaker institutions. Prior research suggests that expropriation of private benefits by controlling shareholders is especially pervasive in these countries (e.g., Dyck and Zingales 2004), and this is where financial transparency can play a more prominent role in reducing financing constraints of private firms.

We contribute to the literature in several ways. First, we add to and complement the extant literature on economic consequences of accounting and auditing. Using data for an extensive sample of firms from 68 countries, we show that audited financial statements are associated with a highly economically important issue (i.e., financing constraints). Financing constraints have attracted the attention of an influential body of economics and finance literature (see for example, Rajan and Zingales (1998), who argue that financing constraints have an impact on investment and growth) and thus represent an interesting and important area of study.

The importance of understanding the role of financial transparency on private firms may be especially apparent during difficult economic periods when access to external financing is more limited (e.g., the current financial crisis). Instead of relying on broad capital markets, private companies are more likely to obtain external financing from bank loans, the sale of receivables, letters of credit, or large individual investors. When traditional credit markets become less liquid, these alternative sources of financing are also affected, limiting access to financing and/or increasing its cost for private firms.

Second, we contribute to the literature on the moderating effects of concentrated ownership (e.g., Morck et al. 1988; McConnell and Servaes 1990; Shleifer and Vishny 1997). External providers of finance are likely to base their assessments on multiple signals about firm type, and these signals are likely to interact with each other. Hence, viewing transparency in isolation will not necessarily lead to a complete understanding of the economic forces shaping financing constraints faced by firms. Since we have detailed data on ownership, we make an important contribution by testing the simultaneous effects of these two mechanisms – a controlling shareholder (or degree of ownership concentration in sensitivity tests) and the choice of having audited financial statements. Most prior research has been carried out with data on publicly listed companies for which ownership is likely to be more diffused by definition. By using the World Bank database, we are able to examine this issue using a sample for which the average ownership concentration is high but with significant cross-sectional variation. We view this contribution as important since it enables us to better understand a potential mechanism through which financial transparency affects financing constraints.

Further, we leverage the international dimension of our database and find that the mediating role of ownership concentration is especially important for countries where the

institutional environment is likely to be weaker (e.g., weaker investor protection rights).

Arguably, agency problems associated with concentrated ownership (such as the existence of private benefits of controls) are higher in these countries. Our finding indicates that transparency plays a more important role in mitigating agency costs pertaining to controlled ownership in these environments. This finding contributes to the international finance literature which studies the cross-country variation in private benefits of control (e.g., Dyck and Zingales 2004).

Third, in prior research, tests for the presence of financing constraints consist mainly in adding proxies for the availability of internal funds and/or firms' net worth or cash flow sensitivities. The choice of variables used to measure financing constraints has been a subject of academic debate (for example, see the interaction between Fazzari, Hubbard, and Petersen 2000 and Kaplan and Zingales 2000). We avoid this debate to some extent by using a more direct measure of financing constraints. Specifically, we use a survey-based measure which captures a firm's self-reported financing constraints.⁴

Finally, prior research on financing constraints and investment efficiency has focused on large, publicly traded firms (likely due to the difficulty in obtaining data on private firms). The majority of companies worldwide, however, are not publicly listed. In fact, in most countries around the world, non-publicly listed firms have (in aggregate) considerably more employees, greater revenues, and more in total asset values than publicly listed firms (e.g., Berzins, Bøhren, and Rydland 2008).⁵ The lack of evidence on non-publicly traded firms despite their economic

⁴ An additional advantage of using firm-reported survey data to measure financing constraints is avoiding problems associated with empirical estimates of investment efficiency as discussed in Bushman, Smith, and Zhang (2007).

⁵ According to Nagar, Petroni, and Wolfenzon (2005), in the United States there are about seven million corporate tax filers, of which only about 8,000 are public firms. As an additional example, in Burgstahler et al.'s (2006) sample of European firms, after excluding the smallest private firms they have 368,620 private firms and 9,502 public firms.

importance and likely differences from public companies (both in terms of constraints and incentives) provides an interesting research opportunity.

The next section reviews prior research and develops our hypotheses. Section 3 describes our sample and data. Section 4 presents our multivariate results and sensitivity tests. Section 5 offers summary and concluding remarks.

2. Literature Review and Hypotheses Development

2.1 Brief Background on Financing Constraints

Under the Modigliani–Miller theorem (1958), a firm’s capital structure is irrelevant to its value. Among other things, the theorem assumes that decision makers in the firm and external suppliers of funds have the same information about the firm’s choice and use of inputs, investment opportunities, riskiness of projects, and output or profits (Hubbard 1998). These assumptions are strong and imply that there is no cost in acquiring information. In such a setting, there is no need to expend resources to identify and evaluate investment opportunities, to monitor and discipline managers who may undertake value-destroying investments or expropriate firm resources for personal consumption, or to reduce information asymmetry between investors (Levine 1997). In practice, however, managers have significantly better information than investors and creditors do about most aspects of the firm’s investment and production (Hubbard 1998). In other words, in the real world, information costs are significant and can lead to difficulties in obtaining external finance (referred to hereafter as “financing constraints”). Financing constraints can impede economic growth by affecting the efficiency with which scarce resources are allocated (e.g., Levine 1997; Bushman and Smith 2003).

2.2 The Role of Financial Transparency

Bushman and Smith (2001) discuss three channels through which financial accounting information (or transparency) affects economic performance. First, high quality information can help managers identify good projects or investment opportunities, thereby aiding investment efficiency even in a world without moral hazard.⁶ The second channel which Bushman and Smith (2001) discuss is the governance role. In this role, financial accounting information helps corporate control mechanisms in preventing managers from expropriating wealth from investors or creditors (e.g., Fama and Jensen 1983). The third channel through which financial accounting information impacts economic performance is by reducing adverse selection and liquidity risk (Diamond and Verrecchia 1991; Baiman and Verrecchia 1996; Leuz and Verrecchia 2000). In our research setting, we expect that credible (audited) financial statements would enhance efficient capital allocation through all three mechanisms outlined above. Specifically, providers of external financing will find it easier to identify good investments, be more assured about the safety of their capital, and reduce price protection for adverse selection. All of these are likely to result in better access to (and lower cost of) external financing for firms.

The accounting system and financial disclosures are important means of reducing information asymmetries and monitoring managers to make them more accountable (e.g., Stiglitz 1975; Holmström 1979; Fama and Jensen 1983; Diamond and Verrecchia 1991). Healy and Palepu (2001) discuss how disclosures can reduce agency costs by providing principals with an effective monitoring tool. Specifically, better disclosures improve the monitor's ability to relate managerial decisions to firm performance (Lombardo and Pagano 2002; Hope and Thomas

⁶ Also, as Barry and Brown (1985) establish, reduced estimation risk can result in a lower cost of capital.

2008). Similarly, Ball (2006) argues that increased transparency causes managers to act more in the interests of shareholders.⁷

A number of empirical studies provide evidence of how firm disclosure can be used by outsiders to monitor the activities of managers. Perhaps most directly related to our study, Biddle and Hilary (2006) find a positive association between financial reporting quality and investment efficiency (see also Biddle, Hilary, and Verdi 2008; Hope and Thomas 2008; Khurana, Pereira, and Martin 2006; and Bens and Monahan 2004).⁸

A key component of high quality financial information is the external audit provided by independent accountants. Levitt (2000), among others, argues that providers of capital cannot be expected to trust a company's reported financial information without the objectivity and fairness provided by the external auditor. Audits lend credibility to accounting information by providing independent verification of manager-prepared financial statements (e.g., Simunic and Stein 1987). Specifically, auditing provides an independent assessment of the accuracy and fairness with which financial statements represent the results of operation, financial position, and cash flows in conformity with generally accepted accounting principles (e.g., Abdel-Khalik and Solomon 1988). Consistent with this argument, research has shown that auditing lowers investors' perceived information risk (e.g., Boone, Khurana, and Raman 2008). External audits further improve the precision of accounting information (Simunic and Stein 1987; Becker, DeFond, Jiambalvo, and Subramanyam 1998), thus allowing financial information to serve as useful corporate governance mechanisms (e.g., by allowing lenders to put more faith in reported numbers). As a consequence, external audits reduce information asymmetries and agency

⁷ It is also possible that increased disclosure can allow external stakeholders to develop their own independent and informed views on firms' decisions, which can help in the "monitoring of the monitors" (e.g., Hartzell and Starks 2003; Bebchuk and Fried 2005)

⁸ As an example of the importance of disclosure and transparency at the economy level, Porter (1992) recommends more and better disclosure to improve capital allocation in the interest of national competitiveness.

conflicts between the firm and its debt holders and stockholders (e.g., Jensen and Meckling 1976; Watts and Zimmerman 1986; Craswell et al. 1995).⁹

Although we provide compelling reasons why transparency (and auditing in particular) will be important for access to (and cost of) external financing, we note that prior literature argues and finds evidence suggesting that the usefulness of accounting information is reduced in private firms compared with public firms (e.g., Ball and Shivakumar 2005; Burgstahler et al. 2006).¹⁰ Thus, it is an empirical question whether financial transparency is in fact associated with financing constraints in our setting of private firms.¹¹ Based on the above discussion, our first hypothesis follows:

H1: Greater financial transparency (i.e., audited financial statements) is associated with lower financing constraints.

⁹ Using a sample of U.S publicly traded firms, Chang, Dasgupta, and Hilary (2007) find that firms that employ Big 4 auditors maintain lower debt-equity ratios and issue more equity as opposed to debt. They interpret these results as consistent with the certification role of auditing, in which auditing reduces information asymmetry and thus affects financial decisions. The research evidence is not limited to Western countries. As an example, using a sample of Chinese listed firms, Haw, Qi, and Wu (2008) find that earnings of firms that had their interim financial reports voluntarily audited were valued higher (i.e., higher earnings response coefficients) than were non-audited firms. As another example, Fan and Wong (2005) find that auditors fulfill a governance role also in emerging markets.

¹⁰ It is also the case that prior research finds a reduced role for accounting in developing countries and countries with low investor protection than in highly developed countries with strong investor protection (Ball, Kothari, and Robin 2000; Bushman and Smith 2001; Doidge, Karolyi, and Stulz 2007). Our sample consists largely of the former countries. This further potentially confounds the expected relation between audited financial statements and financing constraints for our sample of firms.

¹¹ If there were only benefits and no costs associated with engaging the services of an independent audit firm, all firms would hire an auditor. This is not what we observe for non-publicly listed firms. For example, an unconditional comparison for our full sample shows that 50.36% of non-publicly listed firms have their annual financial statements audited. This suggests that there are non-trivial costs related to auditing (out-of-pocket costs, reduction in ability to extract private benefits of control, etc.). In the empirical section of this paper, we model the choice to have an audit, and control for this potential endogeneity in our tests.

2.3 The Role of Ownership

In this study, we focus on firms that are not publicly traded on stock exchanges (referred to as “private firms”). The World Bank survey provides us with firm-specific ownership information on these firms. Private firms tend to have more concentrated ownership than do public firms. In our sample, the largest shareholder owns on average 74% of the shares. However, there is considerable variation in ownership concentration also among private firms, as can be seen from our sample standard deviation of 29% (not tabulated).

There is a large literature on the role of ownership (see, e.g., Shleifer and Vishny 1997 for references). Morck, Shleifer, and Vishny (1988) argue that increased ownership concentration may entrench managers, as they are increasingly less subject to governance by boards of directors and to discipline by the market for corporate control (with the latter likely not being as important for private firms). Controlling shareholders may either engage in outright expropriation from self-dealing transactions or exercise de facto expropriation through the pursuit of objectives that are not profit-maximizing in return for personal utilities (e.g., Fan and Wong 2002).¹² In other words, increased concentration can increase agency costs via the positive association with private benefits of control (Dyck and Zingales 2004). Concentrating ownership further allows firms to limit their information disclosure to outsiders. Such opacity prevents leakage of proprietary information to competitors and allows firms to avoid unwanted political or social scrutiny (Jensen and Meckling 1992). Consistent with this notion, Fan and Wong (2002) find that concentrated ownership is associated with low informativeness of accounting earnings.

¹² Similarly, Burgstahler et al. (2006, 987) argue that insiders in private firms may attempt to transfer assets out of the firm, effectively expropriating the creditors.

However, it is possible that the presence of a controlling shareholder may actually reduce agency costs. When ownership is dispersed, it is harder for shareholders to monitor managerial actions. When ownership is limited to one or a few individuals, it is easier and more efficient for those individuals to directly monitor managerial actions. Furthermore, controlling shareholders could enable a long investment horizon which allows the building of strong relationships between the firms and outside providers of capital (Ellul, Guntay, and Le1 2007). In fact, a controlling shareholder could increase business focus and make contracting negotiations easier.

To summarize our discussion, ownership concentration represents forces that work in opposite directions. Increased agency costs and information problems associated with high ownership concentration will work to *increase* financing constraints. However, incentive alignment, investment horizon effects, focus, ease of contracting, and greater monitoring associated with high ownership concentration will work to *decrease* financing constraints. Thus, it is difficult to predict the direction of the main effect of ownership concentration on financing constraints.

More pertinent to our study, we are primarily interested in the moderating effect of financial transparency on the association between ownership concentration and financing constraints. When ownership concentration is high, financial transparency can play a greater role in reducing costs associated with agency and information problems. In other words, financial transparency matters more when there is a stronger need for it (i.e., high agency cost setting such as concentrated ownership). In addition, there is no reason to expect increased financial transparency to reduce the benefits associated with high ownership concentration. In fact, financial transparency may further improve monitoring and incentive alignment when ownership concentration is high. Therefore, regardless of whether the agency costs of high ownership

outweigh the benefits (i.e., whether there is a positive or negative direct relation between ownership concentration and financial constraints), we unambiguously predict that financial transparency will have a greater effect on reducing financing constraints as ownership concentration increases. We state this as our second hypothesis.

H2: The ability of financial transparency to reduce financing constraints increases with ownership concentration.

As discussed above, ownership concentration can affect financing constraints through incentive alignment or through reduction of private benefits of control. Recent cross-country literature in finance has placed considerable emphasis on the adverse effects of private benefits of control (e.g., Dyck and Zingales 2004). Countries which have better institutional properties (e.g., investor protection, legal enforcement, etc.) are better equipped to curb costs associated with private benefits of control. Hence, if agency costs related to private benefits of control are considered important by providers of external finance, then we expect the mitigating role of transparency to be more pronounced in regimes with weaker institutions. On the other hand, we do not have strong reasons to expect a cross-country variation in the incentive alignment role of ownership concentration per se. We thus predict that the interaction effect between transparency and ownership concentration will be more pronounced (significant) in countries with weaker institutional framework. We state our third hypothesis as follows:

H3: The joint role (interaction effect) of transparency and ownership concentration in reducing financing constraints is more pronounced in countries with weaker institutions.

3. Sample and Data

3.1 Data Source

We obtain our data from the World Bank's Enterprise Surveys which contain detailed firm-level data on the quality of the institutional environment in which firms operate. The World Bank has undertaken large numbers of firm level surveys with the express intention of measuring the quality of the "business environment" or the "investment climate." This database has information on 49,584 manufacturing and service firms from 71 countries around the world for 2002-2005, of which 46,429 are not publicly traded on stock exchanges.^{13,14}

3.2 Proxy for Financing Constraints

The dependent variable in our tests, financing constraints, is based on a survey in which managers are asked to use ordinal response categories to answer questions on investment climate constraints. Specifically, our main proxy for financing constraints (*FinCon*) is on a scale from 0 (no problems with access to finance) to 4 (most severe constraints). The variable thus measures managers' perceptions of how constrained their firms are with respect to external financing.

This is a different approach to measuring financing constraints from the one typically followed in the literature. A potential limitation of this measure could be that some managers

¹³ Note that the identity of the firms is kept anonymous in the survey and in the database.

¹⁴ According to the World Bank website, the World Bank "ensures that confidentiality of the data is never compromised (through the use of private contractors). This enables the greatest degree of participation, integrity and confidence in the quality of the data." Furthermore, "The Enterprise Surveys sample from the universe of registered businesses and follow a *stratified random sampling* methodology" [emphasis added].

simply tend to have a high propensity to complain about financing constraints, regardless of which actual constraints they may face (e.g., Bertrand and Mullainathan 2001). However, as long as this propensity is not correlated with our variable of interest, firm-level transparency, there is no reason to believe that it would bias our results. Moreover, Carlin, Shaffer, and Seabright (2007, 32) conclude that the World Bank survey data “are indeed useful measures of the constraints to development across a wide range of countries.” Other proxies used in the literature likely have limitations as well. In particular, they tend to be quite indirect, often cash flows or the sensitivity of investment to availability of internal funds. Since extant research has questioned the meaning of the cash flow sensitivities of investment on theoretical and empirical grounds (e.g., Alti 2003; Cleary 1999; Erickson and Whited 2000; Kaplan and Zingales 1997; Bushman, Smith, and Zhang 2007), we are able to sidestep these issues by focusing on the impact of transparency on managers’ perceptions of the financial constraints they face.¹⁵

Because our measure of financing constraints has not been extensively used in prior research, we conduct a validity test to increase the confidence in our measure. Specifically, we compute the median and mean scores by country and then correlate these aggregate scores with two widely used measures of financing constraints from the finance literature (La Porta, Lopez-de-Silanes, and Shleifer 2008): (1) stock market capitalization divided by GDP and (2) private credit divided by GDP (with the latter likely to be more relevant for private firms).¹⁶ Note that these are inverse proxies for financing constraints (i.e., lower values are indicative of restricted access to external financing). We find that that our measure is negatively and significantly

¹⁵ Note that we are not criticizing the use of cash flow sensitivities; we are merely pointing out that although our measure has certain limitations, so do alternative approaches.

¹⁶ We believe that financing constraints perceived by individual firm managers will be greatly influenced by the overall external macro-economic and financial context in which they operate. Hence, it is highly likely that perceived firm-level measures of financing constraints are derivatives of the more primitive macro-level construct outlined above.

correlated with both these alternative measures, which provides some external assurance that the measure captures what we want it to capture.¹⁷

Finally, although our main tests employ *access* to financing as the key independent variable, we provide corroborative evidence in additional analyses by using an alternative measure, *cost* of financing.

3.3 Proxy for Financial Transparency

For our measure of financial transparency (*Audit*), we use an indicator variable that takes the value one (zero otherwise) if the firm managers answered “yes” to the following question: “Does your establishment have its annual financial statements reviewed by an external auditor?”¹⁸ The choice of external audit is likely to be shaped by firm characteristics, and in subsequent analyses we control for this potential self-selection bias.

3.4 Sample

We start with the full sample of 46,429 private firm observations in the database. After losing observations for missing values on whether financial statements are audited, perceived access to financing, and control variables (described below), we have data on firms from 68 countries. We note here that firm-level identifiers such as names are not available, and hence we are unable to intersect the data with other firm-level databases. However, as will be evident later, the choice of firm-level variables within the World Bank data itself is rich and we do not view this as a significant empirical constraint. For our main test, the number of observations is

¹⁷ Based on medians (means) the Pearson correlations are -0.34 (-0.27) and -0.33 (-0.28), respectively.

¹⁸ Specifically, the survey does not distinguish between audits and reviews. Audits involve more work by auditors than do reviews, but clearly having the financial statements either audited or reviewed will imply higher credibility and quality than not having an independent auditor examine the statements at all.

30,871. Later samples are smaller as we introduce additional firm-level control variables. The appendix provides definitions of the variables used. Panel A of Table 1 provides descriptive statistics for these variables. Pertinent to our study, note that half the sample firms do not choose to subject their financial statements to an external audit. Also, the firms in our sample are relatively mature with an average age of 21 years. In Panel B we report the number of observations by country. Countries from around the world are represented, with Turkey, Brazil, Poland, and Vietnam contributing the largest number of firms. With the exception of a few countries such as Germany and Ireland, most of the firms in the sample are from developing countries. Panel C shows that the sample is also spread across a number of industries, with the heaviest concentration in retail, metals, garments, and food.¹⁹

3.5 Correlations

Table 2 provides Pearson correlations among the main variables. As predicted, our main proxy for financing constraints (*FinCon*) is negatively correlated with financial transparency (*Audit*) with a correlation coefficient of -0.12 (significant at the one percent level). Similarly, as expected we observe a significant negative correlation between financing costs (*FinCost*) and *Audit*. *FinCon* is also negatively correlated with *Control*, but the magnitude of the correlation coefficient is small (-0.04). Financing constraints are moderately (but significantly) negatively correlated with *Employ* and *Age*, and moderately (but significantly) positively correlated with *Invest* (variables defined below). As expected, our two proxies for financing constraints (*FinCon* and *FinCost*) are positively and significantly correlated (coefficient of 0.71). We also note the strong positive correlation between *FinCon* and *Corrupt* (0.33), suggesting that corruption hinders access to financing (and also that this variable is an important control variable for our

¹⁹ Our empirical tests include both country and industry fixed effects.

tests). Correlation results should, however, be interpreted cautiously as they do not control for differences in firm, industry, or country characteristics. Consequently, in the next section we turn to multivariate test results.

4. Research Design and Results

4.1 Empirical Model

Our basic model is:

$$FinCon = a + b * Audit + c * Control + d * Audit * Control + Control Variables + \varepsilon$$

To the extent that *Audit* reduces a firm's financing constraints (H1), *b* is expected to be negative. To test H2, we use an indicator variable that takes the value one if the largest shareholder owns more than 50% of the outstanding shares in the company (*Control*), and zero otherwise. The coefficient on the interaction of *Audit* and *Control* (*d*) measures the moderating effect of the presence of a controlling shareholder on the relation between *Audit* and *FinCon*. If *Audit* is increasingly important in reducing financing constraints in the presence of a controlling shareholder (H2), then *d* is expected to be negative.

Firm size is a natural control variable under the presumption that size is highly correlated with the fundamental factors that determine the probability of being constrained (Schiantarelli 1996, 82). Smaller firms are more likely to suffer from idiosyncratic risks, may have lower collateral relative to their liabilities, and face higher unit bankruptcy costs.²⁰ Consistent with Abdel-Khalik (1993), we use the number of employees (*Employ*) as our (primary) size variable.

²⁰ Clementi and Hopenhayn (2006) further show that the sensitivity of investment to cash decreases with age and size.

This is also the most widely available size variable in the database.²¹ To account for possible size non-linearities (e.g., Abdel-Khalik 1993), we also include the square of *Employ* ($Employ^2$). We further include firm age (*Age*) as a control for the track record that helps investors to distinguish between good and bad firms (Schiantarelli 1996).²² We include the firm's expansion initiatives (i.e., developing a new product line or opening a new plant, *Invest*) in the last three years to capture growth needs. Finally, we use a firm-level measure of the perceived degree of corruption in the country (*Corrupt*). Since prior research shows that financing constraints vary across countries and industries (e.g., Love 2003), we include both country and industry fixed effects. Finally, we control for time period effects through year indicators. Reported significance levels are based on two-tailed tests and with Huber/White standard errors that are adjusted for clustering by country.²³

4.2 Tests of Hypotheses

Results are presented in Table 3. Columns I and II show results of OLS with and without the interaction between *Audit* and *Control*. For both columns, we find results consistent with H1. The estimated coefficient on *Audit* is negative (and significant at the one percent level), suggesting that firms that provide more transparent and more credible financial information are rewarded through improved access to financing. Everything else remaining constant, the coefficient on *Audit* indicates that on a scale from 0 to 4, the level of financing difficulty is lower by 0.185 (or 4.6 percent) for firms that have an external audit (and hence have more transparent

²¹ The sample size is reduced by one-third when using sales and by two-thirds when using total assets as alternative size proxies. Nevertheless, we later document that using sales revenues or total assets as alternative size proxies does not change any inferences.

²² Inferences are not affected if we use log transformations of *EMPLOY* and *AGE*.

²³ We have also clustered standard errors by either industry or year. Results are similar and no inferences are affected with alternative clustering methods (i.e., results are even stronger than those tabulated). Recall that firm identity is anonymous in the World Bank database (which precludes clustering at the firm level).

financial information). Both firm size (*Employ*) and firm age are negatively and significantly related to financing constraints. The significantly positive coefficient on *Employ*² suggests that size non-linearities are present in the data. *Corrupt* is positive and highly significant, suggesting that managers' perceived level of corruption in the country increases their perceived financing constraints. Untabulated F-tests indicate that the fixed effects for country, industry, and year are all significant at the one percent level.

In column II, we test H2. The interaction of *Audit* and *Control* is negative and significant at the five percent level (using a two-tailed test). In other words, the effect of transparency on reducing financing constraints is increasingly important in the presence of a controlling shareholder. This result is intuitive; external audits can either increase the credibility of incentive alignment between owners and outside investors, or reduce the ability of owners to consume private benefits of control. Under either explanation, *Audit* will have a greater financing constraint-reducing effect in presence of a controlling shareholder. We note that whereas the main effect of *Control* is negative and significant in column I (when the interaction term is excluded), it is no longer significant once we control for the interaction effect between financial transparency and ownership concentration. This finding suggests that ownership is important, but as a mediating variable in the relation between access to external financing and accounting transparency.

Since the dependent variable ranges between 0 and 4 (and thus violates the standard OLS assumptions), we repeat the analysis using ordered probit and show results in Column III. The results are consistent with those estimated using OLS. Thus, for brevity we present only OLS results for remaining tests.²⁴ Further, to mitigate the possibility that our results are driven by

²⁴ Another reason for presenting OLS results is the complexity associated with interpreting interaction effects in probit models (e.g., Ai and Norton 2003).

extreme observations, we delete observations for which the absolute value of studentized residuals exceeds two ($N = 30,091$).²⁵ Results are presented in Column IV of Table 3. These results are consistent with the main results and suggest that outlying observations do not drive the observed effects.

4.3 Effect of Variation in Institutional Environment

As discussed, our sample comprises companies from 68 countries that are different in many interesting respects.²⁶ Perhaps most importantly, countries differ in how they protect the interests of shareholders and creditors (e.g., La Porta et al. 1998). Since data on investor protection are only available for one-third of our sample we instead condition our test on gross national income per capita (GNI), which is available for the entire sample. The correlation between GNI and “Legal enforcement” from La Porta et al. (1998) is 0.84 and significant at the 0.01 level, suggesting that GNI is a good proxy for the degree of investor protection in a country.²⁷

In Table 4 we report results for lower and higher income countries separately, using the median to split the sample.²⁸ As the table shows, whereas *Audit* is negative and significant in both subsamples, the interaction between *Audit* and *Control* is negative for both subsamples but statistically significant only for the low income group. Finding the interaction economically and

²⁵ As an alternative method to control for outliers, in untabulated analysis, we eliminate observations with a Cook’s D value greater than $4/n$, where n is the number of observations in the sample. Inferences are unchanged.

²⁶ We include country fixed effects in all tests. This is a common approach for controlling country-specific effects and addressing correlated omitted country-level variable problems (Doidge et al. 2007). However, as an alternative to country fixed effects, we include controls for legal origin (common law versus code law) or gross national income per capita and continue to find that transparency is significantly related to financing constraints.

²⁷ La Porta et al.’s (1998) investor protection variable has been used in several studies and is measured as the mean score across three legal variables: (1) the efficiency of the judicial system, (2) an assessment of the rule of law, and (3) the corruption index.

²⁸ The difference in mean income between the two groups is highly economically and statistically significant. Specifically, the means of GNI per capita for the low and high groups are 1,123 and 9,161, respectively.

statistically (at the one percent level) more significant for poorer countries suggests that agency problems associated with concentrated ownership such as private benefits of control are more severe in these countries (or alternatively that the counter-effect of controlling ownership monitoring is more pronounced in richer countries). This finding is consistent with the expectation that private benefits of control should be higher in poorer countries with worse institutional environments including weaker investor protection (e.g., Dyck and Zingales 2004).

4.4 Robustness Tests

We perform several analyses to test the robustness of our results: (1) endogeneity tests, (2) additional firm-level control variables, (3) a continuous measure of ownership concentration, (4) an alternative proxy for financing constraints (i.e., cost of financing), and (5) mandatory audits.

4.4.1 Controlling for Self-Selection Bias

Our sample consists of firms that are not publicly traded. For many private firms, it is a choice to elect to have their financial statements audited, and firms that choose an audit are ones for which the benefits exceed the incremental costs. It is thus potentially important to control for factors that influence firms to employ an external auditor (i.e., self-selection bias), as otherwise it is possible that the effect we pick up is related to these other factors and not to financial transparency (audit) per se.²⁹

To control for the potential endogeneity of audit choice, we employ a Heckman two-step model (Heckman 1979). In the first-stage equation we first include the instruments included in

²⁹ In later tests, we address the possibility that audits for private firms may be mandatory in some of the sample countries (at least for certain firms).

the main equation (including country, industry, and year fixed effects). In particular, prior research has shown that the choice of auditing is associated with firm size (e.g., Abdel-Khalik 1993; Carey, Simnett, and Tanewski 2000), firm age (Mansi, Maxwell, and Miller 2004), ownership concentration (Fan and Wong 2005), and industry (Ettredge et al. 1994). In addition, we add the following instruments: (1) an indicator variable for whether the firm is an exporter (*Export*), with the expectation that exporters are more likely to be audited and be more transparent (in part due to demand from their foreign customers); (2) an indicator variable for whether the firm has foreign ownership or not (*ForOwner*), with the expectation that foreign owners (who are farther removed from the company) are more likely to demand auditing to help monitor their investment (Francis et al. 2008); and (3) an indicator variable denoting whether the firm is located in the country's capital (*Capital*), with the expectation that auditing services are more readily available in the capital than elsewhere.³⁰ The audit choice model is thus (with country, industry, and year fixed effects omitted):

$$Prob(Audit = 1) = a + b * Export + c * ForOwner + d * Capital + e * Employ + f * Employ^2 + g * Age + h * Control + \varepsilon$$

The first stage results, reported in Table 5, show that audit is positively and significantly related to firm size and to being an exporter, and negatively and significantly related to having a controlling shareholder. More importantly, the second stage regression shows that, after controlling for the Inverse Mills ratio (which is significant, confirming the importance of controlling for selection bias), we continue to find *Audit* (our proxy for transparency) strongly

³⁰ In the next section we discuss results of tests that employ three additional first-stage instruments (and thus have a smaller sample of observations).

negatively associated with financing constraints, supporting H1. In addition, the interaction between *Audit* and *Control* remains significantly negative, supporting H2. Untabulated analysis further shows that the interaction term is significantly more negative in poorer countries, supporting H3. These findings suggest that our results above were not caused by lack of control for factors that influence firms to have their financial statements audited and hence have higher quality financial statements.³¹ Thus, controlling for potential self-selection bias does not impact the inferences regarding our hypotheses.

4.4.2 Additional Firm-Level Control Variables and Additional First-Stage Instruments

Although we control for several important factors related to financing constraints above, it is always possible that there is some omitted (and correlated) variable. To address such concerns, we conduct two tests. We first add two additional control variables to the main regression that potentially impact firms' access to financing. These variables were not included in the initial results because they are missing for several observations. We add (1) the interest coverage ratio (*IntCov*; earnings before taxes and interest divided by interest expense) and (2) leverage (*Leverage*; long-term liabilities divided by total assets).

Second, we further add three additional instruments to the first-stage of the Heckman model: (1) the percent of the workforce that is unionized, (2) the contribution of bank loan financing to working capital investments, and (3) the percentage of sales to multinationals. All these additional variables are from the World Bank survey. Requiring data on these variables results in much smaller samples.

³¹ Since the Heckman procedure is known to be relatively sensitive to model specification, we repeat the analysis using two-stage least squares or OLS with the first-stage instruments used as additional control variables (untabulated). No inferences are affected.

For brevity we only tabulate the second-stage Heckman results. Column I of Table 6 reports the results of the expanded regressions that include *IntCov* and *Leverage* (N = 4,882). Neither is statistically significant. *Audit* and the interaction of *Audit* and *Control* continue to be negatively significantly associated with financing constraints. In Column II, we present the results after adding the additional first-stage instruments (N = 3,837). Again, no inferences are affected (even in this relatively small sample).³² In summary, the results in Table 6 alleviate additional concerns over possible correlated omitted variables from the analysis.³³

4.4.3 Alternative Ownership Variable

Table 7 reports results when using a continuous measure of ownership concentration. In prior results, we conduct tests with an indicator variable equal to one if the firm has a controlling shareholder (*Control*). Here, we repeat tests with a continuous measure of ownership concentration measured as the percentage stake held by the largest shareholder (*OwnerCon*). We provide results using OLS (Column I) and after controlling for self-selection bias (Column II). We continue to find evidence that audit reduces financing constraints, and the constraint-reducing effect of audit increases with ownership concentration.

4.4.4 Alternative Dependent Variable (Financing Cost)

As discussed above, the literature has measured financing constraints in various ways, suggesting that no measure is perfect in all circumstances. To mitigate concerns both over construct validity and potential measurement error related to our main variable, financing

³² The pseudo R^2 for the first-stage model increases to 0.290. For the second stage, the only difference from previously reported results in these small-sample tests is that the main effect of *Control* turns positive. Recall that we do not have a prediction for the sign of the coefficient on *Control*.

³³ In sensitivity analyses, we have replaced *Employ* with sales revenues or total assets as size controls. No inferences are affected.

constraints, we repeat the test using financing costs (*FinCost*). Financing cost is an intuitively appealing alternative measure, as regardless of circumstances, a higher cost of financing should be detrimental to the firm. We conjecture based on intuition that firms with difficulties in accessing financing are also likely to face a higher financing cost. Consistent with this notion, the Pearson correlation between the two measures is 0.71 (Table 2), suggesting that financing constraints and financing costs are positively related (as expected) but not identical measures.

We report four sets of results in Table 8. In Columns I and II, we report tests using OLS with and without the interaction of *Audit* and *Control*. In Columns III and IV we repeat these tests after controlling for self-selection bias. Consistent with the results using *FinCon*, we find that *Audit* is negatively associated with cost of financing (significant at the one percent level), when not controlling for the interaction between *Audit* and *Control*. When we add this interaction, we find the interaction significantly negative but the main effect of *Audit* is no longer significant. This result further corroborates our argument that signals such as transparency and ownership control should be viewed simultaneously and not in isolation.

4.4.5 Controlling for Potential Mandatory Audits

Our hypotheses use *choice* of audit as an underlying construct, but in some countries audits are mandatory for private firms when firm size exceeds a certain threshold. Thus, certain private firms in our sample may not have a choice of whether to receive an external audit. However, this fact does not negate the validity of our hypotheses or inferences from our tests. In settings where audits are required in one country (or for one set of firms) but not in others, the same predictions for H1-3 would hold.³⁴ Using a variety of control variables and correcting for

³⁴ In other words, our predictions do not rely on the choice of audit being made at the firm level, but only that some firms receive an audit while others do not.

self-selection effects (including firm size and country fixed effects which relate to mandated audits), we test whether receiving an audit affects financing constraints and whether this relation is moderated in settings with a controlling shareholder.

Nonetheless, we acknowledge that including some firms with mandatory audits could bias the results in some unknown manner. We control for this possible bias in two ways. First, we rerun all tests after excluding observations from countries with mean audit rates above 80%, since in these countries' audits are more likely be mandatory (at least for a large number of firms).³⁵ Second, we repeat the analyses after excluding the largest ten percent of firms, either in the pooled sample or by country. For all tests (untabulated), we find that our inferences remain.

5. Conclusion

Agency theory posits that information asymmetry between a principal and an agent creates a moral hazard problem – the possibility that an agent will pursue her self-interest at the expense of the principal. The theory predicts that both agents and principals recognize that it can be beneficial to reduce the moral hazard and will devise arrangements to align their self-interests. Transparent and credible financial reporting is one means by which agency costs can be reduced. External auditing of financial statements reduces the misreporting of accounting information and thus represents a valuable form of monitoring used by firms to reduce agency costs with debt holders and stockholders (Jensen and Meckling 1976; Watts and Zimmerman 1986). External auditing also has the potential to reduce information asymmetries that exist between managers and firm stakeholders by allowing outsiders to verify the validity of financial statements (Becker et al. 1998).

³⁵ Twelve countries comprising 4,096 observations are excluded when using a cut-off of 80%. We have also performed this test using cut-offs of 75%, 85%, 90%, or 95%. Note that none of our sample countries have audit rates of 100%.

In this study, we examine the role of financial accounting transparency (proxied for by the external audit of financial statements) in mitigating financing constraints for a large sample of private firms from 68 countries. Private firms are predominant in most countries, but there is limited prior research on the role of financial transparency or auditing in such firms. We find strong evidence that increased transparency does in fact reduce external financing constraints (both perceived constraints to financing and cost of financing). Furthermore, this negative relation increases in the presence of a controlling shareholder, especially in poor countries with weaker investor protection rights. Our results are robust to the inclusion of firm-level control variables, industry and country fixed effects, and tests that explicitly model the choice to have financial statements audited.

We contribute to the economics and finance literature on financing constraints by documenting the role that firm-level financial transparency plays. At the macro level, there is a large body of literature which studies the impact of financial development on growth. For example, Rajan and Zingales (1998) argue that in the context of financing constraints, financial market imperfections have an impact on investment and growth. Given that institutional structures evolve slowly over time, it has been a challenge for researchers to isolate the exact mechanism through which financial development and financing constraints affect growth and investment. Researchers such as Rajan and Zingales (1998) have appealed to micro-level data to better understand these macro-phenomena. While these financial economists have documented the link between (macro-level) financing constraints (or conversely, in a macro-context, financial development) and growth, more primitively we need to understand the underlying factors that affect financing constraints. We argue based on economic theory that corporate transparency is one such mechanism through which firms can attempt to reduce financing constraints. As such,

our paper provides a firm-level understanding of the forces that drive the phenomena that macro-economists are interested in.

We further contribute to the accounting and auditing literature by examining important economic consequences of auditing in an international context. We show that audited financial statements are associated with an economically important issue: both financing constraints and cost of financing.

Our study also adds to the extant research on the role of ownership. Ownership concentration represents forces that work in opposite directions. Using private firms with high ownership concentration (but with significant variation in concentration), we find that financial transparency enhances the financing constraint-reducing effect of ownership concentration. In other words, external audit (financial transparency) can enhance the credibility of the incentive alignment signal and constrain the ability of owners to consume private benefits of control when a controlling shareholder is present. This contribution is important because it highlights the fact that market participants assess firms using multiple signals (in our case financial transparency and ownership), rather than one single signal in isolation. Further, our cross-country analysis indicates that the role of transparency in mitigating the agency costs related to private benefits of control is more important in poor countries with weaker institutional environments. This finding contributes to the stream of international finance literature that analyzes cross-country variations in private benefits of control.

Finally and importantly, our study may enhance our understanding of private firms. Private firms provide the main vehicle for economic growth in most countries. However, there is limited extant research on private firms in general (likely due to data availability problems) and almost no prior research related to financial transparency or external auditing in such firms.

We leave it for future research to examine other interesting consequences of financial transparency beyond financing constraints in an international setting. Such alternative outcome variables could include investments, growth, profitability, etc.

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APPENDIX
Definitions of Main Variables

Variable	Definition	Source
<i>FinCon</i>	Response to a question of whether “Access to Financing” is a problem for the operation and growth of the firm’s business. Takes values from 0 (no obstacle) to 4 (very severe obstacle)	World Bank Enterprise Survey
<i>FinCost</i>	Response to a question of whether “Cost of Financing” is a problem for the operation and growth of the firm’s business. Takes values from 0 (no obstacle) to 4 (very severe obstacle)	World Bank Enterprise Survey
<i>Audit</i>	Indicator variable indicating whether annual financial statement reviewed by external auditor.	World Bank Enterprise Survey
<i>Control</i>	Indicator variable indicating whether the largest shareholder owns more than 50% of the shares	World Bank Enterprise Survey
<i>Employ</i>	Number of employees	World Bank Enterprise Survey
<i>Age</i>	Age of the firm in years	World Bank Enterprise Survey
<i>Invest</i>	Sum of responses to questions regarding whether the firm has (1) developed a major new product line or (2) opened a new plant in the last three years (i.e., <i>Invest</i> takes values of 0,1, or 2)	World Bank Enterprise Survey
<i>Corrupt</i>	Response to question of whether corruption is a problem for the operation and growth of the business. Takes values from 0 (no obstacle) to 4 (very severe obstacle)	World Bank Enterprise Survey
<i>GNI</i>	Gross National Income per Capita (Atlas method)	World Bank Enterprise Survey

TABLE 1
Descriptive Statistics and Sample Composition

Panel A: Descriptive Statistics for Aggregate Sample						
	25%	50%	75%	Mean	Std. Dev.	
<i>FinCon</i>	0	1	3	1.46	1.36	
<i>FinCost</i>	0	2	3	1.68	1.37	
<i>Audit</i>	0	1	1	0.50	0.50	
<i>Control</i>	0	1	1	0.69	0.46	
<i>Employ</i>	8	23	77	129.18	451.83	
<i>Age</i>	11	15	24	20.67	18.49	
<i>Invest</i>	0	0	1	0.42	0.56	
<i>Corrupt</i>	0	1	3	1.48	1.44	
<i>GNI</i>	960	2,510	4,910	5,075	7,469	

The number of observations equals 30,871. Variables are defined in the appendix

TABLE 1 (continued)
Descriptive Statistics and Sample Composition

Panel B: Number of Observations by Country

Country	Obs.	Country	Obs.
Albania	301	Lithuania	501
Algeria	402	Madagascar	243
Armenia	457	Malawi	136
Azerbaijan	393	Mali	68
Bangladesh	110	Mauritius	151
Belarus	495	Moldova	508
Benin	170	Montenegro	47
Bosnia & Herzegovina	237	Nicaragua	417
Brazil	1,462	Oman	273
Bulgaria	445	Pakistan	112
Cambodia	332	Philippines	430
Chile	791	Poland	1,317
Croatia	260	Portugal	436
Czech Republic	508	Romania	733
Ecuador	163	Russia	873
Egypt	690	Senegal	221
El Salvador	434	Serbia	261
Estonia	321	Serbia & Montenegro	385
Ethiopia	19	Slovakia	270
Macedonia	259	Slovenia	344
Georgia	319	South Africa	533
Germany	1,076	South Korea	539
Greece	485	Spain	568
Guatemala	432	Sri Lanka	342
Guyana	109	Syria	463
Honduras	407	Tajikistan	349
Hungary	741	Tanzania	217
Indonesia	579	Thailand	549
Ireland	463	Turkey	2,062
Kazakhstan	660	Uganda	244
Kenya	192	Ukraine	898
Kosovo	28	Uzbekistan	530
Kyrgyzstan	399	Vietnam	1,234
Latvia	305	Zambia	175
		Total	30,871

TABLE 1 (continued)
Descriptive Statistics and Sample Composition

Panel C: Number of Observations by Industry

Industry	Obs.	Industry	Obs.
Retail	4,826	Advertising	816
Metals	3,320	Paper	689
Garments	2,667	Real	666
Food	2,521	Other	598
Construction	2,237	Agro-industry	543
Wood	1,880	Leather	451
Textiles	1,582	IT	431
Non-metallic	1,464	Electronics	284
Hotels	1,274	Auto	200
Beverages	1,234	Mining	186
Chemicals	1,138	Telecommunications	164
Transport	1,070	Other	631
		Total	30,871

TABLE 2
Pearson Correlations among Main Variables

	<i>FinCon</i>	<i>FinCost</i>	<i>Audit</i>	<i>Control</i>	<i>Employ</i>	<i>Age</i>	<i>Invest</i>
<i>FinCon</i>	1.00						
<i>FinCost</i>	0.71 <i>0.00</i>	1.00					
<i>Audit</i>	-0.12 <i>0.00</i>	-0.08 <i>0.00</i>	1.00				
<i>Control</i>	-0.04 <i>0.00</i>	-0.04 <i>0.00</i>	-0.08 <i>0.00</i>	1.00			
<i>Employ</i>	-0.05 <i>0.00</i>	-0.03 <i>0.00</i>	0.15 <i>0.00</i>	0.00 <i>0.65</i>	1.00		
<i>Age</i>	-0.03 <i>0.00</i>	0.00 <i>0.39</i>	0.14 <i>0.00</i>	-0.04 <i>0.00</i>	0.15 <i>0.00</i>	1.00	
<i>Invest</i>	0.03 <i>0.00</i>	0.06 <i>0.00</i>	0.05 <i>0.00</i>	-0.02 <i>0.00</i>	0.10 <i>0.00</i>	0.02 <i>0.00</i>	1.00
<i>Corrupt</i>	0.33 <i>0.00</i>	0.38 <i>0.00</i>	-0.05 <i>0.00</i>	-0.04 <i>0.00</i>	-0.01 <i>0.11</i>	0.00 <i>0.88</i>	0.11 <i>0.00</i>

Variables are defined in the appendix. The numbers in italics are two-sided p-values.

TABLE 3
Effect of Audit on Financing Constraints

$$FinCon = a + b * Audit + c * Control + d * Audit * Control + Control\ Variables + \varepsilon$$

Variable	Pred.	I.	II.	III.	IV.
<i>Audit</i> (H1)	–	-0.185 *** <i>-6.97</i>	-0.135 *** <i>-3.37</i>	-0.111 *** <i>-3.01</i>	-0.136 *** <i>-3.90</i>
<i>Control</i>	?	-0.051 ** <i>-2.30</i>	-0.012 <i>-0.34</i>	-0.007 <i>-0.20</i>	-0.018 <i>-0.56</i>
<i>Audit*Control</i> (H2)	–		-0.072 ** <i>-1.96</i>	-0.068 ** <i>-1.99</i>	-0.070 ** <i>-2.01</i>
<i>Employ</i>	–	-0.001 *** <i>-4.02</i>	-0.001 *** <i>-3.99</i>	-0.001 *** <i>-3.82</i>	-0.001 *** <i>-4.55</i>
<i>Employ</i> ²	+	0.001 *** <i>4.74</i>	0.001 *** <i>4.71</i>	0.001 *** <i>4.47</i>	0.001 *** <i>4.93</i>
<i>Age</i>	–	-0.002 *** <i>-3.88</i>	-0.002 *** <i>-3.85</i>	-0.002 *** <i>-3.61</i>	-0.002 *** <i>-4.13</i>
<i>Invest</i>	+	0.027 <i>1.49</i>	0.027 <i>1.52</i>	0.031 ** <i>2.01</i>	0.018 <i>1.08</i>
<i>Corrupt</i>	+	0.250 *** <i>25.99</i>	0.250 *** <i>26.04</i>	0.222 *** <i>21.34</i>	0.300 *** <i>26.74</i>
Intercept		1.062 *** <i>14.42</i>	1.034 *** <i>13.22</i>		0.915 *** <i>11.65</i>
Country fixed effects		Yes	Yes	Yes	Yes
Industry fixed effects		Yes	Yes	Yes	Yes
Year fixed effects		Yes	Yes	Yes	Yes
Adj. R ² (pseudo R ² for probit)		0.197	0.197	0.074	0.262
N		30,781	30,781	30,781	30,091

Variables are defined in the appendix. Columns I and II are OLS regressions using the full sample. Column III is identical to Column II but ordered probit is used instead of OLS. Column IV is identical to Column II but outlying observations have been deleted (i.e., with absolute values of studentized residuals greater than two). *, **, and *** represent significance at the 10%, 5%, and 1% level, respectively, using two-tailed tests (t-statistics for OLS and z-statistics for ordered probit in italics). Huber/White robust standard errors (not reported) are adjusted for clustering at the country level.

TABLE 4
Effect of Audit on Financing Constraints Based on Country-Level Income

$$FinCon = a + b * Audit + c * OwnerCon + d * Audit * OwnerCon + Control\ Variables + \varepsilon$$

Variable	Pred.	Below Median	Above Median
<i>Audit</i> (H1)	–	-0.090 *	-0.162 **
		-1.73	-2.65
<i>Control</i>	?	-0.009	-0.011
		-0.18	-0.20
<i>Audit*Control</i> (H2)	–	-0.105 **	-0.050
		-2.11	-0.89
<i>Employ</i>	–	-0.001 **	-0.001 ***
		-2.36	-4.53
<i>Employ</i> ²	+	0.001 ***	0.001 **
		3.12	2.59
<i>Age</i>	–	-0.001 **	-0.003 ***
		-2.11	-4.27
<i>Invest</i>	+	-0.013	0.065 ***
		-0.50	3.55
<i>Corrupt</i>	+	0.226 ***	0.262 ***
		18.00	16.92
Intercept		1.021 ***	0.485 ***
		9.82	3.58
Country fixed effects		Yes	Yes
Industry fixed effects		Yes	Yes
Year fixed effects		Yes	Yes
Adj. R ²		0.159	0.241
N		15,670	15,201

Column I (II) presents OLS regression results for below (above) median income countries. Income is Gross National Income per capita. Variables are defined in the appendix. *, **, and *** represent significance at the 10%, 5%, and 1% level, respectively, using two-tailed tests (t-statistics for OLS). The difference in *Audit*Control* between low and high income countries is significant at the one percent level. Huber/White robust standard errors (not reported) are adjusted for clustering at the country level.

TABLE 5
Effect of Audit on Financing Constraints (Two-stage Heckman Self-selection Model)

First stage:

$$Prob(Audit = 1) = a + b * Export + c * ForOwner + d * Capital + e * Employ + f * Employ^2 + g * Age + h * Control + \varepsilon$$

Second stage:

$$FinCon = a + b * Audit + c * Control + d * Audit * Control + Control Variables + \varepsilon$$

<i>First stage</i>			<i>Second stage</i>		
	Pred.			Pred.	
<i>Export</i>	+	0.123 *** 3.05	<i>Audit (H1)</i>	-	-0.132 *** -4.91
<i>ForOwner</i>	+	0.057 1.24	<i>Control</i>	?	-0.025 -1.02
<i>Capital</i>	+	0.029 0.89	<i>Audit*Control (H2)</i>	-	-0.068 ** -2.19
<i>Employ</i>	+	0.001 ** 2.48	<i>Employ</i>	-	-0.001 *** -4.93
<i>Employ</i> ²	-	-0.001 -1.43	<i>Employ</i> ²	+	0.001 *** 4.09
<i>Age</i>	+	-0.001 -0.60	<i>Age</i>	-	-0.002 *** -4.76
<i>Control</i>	-	-0.062 ** -2.00	<i>Invest</i>	+	0.031 ** 2.27
Intercept		3.488 *** 9.21	<i>Corrupt</i>	+	0.251 *** 43.80
			Mills ratio (<i>lambda</i>)		1.333 ** 2.58
			Intercept		2.539 *** 13.18
Pseudo R ²		0.213	Wald chi-squared		7,803
Country fixed effects		Yes	Country fixed effects		Yes
Industry fixed effects		Yes	Industry fixed effects		Yes
Year fixed effects		Yes	Year fixed effects		Yes
N		30,732	N		30,732

Variables are defined in the appendix. Additionally, *Export* is an indicator variable that takes the value one if the firm is an exporter (zero otherwise); *ForOwner* is an indicator variable that takes the value one if the firm has foreign ownership (zero otherwise); *Capital* is an indicator variable that takes the value one if the firm is headquartered in the country's capital city (zero otherwise). *, **, and *** represent significance at the 10%, 5%, and 1% level, respectively, using two-tailed tests (z-statistics in italics). Huber/White robust standard errors (not reported) are adjusted for clustering at the country level.

TABLE 6
Effect of Audit on Financing Constraints (Additional Firm-level Controls)

$$FinCon = a + b * Audit + c * Control + d * Audit * Control + Control\ Variables + \varepsilon$$

Variable	Pred.	I.	II.
<i>Audit</i> (H1)	–	-0.159 ** <i>-2.17</i>	-0.170 ** <i>-2.03</i>
<i>Control</i>	?	0.184 *** <i>3.05</i>	<i>0.184</i> *** <i>2.85</i>
<i>Audit*Control</i> (H2)	–	-0.224 *** <i>-2.77</i>	-0.189 ** <i>-2.02</i>
<i>Employ</i>	–	-0.001 *** <i>-5.19</i>	-0.001 *** <i>-4.12</i>
<i>Employ</i> ²	+	0.001 *** <i>4.33</i>	0.001 *** <i>3.93</i>
<i>Age</i>	–	-0.004 *** <i>-3.21</i>	-0.004 *** <i>-2.82</i>
<i>Invest</i>	+	0.072 ** <i>2.08</i>	0.105 *** <i>2.65</i>
<i>Corrupt</i>	+	0.240 *** <i>16.60</i>	0.228 *** <i>13.74</i>
<i>IntCov</i>	–	-0.001 <i>-0.13</i>	-0.001 <i>-0.15</i>
<i>Leverage</i>	+	0.001 <i>0.20</i>	0.001 <i>0.47</i>
Mills ratio (<i>lambda</i>)		-0.599 * <i>-1.85</i>	-0.223 <i>-0.99</i>
Intercept		1.873 *** <i>8.88</i>	2.043 *** <i>3.79</i>
Country fixed effects		Yes	Yes
Industry fixed effects		Yes	Yes
Year fixed effects		Yes	Yes
Wald chi-squared		9,368	3,803
N		4,882	3,837

Column I shows the second stage of a Heckman self-selection model with the first stage choice model (not shown) being identical to that in Table 5. Variables are defined in the appendix. Additionally, *IntCov* is the interest coverage ratio and *Leverage* is long-term liabilities divided by total assets. Column II is similar to column I except that the first stage includes three additional instruments: (1) the percent of the workforce that is unionized, (2) the contribution of bank loan financing to working capital investments, and (3) the percentage of sales to multinationals. *, **, and *** represent significance at the 10%, 5%, and 1% level, respectively, using two-tailed tests (z-statistics in italics). Huber/White robust standard errors (not reported) are adjusted for clustering at the country level.

TABLE 7
Effect of Audit on Financing Constraints (Using Continuous Ownership Concentration)

$$FinCon = a + b * Audit + c * OwnerCon + d * Audit * OwnerCon + Control\ Variables + \varepsilon$$

Variable	Pred.	I.	II.
<i>Audit</i> (H1)	–	-0.094 * <i>-1.71</i>	-0.094 ** <i>-2.13</i>
<i>OwnerCon</i>	?	-0.001 <i>-0.70</i>	-0.001 ** <i>-1.93</i>
<i>Audit*OwnerCon</i> (H2)	–	-0.001 ** <i>-2.06</i>	-0.001 ** <i>-2.22</i>
<i>Employ</i>	–	-0.001 *** <i>-4.06</i>	-0.001 *** <i>-4.75</i>
<i>Employ</i> ²	+	0.001 *** <i>4.76</i>	0.001 *** <i>3.92</i>
<i>Age</i>	–	-0.002 *** <i>-3.94</i>	-0.002 *** <i>-4.64</i>
<i>Invest</i>	+	0.026 <i>1.48</i>	0.030 ** <i>2.04</i>
<i>Corrupt</i>	+	0.250 *** <i>26.00</i>	0.251 *** <i>40.76</i>
Mills ratio (<i>lambda</i>)			<i>1.431</i> *** <i>2.66</i>
Intercept		1.065 *** <i>11.71</i>	2.609 *** <i>12.35</i>
Country fixed effects		Yes	Yes
Industry fixed effects		Yes	Yes
Year fixed effects		Yes	Yes
Adj. R ²		0.197	
Wald chi-squared			6,276
N		30,871	30,732

Column I presents OLS regression results. Column II is similar to column I except for correction for self-selection bias (using the same first-stage model as in Table 5). Variables are defined in the appendix. Additionally, *OwnerCon* is the percentage stake by the largest shareholder. *, **, and *** represent significance at the 10%, 5%, and 1% level, respectively, using two-tailed tests (t-statistics for OLS and z-statistics for Heckman model in italics). Huber/White robust standard errors (not reported) are adjusted for clustering at the country level.

TABLE 8
Effect of Audit on Financing Cost

$$FinCost = a + b * Audit + c * Control + d * Audit * Control + Control\ Variables + \varepsilon$$

Variable	Pred.	I.	II.	III.	IV.
<i>Audit</i> (H1)	–	-0.099 *** <i>-4.18</i>	-0.024 <i>-0.78</i>	-0.100 *** <i>-6.52</i>	-0.026 <i>-1.02</i>
<i>Control</i>	?	-0.057 ** <i>-2.60</i>	0.001 <i>0.04</i>	-0.050 *** <i>-3.12</i>	0.008 <i>0.37</i>
<i>Audit*Control</i> (H2)	–		-0.107 *** <i>-3.33</i>		-0.107 *** <i>-3.65</i>
<i>Employ</i>	–	-0.001 * <i>-1.75</i>	-0.001 * <i>-1.71</i>	-0.001 *** <i>-4.65</i>	-0.001 *** <i>-4.56</i>
<i>Employ</i> ²	+	0.001 ** <i>2.01</i>	0.001 ** <i>1.98</i>	0.001 *** <i>3.86</i>	0.001 *** <i>3.80</i>
<i>Age</i>	–	-0.001 <i>-1.63</i>	-0.001 <i>-1.61</i>	-0.001 ** <i>-2</i>	-0.001 ** <i>-1.99</i>
<i>Invest</i>	+	0.031 <i>1.62</i>	0.031 <i>1.65</i>	0.033 ** <i>2.50</i>	0.034 ** <i>2.55</i>
<i>Corrupt</i>	+	0.272 *** <i>22.29</i>	0.272 *** <i>22.29</i>	0.272 *** <i>50.2</i>	0.272 *** <i>50.24</i>
Mills ratio (<i>lambda</i>)				-1.253 ** <i>-2.54</i>	-1.253 ** <i>-2.54</i>
Intercept		1.332 *** <i>19.64</i>	1.291 *** <i>17.95</i>	3.055 *** <i>20.24</i>	3.008 *** <i>19.87</i>
Country fixed effects		Yes	Yes	Yes	Yes
Industry fixed effects		Yes	Yes	Yes	Yes
Year fixed effects		Yes	Yes	Yes	Yes
Adj. R ²		0.264	0.264		
Wald chi-squared				11,167	11,184
N		30,913	30,913	30,774	30,774

Variables are defined in the appendix. Columns I and II are OLS regressions with and without interaction between *Audit* and *Control*. Columns III and IV are identical to Columns I and II respectively but include correction for self-selection (using the same first-stage model as in Table 5). *, **, and *** represent significance at the 10%, 5%, and 1% level, respectively, using two-tailed tests (t-statistics for OLS and z-statistics for Heckman model in italics). Huber/White robust standard errors (not reported) are adjusted for clustering at the country level.