

# Unbundling Institutions for External Finance

## Worldwide Firm-Level Evidence

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## Abstract

The empirical literature on institutions and development has been challenged on grounds of reverse causality, measurement error in institutional indicators, and heterogeneity. This paper uses firm-level data across countries to confront these challenges. Instead of analyzing ultimate outcomes, such as income levels where institutional quality is likely endogenous, the focus is on firm-level external finance. Moreover, institutions are “unbundled” to explore how various types of institutions affect external finance differently. The paper documents that micro firms have significantly less access to external finance than small and medium firms. General financial development and contracting institutions that facilitate transactions between private parties exert little effect, on average, on firms’ access

to external finance. In contrast, property rights institutions that constrain political and economic elites exhibit stronger positive association with access to external finance. The analysis finds evidence of attenuation bias associated with error in measuring institutions. For leveling the playing field between elite and non-elite firms (as proxied by firm size) in their access to external finance, property rights institutions also figure more prominently—with an important exception for the information environment, a component of contracting institutions. The results indicate that a specific channel through which development is affected more by property rights institutions rather than contracting institutions is external financing for firms.

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**Unbundling Institutions for External Finance:  
Worldwide Firm-Level Evidence<sup>1</sup>**

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<sup>1</sup> We have benefited from discussions with Thierry Tresselt.

## 1. Introduction

A large literature has emerged in the past few decades emphasizing the fundamental importance of institutions in explaining economic development. This literature, starting with North and Thomas (1973) and North (1981, 1990), was revived by the growing availability of country-level indicators of institutions (Knack and Keefer, 1995; Mauro, 1995; La Porta, Lopez-de-Silanes, Shleifer and Vishny, 1998, 1999; Rodrik, Subramanian, and Trebbi, 2004), and reinvigorated by recent work that linked country-level development with early endowment and colonial experience (Engerman and Sololoff, 1997; Acemoglu, Johnson, and Robinson, 2001, 2002, 2005). The bulk of this literature concludes that institutions are fundamental causes of long-term growth. Particularly influential among these studies is Acemoglu, Johnson and Robinson (2001) (AJR (2001) hereafter), which use settler mortality in early colonial periods as instruments for current measures of institutions, which in turn determines the current development level. The authors find strong effects of institutions on current development.

This literature, however, also faces strong challenges. One challenge is whether one can claim causality from institutions to development. For instance, Glaeser et al. (2004) disagree with the interpretation of AJR (2001) that they have demonstrated the fundamental importance of institutions for long-term growth. Glaeser et al. (2004) argue that the institutions-development regressions are plagued by reverse causality. Namely, when countries get richer and their populations become more educated, institutions improve, producing a spurious positive correlation between institutions and development. Settler mortality, they argue, is not a good instrument for institutions because the ratio of colonists to the indigenous people (implicit in the settler mortality measure) is also strongly correlated with human capital: colonists brought with them not only better institutions but also human capital and know-how. Because human capital is omitted from the outcome regression, settler mortality is no longer a valid instrument. They also provide explicit evidence consistent with this challenge.

A second, less-noted challenge facing the empirical literature on institutions is that it is unclear whether results on the relationship between institutions and development are comparable across studies. It is hard to pin down institutions precisely. The most famous definition is from North (1990, p. 3), who defines institutions as “the rules of the game in a society or, more formally...the humanly devised constraints that shape human interaction.” With such a broad definition, it is not surprising

that researchers have used different measures of institutions, and that they often reach different conclusions on their importance or lack thereof.<sup>2</sup>

Some studies rely on comprehensive and aggregate measures of institutions: Rodrik, Subramanian and Trebbi (2004) use the Kaufman, Kraay and Zoido (2002) “Rule of Law” index, a composite indicator of numerous variables from various sources measuring different aspects of the protection of property rights and strength of legal and judicial systems. Knack and Keefer (1995) use an index of several indicators (including one on risk of government expropriation) from the International Country Risk Guide (ICRG). Others rely on more specific aspects of institutions: Mauro (1995) uses a corruption indicator from Business International, while AJR (2001) use the ICRG expropriation risk measure and an index of executive constraint from Polity IV.

Other authors prefer more *de jure* or objective measures of institutions. For instance, Glaeser et al. (2004) argue that most indices of institutions used in the literature are outcomes of institutions rather than objective measures of institutions, which, in their view, should be durable and rule-based. Thus they prefer *de jure* measures of institutions such as differences in electoral laws (proportional representation vs. majoritarian elections) and judicial independence. But this approach also suffers from the omission of a key component, enforcement (Woodruff, 2006).<sup>3</sup> The World Bank’s “Doing Business” project developed a series of objective measures pertaining to creditors' rights, minority shareholder protection, and other issues (Djankov et al., 2003; 2007). Again, they are not without their problems, such as the omission of enforcement quality, so there are some anomalous rankings. For example, on legal formalism, Vietnam scores better than France and Germany (Woodruff, 2006), and it is unclear whether and to what extent these measures—often asked about a very specific procedure or type of firm—are relevant to the experience of different types of firms and people. Furthermore, even with the same underlying theoretical construct, different measures are often constructed using different methods, with varying degrees of measurement error, which can result in significant biases in their estimated effects. Thus, an important, though often ignored, issue for the literature of institutions and development is measurement error in institutional indicators.

More importantly, different measures of institutions may very well reflect distinct theoretical constructs, with some mattering more than others for development outcomes. This point is forcefully

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<sup>2</sup> See Woodruff (2006) for a survey of corruption measurement.

<sup>3</sup> Peru, for instance, receives a perfect seven based on judicial independence from La Porta et al. (2004), which is based on objective measures of institutions. Yet, “Peru's judicial opinions were available for purchase, the sales agent was Fujimori's right hand man” (McMillan and Zoido, 2004; Woodruff, 2006).

expressed in Acemoglu and Johnson (2005) (AJ (2005) hereafter), who unbundle institutions into two types: contracting institutions and property rights institutions. Contracting institutions refer to those that “enable private contracts between citizens”, while property rights institutions refer to those that “protect citizens against expropriation by the government and powerful elites.” They argue that government officials, and to a lesser extent, economic elites, can use force or other resources to back up their demands and therefore pose real dangers. In contrast, when contracting institutions increase the costs of doing business in some way, contracting parties may use alternative ways of transacting. For example, instead of using bank finance, firms may resort to reputation-based financing such as trade credit. While AJ (2005) make an invaluable theoretical contribution to the literature, their empirical tests are not without problems. They use legal origin variables as instruments for contracting institutions, and settler mortality as the instrument for property rights institutions. But they may be invalid instruments (Glaeser et al. 2004; Morck and Yeung, 2011; Bazzi and Clemens, 2013) if they are correlated with other determinants of development such as human capital, infrastructure, and other aspects of institutions. Without convincingly valid instruments, the potential for reverse causality remains (Glaeser et al. 2004).

In this paper, we follow AJ (2005) by investigating how contracting institutions and property rights institutions affect a key development channel: external finance. We differ from the literature in relying on firm-level micro data. An advantage of our empirical design is that there is less potential for reverse causality. While it is plausible that the level of development (as measured by GDP per capita, for example) would affect institutions, it is much less likely that firm-level access to external finance would affect institutions, especially in the short run. This research design thus improves the credibility of the estimates of the impact of institutions. We choose external finance as our dependent variable because it is well-established that access to external finance is a key channel through which development occurs. For instance, cross-country empirical studies have shown that financial development contributes to higher growth rates (e.g. King and Levine, 1998; Demirguc-Kunt and Maksimovic, 1998; Clague et al., 1999; Levine, Loayza and Beck, 2000). Rajan and Zingales (1998) show that industries that are more dependent on external finance grow more rapidly in countries with more developed financial systems. Within-country studies find that this relationship holds across regions within Italy, and show at a micro level that the rate of new firm creation is higher in more financially-developed regions (Guisi, Sapienza and Zingales, 2004).

Similarly to AJ (2005), we classify institutions into contracting institutions and property rights institutions. However, we differ by having more measures of institutions in each category. For contracting institutions, we rely on five measures: CPIA legal framework, CPIA legal quality, (Doing Business, or DB) contracting procedures, (DB) creditor rights, and WEF auditing quality. Table 2 contains the list and definitions of the institutional variables. The list includes both *de jure* measures (CPIA legal framework, DB contracting procedures, DB creditor rights), and *de facto* measures such as CPIA legal quality and WEF auditing quality. For property rights institutions, we rely on Heritage Foundation index of property rights protection, CPIA accountability, (Polity IV) executive constraints, WEF financial freedom, WEF access to stock market, and DB minority shareholder protection. Here, DB minority shareholder protection is a *de jure* measure, while the rest are *de facto* (and comprehensive) measures. With the availability of more proxies, we are perhaps in a better position to establish the robustness of our key results.

A further advantage of having multiple measures of contracting and property rights institutions is that we have instruments available for each measure of institutions. To correct for measurement error, one needs a second measure that is conceptually related but with measurement error that is uncorrelated with measurement error on the first indicator. A measure based on the same theoretical construct but measured using different methods (from independent surveys, for instance), therefore, is a natural candidate (Greene, 1997). Having multiple measures of contracting institutions and property rights institutions thus serves two important purposes: to deal with the measurement error contained in each institutional indicator, and to establish the robustness of key results using multiple proxies.

An additional advantage of using firm-level micro data is that we can investigate heterogeneous effects of institutions across different groups of firms. A key concern for understanding the effect of institutions is whether the elite and non-elite benefit differently from institutions, and whether institutions level the playing field between the elite and non-elite (Acemoglu, Johnson and Robinson, 2005). To this end, we classify firms into micro, small, medium and large firms. Smaller firms, especially micro and small ones, are likely to be non-elite. How institutions affect micro and small firms differently from large firms, therefore, sheds light on how institutions affect the elite and the non-elite.

Our main data set is the World Bank Enterprise Surveys (WBES), which are collected using a standard and rigorous approach across countries. The surveys provide representative samples of each

country's private sector including manufacturing, construction, services and retail and wholesale trade. Although Enterprise Surveys were conducted in earlier years, we include only data collected after 2006. Prior to that year, there was considerable heterogeneity across countries and regions in terms of sectors covered, questionnaire format, and sampling methodology. Moreover, the samples for surveys conducted before 2006 were not generally representative. In addition to the WBES, we use country-level institutional measures from several sources (with details to be provided below). Our final sample consists of approximately 60,000 firms in 119 countries. An advantage of this data is that we have a large number of small firms, thus allowing us to distinguish the elite from the non-elite. In particular, micro (i.e., 10 or less employees), small (i.e., 10+ to 50 employees), medium (i.e., 50+ to 150) and large firms (i.e., more than 150 employees) account for 28.8, 41.8, 16.7, and 12.7 percent of our sample, respectively.

We relate firms' access to external finance for both working capital and investment in fixed assets to firm characteristics, country-level institutions, and other country characteristics. Our investigation yields several key findings. We find that MSMEs (i.e., micro, small and medium firms), and micro firms in particular, have significantly worse access to external finance. In general, we do not find firms' access to external finance is facilitated by financial development, nor by contracting institutions. In stark contrast, it is positively and strongly associated with property rights institutions. We also provide evidence that measurement errors in institutional variables are likely to be important: once correcting for such errors with instrumental variable estimations, the roles of property rights institutions become even more prominent. Correcting for measurement error does not alter our conclusion on the lack of importance of contracting institutions. Within property rights institutions, Executive Constraints and Minority Shareholders—two measures on limitations to the power of political and economic elites—prove to be particularly important for facilitating access to external finance. We also find that, overall, property rights institutions tend to level the playing field for access to external finance to a greater extent than contracting institutions or financial development. However, one specific component of contracting institutions, a measure of auditing standards and quality (i.e., WEF Auditing Quality), proves to be an exception to this generalization.

This paper is related to two strands of literature. First, it contributes to the literature of unbundling institutions (AJ, 2005). We differ in our reliance on micro data, our use of more detailed measures of both contracting and property rights institutions, the consideration of measurement error, the differential impacts of institutions on the elites and the non-elites, and our focus on a specific



mechanism of development—access to external finance—which reduces the potential for reverse causality. Cull and Xu (2005) similarly unbundle the role of institutions in determining reinvestment rates in China, but do not deal with measurement error, and focus on only one country that – however large - is not necessarily representative of the developing world. Our overall conclusion renders support to AJ (2005) that property rights institutions loom more prominently than contracting institutions for development. Our results indicate that a specific channel through which development is affected more by property rights institutions rather than contracting institutions is external financing for firms.

Second, this study is related to the literature on firms' access to external finance. Numerous studies have established the importance of external finance for development. Financial development is found to be strongly correlated with country-level growth rates (e.g. King and Levine, 1998; Demircuc-Kunt and Maksimovic, 1998; Clague et al., 1999; Levine, Loayza and Beck, 2000; Levine 2005), growth at the country-industry level (Rajan and Zingales, 1998), and the rate of new firm creation at the regional level in Italy (Guisi, Sapienza and Zingales, 2004). Further empirical work establishes that access to external finance is related to the legal origin of a country (La Porta et al., 1997, 1998, 2000), development of banking systems and stock markets, and with the overall level of institutional development (Beck, Demircuc-Kunt, Laeven and Maksimovic, 2006; Beck et al. 2008). The latter two studies also find that small firms have worse access to external finance. We differ from previous studies by “unbundling” various types of institutions, and examine how measurement error affects our key results. We also show that micro firms are quantitatively important, and are especially vulnerable even compared with small firms.

Section 2 describes our data and methodology in greater detail. Section 3 presents the results. Section 4 concludes.

## **2. Data and Methodology**

The main data set we use is the World Bank Enterprise Surveys (WBES), which are collected using a standard and rigorous approach across countries. The surveys provide representative samples of each country's private sector including manufacturing, construction, services and retail and wholesale trade.<sup>4</sup> Observations are technically establishments rather than firms. Many of these establishments

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<sup>4</sup> See <http://www.enterprisesurveys.org> for a more complete description of the data.

(particularly the larger ones) are part of larger firms, but the survey is designed to elicit information on financing and other issues for the establishment. Henceforth, for simplicity, we use “firms” to refer to establishments, and not to the larger firm of which some of them are a part.

Although Enterprise Surveys were conducted in earlier years, we include only data collected after 2006. Prior to that year, there was considerable heterogeneity across countries and regions in terms of sectors covered, questionnaire format, coverage of microenterprises, and sampling methodology. Moreover, the samples for surveys conducted before 2006 were not generally representative. Data from the Enterprise Surveys are supplemented with data from other sources. A complete list of variables and the sources of these data are shown in Table 1. Our final sample consists of around 60,000 firms in 119 countries.<sup>5</sup> The literature has relied on different size definitions of SMEs, often based on what types of firm samples the authors use. Beck et al. (2008) define small firms to be those with 5 to 50 employees<sup>6</sup>, medium firms to be those with 51 to 500 employees, and large firms as those with more than 500 employees.<sup>7</sup> While this definition is appropriate for their sample—where large, medium, and small firms respectively account for roughly 40%, 40% and 20% of their sample—it is perhaps inappropriate for our sample. The numbers of employees for the 25, 50, 75, 90, and 95 percentiles of the distribution of the number of employees in our sample are 9.25, 20.8, 66.4, 200, and 385, respectively. For our much larger and more representative sample, a different set of firm size definitions is appropriate. Toward that goal, in Figure 1, we present the histogram of the distribution of the number of employees. It is apparent that a large share of firms (about 29%) have 10 or fewer employees. Moreover, the share of firms with between 10 and 50 employees is also quite large, at roughly 45%. About 18% of firms have between 50 and 150 employees, and about 13% have more than 150 employees. In light of the large share of firms that are exceedingly small, and the extensive literature on credit for micro-enterprises, we create a category of micro firms with 10 or fewer employees. We define small, medium, and large firms respectively as those employing 11-50, 51-150, and 150 or more employees. In some sensitivity checks, we use the Beck et al. (2008) three-way size

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<sup>5</sup> For each dependent variable, the number of observations differ, and the figure of 60,000 is for dependent variables with fewer missing observations. The 119 countries refer to when external financing for either working capital or fixed asset investment is not missing.

<sup>6</sup> Firms with fewer than 5 employees were excluded from the sampling frame.

<sup>7</sup> Governments and international organizations also have differing definitions. The EU, for instance, uses 10, 50, and 250 employees as the thresholds for micro, small, medium, and large firms, respectively; the U.S. typically uses 500 for the demarcation of large firms, while Canada uses 100 and 500 as thresholds for small and medium. See [http://en.wikipedia.org/wiki/Small\\_and\\_medium-sized\\_enterprises](http://en.wikipedia.org/wiki/Small_and_medium-sized_enterprises).

classification, with 50 as the maximum size of “small” firms, and 500 as the maximum for “medium.” Under those definitions, only 3.6% of the firms in our sample are large.

For access to external finance, we rely on two measures. The survey asks about the percentages of a firm’s working capital, and of its investment in fixed assets, that are financed from external sources (i.e. not from the firms’ internal funds or retained earnings).

One objective of this paper is to examine how financial development affects access to external finance. For all country-level macro and financial development variables, we construct their one-year lags to minimize the potential for reverse causality. Financial development is captured by two widely-used measures in the literature. For bank development, we rely on private credit, defined as the ratio of credit granted to the private sector by deposit money banks and other financial institutions to GDP (Beck et al., 2008). Beck, Levine and Loayza (2000) show that countries with higher private credit tend to grow faster. Stock market development is captured by value traded, that is, value of shares traded normalized by GDP. Value traded is shown to be robustly related to economic growth in the previous literature (Levine and Zervos 1998; Beck and Levine 2004).

While there is a vast literature on institutions and development (for example, Coase, 1988; North, 1990; Knack and Keefer, 1995; Acemoglu, Johnson and Robinson, 2001; Rodrik, Subramanian, Trebbi, 2004), the literature distinguishing among various types of institutions is relatively thin. The pioneering paper is AJ (2005), which suggests that “contracting institutions” (i.e., those protecting private contracting) tend to be less important than “property rights institutions” (i.e., those dealing with government and elite expropriation) in explaining cross-country economic performance. Cull and Xu (2005) find that in China both of these types of institutions appear to play an important role in explaining Chinese firms’ reinvestment behavior. Closely related, the World Bank Doing Business projects also aims to distinguish the effects of various specific types of institutions (see, for instance, Dankov et al., 2003, 2007, 2008). Following this literature, we examine the effect on external finance of several measures of contracting institutions and of property rights institutions. A few measures cover some aspects of both contracting institutions and property rights institutions, but it is fairly clear to which type they mostly pertain. Table 2 provides definitions and data sources of variables.

Contracting institutions are “the rules and regulations governing contracting between ordinary citizens, for example, between a creditor and a debtor or a supplier and its customers. The most important component of contracting institutions is the functioning of the legal system” (AJ, 2005). The first two measures of the contracting institutions are thus about the legal system, and are taken

from the World Bank's Country Policy and Institutional Assessments ("CPIA"). *First*, "CPIA Legal Framework" measures the legal framework for secure property and contract rights, including predictability and impartiality of laws and regulations. Since this is mostly a *de jure* measure of the legal system and it mainly concerns resolution of conflicts between private citizens, it is a natural measure of contracting institutions. *Second*, "CPIA Legal System" measures the quality of the legal and judicial system as indicated by independence, accessibility, legitimacy, efficiency, transparency, and integrity of the courts and other relevant dispute resolution mechanisms. This is mostly a *de facto* measure of the legal system, and, again, captures primarily contracting institutions.

In addition to the two general measures of the legal system, we also rely on a specific measure of the legal system from the Doing Business (DB) project: "Contracting Procedures" (Djankov et al., 2003). It measures the number of procedures required to resolve a sale-of-goods dispute in local courts. It includes steps to file the case, to go through the trial and judgment, and to enforce the judgment. The data are collected through studying the codes of civil procedure and other court regulations as well as surveying local litigation lawyers. This measure should be complementary to the two measures on the legal system from the CPIA. The CPIA measures are much broader, but because they are highly multi-dimensional and more subjective they may contain more measurement error. The Doing Business indicator is defined more precisely and objectively, so it may contain less pure measurement error but at the expense of measuring only a few narrow aspects of contracting institutions. Obtaining consistent findings from these very different measures would strengthen confidence in our conclusions regarding the importance of contracting institutions for access to external finance. Formal financial systems function better and at lower costs in the presence of a good information and/or institutional environment, where investors have more information on potential borrowers and can better monitor their use of investment funds (Leuz and Verrecchia, 2000; Leuz and Wysocki, 2008; Liu et al., 2015). We measure the information environment by an indicator from the World Economic Forum's Executive Opinion Survey, "WEF Auditing Quality," which captures financial auditing and reporting standards regarding company financial performance in a country. A higher value implies stronger standards. Because auditing standards and quality are maintained mainly to facilitate transactions between private citizens, it is an important ingredient of contracting institutions.

The final measure of contracting institutions specifically deals with the rights of suppliers and demanders of investment funds: from Doing Business, "Creditor Rights" measures the degree to

which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending (Djankov, McLiesh and Shleifer, 2007). This measure ranges from 0 to 10, with higher values implying that the laws are better designed to expand access to credit. When the rights of both borrowers (i.e., firms) and lenders (i.e., banks and other financial institutions) are protected, lenders are more willing to lend due to higher expected returns from lending, and borrowers are more likely to invest due to a lower cost of capital in societies with better protection of lenders rights. Again, Creditor Rights mainly address the rights of private citizens generally, and should thus be viewed as an ingredient of the contracting institutions.

Differing from contracting institutions, which mainly concern the protection of property rights of private citizens in general, property rights institutions mainly capture “the rules and regulations protecting citizens against the power of the government and the elites” (AJ, 2005). In this paper, they are proxied by 6 measures, three general and three specific.

Of the three general measures, two are used by AJ (2005), and one is from the CPIA. First, the Property Rights indicator from the Heritage Foundation, “Heritage PR,” measures protection of property rights broadly—it reflects assessments of the independence, transparency, and effectiveness of judicial systems, and even-handed enforcement of private contracts by government.<sup>8</sup> Where property rights are clearly defined and contracts are reliably enforced, individuals and firms are more likely to hold their financial assets in banks and other financial institutions without fear they will be expropriated by government, and lenders have more secure rights to mortgaged assets in the event of borrower defaults (Clague et al., 1999). Levine (1998) was among the first to provide evidence that property rights (broadly defined) were an important determinant of the extent of financial intermediation, and concluded that “countries that effectively enforce compliance with laws tend to have better-developed banks than countries where enforcement is lax.” Heritage Property Rights varies from 1 to 5, with higher values indicating stronger protection of property rights in general. This indicator’s content overlaps somewhat with CPIA Legal Framework and CPIA Legal System, but emphasizes limits on government expropriation somewhat more, reflecting the libertarian outlook of the Heritage Foundation. *Second*, “Executive Constraints” from Polity IV measures the extent of institutionalized constraints on the decision-making powers of chief executives, whether individuals or collectivities. *Finally*, “CPIA Accountability” measures the extent to which the executive, legislators, and other high-level government officials can be held accountable for their use of funds,

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<sup>8</sup>See <http://www.heritage.org/index/book/chapter-5>.

administrative decisions, and results obtained. Since it mainly concerns the accountability of government officials, it should be viewed as mainly a property rights institution. Another key measure used in the literature is the Government Expropriation index from ICRG (Knack and Keefer 1995). This variable was discontinued after 1997, however, and in the absence of recent values we opted not to use it.

We also have three measures of property rights institutions pertaining specifically to the financial sector. “Financial Freedom” (from the Heritage Foundation) measures the degree to which banking and financial regulations contribute to an accessible and well-functioning formal financial system that ensures the availability of diversified savings, credit, payment, and investment services to individuals. Larger values imply regulations for banks and stock markets that encourage integrity and transparency, and promote disclosure of assets, liabilities and risks, without limiting competition or interfering with the pricing of capital.<sup>9</sup> The rationale behind this “Financial Freedom” indicator is consistent with findings by Cull et al. (2006), who document how a variety of local financial intermediaries emerged endogeneously to meet demand from small and medium-sized enterprises in late 18<sup>th</sup> to early 20<sup>th</sup> century Western Europe and North America. They show that governments “played little role” in the creation of these financing mechanisms “beyond providing a secure property-rights environment and establishing national financial institutions, such as central banks; more crucially, “governments did little to inhibit their formation.”

Similarly, we have two measures that capture the protection of property rights for investors in the context of equity markets. The first, coming from Doing Business, is “Investor Protection.” It measures “legal protection of minority shareholders against expropriation by corporate insiders” (Djankov et al. 2008). Unlike the previous measures of property rights institutions that mainly concern government expropriation, Investor Protection mainly concerns expropriation of elites towards non-elites. Large shareholders are elites of the society, and many of them have various types of connections with the government (Fisman, 2000; Faccio, 2006). Without strong protection of minority shareholders, large shareholders can tunnel funds to their subsidiary companies and convert them into private consumption. With strong protection of minority shareholders’ rights, owners and top managers of firms will focus more on value creation rather than rent extraction, and thus improve the

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<sup>9</sup> (See <http://www.heritage.org/index/book/chapter-5>.)

marginal value of external funds (Morck, Wolfenzon and Yeung, 2005). This index ranges from 1 to 10, with larger values implying stronger protection of minority shareholders.<sup>10</sup>

The final measure of property rights institutions concerning the financial markets is “WEF Access to Stock Markets,” which captures the ease of raising money by issuing shares on the local stock market. This indicator measures the strength of property right institutions because stock markets tend to be strongly regulated by the government, with entry being approved by government regulators. Easier access to stock market listing implies that non-elite investors have better access to the equity market and that the government is more non-discriminatory toward non-elite investors.

Table 2 lists our key measures of financial and institutional development and their definitions. These variables have different scales, so we standardize each of them into a new variable with a mean of zero and a standard deviation of one, to aid interpretation and comparison of relative magnitudes. Coefficients for these standardized variables are directly comparable (Rodrik et al., 2004), and their summary statistics are not necessary to show.<sup>11</sup>

In addition to these key financial and institutional variables, we sometimes also control for the following macro variables: gross domestic product (GDP) per capita, the growth rate of GDP per capita, population, and the inflation rate, all once-lagged. All of these variables are from the World Bank’s World Development Indicators database.

Table 3 provides definitions and summary statistics for the remaining variables. Overall, we can see that the external financing variables and other control variables all exhibit substantial variation as shown by their standard errors (relative to the means). On average, about 30% of firms’ working capital and 33% of their investment in fixed assets is financed by external sources. Of our sample firms, 28.8 percent are micro, 41.8 percent are small, 16.7 percent are medium, and 12.7 percent are large. Micro and small firms thus account for the vast majority (over 70%) of the sample. Foreign ownership of firms averages 8.6 percent, and state ownership only 0.7 percent.

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<sup>10</sup> This strength of investor protection index includes numerous sub-components measuring various aspects of conflict of interest regulation and shareholder rights. “Creditor rights” and “Investor protections” are based on data from questionnaires administered to corporate and securities lawyers and verified through analysis of laws and regulations. For more details see <http://www.doingbusiness.org/methodology/getting-credit> and <http://www.doingbusiness.org/methodology/protecting-minority-investors>.

<sup>11</sup> These variables do exhibit substantial variations. Before standardization, for instance, the Heritage Property Rights index has a standard deviation that is almost half of the mean. Variations in financial development are even larger, with their standard deviations sometimes larger than their means.

In our empirical analysis, we estimate the following basic equation:

$$EF_{icj} = FIRM_{icj}\theta + Z_c\alpha + \sum_s Size_s \gamma_s + FD_c\beta + PR_c\delta + \epsilon_{icj} \quad (1)$$

Here,  $EF$  is external finance, and  $i, c, j$  refers to firm, country, and industry.  $FIRM$  is a vector of firm-level controls, including (the log of) firm age, state ownership share, foreign ownership share, a dummy for firms that export, and a dummy for establishments that are part of a larger firm. We also include the country-industry average sales growth rate to gauge how access to finance is affected by growth opportunities. In unreported sensitivity checks, we relied on firm-level sales growth (instead of the country-industry average sales growth rate), but it did not affect our qualitative results.  $Z$  is a vector of country-level macro controls, including population, income level, per capita GDP growth rate, and inflation, all measured as one-year lags to minimize contemporaneous bias.<sup>12</sup> In some specifications, when we are only concerned about differential access to external finance for smaller v. larger firms,  $Z$  is replaced with country-year fixed effects to control more completely for country-year specific heterogeneity.  $Size_s$  is a vector of dummy variables for size category  $s$  (i.e., micro, small, and medium), with large firms as the default category.  $FD$  denotes measures of financial development, which could be either private credit or value traded, and  $PR$  represents various measures of contracting or property rights institutions. All measures of institutions are once-lagged to avoid contemporaneous bias. We present estimates of several variations of equation (1). First, we drop the country-level controls, but add country dummies, and thus control for all country-specific heterogeneity. We use this base specification to obtain estimates of the effects of firm size on access to external finance. The standard errors are heteroskedasticity-corrected. Second, we add macro controls  $Z$ , along with  $FD$  or  $PR$  one at a time. With country-year-level variables, we cluster the standard errors at the country-year level to allow arbitrary correlations of the error term within a country-year cell and avoid overstating precision of the estimates (Moulton 1990). Finally, we interact the size dummies with financial or institutional development. In these tests, the interaction term varies at the country-year-size category level, so we cluster the standard errors at that level.

In analyzing the effect of institutions on external finance, a natural concern is that institutional variables may contain substantial measurement error. Every measure of institutions is based on different methods, reflecting information drawn from different types of respondents. The Doing

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<sup>12</sup> We have tried lagging some cross-country variables in other ways such as using the averages of  $t-9$  to  $t-1$  (with  $t$  being the current year), and the qualitative results remain similar; however, the limited time coverage for many institutional variables does not allow us to consistently lag the variables using many periods of data.



Business indicators apply to a standardized case and firm, and emphasize formal, required procedures. Actual implementation may differ from formal procedures, however; e.g. the indicators assume no bribes are paid or personal connections exploited to bypass or expedite any procedures. Moreover, the standardized case and firm (necessary for cross-country comparability) cannot possibly reflect reality for firms of all sizes, locations, and industries. For example, the standardized firm is assumed to be located in a country's largest city. In a small number of countries, the Doing Business indicators have been measured for multiple cities, and often show large differences between them. Other indicators based on expert perceptions may emphasize priorities and knowledge of Western-based advocacy NGOs or commercial risk assessment firms, which may incorporate certain biases or neglect concerns or views of domestic investors (Arndt and Oman, 2006).

When the explanatory variable is measured with error (say  $e$ ), the error,  $e$ , is embedded in the residual. But the observed explanatory variable also contains  $e$ , causing a correlation of the regression error term and the explanatory variable, and results in general in attenuation bias. The bias is especially severe when the variability of  $e$  is large—a case of particular concern for us if institutional variables tend to have large measurement errors. We attempt to correct for measurement error using an instrumental variable approach (Greene, 1997, p.437). Specifically, we identify a second institutional variable that is strongly related to the mis-measured variable, but with measurement error that is uncorrelated to the measurement error in the first variable. In our context, we have natural candidates for such variables: our multiple indicators of contracting and property rights institutions are produced by different sources that reflect different methods and information sets. In implementing this approach for any particular institutional measure, we choose an instrument that has similar theoretical content, a relatively small incidence of missing values, and that produces relatively strong first-stage results, i.e. it is not a weak instrument.

Another potential concern is endogeneity of institutions associated with omitted variables, reverse causality, and so on. We do not pursue this issue further due to the absence of a sufficient number of suitable instruments. AJ (2005) rely on legal origins for contracting institutions, and settler mortality and initial population density as instruments for property rights institutions. This approach suffices—or is at least internally consistent—when there are a very limited number of endogenous variables. In our case, however, there are 11 endogenous variables, and it is logically inconsistent to rely on the limited number of instruments used in AJ (2005). When a variable, say  $Z$ , is used as the instrumental variable for the first institutional variable (say  $X_1$ ), it should not be correlated with the

error term; however, the error term also includes other omitted institutional variables (say,  $X_2$  to  $X_{11}$  in our case), which implies that if  $Z$  is a good instrument for  $X_1$ , it cannot be used as the instrumental variable for  $X_2$  to  $X_{11}$ . With this increasingly well-known problem in the applied literature (Morck and Yeung, 2011; Bazzi and Clemens, 2013) in mind, we believe it is futile to attempt to provide convincing answers to the endogeneity problem (other than the measurement error issue). Instead, we deal with the more limited (but potentially serious) issue of mis-measured institutions. We lag institutions by one period to avoid contemporaneous bias, and we use many different proxies of the theoretical constructs to establish the robustness of our results. Moreover, as pointed out earlier, by using firm-level access to external finance—instead of country-level income level or growth—we have substantially reduced the extent of reverse causality between country-level income (or growth) and institutions (Glaeser et al. 2004). Furthermore, in some specifications, when allowing institutions to have heterogeneous effects on elites and non-elites, we control for country-year fixed effects, which substantially reduces the potential for omitted variable bias.

### **3. Empirical Results**

#### **3.1. Firm Size and Access to External Finance**

Table 4 shows how firms in the four size categories differ with respect to access to external finance and other firm-level and country characteristics. Smaller firms tend to have lower access to external finance. The shares of finance from sources external to the firm for micro, small, medium and large firms respectively are 24%, 30%, 34%, and 37% for working capital, and 25%, 32%, 36% and 38% for investment. Micro and small firms also tend to have lower foreign ownership, are less likely to be exporters, and are more likely to operate in industries with low sales growth rates. They are also more likely to be located in countries with weaker institutional environments, or alternatively, average firm size tends to be larger in countries with stronger institutions.

Figure 2 provides a visual impression of how firms of various sizes differ in access to finance. We obtain the residuals of external financing for both working capital and investment from regressions of those variables onto the set of firm-level controls in equation (1) along with country fixed effects. To make the patterns clearer, we present the Lowess graphs, which are based on locally-weighted regressions. Both figures show that micro firms have less access to external finance. Small firms have better access than micro firms, but worse access than medium firms, which in turn trail large firms.

The predicted improvement in access to external finance diminishes substantially beyond about 150 employees.

Table 5 presents regression results on access to external finance for working capital (in column 1) and for fixed asset investments (in column 2). In addition to firm characteristics (including growth opportunities, firm age, and ownership shares) and industry dummies, these regressions also control for country-year fixed effects to hold macro shocks and country-level policy changes constant. Relative to the omitted category of large firms, access to external finance for working capital is significantly lower for micro, small, and medium firms, respectively, by 8.7, 4.6, and 1.4 percentage points. Similar findings hold for access to external finance for fixed assets, with a slightly more pronounced disadvantage relative to large firms: 9.3, 5.5 and 1.8 percentage points for micro, small and medium firms respectively. Overall, the results highlight the need to distinguish micro from other small firms, as their access to external finance is substantially lower.

We conduct two sets of sensitivity checks regarding the effects of firm size on access to external finance. First, we investigate whether the conclusion that smaller firms face more obstacles in access to external finance remains true if we use subjective instead of quantitative measures of access to finance. This test is necessary because lower usage of external finance may simply reflect a lack of demand for it, and may have nothing to do with financial constraints. Firms' perceptions on finance as an obstacle can serve to corroborate whether smaller firms indeed face more financing difficulties. To this end, we rely on a question in the survey asking firms "to what degree is access to finance an obstacle to the current operations of this establishment?" The five response options were "no obstacle," "minor obstacle," "moderate obstacle," "major obstacle," and "very severe obstacle." We construct a dummy variable, "Finance Obstacle," equal to 0 for firms indicating finance is at most a minor obstacle, and equal to 1 for firms in which it is at least a "moderate" obstacle. The last column in Table 6 shows that the smaller a firm is, the more severe the financing obstacles it reports facing. The magnitudes become larger as firm categories become smaller. This finding confirms our presumption that less usage of external financing implies more financing constraints/obstacles.

Second, we use alternative definitions of firm size categories. We here define "small" firms as those with 50 or fewer employees, "large" as 500 or more, and all others as "medium." The basic conclusions are unchanged (see columns (4) and (5) of Table 5): small and medium firms have significantly lower access to external finance, with the disadvantage of small firms especially glaring. The disadvantage in access to external finance by SMEs is thus not an artifact of our size definitions.

Because the more nationally-representative Enterprise Survey samples we use include a larger number of small firms, and because we find important differences in some cases between micro and other small firms, we use our four-category size classifications in the remaining tests reported below.

### **3.2. Financial Development, Institutions, and Access to External Finance**

How do financial development and institutions affect firms' access to external finance? Some preliminary answers to this question are provided in Table 6, in which we include firm-level controls, country-level macro characteristics, and one of the following: Private Credit, Value Traded, and various measures of contracting or property rights institutions. All macro variables and the financial-development and institutional measures are lagged by one period. To conserve space, the coefficients of other macro control variables are reported only for the first set of results, in Panel A of Table 6 where the key independent variables are measures of financial development and contracting institutions. Coefficients of firm-level controls are not reported to conserve space, but they remain similar to those reported in Table 5.

Financial development in general is not associated with better access to external finance at the firm level. Bank credit as a percentage of GDP (i.e., Private Credit), the standard indicator of financial development, does not have a positive and significant association with external finance either for working capital or for fixed asset investment. In fact, the associations are negative and significant. Nor do we find a positive effect of stock market development (i.e., value traded/GDP) on external financing for firms—the associations are again negative, and more pronounced than in the case of Private Credit. There is no reason, therefore, to conclude that financial development (or the sheer size of the formal finance sector) implies better access to external finance for firms overall.

The quality of contracting institutions also has no significant association with access to external finance for firms overall. CPIA Legal Framework, the *de jure* measure of the legal system, is unrelated to the share of finance from external sources either for working capital or investment in fixed assets. Turning to the *de facto* measure of the legal system, CPIA Legal System similarly has no significant association with firms' access to external finance. The measure used by AJ (2005), Contracting Procedures (from Doing Business), again exhibits no significant association. Examining the information environment, WEF Auditing Quality, a specific ingredient of contracting institutions, we once more find no significant associations. Finally, turning to Creditors Rights, a contracting

institution that facilitates lender-borrower relationship, we still do not find significant associations. With such a diverse lineup of measures of contracting institutions—ranging from general to specific, from *de jure* to *de facto*, from the information environment to institutions targeting lending relationship—the consistent finding of no relationship with external financing is remarkable.

As a group, property rights institutions, in sharp contrast, have strong positive association with access to external finance. Two of the three general measures of property rights institutions have significant associations with either one or both of the external financing measures. Despite having the largest number of missing observations, Executive Constraints has the strongest association with external finance. The magnitudes are also nontrivial: a one standard deviation (SD) increase in Executive constraints is associated with an 8.3 percentage point increase in external finance of working capital, or about one-fourth of a SD for the outcome. A similar increase in Executive Constraints is associated with an 8.2 percentage-point increase in external finance of fixed asset investment, or one-fifth of a SD. Increasing CPIA Accountability by one SD is associated with the increase in external finance of working capital by 4.2 percentage points, or one-eighth of one SD of the outcome.

Relative to the general measures of property rights institutions, the positive associations of three specific measures of property rights institutions for financial transactions are even more robust. Financial Freedom and WEF Access to Stock Markets, both statistically significant, have similar magnitudes: an increase of one SD for either one is associated with an increase of about 12% of one SD in both external finance outcomes. Investor Protection is (marginally) significant only for working capital finance: increasing it by one SD is associated with an increase in the external finance of working capital by 7% of one SD.

As discussed earlier, measurement error in institutional variables is potentially a serious concern. Here, we rely on the instrumental variable approach. The specific instrument for each mis-measured institutional variable is listed at the bottom of each column; how it is selected was discussed earlier. Results are presented in Table 7.

While the qualitative results remain robust, coefficient magnitudes are much changed, consistent with the possibility that institutions are measured with substantial error. Similar to the OLS results in Table 6, contracting institutions continue to exhibit no significant relationship with external financing for working capital or investment in fixed assets. Again similar to the OLS results in Table 6, property rights institutions remain positively and robustly related to external finance for either working capital or investment or both—and the results tend to be more pronounced. *First*, the

coefficient for Heritage PR for working capital finance has changed from a statistically insignificant 0.026 to a (marginally) statistically significant 0.062. With the new estimate, a one-SD increase in Heritage PR would increase external finance of working capital by 6.2 percentage points, or 18% of one SD of the outcome. *Second*, the estimated effect of CPIA accountability on external finance for working capital increase by 26%, from 0.042 to 0.053. *Third*, while the Executive Constraints coefficient remains similar for external finance for investment, its estimated effect on working capital finance increases by one-third, from 0.083 to 0.11. With this correction for measurement error, increasing Executive Constraints by one SD implies an increase in the outcome by 1/3 of a SD for the outcome. *Fourth* and similarly, the coefficient for Financial Freedom for working capital finance nearly triples, from 0.041 to 0.117. *Fifth*, the case of WEF Access to Stock Markets is mixed: its coefficient for working capital finance increases slightly, but its coefficient for investment finance drops. *Finally*, the most dramatic case of apparent attenuation bias is that for Investor Protection. Its coefficient for working capital increases from 0.025 to 0.128; that for investment finance increases from a statistically insignificant 0.018 to a highly significant 0.133. Correcting for measurement error, this variable is shown to have the most pronounced effect on external finance: a one-SD increase is associated with an increase of external working capital finance by 37% of a SD; the same figure for external investment finance is 1/3 of a SD. Thus, correcting for measurement errors, despite not altering the qualitative conclusions, can significantly alter estimates of the relative and absolute importance of various types of institutions.

The findings in Tables 6 and 7 echo those of AJ (2005) in spirit: property rights turn out to be much more important than contracting institutions for development or its intermediate channels. In their case, the data consist of country-level observations and aggregate economic outcomes. In our case, the data consist of firm-level observations and a specific but key channel through which development is achieved. Our results thus provide complementary evidence to AJ (2005): a specific channel through which development is affected more by property rights institutions rather than contracting institutions is external financing for firms, and this finding is robust to correcting for measurement error.

### **3.3. Size-Specific Effects of Financial and Institutional Development**

Smaller firms tend to suffer more from information asymmetry problems. Their financial statements are less likely to be audited by professional auditors due to limited financial capacity (Liu et al., 2015).

They may also have less ability to pay bribes to circumvent burdensome regulations (Cull and Xu 2005). Thus, financial and institutional development may have size-biased implications for access to external finance. To test this hypothesis, and to explore how the elite and the non-elite benefit differently from financial development and institutions, we interact our variables of financial development and institutions with the firm size dummies in Table 8. Specifically, we include the three variables:  $X \times \text{Micro}$ ,  $X \times \text{Small}$ , and  $X \times \text{Medium}$ , where  $X$  is a country-level institutional indicator. The coefficients of the three interaction terms measure how smaller firms differ from large firms in the sensitivity of external finance to the variable  $X$ . Because  $X$  varies only at the country-year level, and we include country-year fixed effects to control for country-year heterogeneity, the effect of  $X$  is subsumed in the country-fixed effect. Because the interaction of the firm size dummies and country-year level regressors varies at the country-year-size category level, we cluster the standard errors at that level.

Overall, there is some limited impact of financial development in facilitating better access by smaller firms to external finance. We do not observe any impact of stock market development on relative improvement of micro firms and SMEs in access to external finance. We do see a trace of positive effects of bank development (i.e., Private Credit) for small firms (relative to large firms) in access to external finance for investment. This effect is small and only marginally significant, however: increasing Private credit by one SD would increase small firms' access by only 0.9 percentage points (or 2.5% of a SD) more than it would access for large firms.

Quality of the legal system, both the *de jure* measure (CPIA Legal Framework) and the *de facto* measure (CPIA Legal System), makes a dent, but just barely, in facilitating access to external finance by small firms. A one-SD increase in either measure is associated with a relative increase in the share of external working-capital finance of small firms (relative to large ones) by 0.9 percentage points, or about 2.6% of one SD for the outcome. Micro or medium firms do not benefit relative to large firms from the legal system improvement.

Legal formalism (i.e., Contracting Procedures) and Creditors Rights appears to benefit micro and small firms less than large firms. When Contracting Procedures are less cumbersome, large firms' access to finance for investment in fixed assets increases by slightly more than for small firms, but this effect is very small (0.003) and barely statistically significant. When Creditors Rights is stronger, the relative access of micro firms to external finance drops by 1.5 percentage points, or 4.4% of one SD of the outcome. This effect is non-trivial. A possible explanation is that better creditor rights

protection shifts lenders' focus to firms with good collateral, because their likelihood of obtaining collateral upon firm defaults is higher. Micro firms, with lower availability of valuable collateral, benefit little if at all from a system that strengthens the role of collateral in lending.

Not all contracting rights institutions are unimportant: WEF Auditing Quality turns out to be *the* most important measure that facilitates micro firms and SME financing. Relative to large firms, micro firms' access to external working-capital finance increases by 2.2 percentage points (or 6.4% of one SD of the outcome); for small firms, the corresponding figure is 1.9 percentage points (or 5.5% of one SD of the outcome). Relative to large firms, small firms' access to external *investment* finance by 2.1 percentage points (or 5.2% of one SD of the outcome); for medium firms, the figure is 2.7 percentage points (or 6.7% of one SD of the outcome).

Relative to contracting institutions, property rights institutions appear to have a more profound association with access of smaller firms to external finance. How they matter differs in details.

General measures of property rights institutions—Heritage PR, CPIA Accountability, and Executive Constraints—tend to be positively associated with improved access to external finance for micro and small firms relative to large (and medium) firms. Relative to large firms, a one-SD increase in Heritage PR for micro and small firms is associated with improved access to working-capital external finance by 1-1.2 percentage points (or 3-3.5% of one SD of the outcome); the same increase for small firms is associated with improved access to investment external finance by 1 percentage points (or 2.4% of one SD of the outcome). The effect of CPIA Accountability is slightly larger than Heritage PR but of the same order of magnitude. In contrast, Executive Constraints does not increase smaller firms' relative access to external finance.

While the general measure of property rights institutions for finance, Financial Freedom (from Heritage), does not seem to exhibit significant influence, the two specific measures do. Relative to large firms, a one-SD increase in WEF Access to Stock Markets is associated with improved access by small firms to working-capital external finance, by 1.3 percentage points (or 4% of one SD of the outcome); the same increase is associated with improved access by *medium* firms to investment external finance by 2.5 percentage points (or 6.2% of one SD of the outcome). The effect of Investor Protection is limited to the finance of working capital: increasing it by one SD is associated with better access to working capital external finance by 1.8 percentage points (or 5.2% of one SD of the outcome) for micro firms, and 1.3 percentage points (or 3.8% of one SD) for small firms.



#### 4. Conclusions

Using a comprehensive cross-country firm-level data set, we examine how institutions and financial development affect firms' access to external finance, and unbundle the roles of contracting institutions and property rights institutions. We pay particular attention to how micro enterprises and SMEs are affected by institutions and financial development relative to large firms. We document that MSMEs but especially micro firms had significantly lower access to external finance. Overall, we do not find firms' access to external finance to be facilitated by financial development, nor by contracting institutions. In stark contrast, it is positively and strongly associated with property rights institutions. We also find evidence that measurement error in institutional indicators is likely to be important: after correcting for such error, the roles of property rights institutions become even more prominent. In contrast, correcting for measurement error does not alter our conclusion on the lack of importance of contracting institutions. Among property rights institutions, Executive Constraints and Minority Shareholders—two measures pertaining to limitations on the power of political and economic elites—prove to be particularly important for facilitating external finance. We also find that, overall, property rights institutions tend to facilitate the relative access to external finance of micro firms and SMEs more than contracting institutions or financial development. However, a specific aspect of contracting institutions, auditing standards and quality (i.e., WEF Auditing Quality), proves to be particularly important for leveling access to finance across sizes.

Our findings suggest that particular attention should be given to the financing plight of micro firms, which seem to have much more difficulty in obtaining external financing, particularly from formal sources. Furthermore, institutions -- especially property rights institutions -- appear to be more important than financial depth in facilitating firms' external finance. For leveling the playing field by firm size in access to finance, both property rights institutions and contracting institutions that facilitate the information environment are essential. Our results offer complementary micro-level evidence to support Acemoglu and Johnson (2005) in asserting the importance of property rights institutions over contracting institutions, and limitations on the power of political or economic elites. Our results suggest that an important channel of institutions (and mainly property rights institutions) affecting economic development is through firms' access to external finance.

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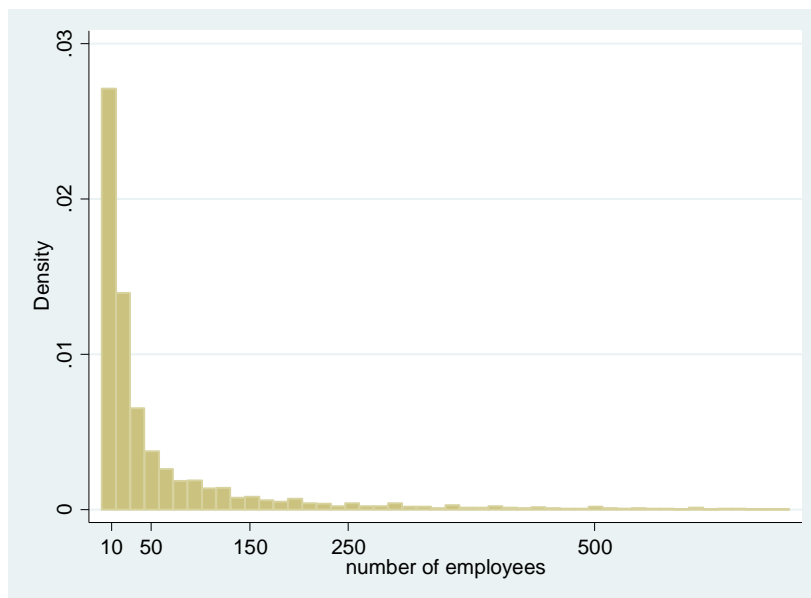
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**Figure 1. Histogram of the Number of Employees**



**Figure 2. Access to external finance by firm size**

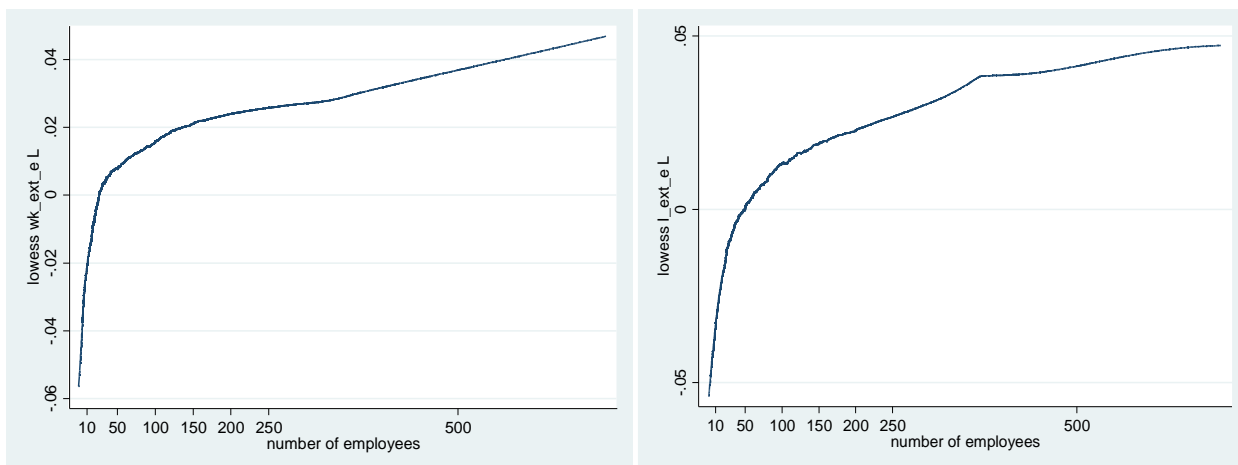


Table 1

List of countries and their access to external finance

This table describes the number of observation and the share of external financing for working capital and for investment. The source of the variables is WBES.

Country	WC_ext		I_ext		Country	WC_ext		I_ext	
	N obs	ext	N obs	ext		N obs	Total ext	N obs	Total ext
Montenegro			45	0.700	Cote d'Ivoire	297	0.139	118	0.154
Afghanistan	141	0.055	9	0.133	Croatia	467	0.435	374	0.487
Albania	113	0.188	61	0.227	Czech Rep.			122	0.378
Angola	500	0.159	182	0.127	Dominica	137	0.233	52	0.294
Antigua & Barbuda	125	0.295	62	0.380	Dominican Rep.	257	0.526	130	0.445
Argentina	1544	0.394	1089	0.357	Ecuador	445	0.534	303	0.518
Armenia			93	0.546	El Salvador	782	0.495	472	0.480
Azerbaijan			95	0.343	Eritrea	81	0.044	15	0.160
Bahamas, The	105	0.335	51	0.160	Estonia			170	0.388
Bangladesh	1310	0.247	336	0.300	Ethiopia	305	0.092	119	0.161
Barbados	91	0.305	41	0.212	Fiji	63	0.385	40	0.493
Belarus	207	0.195	214	0.314	Gabon	82	0.090	54	0.095
Belize	145	0.378	75	0.306	Gambia	118	0.464	63	0.211
Benin	91	0.357	43	0.167	Georgia	182	0.287	164	0.305
Bolivia	536	0.388	322	0.332	Ghana	436	0.255	234	0.141
Bosnia & Herz.			170	0.633	Grenada	132	0.488	77	0.375
Botswana	446	0.350	251	0.305	Guatemala	827	0.378	459	0.401
Brazil	992	0.492	697	0.491	Guinea	123	0.174	55	0.150
Bulgaria	872	0.196	688	0.256	Guinea-Bissau	179	0.275	110	0.073
Burkina Faso	290	0.276	143	0.239	Guyana	118	0.547	91	0.420
Burundi	214	0.339	114	0.359	Honduras	557	0.343	262	0.394
Cameroon	317	0.422	153	0.379	Hungary			119	0.324
Cape Verde	73	0.387	37	0.350	Indonesia	1074	0.156	307	0.154
Central African Rep.	109	0.249	56	0.246	Iraq	695	0.150	265	0.148
Chad	109	0.204	69	0.217	Jamaica	217	0.386	83	0.266
Chile	1587	0.455	1120	0.440	Kazakhstan	276	0.179	264	0.291
China	2378	0.113	1225	0.110	Kenya	1101	0.403	592	0.359
Colombia	1619	0.578	931	0.552	Kyrgyz Rep.	181	0.191	133	0.264
Congo, Rep.	37	0.143	22	0.200	Lao PDR	529	0.112	186	0.146
Costa Rica	323	0.229	211	0.307					

Table 1 (cont'd)

Country	WC_ext		I_ext		Country	WC_ext		I_ext	
	N obs	Total ext	N obs	Total ext		N obs	Total ext	N obs	Total ext
Latvia			174	0.452	Rwanda	313	0.342	166	0.287
Lesotho	109	0.384	81	0.410	Samoa	54	0.478	33	0.444
Liberia	135	0.195	95	0.199	Senegal	411	0.243	120	0.214
Lithuania			160	0.507	Sierra Leone	69	0.138	41	0.142
Macedonia, FYR			177	0.363	Slovak Rep.			114	0.370
Madagascar	287	0.273	145	0.216	South Africa	808	0.319	366	0.328
Malawi	103	0.308	73	0.231	Sri Lanka	462	0.320	131	0.461
Mali	500	0.176	203	0.070	St. Kitts & Nev.	106	0.489	60	0.546
Mauritania	197	0.342	54	0.196	St. Lucia	139	0.273	59	0.264
Mauritius	282	0.384	159	0.539	St. Vincent & Gren.	113	0.336	50	0.421
Mexico	2285	0.318	983	0.345	Suriname	152	0.438	65	0.344
Micronesia	15	0.200	11	0.282	Swaziland	199	0.349	99	0.226
Mongolia			218	0.269	Tajikistan			74	0.443
Mozambique	431	0.211	145	0.129	Tanzania	503	0.326	264	0.179
Namibia	234	0.403	110	0.280	Togo	84	0.222	49	0.214
Nepal	769	0.227	264	0.277	Tonga	112	0.076	53	0.409
Nicaragua	631	0.285	315	0.328	Trinidad & Tobago	287	0.496	103	0.481
Niger	76	0.351	45	0.197	Turkey			325	0.480
Nigeria	1644	0.301	721	0.084	Uganda	766	0.281	318	0.224
Pakistan	776	0.154	133	0.229	Ukraine			231	0.368
Panama	466	0.293	239	0.386	Uruguay	766	0.321	472	0.280
Paraguay	592	0.366	370	0.361	Vanuatu	6	0.450	6	0.400
Peru	1351	0.576	933	0.603	Venezuela	133	0.447	75	0.458
Philippines	946	0.238	378	0.285	Vietnam	845	0.412	586	0.323
Poland			134	0.361	Yemen, Rep.	247	0.203	106	0.244
Russia	2288	0.203	1329	0.257	Zambia	406	0.301	161	0.174



Table 2

## Definitions of Variables related to Financial and Institutional Development

This table describes the variables related to financial and institutional development in our study. The sources are explained in the table. All variables below are standardized to have a mean of zero and a SD of one; the units in the table, if mentioned, are before the stage of standardization.

Variables	Description
Private credit	Bank private credit to GDP (%). From World Development Indicators.
Value traded	Stock market total value traded to GDP (%). From World Development Indicators.
CPIA Legal Framework	Legal framework for secure property and contract rights, including predictability and impartiality of laws and regulations. From the World Bank's Country Policy and Institutional Assessments (CPIA). See <a href="http://go.worldbank.org/EEAIU81ZG0">http://go.worldbank.org/EEAIU81ZG0</a> .
CPIA Legal Systemy	Quality of the legal and judicial system, as measured by independence, accessibility, legitimacy, efficiency, transparency, and integrity of the courts and other relevant dispute resolution mechanisms. From CPIA.
Contracting procedures	The number of procedures required to resolve a sale of goods dispute in local courts. It includes steps to file the case, to go through the trial and judgment, and to enforce the judgment. The data are collected through studying the codes of civil procedure and other court regulations as well as surveying local litigation lawyers (and, in a quarter of the countries, judges as well). Source: World Bank, Doing Business.
WEF Auditing quality	"Financial auditing and reporting standards regarding company financial performance in your country are (1 = extremely weak, 7 = extremely strong, the best in the world)." From the World Economic Forum's Executive Opinion Surveys. For data access see <a href="http://reports.weforum.org/global-competitiveness-report-2014-2015/downloads/">http://reports.weforum.org/global-competitiveness-report-2014-2015/downloads/</a>
Creditor rights	Strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The index ranges from 0 to 10, with higher scores indicating that these laws are better designed to expand access to credit. From Doing Business.
Heritage PR	This variable is "a qualitative assessment of the extent to which a country's legal framework allows individuals to freely accumulate private property, secured by clear laws that are enforced effectively by the government. It measures the degree to which a country's laws protect private property rights and the extent to which those laws are respected. It also assesses the likelihood that private property will be expropriated by the state and analyzes the independence of the judiciary, the existence of corruption within the judiciary, and the ability of individuals and businesses to enforce contracts." A higher score means better protection and less government expropriation. From the Heritage Foundation's Economic Freedom index. See <a href="http://www.heritage.org/index/book/methodology">http://www.heritage.org/index/book/methodology</a> .
CPIA accountability	The extent to which the executive, legislators, and other high-level officials can be held accountable for their use of funds, administrative decisions, and results obtained. It includes four components: the accountability of the executive and other top officials to effective oversight institutions; access of civil society to timely and reliable information on public affairs and public policies; state capture by narrow vested interests; integrity in the management of public resources. From CPIA.
Executive Constraints	The extent of institutionalized constraints on the decision-making powers of chief executives, whether individuals or collectivities. From Polity IV Project.
Financial Freedom	An indicator of banking efficiency as well as a measure of independence from government control and interference in the financial sector. It is higher with less government interference, more independent central bank supervision, limited government regulation, more market-oriented deposit and credit allocation, and equal treatment of foreign financial institutions. See <a href="http://www.heritage.org/index/book/methodology">http://www.heritage.org/index/book/methodology</a>
WEF access to stock markets	"Raising money by issuing shares on the local stock market is (1 = nearly impossible, 7 = quite possible for a good company)".

Investor protection	The strength of minority shareholder protections against misuse of corporate assets by directors for their personal gain as well as shareholder rights, governance safeguards and corporate transparency requirements that reduce the risk of abuse. From 0 to 10. From Doing Business.
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Table 3

Summary Statistics and Definitions

This table presents our dependent and some of our independent variables, their definitions, along with their mean and standard deviations.

	Definitions	mean	sd
WC_ext	Share of a firm's finance for working capital from external sources.	0.297	0.344
I_ext	Share of a firm's finance for investment in fixed asset from external sources.	0.328	0.406
Ln(firm age)	Log(firm age)	2.546	0.840
Foreign	Foreign ownership share.	0.086	0.263
state	State ownership share.	0.007	0.069
exporter	A dummy variable indicating exporter status.	0.213	0.410
Country-ind avg of sales growth	Sales growth rate in the past 3 years. (should be country-industry avg sales growth)	0.035	0.222
part of a large firm	A dummy variable indicating the establishment being a part of a large firm.	0.146	0.353
micro	The firm has 10 or less full-time (equivalent) employees. A part-time worker is counted as half a full-time worker.	0.288	0.453
Small	Equals to 1 when the firm has 10+ to 50 full-time (equivalent) employees.	0.418	0.493
Medium	Equals to 1 when the firm has 50+ to 150 full-time (equivalent) employees.	0.167	0.373
Large	Equals to 1 when the firm has 50+ to 150 full-time (equivalent) employees.	0.127	0.333
Ln(GDP PC) <sub>t-1</sub>	Log(average GDP per capita in constant US dollars, lagged by one period).	7.604	1.145
GDP PC gr <sub>t-1</sub>	Average per capita GDP growth rate, lagged by one period.	4.664	3.367
Infla <sub>t-1</sub>	Average inflation rate, lagged by one period.	0.079	0.059
Lnpop <sub>t-1</sub>	Log(average population).	16.984	1.779
Finance Obstacle	A dummy indicating a firm facing moderate or more severe obstacle in accessing finance.	0.508	0.500

Table 4

## Summary statistics by firm size

This table summarizes key characteristics by firm size. Definition of the variables are in Tables 2 and 3.

	Micro firms		Small firms		Medium firms		Large firms	
	mean	SD	mean	SD	mean	SD	mean	SD
WC_ext	0.241	0.324	0.299	0.343	0.341	0.355	0.374	0.359
I_ext	0.253	0.383	0.321	0.405	0.360	0.412	0.384	0.411
ln(firm age)	2.260	0.827	2.520	0.791	2.770	0.788	2.982	0.826
foreign	0.044	0.197	0.067	0.233	0.121	0.302	0.198	0.372
state	0.002	0.036	0.005	0.055	0.012	0.089	0.022	0.118
exporter	0.071	0.256	0.163	0.369	0.338	0.473	0.540	0.498
Country-ind avg sales growth	-0.009	0.647	0.029	0.639	0.062	0.587	0.080	0.580
Part of a large firm	0.072	0.259	0.123	0.328	0.204	0.403	0.318	0.466
Ln(GDP PC <sub>t-1</sub> )	7.418	1.165	7.618	1.140	7.776	1.104	7.764	1.107
GDP PC growth <sub>t-1</sub>	4.258	3.400	4.661	3.333	5.080	3.390	5.067	3.253
Inflation <sub>t-1</sub>	0.083	0.066	0.080	0.061	0.073	0.049	0.074	0.047
Ln(pop <sub>t-1</sub> )	16.769	1.750	16.938	1.755	17.172	1.852	17.377	1.732
Finance Obstacle	0.554	0.497	0.521	0.500	0.467	0.499	0.423	0.494
Private credit <sub>t-1</sub>	-0.197	0.807	-0.018	0.957	0.226	1.197	0.214	1.144
Stock market <sub>t-1</sub>	-0.117	0.796	-0.038	0.941	0.166	1.213	0.115	1.153
Heritage PR <sub>t-1</sub>	-0.033	0.893	0.010	1.012	0.019	1.071	0.012	1.073
CPIA accountability <sub>t-1</sub>	-0.101	0.928	0.003	1.016	0.086	1.031	0.100	1.040
Executive constraints <sub>t-1</sub>	-0.107	1.010	0.029	0.987	0.024	1.004	0.091	0.998
CPIA Legal Framework <sub>t-1</sub>	-0.125	0.942	0.007	1.016	0.094	1.027	0.132	1.006
CPIA Legal System <sub>t-1</sub>	-0.106	0.931	0.017	1.017	0.066	1.037	0.094	1.023
Contracting procedures <sub>t-1</sub>	38.409	5.042	37.957	4.704	37.460	4.283	37.355	4.015
Financial Freedom	0.007	0.954	0.012	0.997	0.018	1.016	-0.077	1.073
WEF auditing quality <sub>t-1</sub>	-0.116	0.978	-0.024	1.019	0.102	0.997	0.120	0.959
Creditor rights <sub>t-1</sub>	-0.015	1.036	-0.011	1.012	0.011	0.964	0.058	0.922
WEF loan access <sub>t-1</sub>	-0.034	1.044	-0.053	0.997	0.059	0.972	0.124	0.955
Investor protection <sub>t-1</sub>	-0.099	1.037	0.020	1.010	0.025	0.954	0.113	0.930
WEF access to stock markets <sub>t-1</sub>	-0.084	1.058	-0.040	0.996	0.052	0.962	0.177	0.938

Table 5

## Firm Size and Access to Finance

This table reports the OLS regression results. The dependent variables are WC\_ext (column (1)), I\_ext (column (2)), obstacle in financial access (column (3)), WC\_ext (column (4)), and I\_ext (column (5)). The independent variables are: ln(firm age), foreign, state, exporter, country-industry average of sales growth rate, the dummy for being part of a large firm, dummies for micro, small, and medium firms (or the dummies of firm sizes defined with alternative criteria); country-year dummies and industry dummies. Tables 2 and 3 provide definitions for the variables.

\*, \*\*, and \*\*\* represent statistical significance at the 10, 5 and 1 percent level. White-corrected standard errors in parentheses.

	(1)	(2)	(3)	(4)	(5)
	WC_ext	I_ext	Finance Obstacle	WC_ext	I_ext
ln(firm age)	0.0007 (0.0018)	-0.0154*** (0.0029)	-0.0211*** (0.0026)	0.0032* (0.0018)	-0.0135*** (0.0029)
foreign	-0.0531*** (0.0055)	-0.0892*** (0.0080)	-0.1104*** (0.0076)	-0.0508*** (0.0055)	-0.0878*** (0.0079)
state	0.0226 (0.0205)	-0.0023 (0.0339)	-0.0474* (0.0275)	0.0254 (0.0205)	-0.0027 (0.0338)
exporter	0.0427*** (0.0038)	0.0273*** (0.0054)	0.0037 (0.0053)	0.0461*** (0.0038)	0.0294*** (0.0054)
Country-ind avg sales growth	0.0076 (0.0113)	0.0038 (0.0170)	-0.0047 (0.0156)	0.0076 (0.0113)	0.0029 (0.0170)
Part of a large firm	-0.0113*** (0.0040)	-0.0035 (0.0061)	-0.0419*** (0.0057)	-0.0079** (0.0040)	-0.0021 (0.0061)
micro	-0.0865*** (0.0054)	-0.0926*** (0.0081)	0.0901*** (0.0076)		
small	-0.0461*** (0.0049)	-0.0551*** (0.0067)	0.0684*** (0.0067)		
medium	-0.0139*** (0.0053)	-0.0179** (0.0070)	0.0427*** (0.0072)		
small (50 or fewer employees)				-0.0658*** (0.0083)	-0.0813*** (0.0104)
medium (between 50+ & 500 employees)				-0.0185** (0.0082)	-0.0317*** (0.0100)
Country-year dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes
N	59,399	33,516	61,421	59,399	33,516
r2_a	0.159	0.123	0.107	0.156	0.122

Table 6

Financial and institutional development and access to external finance

This table reports the OLS regression results. The dependent variables are WC\_ext and I\_ext (repeating every two columns). The independent variables are: ln(firm age), foreign, state, exporter, country-industry average of sales growth rate, the dummy for being part of a large firm, dummies for micro, small, and medium firms (or the dummies of firm sizes defined with alternative criteria); industry dummies; log(GDP per capita<sub>t-1</sub>), GDP PC growth<sub>t-1</sub>, inflation<sub>t-1</sub>, and log(population<sub>t-1</sub>).

Panel A deals with the effects of financial development and contracting institutions; Panel B, the effects of property rights institutions

Tables 2 and 3 provide definitions for the variables.

\*, \*\*, and \*\*\* represent statistical significance at the 10, 5 and 1 percent level. White-corrected standard errors clustered at the country-year level in parentheses.

Table 6 (cont'd)

Panel A.	WC_ext	I_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext
	Key var = Private Credit <sub>t-1</sub>		Key var. = Value traded <sub>t-1</sub>		Key var = CPIA Legal Framework <sub>t-1</sub>		Key var = CPIA Legal System <sub>t-1</sub>		Key var = Contracting Procedures <sub>t-1</sub>		Key var = WEF Auditing quality <sub>t-1</sub>		Key var = Creditor rights <sub>t-1</sub>	
micro	-0.1010***	-0.1166***	-0.0856***	-0.1111***	-0.0960***	-0.1127***	-0.0974***	-0.1129***	-0.0949***	-0.1112***	-0.0842***	-0.0729***	-0.0941***	-0.1107***
	(0.0157)	(0.0139)	(0.0157)	(0.0160)	(0.0159)	(0.0140)	(0.0158)	(0.0139)	(0.0159)	(0.0140)	(0.0210)	(0.0174)	(0.0151)	(0.0140)
small	-0.0483***	-0.0592***	-0.0372***	-0.0497***	-0.0453***	-0.0562***	-0.0463***	-0.0565***	-0.0463***	-0.0582***	-0.0355*	-0.0416***	-0.0454***	-0.0578***
	(0.0132)	(0.0120)	(0.0139)	(0.0131)	(0.0134)	(0.0122)	(0.0133)	(0.0122)	(0.0134)	(0.0119)	(0.0183)	(0.0150)	(0.0128)	(0.0118)
medium	-0.0152**	-0.0191*	-0.0136	-0.0153	-0.0159**	-0.0198*	-0.0161**	-0.0199*	-0.0174**	-0.0211**	-0.0176*	-0.0207*	-0.0169**	-0.0211**
	(0.0077)	(0.0106)	(0.0090)	(0.0119)	(0.0078)	(0.0104)	(0.0077)	(0.0104)	(0.0076)	(0.0103)	(0.0102)	(0.0112)	(0.0076)	(0.0102)
Ln(GDP	0.0191	0.0403***	0.0074	0.0349***	0.0148	0.0330***	0.0124	0.0363***	0.0151	0.0336***	0.0133	0.0188	0.0178*	0.0331***
PC <sub>t-1</sub> )	(0.0134)	(0.0115)	(0.0164)	(0.0126)	(0.0130)	(0.0115)	(0.0122)	(0.0104)	(0.0114)	(0.0096)	(0.0188)	(0.0171)	(0.0102)	(0.0090)
GDP PC	-0.0051	0.0031	-0.0035	0.0046	-0.0111*	-0.0003	-0.0116**	-0.0004	-0.0110*	-0.0011	-0.0136	-0.0026	-0.0115**	-0.0011
growth <sub>t-1</sub>	(0.0063)	(0.0037)	(0.0089)	(0.0052)	(0.0060)	(0.0043)	(0.0059)	(0.0043)	(0.0058)	(0.0041)	(0.0095)	(0.0048)	(0.0057)	(0.0041)
Inflation <sub>t-1</sub>	-0.0818	-0.3483**	-0.0091	-0.7966**	-0.0046	-0.2673**	0.0085	-0.2830**	-0.0351	-0.2909**	-0.0933	-0.1173	-0.0604	-0.2957**
	(0.1321)	(0.1369)	(0.3092)	(0.3726)	(0.1336)	(0.1350)	(0.1210)	(0.1374)	(0.1276)	(0.1342)	(0.3201)	(0.3251)	(0.1028)	(0.1322)
Ln(pop <sub>t-1</sub> )	-0.0119*	-0.0203***	0.0030	0.0037	-0.0139*	-0.0242**	-0.0130*	-0.0253***	-0.0143*	-0.0253***	-0.0247*	-0.0350***	-0.0137*	-0.0253***
	(0.0071)	(0.0071)	(0.0101)	(0.0103)	(0.0074)	(0.0094)	(0.0079)	(0.0098)	(0.0079)	(0.0094)	(0.0130)	(0.0117)	(0.0075)	(0.0093)
Key Var	-0.0275*	-0.0311**	-0.0649***	-0.0852***	0.0086	0.0112	0.0183	0.0018	-0.0009	0.0006	0.0060	0.0065	0.0158	0.0005
	(0.0156)	(0.0158)	(0.0204)	(0.0189)	(0.0150)	(0.0132)	(0.0152)	(0.0139)	(0.0028)	(0.0027)	(0.0205)	(0.0198)	(0.0119)	(0.0114)
N	53,035	29,832	37,750	22,122	53,095	29,771	53,095	29,771	53,723	29,985	28,762	18,026	53,723	29,985
r2_a	0.058	0.054	0.085	0.073	0.057	0.051	0.058	0.051	0.059	0.052	0.084	0.050	0.061	0.052
Panel B.	WC_ext	I_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext		
	Key var. = Heritage PR <sub>t-1</sub>		Key var. = CPIA Accountability <sub>t-1</sub>		Key var. = Executive Constraints <sub>t-1</sub>		Key var. = Financial Freedom <sub>t-1</sub>		Key var. = WEF access to Stock markets <sub>t-1</sub>		Key var = investor protection <sub>t-1</sub>			
Key Var	0.0264	-0.0031	0.0417**	0.0105	0.0833***	0.0820***	0.0411**	0.0482***	0.0472***	0.0470***	0.0245*	0.0181		
	(0.0180)	(0.0175)	(0.0167)	(0.0169)	(0.0164)	(0.0181)	(0.0163)	(0.0159)	(0.0163)	(0.0144)	(0.0148)	(0.0155)		
N	50,858	28,462	53,095	29,771	27,686	15,910	50,858	28,462	28,762	18,026	43,831	24,950		
r2_a	0.058	0.049	0.063	0.051	0.115	0.080	0.063	0.056	0.100	0.062	0.072	0.058		

Table 7

Financial and institutional development and access to external finance: Instrumental Variable Estimation

This table reports the 2SLS regression results. The dependent variables are WC\_ext and I\_ext (repeating every two columns). The independent variables are: ln(firm age), foreign, state, exporter, country-industry average of sales growth rate, the dummy of being a part of the a large firm, the dummies of micro, of small, and of medium (or the dummies of firm sizes defined with alternative criteria); industry dummies; log(GDP per capita<sub>t-1</sub>), per capita GDP growth<sub>t-1</sub>, inflation<sub>t-1</sub>, and log(population<sub>t-1</sub>).

Panel A deals with the effects of financial development and contracting institutions; Panel B, the effects of property rights institutions

Tables 2 and 3 provide definitions for the variables.

\*, \*\*, and \*\*\* represent statistical significance at the 10, 5 and 1 percent level. White-corrected standard errors clustered at the country-year level at parentheses.

<b>Panel A.</b>	<b>WC_ext</b>	<b>I_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>
	<b>Key var = CPIA Legal Framework<sub>t-1</sub></b>		<b>Key var = CPIA Legal System<sub>t-1</sub></b>		<b>Key var = Contracting Procedures<sub>t-1</sub></b>		<b>Key var = WEF Auditing Quality<sub>t-1</sub></b>		<b>Key var = Creditor Rights<sub>t-1</sub></b>		
<b>Key Var</b>	0.0327	0.0030	0.0138	0.0165	-0.0049	-0.0053	0.0007	-0.0082	0.0303	-0.0036	
	(0.0275)	(0.0231)	(0.0242)	(0.0196)	(0.0117)	(0.0148)	(0.0433)	(0.0277)	(0.0274)	(0.0279)	
N	53,095	29,771	53,095	29,771	52,405	29,406	28,647	17,977	52,405	29,406	
r2_a	0.055	0.051	0.058	0.050	0.055	0.047	0.086	0.051	0.059	0.052	
IV	CPIA legal quality <sub>t-1</sub>		CPIA legal framework <sub>t-1</sub>		CPIA legal framework <sub>t-1</sub>		CPIA legal quality <sub>t-1</sub>		CPIA legal quality <sub>t-1</sub>		
F-stat in 1 <sup>st</sup> stage	32.45	40.98	46.76	76.41	5.65	2.42	34.04	52.34	20.43	14.67	
<b>Panel B.</b>	<b>WC_ext</b>	<b>I_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>	<b>WC_ext</b>
	<b>Key var. = Heritage PR<sub>t-1</sub></b>		<b>Key var. = CPIA Accountability<sub>t-1</sub></b>		<b>Key var. = Executive Constraints<sub>t-1</sub></b>		<b>Key var. = Financial Freedom<sub>t-1</sub></b>		<b>Key var. = WEF access to stock markets<sub>t-1</sub></b>		<b>Key var = investor protection<sub>t-1</sub></b>
<b>Key Var</b>	0.0616*	0.0183	0.0529*	-0.0020	0.1096***	0.0839**	0.1165*	0.0374	0.0545*	0.0084	0.1275*
	(0.0336)	(0.0330)	(0.0321)	(0.0364)	(0.0390)	(0.0359)	(0.0649)	(0.0627)	(0.0308)	(0.0426)	0.1332**
N	50,464	28,288	50,464	28,288	27,386	15,741	50,464	28,288	28,647	17,977	40,849
r2_a	0.056	0.050	0.060	0.051	0.113	0.081	0.039	0.057	0.103	0.056	23,305
IV	CPIA Accountability <sub>t-1</sub>		Heritage PR <sub>t-1</sub>		CPIA Accountability <sub>t-1</sub>		CPIA Accountability <sub>t-1</sub>		CPIA Accountability <sub>t-1</sub>		Financial Freedom <sub>t-1</sub>
F-stat in 1 <sup>st</sup> stage	62.72	44.77	28.59	31.29	32.38	27.60	6.73	6.20	11.6	6.19	4.89
											9.00

Table 8

Relative effect of financial and institutional development on smaller firms

This table reports the OLS regression results. The dependent variables are WC\_ext and I\_ext (repeating every two columns). The independent variables are: ln(firm age), foreign, state, exporter, country-industry average of sales growth rate, the dummy of being a part of the a large firm, the dummies of micro, of small, and of medium (or the dummies of firm sizes defined with alternative criteria); industry dummies; country-year dummies; financial development or institutions interacted with three size dummies (i.e., micro, small, and medium).

Panel A deals with the effects of financial development and contracting institutions; Panel B, the effects of property rights institutions

Tables 2 and 3 provide definitions for the variables.

\*, \*\*, and \*\*\* represent statistical significance at the 10, 5 and 1 percent level. White-corrected standard errors clustered at the country-year-size level at parentheses.



Table 8 (cont'd)

	WC_ext	I_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext	WC_ext
	Key var = Private Credit <sub>t-1</sub>		Key var. = Value traded <sub>t-1</sub>		Key var = CPIA Legal Framework <sub>t-1</sub>		Key var = CPIA Legal System <sub>t-1</sub>		Key var = Contracting Procedures <sub>t-1</sub>		Key var = WEF Auditing Quality <sub>t-1</sub>		Key var = Creditor Rights <sub>t-1</sub>	
X * micro	0.0054	0.0029	0.0072	0.0147	0.0006	-0.0078	0.0077	-0.0020	-0.0011	0.0016	0.0215***	-0.0002	-0.0149**	-0.0082
	(0.0059)	(0.0077)	(0.0050)	(0.0114)	(0.0077)	(0.0079)	(0.0070)	(0.0074)	(0.0015)	(0.0019)	(0.0080)	(0.0108)	(0.0073)	(0.0084)
X * small	0.0024	0.0087*	0.0016	0.0031	0.0094*	0.0076	0.0089*	0.0056	-0.0020	-0.0026*	0.0189**	0.0208***	-0.0077	0.0044
	(0.0045)	(0.0049)	(0.0041)	(0.0058)	(0.0051)	(0.0058)	(0.0051)	(0.0056)	(0.0014)	(0.0016)	(0.0073)	(0.0071)	(0.0065)	(0.0066)
X * medium	0.0011	0.0029	0.0019	0.0029	0.0043	0.0022	0.0065	0.0008	-0.0011	-0.0002	0.0075	0.0265***	-0.0063	-0.0034
	(0.0046)	(0.0045)	(0.0042)	(0.0049)	(0.0059)	(0.0069)	(0.0060)	(0.0066)	(0.0018)	(0.0018)	(0.0084)	(0.0076)	(0.0081)	(0.0075)
N	55,354	31,343	40,069	23,633	57,966	32,888	57,966	32,888	58,594	33,102	32,343	20,277	58,594	33,102
r2_a	0.155	0.125	0.159	0.125	0.158	0.123	0.158	0.122	0.160	0.122	0.175	0.115	0.160	0.122
	Key var. = Heritage PR <sub>t-1</sub>		Key var. = CPIA Accountability <sub>t-1</sub>		Key var. = Executive Constraints <sub>t-1</sub>		Key var. = Financial Freedom <sub>t-1</sub>		Key var. = WEF access to stock markets <sub>t-1</sub>		Key var = investor protection <sub>t-1</sub>			
	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se	coef/se		
X * micro	0.0117*	0.0010	0.0164***	-0.0007	0.0129	0.0077	0.0111	-0.0004	0.0087	0.0023	0.0178**	0.0027		
	(0.0068)	(0.0074)	(0.0062)	(0.0082)	(0.0087)	(0.0123)	(0.0081)	(0.0090)	(0.0078)	(0.0093)	(0.0071)	(0.0096)		
X * small	0.0101**	0.0102**	0.0168***	0.0109*	0.0053	-0.0044	0.0111	0.0066	0.0131*	0.0104	0.0130*	0.0095		
	(0.0050)	(0.0050)	(0.0050)	(0.0059)	(0.0076)	(0.0092)	(0.0072)	(0.0067)	(0.0079)	(0.0069)	(0.0067)	(0.0078)		
X * medium	0.0081	0.0082	0.0086	0.0055	-0.0013	-0.0051	0.0015	0.0038	0.0054	0.0247***	0.0095	0.0069		
	(0.0055)	(0.0058)	(0.0057)	(0.0070)	(0.0083)	(0.0094)	(0.0079)	(0.0073)	(0.0089)	(0.0076)	(0.0078)	(0.0093)		
N	55,574	31,541	57,966	32,888	32,382	18,945	55,574	31,541	32,343	20,277	47,567	27,239		
r2_a	0.153	0.122	0.158	0.123	0.184	0.128	0.153	0.122	0.174	0.115	0.176	0.131		