

# The Binding Constraint on Firms' Growth in Developing Countries

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## Abstract

Firms in developing countries face numerous and serious constraints on their growth, ranging from corruption to lack of infrastructure to inability to access finance. Countries lack the resources to remove all the constraints at once and so would be better off removing the most binding one first.

This paper uses data from World Bank Enterprise Surveys in 2006–10 to identify the most binding constraints on firm operations in developing countries. While each country faces a different set of constraints, these constraints also vary by firm characteristics, especially firm size. Across all countries, access to finance

is among the most binding constraints; other obstacles appear to matter much less. This result is robust for all regions.

Smaller firms must rely more on their own funds to invest and would grow significantly faster if they had greater access to external funds. As a result, a low level of financial development skews the firm size distribution by increasing the relative share of small firms. The results suggest that financing constraints play a significant part in explaining the “missing middle”—the failure of small firms in developing countries to grow into medium-size or large firms.

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This paper—a product of the Operations and Strategy Unit, Development Economics—is part of a larger effort in the department to develop new practical insights as to how African countries can significantly improve their production of light manufacturing products. Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. The author may be contacted at [HDinh@worldbank.org](mailto:HDinh@worldbank.org).

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# **The Binding Constraint on Firms' Growth in Developing Countries**

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## 1. Introduction

Private sector growth remains one of the main challenges facing developing countries in their quest for development and poverty reduction. Extensive evidence shows that a favorable business environment helps promote the growth of firms. As shown in recent research, however, firms in developing countries face a tougher business environment than their counterparts in the developed world.

Our aim in this paper is twofold. First, we seek to go beyond the traditional menu of constraints on firm growth to find out which of these constraints is the most binding. As the growth diagnostics approach points out, developing countries have scarce resources and therefore need to focus on removing the most binding constraint. Second, we examine the effects of the most binding constraint on firm growth not only across countries but also by firm characteristics.

We first explore the relationship between the business environment and firm growth as measured by employment growth. Among 15 components of the business environment, we identify the most binding constraint using both subjective and objective measures. Our focus is on the most binding constraints for existing firms and, more specifically, the binding constraint that matters the most for firm growth. The methodology follows two steps. The first is to find out which constraints are statistically significant among all regressions after controlling for firm characteristics and country fixed effects. The second is to identify the most binding constraint. We find that besides informal sector competition, access to finance is the obstacle that matters the most for growth. This result is robust for all regions and all sectors.

Our analysis contributes to the existing literature in several ways. First, using a large sample, containing more than 39,000 firms across 98 countries, we identify the most binding constraint on firms using subjective measures, then evaluate the importance of this constraint to firm growth using objective measures and controlling for firm characteristics. The sample comes from World Bank Enterprise Surveys conducted in 2006–2010 in mostly emerging and developing countries. The surveys provide both subjective data on perceived obstacles and objective measures of many constraints.

Second, we investigate the effect of financial access variables on firm growth by using firm-level regressions across countries controlling for the effects of different firm sizes, firm ages, sectors, and regions. Our results show that having access to finance in the form of a loan, sales credit, or external finance helps micro firms the most. This finding holds not only for the full sample but also for different regions. Sales credit is important only to micro and small firms, probably because it substitutes for bank loans. Having a loan or overdraft facility and receiving external finance for investment help growth for firms of all sizes across regions.

Third, we find clear evidence that a low level of financial sector development affects the firm size distribution and therefore contributes to the phenomenon of the “missing middle” in developing countries. Firm size distribution is skewed toward small and medium-size firms—and more so in

Africa, among firms that are credit constrained, and among firms that perceive access to finance as an obstacle. Our analysis shows that firm size and age are significantly correlated with firm growth. Distinguishing between different types of ownership, we find that firms tend to have higher growth if they are an exporter, are part of entities with multiple establishments, are foreign owned, or are privately owned.

The paper is organized as follows. The next section reviews the literature and shows how this paper relates to it. Section 3 presents an overview of the data and describes the sample used. Section 4 examines the most binding constraint of the business environment. Section 5 examines the effect of access to finance on employment growth in the full sample and by region, while section 6 looks at determinants of access to finance. Section 7 investigates differences in the effect of financial access variables on employment growth, and section 8 looks at the relationship between firm size and financial constraints. The last section concludes.

## **2. Literature Review**

Understanding the firm growth process is important for designing appropriate policies for job creation and pro-poor growth. Many studies are devoted to understanding the determinants of firm growth, especially employment growth. Most of these studies focus on the manufacturing sector and large firms (Evans 1987a, 1987b; Hall 1987; Dunne, Roberts, and Samuelson 1989). They find that firm age and firm size are important in the analysis of firm growth.

### **2.1 Effect of the Business Environment on Firm Growth**

A number of recent studies use World Business Environment Survey data (a firm-level data set covering 4,000 firms across 54 countries) to study the effect of the business environment on firm growth. Using subjective, firm-level data on the business environment, some of these studies show the importance of finance, corruption, and property rights (Batra, Kaufmann, and Stone 2003; Ayyagari, Demirgüç-Kunt, and Maksimovic 2006). Others examine the relationship between the business environment and firm growth in individual countries or a small group (Dollar, Hallward-Driemeier, and Mengistae 2005 in Bangladesh, China, India, and Pakistan; Fisman and Svensson 2007 and Reinikka and Svensson 2002 in Uganda; Bigsten and Söderbom 2006 in Africa).

Other studies also assess the effect of different dimensions of the business environment on firm growth. Some focus on the importance of access to finance for firm development and growth using subjective data (Rajan and Zingales 1998; Galindo and Micco 2007). Others investigate the impact of employment regulations on firm creation and growth (Djankov and others 2002; Klapper, Laeven, and Rajan 2004).

Several papers have emphasized the importance of financing obstacles. Using firm-level data, Demirgüç-Kunt and Maksimovic (1998) provide evidence on the importance of the financial system and legal enforcement on firm growth. Rajan and Zingales (1998) present supporting evidence on

the role of external finance for faster growth in countries with better developed financial systems. These papers focus on only a small set of obstacles that firms confront without discussing the motivation for choosing that set.

It is essential to explore the relationship between the business environment and firm growth not only across countries but across regions and by firm characteristics within countries—by firm size, age, sector, and ownership type. In examining this relationship, the literature has focused largely on the effect of difficulties in access to finance by firm type, particularly firm size. Generally the finding is that smaller firms are more constrained (Love and Mylenko 2003; IDB 2007). Beck, Demirgüç-Kunt, and Maksimovic (2005), using the World Business Environment Survey data set, include measures of corruption and property rights. Based on firms' perceptions of potential constraints, they also find patterns across countries, with small firms benefiting the most from greater financial and institutional development.

Aterido, Hallward-Driemeier, and Pagés (2007, 2009, 2010) analyze the effect of several aspects of the business environment—access to finance, corruption, and regulations—on the growth of firms. Their findings show that the business environment affects small, medium-size, and large firms differently. The reason is that small firms are exposed to a different set of constraints than large firms are. Access to electricity, for example, has heterogeneous effects: small and medium-size firms are often affected by power cuts, while large and micro firms tend not to be. The main reason is that micro firms use less energy-intensive tools and large firms are more likely to secure their own energy supply (Gelb and others 2007). Thus infrastructure such as the electricity grid affects the growth rate of small and medium-size firms directly, but has only an indirect effect on the growth rate of micro and large firms. Micro firms are much more credit constrained and must rely less on external funds to finance investment. Improving access to finance might boost the entry rate and the growth of small firms, perhaps at the expense of larger incumbents.

According to Dollar, Hallward-Driemeier, and Mengistae (2005), improving the business environment is an important complement to trade policies aimed at increasing international trade integration. Factors such as fast customs clearance times, good infrastructure, and availability of financial services have a significant impact on the probability of a firm's exporting and receiving foreign investment. Freund and Rocha (2010) provide more evidence of the link between the business environment and international trade. Using data from Africa, they find that even though poor trade infrastructure is one of the main obstacles to trade, most of the burden is due to heavy "red tape," bureaucratic customs practices that increase the time and cost of trade.

Gelb and others (2007) use subjective data on the business environment from 26 African countries to show that perceived constraints are not always independent of scale. Complaints about access to finance and land are more common among small firms, while complaints about infrastructure and corruption are more evenly distributed. They also find that a country's level of development strongly determines which constraints are present (country fixed effects are more important than within-

country variations). This finding is shared by the World Bank's *Africa Competitiveness Report 2009*, which shows that as a country's income rises, its set of constraints changes.

All these studies share a common result: business environment variables affect firms' growth, in the expected direction. The results are heterogeneous by firm size, and they are robust.

## **2.2 Financial Development and Firm Size Distribution**

A common finding in the literature is that the firm size distribution in developing countries is skewed toward small and medium-size firms. Small firms are often credit constrained and cannot borrow to engage in productive investments, which limits their growth and can prolong the skewness. If lack of access to finance prevents small firms from growing, the allocation of resources will be distorted. Capital and labor will not be able to flow to where they are most productive, and growth will suffer.

Cooley and Quadrini (2001) and Cabral and Mata (2003) present different models of firms' growth, showing that capital constraints can cause a skewness in the firm size distribution. Their prediction is verified empirically. Cabral and Mata (2003) find that the size distribution of firms is skewed toward small firms and that the skewness decreases with firm age. Many subsequent papers confirm the skewness of the firm size distribution, such as Angelini and Generale (2008), Beck, Demirgüç-Kunt and Maksimovic (2005), and Desai, Gompers, and Lerner (2003).

Desai, Gompers, and Lerner (2003) find that in countries with less developed capital markets, the firm size distribution is significantly more skewed. They also find that a better legal environment favors entry (more small firms will enter) while the growth of small firms reduces the skewness. Angelini and Generale (2008) and Beck, Demirgüç-Kunt and Maksimovic (2005) find that capital-constrained firms grow more slowly than their counterparts.

## **2.3 Growth Diagnostics Approach**

The growth diagnostics approach proposed by Hausmann, Rodrik, and Velasco (2005) (hereafter, the HRV approach) provides a theoretical framework to identify the most binding constraints on economic growth in general. This methodology recognizes that constraints on the growth of a developing economy are numerous and that previous approaches to reforms and growth are either unrealistic (as with wholesale reform that attempts to eliminate all obstacles at the same time) or wrong (by hoping to do as many reforms as possible, the current prevailing approach goes against the principle of second best).

The HRV approach is based on the theory of second best (Lipsey and Lancaster, 1956). According to this theory, if there are many distortions in the economy, fixing any one distortion would not necessarily lead to a better Pareto outcome. The HRV approach shows that if there are many distortions, whether removing one growth constraint will have a positive effect on growth depends

on the interaction effects and coefficients of the other constraints. In the face of uncertainty about these effects, Hausmann, Rodrik, and Velasco recommend a practical approach based on removing the most binding constraint, with the “most binding constraint” defined as the one with the largest effect where issues of second-best effects are likely to be minimal.

## **2.4 This Study’s Contribution to the Literature**

In this paper, based on the HRV approach, we investigate the most binding constraint on the growth of firms, with the “most binding constraint” defined as the one with the largest estimated coefficient across all models and across regions and sectors. Compared with studies using the World Business Environment Survey data set, our paper uses a much larger sample. And while other studies use subjective firm responses as measures of the business environment at the firm level, we also include objective measures, in part to deal with endogeneity and in part to avoid measurement errors of perceptions at the country level.

In exploring the relationship between the business environment and firm growth, we go beyond distinguishing effects by firm size. We look closely at the effect of financial access variables—loan, credit constraint, sales credit, and external investment finance—on firm growth by firm size and age in different sectors and regions. We combine multiple financial access variables in a single regression in addition to evaluating the effect of each variable on employment growth controlled for firm size, age, and other characteristics. This allows an understanding of the impact of each dimension of finance on firm growth as firm characteristics change.

Moreover, our paper emphasizes which element of the business environment matters most for firms, especially for small firms. And it analyzes how different financial access variables affect the firm size distribution across regions and sectors.

## **3. Data**

In this paper we use a newly available firm-level data set from the World Bank Enterprise Surveys. The surveys cover more than 100,000 firms across more than 120 economies and six regions during 2006–10. We use a sample of 39,538 firms in 98 countries for which data are complete. The unit in the sample is the establishment; one firm may have more than one establishment. For simplicity, we use the term firms throughout the paper, though the analysis is based on establishment data.

Our outcome variable of interest is employment growth, measured by the number of permanent employees. Our policy interest is in understanding the determinants that are important to the long-term business operation and employment growth of firms.<sup>2</sup> Because there are no data on temporary

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<sup>2</sup> Like other researchers, we use employment growth rather than sales growth, for several reasons. Sales growth is more volatile and is also more prone to reporting and measurement biases, especially when survey respondents are reporting sales realized three years before. Moreover, for tax reasons, firms may not choose to report actual sales.



employees collected three fiscal years before the survey fiscal year, we focus on permanent full-time employees rather than general full-time employees.

The firm growth rate is calculated as the log difference between the current number of employees and the number of employees three fiscal years before the survey fiscal year. The formula for employment growth is as follows:

$$EG_{it} = (\ln S_{it} - \ln S_{i,t-3})/3$$

where  $S_{it}$  is firm size, and  $EG_{it}$  employment growth, for firm  $i$  at time  $t$ .<sup>3</sup> The description and summary statistics for the employment growth variable are reported in table 1.

World Bank Enterprise Surveys are conducted to provide information on different aspects of the business environment and the performance of firms. The core questionnaire, which contains survey questions answered by business owners and top managers around the world, provides both subjective and objective information on the business environment that firms confront. The questionnaire includes a section asking firms to rank 15 components of the business environment, indicating which represent the biggest obstacles, and to evaluate these 15 components on a scale of 0–4 (0 being no obstacle, 1 a minor obstacle, 2 a moderate obstacle, 3 a major obstacle, and 4 a very severe obstacle). Summary statistics for the related variables are provided in table 1.

These subjective evaluations show the severity of obstacles across regions and countries. This makes it possible to identify the top obstacles and examine which obstacles firms  $t$  consider to be the most important. But because the data are subjective—reflecting entrepreneurs’ perceptions of the impact of the business environment on firm operation, with successful entrepreneurs perhaps likely to consider the business environment to be less restrictive—we need to control for firm characteristics in explaining firm growth. In addition, we need to include objective measures of business environment constraints.

The World Bank Enterprise Surveys provide a large set of objective measures of business environment constraints. In addition to subjective information on access to finance as an obstacle, the questionnaire also collects objective information on aspects of financial access, allowing us to create several variables: *Loan* is a dummy variable indicating whether a firm has a loan or line of credit from a financial institution or an overdraft facility. *Credit constraint* is a dummy variable indicating whether an establishment did not apply for loans or lines of credit for one or more of the following reasons: application procedures for loans or lines of credit are complex, interest rates are not favorable, collateral requirements are too high, the size and maturity of loans are insufficient, getting bank loans requires making informal payments, or the establishment did not think its application would be approved.<sup>4</sup> *Sales credit* is a dummy variable indicating whether the firm has positive purchase of its material inputs or services paid for after delivery (about 70 percent of firms

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<sup>3</sup>  $\ln(1+X)$  is considered approximately equal to  $\ln(X)$ . We therefore use  $\ln(1+X)$  to compute the log of the number of employees, since some firms have zero employees in a specific year but not in both years.

<sup>4</sup> No dummy variable is included for firms applying for new loans or lines of credit whose applications were rejected because this information is available for only 14 percent of firms in the sample.

in the sample have sales credit). We also include a dummy variable indicating whether a firm has a positive share of investment financed with external funds (this applies to 24 percent of firms in the sample).

The World Bank Enterprise Surveys also provide important information on firm characteristics, including size, age, sector,<sup>5</sup> export activity, and ownership as well as whether a firm is an independent, single establishment. The sample used in this paper is stratified by size, age, sector, region, and other firm characteristics. (Variable descriptions and distributions are reported in tables 1, 2 and 3.) Firms are divided into four categories by size: *micro* (1–10 permanent employees), *small* (11–50), *medium* (51–200), and *large* (more than 200). The sample includes mostly micro firms (39 percent of the total) and small firms (37 percent); only 16 percent are medium-size and 7 percent large. Firms are divided into three categories by age: *young* (1–5 years),<sup>6</sup> *mature* (6–15), and *older* (more than 15). Most are mature (47 percent) or older (41 percent); only 11 percent are young firms. Ownership is defined as being *foreign* or *government* if “10 percent or more” of the firm is foreign or government owned; 12 percent of the firms in the sample are foreign owned and only 2 percent are government owned. *Exporter* is a dummy variable indicating that direct exports account for 10 percent or more of a firm’s sales; 13 percent of the sample firms are exporters.

Whether a firm has a single establishment or multiple ones matters for firm growth, especially in the manufacturing sector (see Dunne, Roberts, and Samuelson 1989). We therefore include a dummy variable indicating whether a firm is an independent, single establishment. Most of the firms in the sample are single establishments (85 percent), while 14 percent are part of multi-establishment entities. Finally, we divide the firms into three sectors: *manufacturing* (55 percent), *sales* (23 percent are in the retail and wholesale sector), and other *services* (20 percent). The sample includes firms from six regions: 31 percent from Sub-Saharan Africa, 28 percent from Latin America and the Caribbean, 27 percent from Europe and Central Asia, 11 percent from East Asia and Pacific, and only 3 percent from the Middle East and North Africa and South Asia.<sup>7</sup>

Table 1 provides an overview of firm growth by firm characteristics and by region. Young, small firms experience rapid growth in their labor force. The mean growth rate for micro firms is twice that for small firms and three times that for medium-size firms. There appears to be little growth in employment for large firms on average. The mean growth rate for young firms is nearly twice that for mature firms and more than three times that for older firms. On average, there is little difference in growth rate between single, independent establishments and those that are part of multi-establishment entities or between the manufacturing, sales, and services sectors. Firms in Africa and Latin America grow faster than those in Europe and Central Asia and East Asia and Pacific.

#### 4. The Most Binding Constraint of the Business Environment

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<sup>5</sup> The questionnaire provides information on industry, and we use this information to establish the sector variable.

<sup>6</sup> Firms operating for less than one year are classified as young firms.

<sup>7</sup> Because of space limitations, abbreviations are sometimes used for the regions in tables: AFR for Sub-Saharan Africa, LAC for Latin America and the Caribbean, ECA for Europe and Central Asia, and EAP for East Asia and Pacific.

Having the managers of firms rate constraints on the firms' operation and growth is a useful start for identifying important obstacles in the business environment. We analyze these obstacles not only by using econometric tools but also by examining the importance of these obstacles across regions and sectors.

#### **4.1 Understanding Obstacles to Firms' Operation**

In the World Bank Enterprise Survey, as noted, firms rate 15 obstacles in their business environment. These are access to finance, practices of competitors in the informal sector, electricity, corruption, crime, inadequately educated workforce, labor regulations, business licensing and permits, political instability, tax administration, tax rates, transport, customs and trade regulations, courts, and access to land.

A review of firm responses shows that the biggest reported obstacles differ across regions and countries (see appendix). Using model 2 (as explained in greater detail in the next section), we find that different sectors also confront different obstacles. For example, in the manufacturing sector access to finance, informal sector competition, tax rates, and labor regulations matter the most, while in the sales and services sectors only access to finance and informal sector competition are negatively and significantly correlated with firm growth (see table 6). Estimation results for the same model show that each country faces its own set of significant obstacles.<sup>8</sup> So does each region (see table 5).

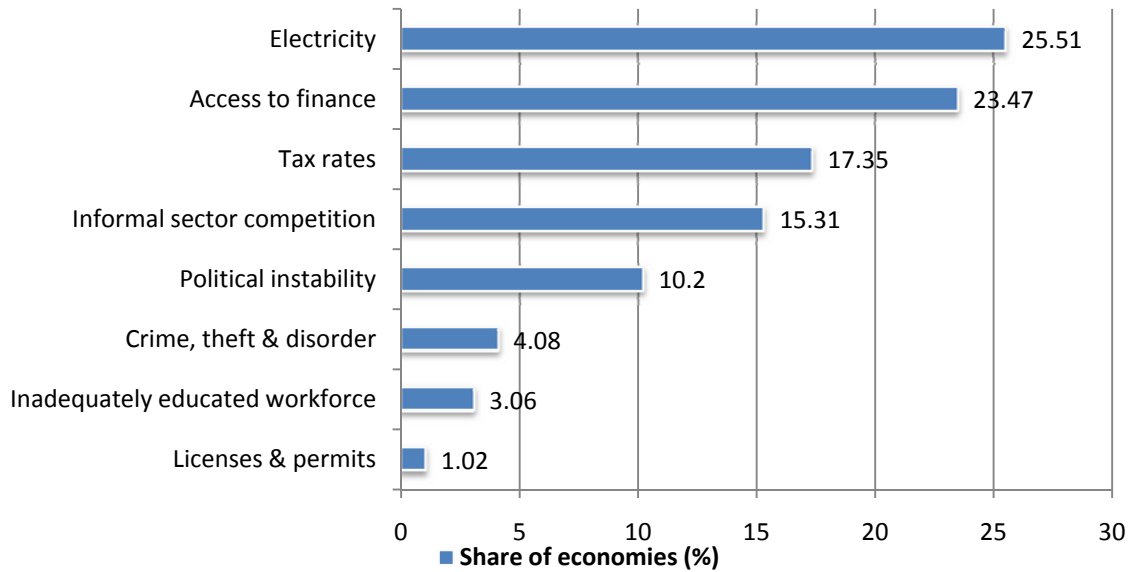
Many of these obstacles are linked directly or indirectly to poor firm performance. In an ideal world a country would address all these problems in order to improve firm performance. But governments in developing countries have limited financial and human resources and, as argued by the growth diagnostics approach, should therefore prioritize reform efforts to remove the most important constraints.

The top three obstacles to firms' operation emerging from the survey data for our sample are electricity, access to finance, and tax rates (figure 1). But we do not know whether these are the top obstacles to employment growth. We therefore need to analyze which obstacles have a significant effect on employment growth.

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<sup>8</sup> The estimation results are available upon request.

**Figure 1. Distribution of the Top Obstacle Cited by Enterprises, All Economies**



Source: World Bank Enterprise Surveys (2006–10).

#### 4.2 Identifying the Most Binding Constraint on Firms' Growth

With figure 1 as a starting point, we set up an econometric model to investigate which of the 15 constraints is the most binding. We define a constraint as the most binding if it is statistically significant, has a large coefficient in all estimations (models), and has the right sign—that is, has a negative effect on employment growth. We design three models:

*Model 1:*

$$EG = b_0 + b_1 \text{Individual Obstacle} + b_2 \text{Firm Characteristics} + \text{Country Fixed Effects} + e_1 \quad (1)$$

*Model 2:*

$$EG = b_0 + b_1 \text{All 15 Obstacles} + b_2 \text{Firm Characteristics} + \text{Country Fixed Effects} + e_2 \quad (2)$$

*Model 3:*

$$EG = b_0 + b_1 \text{Only Significant Obstacle (in Model 2)} + b_2 \text{Firm Characteristics} + \text{Country Fixed Effects} + e_3 \quad (3)$$

where  $EG$  refers to the employment growth of firm  $i$  at time  $t$ ; *Individual Obstacle* is each obstacle among the 15 shown in the last 15 rows of table 1; *Firm Characteristics* include labor size (the number

of permanent employees at the beginning of period  $t-3$ ), labor size squared, age, age squared, and indicators of whether a firm is part of a multi-establishment entity (multi), is in manufacturing (manuf), is an exporter, is foreign owned (foreign), and is government owned (govt).

The results suggest that access to finance and competition from the informal sector are the most binding constraints, with statistically significant effects in all models. Columns 1–15 in table 4, presenting the estimation results for model 1 for each obstacle, show that only access to finance and competition from the informal sector have a significant negative effect on employment growth. Column 16 shows the estimation results for model 2, run for all 15 obstacles together, and column 17 presents the results for model 3, which includes all significant obstacles. Once again we find that access to finance and competition from the informal sector are the most binding constraints. We also examine the significance of the effect of these obstacles on firm growth across regions and sectors to check the robustness of the findings. Tables 5 and 6 confirm that access to finance and competition from the informal sector matter the most after controlling for firm characteristics.

Our results demonstrate that both econometrically and economically access to finance and competition from the informal sector matter the most for firms' employment growth—findings that are in line with the starting point of the rankings of reported obstacles shown in the appendix. While statistically both constraints are equally binding, the meaning of the second constraint is ambiguous. The survey asks firms whether they see competition from the informal sector as an obstacle. To any individual firm, competition poses a threat to survival. Yet at the level of the economy it is competition that drives firms to improve productivity and therefore drives growth. So it is not clear to us that competition from the informal sector should be considered an obstacle to firms' operation. The finding that competition from the informal sector is the second most important binding constraint may indicate that the formal firms covered by the survey are not the appropriate firm organization form in developing countries. Moreover, this survey question is not followed by other questions on related aspects of competition, allowing too little information to assess the importance of informal sector competition. Therefore we do not further address this issue in the paper.

While perception-based indicators like those applied in the analysis discussed here are useful, quantitative indicators may give a more accurate picture of the business environment. Firm managers within a country may have different perceptions of the same obstacle, and firm managers in different countries and regions have different frames of reference. A problem perceived as a moderate obstacle by one firm may be perceived as a severe obstacle by another, even though the problem imposes a smaller cost on the second firm.

In the next three sections we use objective measures to examine the importance of access to finance. As discussed, we cannot analyze informal sector competition because of its ambiguity and because the data do not provide sufficient information. We leave further analysis of this constraint with objective measures for future work, when the data are available.

## 5. Impact of Financial Access Variables on Employment Growth

In this section we examine the effect of financial access variables on firm employment growth, controlling for individual firm characteristics. The model is set up with the following specification:

$$EG = b_0 + b_1 \text{Laborsize} + b_2 \text{Age} + b_3 \text{Multi} + b_4 \text{Manuf} + b_5 \text{Exporter} + b_6 \text{Foreign} + b_7 \text{Govt} + b_8 \text{FC}(s) + \text{Country Fixed Effects} + e \quad (4)$$

where  $EG$  refers to the employment growth of firm  $i$  at time  $t$  (the growth in the number of permanent employees between  $t-3$  and  $t$ ) and  $FC$  denotes each of the financial access variables—loan, credit constraint, sales credit, and external finance.

Our specification accounts for heteroskedasticity and country fixed effects. All outliers have been removed. We also emphasize the importance of ownership structure by varying the type of establishment: single or multiple, foreign or government owned, exporter or nonexporter. The negative relationship between firm growth and firm size shown in table 7—along with the supportive evidence in table 1 showing that smaller firms grow faster than larger firms—suggests that Gibrat’s law does not hold in this sample of firms. This finding is true across regions and sectors. The negative and statistically significant coefficient on firm age tells us that there is an inverse relationship between firm growth and firm age, which is consistent with Jovanovic’s model (1982) of disproportionate growth.

With other firm characteristics held constant, the rate of growth is significantly lower for independent, single-establishment firms and government-owned firms. Exporters and foreign-owned firms tend to have greater employment growth. In Africa and East Asia firms in the manufacturing sector have higher employment growth than firms in the sales and services sectors.

On average, a 1 percent increase in beginning-of-period firm size is associated with a 0.93 percent increase in end-of-period size (after three years) when the beginning-of-period age is held constant (based on the results in table 7, column 1). Based on the analysis across regions, we get estimated elasticities of end-of-period size with respect to beginning-of-period size of approximately 0.9 for Africa, East Asia and Pacific, Europe and Central Asia, and Latin America and the Caribbean (table 7, columns 6–9). With beginning-of-period size held constant, a 1 percent increase in beginning-of-period firm age is associated with a 0.07 percent decrease in end-of-period size (table 7, column 1).

The results in table 7 show that financial access variables have a significant effect on firm growth. Columns 1–4 indicate that with other factors held constant, having a loan or overdraft facility increases the growth in a firm’s number of permanent employees by 3.1 percent; being credit constrained reduces a firm’s employment growth by 1.9 percent; having sales credit increases firm’s growth by 2.6 percent; and having external investment funds increases growth by 4.2 percent. If we include all these significant financial access variables in one model after controlling for firm characteristics, they still have significant effects on employment growth, though the effects are of smaller magnitude. And if we use the same model and run the regressions in different regions, the

significance and signs of the effects remain the same across regions. These strong results show that access to finance does indeed matter for firm growth.

## 6. Determinants of Financial Access

In this section we estimate the probability of a firm having access to finance based on its characteristics. We use the following model:

$$FC = b_0 + b_1\text{Small} + b_2\text{Medium} + b_3\text{Large} + b_4\text{Mature} + b_5\text{Older} + b_6\text{Multi} + b_7\text{Manuf} + b_8\text{Exporter} + b_9\text{Foreign} + b_{10}\text{Govt} + e \quad (5)$$

where  $FC$  denotes each of the financial access variables—loan, credit constraint, sales credit, and external finance.

We estimate this model by probit. We focus on firms of different sizes (micro, small, medium-size, and large, with micro as the base category that is omitted from the regression) and different ages (young, mature, and older, with young as the base category that is omitted from the regression). The results show that a firm's size, age, and status as an exporter are strong determinants of its access to finance (table 8).

There is a bigger difference in access to finance between micro and large firms than between small and large firms. With the analysis controlling for firm characteristics and using country fixed effects, micro firms are more likely to be credit constrained. With other factors held constant, large firms are 85 percent less likely to be credit constrained than micro firms. In addition, large firms are 97 percent more likely to have a loan or overdraft facility and 75 percent more likely to have a share of investment financed externally than micro firms. Medium-size and large firms are about 32 and 43 percent more likely to have sales credit than micro firms, while small firms are about 19 percent more likely to offer sales credit than micro firms.

Older firms are 29 percent more likely to have a loan, 8 percent more likely to have sales credit, and 20 percent less likely to be credit constrained than young firms. Mature firms are only 6 percent less likely to be credit constrained and about 10 percent more likely to have a loan than young firms, with other factors held constant.

Other interesting results also emerge. Firms in the manufacturing sector are 20 percent more likely to be credit constrained. With other factors held constant, firms that are exporters are 41 percent more likely to have a loan, 26 percent less likely to be credit constrained, and 20 percent more likely to have external finance for investment than non-exporters.

## 7. Effect of Financial Access on Employment Growth by Firm Size and Age

In this section we investigate the effect of financial access on employment growth by firm size and firm age first for each of the financial access variables individually and then for all the variables combined.

### 7.1 Effect of Individual Financial Access Variables

To examine the effect of the financial access variables individually, we use the following model:

$$EG = b_0 + b_1FC + b_2\text{Small} * FC + b_3\text{Medium} * FC + b_4\text{Large} * FC + b_5\text{Mature} * FC + b_6\text{Older} * FC + b_7\text{Multi} + b_8\text{Manuf} + b_9\text{Exporter} + b_{10}\text{Foreign} + b_{11}\text{Govt} + \text{Country Fixed Effects} + e \quad (6)$$

where  $EG$  refers to the employment growth of firm  $i$  at time  $t$  (the growth in the number of permanent employees between  $t-3$  and  $t$ ) and  $FC$  denotes each of the financial access variables—loan, credit constraint, sales credit, and external finance.

Table 9 shows the effect of each of the financial access variables—loan, credit constraint, sales credit, and external finance—in turn on employment growth. Micro firms are again the base category that is omitted from the regression.

Among size categories, micro firms appear to benefit the most from having access to finance. Column 1 shows that having a loan increases employment growth by 9 percent in micro firms, but by only 4 percent in medium-size firms and 2 percent in large firms, with other factors held constant. The results in columns 3 and 4 tell the same story. Micro and small firms gain the most from finance in forms ranging from simple to more sophisticated—from having a loan or overdraft facility to sales credit to external finance for investment. Column 2 supports the argument that micro and small firms benefit the most from having access to finance. Being credit constrained will make larger firms suffer more than smaller firms.

Young firms expand more than older firms with access to the same forms of finance. Having a loan or overdraft facility increases employment growth by 9 percent for young firms, but by 6 percent for mature firms and 3 percent for older firms, with other factors held constant. Similarly, having sales credit or external finance increases growth more for young firms than for mature and older firms. Being credit constrained reduces firm growth as firms age. This finding emphasizes the importance of firm age to firm growth. The effect of being credit constrained also varies by sector, appearing to be stronger in manufacturing than in the sales or services sector.

We also look at the effect of financial access on employment growth across regions. The estimation results by region are presented in table 10 for each financial access variable at a time. The finding that having a loan, sales credit, or a share of investment financed externally helps micro firms the most still holds. Indeed, this finding holds for all regions. The finding that young firms expand more than older firms with access to the same forms of finance also holds across regions.



## 7.2 Effect of Combined Financial Access Variables

In this section we look at the effect of all four financial access variables combined on employment growth, by firm size, age, sector, and region. We use the following model:

$$EG = b_0 + b_1\text{Small} + b_2\text{Medium} + b_3\text{Large} + b_4\text{Mature} + b_5\text{Older} + b_6\text{Multi} + b_7\text{Manuf} + b_8\text{Exporter} + b_9\text{Foreign} + b_{10}\text{Govt} + b_{11}\text{Loan} + b_{12}\text{Credit Constraint} + b_{13}\text{Sales Credit} + b_{14}\text{External Finance} + \text{Country Fixed Effects} + e \quad (7)$$

where  $EG$  refers to the employment growth of firm  $i$  at time  $t$  (the growth in the number of permanent employees between  $t-3$  and  $t$ ).

Table 11 shows the estimation results for equation 7. The effects of all the financial access variables are statistically significant and have the right signs. The results in column 1 indicate that firm growth slows both as a firm expands its labor force and as it ages, controlling for other firm characteristics. Columns 2–5 suggest that having a loan and having external finance are important for firms of all sizes, though the effects are largest for small firms. The effects for medium-size and large firms are similar in size. The effect of being credit constrained increases with firm size.

Columns 6–8 show that having a loan is very important for firms of all ages, with the largest effect on young firms. Being credit constrained has the largest effect on medium-size firms followed by large firms. The effects of having external finance are statistically significant for firms of all ages. In other words, trust and external finance matter to firms, regardless of their age.

Columns 9–11 show that most forms of financial access are important to firms, no matter their sector. Having a loan has the largest effect on employment growth for firms in the manufacturing sector. Being credit constrained has a negative effect on firms in all sectors, with the largest effect in the manufacturing and sales sectors. Having external finance matters in all sectors, and the effects are of similar magnitude.

Columns 12–15 present the estimation results across regions. Having a loan and external finance matters to firms in different regions, with the largest effects in Latin America. Being credit constrained has a significant effect on firm employment growth only in Europe and Central Asia and Latin America. From these results, together with the results in tables 7–10, we find that the interaction between financial access variables and firms' size or age is significant in explaining firms' employment growth.

## 8. Firm Size Distribution

Because a firm's size plays a significant part in determining its employment growth, we further assess the relationship between firm size and financial constraints. The survey data allow the creation of a variable showing which firms are credit constrained, which we identify as those that applied for a

loan and were rejected or that were discouraged from applying for a loan.<sup>9</sup> The data also include extensive information on the sources of firms' investments in fixed assets. These sources can be external (formal or informal) or internal.<sup>10</sup>

Confirming the findings of Cabral and Mata (2003), figure 2 shows that the firm size distribution is skewed to the right and that the skewness tends to diminish with age. The size distribution of older firms is more symmetric than that of young firms.

As shown in figure 3, the firm size distribution is skewed more to the right in the manufacturing and services sectors, where micro and small firms make up about two-thirds of the sample. Figure 4 suggests that Africa has the largest share of micro and small firms while other regions have more medium-size and large firms. This again provides evidence of the “missing middle” in Africa.

Using the indicator of credit constrained created for this analysis, we split the sample into two groups, credit-constrained and non-credit-constrained firms. As figure 5 shows, the firm size distribution is skewed to the right for credit-constrained firms. This result is in line with the finding that being credit constrained has a negative effect on firm growth—and, especially, that this effect is largest for small firms. Taking this analysis further, we investigate the firm size distribution using the survey data on firms' perceptions of access to finance, splitting the sample between those perceiving it as a major or very severe obstacle and those viewing it as a minor obstacle or no obstacle. Figure 6 shows that the size distribution of firms perceiving access to finance as a major or very severe obstacle is skewed to the right. This result is confirmed by the data for our sample showing that most of the firms regarding access to finance as a major or very severe obstacle are micro or small. The size distribution for firms perceiving access to finance as a minor obstacle or no obstacle is more symmetric.

The findings in this and previous sections suggest that a low level of financial development results in a skewed firm size distribution, with a larger relative share of small firms. Policies favoring the development of the financial sector should therefore have an effect on the firm size distribution and, ultimately, favor the adoption of different technologies and an improved allocation of resources if the industry in question is in line with the country's comparative advantages (Lin, 2010).

## 9. Conclusion

Using a newly available data set from the World Bank Enterprise Surveys (2006–10) for 39,538 firms across 98 countries, we investigate the binding constraints on firms' employment growth. With an econometric model and subjective measures, we find that access to finance and informal sector competition are the most binding constraints—both globally and in each region. Using objective

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<sup>9</sup> Our measure of credit-constrained firms comprises those that applied for a loan and were rejected and those that did not apply for one or more of the following reasons: fear of rejection, collateral requirements too high, interest rates not favorable, or a belief that the application would not be approved.

<sup>10</sup> Formal sources are private or public banks, nonbank financial institutions, issues of new debt, and suppliers' credit. Informal sources are friends and moneylenders. Internal sources consist of issuances of new shares and own funds.

measures and controlling for firm characteristics, we evaluate the importance of access to finance for firms' employment growth. We find that access to different forms of finance matters. These results from our cross-country firm-level analysis suggest that governments seeking to improve the business environment and promote firm growth should make financial sector reforms a priority.

Objective business conditions vary systematically across firms of different sizes and ages, and good business conditions favor smaller firms, especially micro firms. Micro and small firms gain the most from access to finance in forms ranging from simple to more sophisticated—from a loan or overdraft facility to sales credit to external finance for investment. This finding holds not only globally but also for different regions. While sales credit is important only for micro and small firms, having a loan or overdraft facility and receiving external finance for investment promote employment growth for firms of all sizes across regions. And sales credit and external finance matter for firms of all ages.

The firm size distribution is skewed toward smaller firms. The skewness declines with firm age—and is more present in Africa, among firms that are credit constrained, and among those that perceive access to finance as a serious obstacle. These findings call for policies favoring the development of the financial sector, which can help small firms grow into medium-size and large firms.

The findings have several implications for developing countries. First, because the constraints faced by firms differ across countries and, within countries, across sectors, policies to promote firm growth need to be tailored to each country and sector. Second, finance appears to be the most binding constraint across sectors and countries, suggesting that reforms in this sector could yield broad benefits—including by helping to address the problem of the “missing middle” in developing countries. Third, while access to finance is a binding constraint on firms' growth in all developing countries, the fact that industrial development in some countries took off faster and sooner than others indicate that there are other constraints that are not captured by the Enterprise Survey. Finally, reforms in finance take time, and a quicker development strategy could be to identify the binding constraints in a specific subsector and try to address them through direct policy measures.

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**Table 1. Variable Descriptions and Summary Statistics**

Variable	Description	Mean	SD
Employment growth	Employment growth $[(\ln S_{it} - \ln S_{i,t-3})/3]$	0.052	0.127
Laborsize	Number of permanent employees $[\ln S_{i,t-3}]$	3.112	1.350
Age	Years of firm's operation	2.602	0.741
Multi	Equal to 1 if firm is independent, single establishment; 0 otherwise	0.138	0.345
Manuf	Equal to 1 if firm is in manufacturing or construction sector; 0 otherwise	0.555	0.497
Exporter	Equal to 1 if direct exports account for more than 10 percent of firm's sales; 0 otherwise?	0.130	0.336
Foreign	Equal to 1 if firm has 10 percent or more of foreign ownership; 0 otherwise	0.117	0.321
Govt	Equal to 1 if firm has 10 percent or more of government ownership; 0 otherwise	0.017	0.129
Loan	Equal to 1 if firm has loan, line of credit, or overdraft facility; 0 otherwise	0.573	0.495
Credit constraint	Equal to 1 if firm did not apply for loan for some reason; 0 otherwise	0.334	0.472
Sales credit	Equal to 1 if firm has positive sales paid for after delivery; 0 otherwise	0.702	0.458
External finance	Equal to 1 if firm has a positive amount of external funds; 0 otherwise	0.237	0.425
Access to finance	How much of an obstacle to firm's operation is access to finance?	1.725	1.564
Informal competition	How much of an obstacle to firm's operation are informal sector competitors?	1.627	1.453
Labor regulations	How much of an obstacle to firm's operation are labor regulations?	0.958	1.181
Inadequate education	How much of an obstacle to firm's operation is an inadequately educated workforce?	1.408	1.353
Electricity	How much of an obstacle to firm's operation is electricity?	1.843	1.526
Transport	How much of an obstacle to firm's operation is transport of goods, supplies, and inputs?	1.224	1.310
Customs and trade	How much of an obstacle to firm's operation are customs and trade regulations?	0.954	1.242
Access to land	How much of an obstacle to firm's operation is access to land?	1.031	1.334
Courts	How much of an obstacle to firm's operation are courts?	1.025	1.280
Crime	How much of an obstacle to firm's operation are crime, theft, and disorder?	1.423	1.382
Tax rates	How much of an obstacle to firm's operation are tax rates?	1.828	1.374
Tax administration	How much of an obstacle to firm's operation is tax administration?	1.439	1.319
Licensing and permits	How much of an obstacle to firm's operation are business licensing and permits?	1.095	1.238
Political instability	How much of an obstacle to firm's operation is political instability?	1.615	1.504
Corruption	How much of an obstacle to firm's operation is corruption?	1.780	1.530

Source: World Bank Enterprise Surveys (2006-10).

**Table 2. Firm Characteristics by Different Groups of Controls**

Characteristic	Frequency	Percent	Cumulative percent
<i>By size</i>			
Micro	15,357	38.84	38.84
Small	14,791	37.41	76.25
Medium	6,499	16.44	92.69
Large	2,845	7.2	99.88
Unknown	46	0.12	100
<i>By age</i>			
Young	4,440	11.23	11.23
Mature	18,551	46.92	58.15
Older	16,146	40.84	98.99
Unknown	401	1.01	100
<i>By establishment number</i>			
Multi-establishment	5,397	13.65	13.65
Single establishment	33,729	85.31	98.96
Unknown	412	1.04	100
<i>By sector</i>			
Manufacturing	21,783	55.09	55.09
Sales	8,901	22.51	77.6
Services	7,845	19.84	97.44
Unknown	1,009	2.55	100
<i>By trade orientation</i>			
Nonexporter	34,405	87.02	87.02
Exporter	5,133	12.98	100
<i>By foreign ownership</i>			
Domestically owned	34,587	87.48	87.48
Foreign owned	4,579	11.58	99.06
Unknown	372	0.94	100
<i>By government ownership</i>			
Government owned	37,858	95.75	95.75
Privately owned	649	1.64	97.39
Unknown	1,031	2.61	100
Total establishments	39,538		

Source: World Bank Enterprise Surveys (2006-10).



**Table 3. Employment Growth by Firm Characteristic and by Region**

<b>Characteristic or region</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>
<i>By size (number of employees)</i>			
Micro (1-10)	0.086	-0.536	0.866
Small (11-50)	0.035	-0.732	0.844
Medium (51-200)	0.025	-0.638	0.594
Large (201+)	0.007	-0.562	0.753
Unknown	0.606	0.231	0.880
<i>By age (years of operation)</i>			
Young (1-5)	0.100	-0.732	0.880
Mature (6-15)	0.061	-0.623	0.807
Older (16+)	0.029	-0.584	0.866
Unknown	0.022	-0.458	0.448
<i>By establishment number</i>			
Multi-establishment	0.051	-0.732	0.880
Single establishment	0.055	-0.452	0.866
<i>By sector</i>			
Manufacturing	0.049	-0.638	0.880
Sales	0.057	-0.525	0.855
Services	0.054	-0.732	0.799
<i>By region</i>			
Sub-Saharan Africa	0.066	-0.732	0.813
East Asia & Pacific	0.025	-0.638	0.880
Europe & Central Asia	0.043	-0.547	0.799
Latin America & Caribbean	0.056	-0.510	0.697
Middle East & North Africa	0.043	-0.384	0.462
South Asia	0.076	-0.623	0.866

Source: World Bank Enterprise Surveys (2006-10).

**Table 4. Effect of Business Environment Obstacles on Employment Growth**

Variable	Dependent variable: employment growth																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Access to finance	-0.002*** (0.000)																-0.004*** (0.001)	-0.002*** (0.000)
Informal sector competition		-0.003*** (0.000)															-0.003*** (0.001)	-0.003*** (0.001)
Inadequate education			0.005*** (0.001)														0.007*** (0.001)	0.007*** (0.001)
Electricity				0.002*** (0.000)													0.001* (0.001)	
Customs and trade					0.005*** (0.001)												0.005*** (0.001)	
Access to land						0.003*** (0.001)											0.003*** (0.001)	
Political instability							-0.001 (0.001)										-0.002** (0.001)	
Courts								-0.000 (0.001)									-0.001 (0.001)	
Crime									0.001** (0.001)								0.000 (0.001)	
Tax rates										-0.001* (0.001)							-0.001* (0.001)	
Tax administration											-0.000 (0.001)						-0.000 (0.001)	
Licensing and permits												0.001 (0.001)					0.001 (0.001)	
Corruption													-0.000 (0.000)				-0.001* (0.001)	
Transport														0.002*** (0.001)			0.000 (0.001)	
Labor regulations																0.002*** (0.001)	-0.001 (0.001)	
Adjusted R-squared	0.123	0.122	0.124	0.121	0.125	0.122	0.121	0.117	0.121	0.122	0.122	0.122	0.122	0.121	0.121	0.130	0.127	
Number of observations	35,837	35,466	36,216	36,554	32,967	35,399	35,814	32,794	36,278	36,287	36,154	35,350	35,435	36,222	36,297	26,574	34,359	
Number of countries	96	96	96	96	96	96	96	95	96	96	96	96	96	96	96	95	96	

Note: Standard errors (in parentheses) are robust to heteroskedasticity and clustered on countries. Model 1 (col. 1-15):  $EG = b_0 + b_1 \text{Individual Obstacle} + b_2 \text{Firm Characteristics} + \text{Country Fixed Effects} + e_1$ .

Model 2 (col. 16):  $EG = b_0 + b_1 \text{All 15 Obstacles} + b_2 \text{Firm Characteristics} + \text{Country Fixed Effects} + e_2$ . The hypothesis that the coefficients for access to finance and informal sector competition differ is tested and rejected.

\* Significant at the 10 percent level. \*\* Significant at the 5 percent level. \*\*\* Significant at the 1 percent level.

Source: Authors' estimations based on data from World Bank Enterprise Surveys (2006-10).

**Table 5. Effect of Business Environment Obstacles on Employment Growth by Region**

Variable	Dependent variable: employment growth				
	World (1)	AFR (2)	EAP (3)	ECA (4)	LAC (5)
Laborsize	-0.022*** (0.001)	-0.026*** (0.001)	-0.029*** (0.002)	-0.018*** (0.001)	-0.019*** (0.001)
Age	-0.023*** (0.001)	-0.021*** (0.002)	-0.019*** (0.004)	-0.031*** (0.003)	-0.024*** (0.002)
Multi	0.018*** (0.002)	0.012*** (0.003)	0.010 (0.007)	0.020*** (0.006)	0.022*** (0.004)
Manuf	0.003 (0.002)	0.012*** (0.003)	0.012** (0.006)	-0.009** (0.004)	0.005 (0.003)
Exporter	0.020*** (0.002)	0.020*** (0.004)	0.018** (0.007)	0.020*** (0.004)	0.025*** (0.004)
Foreign	0.011*** (0.002)	0.008** (0.003)	0.009 (0.006)	0.021*** (0.006)	0.011** (0.005)
Govt	-0.017*** (0.005)	-0.013 (0.011)	0.017 (0.012)	-0.022*** (0.008)	-0.020 (0.017)
Access to finance	-0.004*** (0.001)	-0.002* (0.001)	-0.008*** (0.002)	-0.004*** (0.001)	-0.005*** (0.001)
Informal sector competition	-0.003*** (0.001)	-0.003*** (0.001)	-0.008*** (0.002)	-0.002* (0.001)	-0.003*** (0.001)
Inadequate education	0.007*** (0.001)	0.005*** (0.001)	0.008*** (0.002)	0.006*** (0.001)	0.010*** (0.001)
Electricity	0.001* (0.001)	-0.001 (0.001)	0.004** (0.002)	0.001 (0.001)	0.002** (0.001)
Customs and trade	0.005*** (0.001)	0.004*** (0.001)	0.006** (0.003)	0.006*** (0.002)	0.003* (0.001)
Access to land	0.003*** (0.001)	-0.000 (0.001)	0.004* (0.002)	0.004*** (0.001)	0.005*** (0.001)
Political instability	-0.002** (0.001)	-0.001 (0.001)	-0.002 (0.003)	-0.001 (0.001)	-0.003** (0.002)
Courts	-0.001 (0.001)	-0.001 (0.001)	0.001 (0.003)	-0.004** (0.002)	0.000 (0.001)
Crime	0.000 (0.001)	0.001 (0.001)	0.002 (0.003)	-0.000 (0.001)	-0.001 (0.001)
Tax rates	-0.001* (0.001)	-0.002 (0.001)	-0.000 (0.003)	-0.000 (0.002)	-0.002 (0.002)
Tax administration	-0.000 (0.001)	0.002* (0.001)	-0.002 (0.003)	-0.002 (0.002)	-0.002 (0.002)
Licensing and permits	0.001 (0.001)	-0.001 (0.001)	0.003 (0.003)	0.002 (0.002)	0.002 (0.002)
Corruption	-0.001* (0.001)	-0.001 (0.001)	-0.002 (0.003)	0.000 (0.002)	-0.002 (0.001)
Transport	0.000 (0.001)	-0.002 (0.001)	0.002 (0.002)	0.001 (0.001)	0.001 (0.001)
Labor regulations	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.003)	-0.002 (0.002)	-0.001 (0.002)
Constant	0.176*** (0.004)	0.182*** (0.006)	0.156*** (0.011)	0.184*** (0.008)	0.174*** (0.008)
Adjusted R-squared	0.130	0.129	0.148	0.130	0.112
Number of observations	26,574	8,600	3,079	6,596	7,592
Number of countries	95	37	10	30	15

Note: Standard errors (in parentheses) are robust to heteroskedasticity and clustered on countries. Regressions for the Middle East and North Africa and South Asia are excluded because of insufficient data.

Model:  $EG = b_0 + b_1 \text{All 15 Obstacles} + b_2 \text{Firm Characteristics} + \text{Region} + \text{Country Fixed Effects} + e$ .

\* Significant at the 10 percent level. \*\* Significant at the 5 percent level. \*\*\* Significant at the 1 percent level.

Source: Authors' estimations based on World Bank Enterprise Surveys (2006-10).

**Table 6. Effect of Business Environment Obstacles on Employment Growth by Sector**

Variable	Dependent variable: employment growth		
	Manufacturing	Sales	Services
	(1)	(2)	(3)
Laborsize	-0.026*** (0.001)	-0.014*** (0.002)	-0.021*** (0.002)
Age	-0.024*** (0.002)	-0.025*** (0.002)	-0.018*** (0.003)
Multi	0.022*** (0.003)	0.014*** (0.004)	0.014*** (0.005)
Exporter	0.026*** (0.003)	0.017** (0.007)	0.010 (0.007)
Foreign	0.011*** (0.003)	0.009* (0.005)	0.012** (0.005)
Govt	-0.009 (0.007)	-0.036** (0.015)	-0.020* (0.011)
Access to finance	-0.004*** (0.001)	-0.002* (0.001)	-0.004*** (0.002)
Informal sector competition	-0.004*** (0.001)	-0.002* (0.001)	-0.004*** (0.001)
Inadequate education	0.008*** (0.001)	0.007*** (0.001)	0.003** (0.002)
Electricity	0.002*** (0.001)	0.001 (0.001)	-0.002 (0.001)
Customs and trade	0.004*** (0.001)	0.006*** (0.001)	0.007*** (0.002)
Access to land	0.003*** (0.001)	0.003*** (0.001)	0.001 (0.002)
Political instability	-0.002 (0.001)	-0.001 (0.001)	-0.002 (0.002)
Courts	-0.001 (0.001)	-0.001 (0.002)	-0.002 (0.002)
Crime	0.001 (0.001)	-0.001 (0.001)	0.001 (0.002)
Tax rates	-0.002** (0.001)	0.001 (0.002)	-0.001 (0.002)
Tax administration	0.001 (0.001)	-0.002 (0.002)	-0.001 (0.002)
Licensing and permits	0.000 (0.001)	0.000 (0.002)	0.002 (0.002)
Corruption	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.002)
Transport	0.000 (0.001)	0.001 (0.001)	-0.001 (0.002)
Labor regulations	-0.002* (0.001)	-0.003 (0.002)	0.004** (0.002)
Constant	0.191*** (0.005)	0.151*** (0.007)	0.167*** (0.009)
Adjusted R-squared	0.146	0.118	0.114
Number of observations	15,322	6,014	5,237
Number of countries	95	95	95

Note: Standard errors (in parentheses) are robust to heteroskedasticity and clustered on countries.

Model:  $EG = b_0 + b_1 \text{All 15 Obstacles} + b_2 \text{Firm Characteristics} + \text{Region} + \text{Country Fixed Effects} + e$ . \*

Significant at the 10 percent level. \*\* Significant at the 5 percent level. \*\*\* Significant at the 1 percent level.

Source: Authors' estimations based on data from World Bank Enterprise Surveys (2006-10).

**Table 7. Effect of Objective Financial Access Variables on Employment Growth**

Dependent variable: employment growth									
Variable	(1) World	(2) World	(3) World	(4) World	(5) World	(6) AFR	(7) EAP	(8) ECA	(9) LAC
Laborsize	-0.024*** (0.001)	-0.023*** (0.001)	-0.022*** (0.001)	-0.024*** (0.001)	-0.026*** (0.001)	-0.029*** (0.001)	-0.032*** (0.002)	-0.022*** (0.001)	-0.023*** (0.001)
Age	-0.024*** (0.001)	-0.023*** (0.001)	-0.023*** (0.001)	-0.022*** (0.001)	-0.023*** (0.001)	-0.020*** (0.002)	-0.018*** (0.003)	-0.030*** (0.002)	-0.023*** (0.002)
Multi	0.019*** (0.002)	0.018*** (0.002)	0.019*** (0.002)	0.019*** (0.002)	0.019*** (0.002)	0.013*** (0.003)	0.017*** (0.006)	0.020*** (0.005)	0.022*** (0.004)
Manuf	0.0003 (0.001)	0.001 (0.001)	-0.000 (0.001)	-0.001 (0.001)	-0.000 (0.001)	0.010*** (0.002)	0.010** (0.005)	-0.010*** (0.003)	-0.002 (0.003)
Exporter	0.022*** (0.002)	0.024*** (0.002)	0.024*** (0.002)	0.023*** (0.002)	0.021*** (0.002)	0.022*** (0.004)	0.023*** (0.007)	0.015*** (0.004)	0.028*** (0.004)
Foreign	0.013*** (0.002)	0.012*** (0.002)	0.013*** (0.002)	0.014*** (0.002)	0.014*** (0.002)	0.008** (0.003)	0.019*** (0.006)	0.020*** (0.005)	0.016*** (0.005)
Govt	-0.009** (0.005)	-0.011** (0.005)	-0.011** (0.005)	-0.010** (0.005)	-0.008* (0.005)	-0.008 (0.010)	0.024** (0.011)	-0.015** (0.007)	-0.016 (0.020)
Loan	0.031*** (0.002)				0.020*** (0.002)	0.014*** (0.003)	0.018*** (0.004)	0.023*** (0.003)	0.026*** (0.003)
Credit constraint		-0.019*** (0.002)			-0.010*** (0.002)	-0.004* (0.002)	0.001 (0.004)	-0.024*** (0.003)	-0.012*** (0.003)
Sales credit			0.026*** (0.003)		0.009*** (0.002)	0.010*** (0.002)	0.006 (0.005)	0.012*** (0.003)	0.005 (0.003)
External finance				0.042*** (0.002)	0.036*** (0.002)	0.021*** (0.003)	0.041*** (0.005)	0.036*** (0.003)	0.041*** (0.003)
Constant	0.163*** (0.003)	0.182*** (0.003)		0.166*** (0.003)	0.162*** (0.003)	0.174*** (0.005)	0.144*** (0.009)	0.165*** (0.006)	0.153*** (0.006)
Number of observations	34,894	35,641	36,722	36,722	34,524	10,270	3,971	9,423	9,911
Adjusted R-squared	0.131	0.125	0.123	0.138	0.146	0.144	0.155	0.154	0.128

Note: Standard errors (in parentheses) are robust to heteroskedasticity and clustered on countries. Regressions for the Middle East and North Africa and South Asia are excluded because of insufficient data.

Model:  $EG = b_0 + b_1 \text{Laborsize} + b_2 \text{Age} + b_3 \text{Multi} + b_4 \text{Manuf} + b_5 \text{Exporter} + b_6 \text{Foreign} + b_7 \text{Govt} + b_8 \text{FC}(s) + \text{Country Fixed Effects} + e$  ; \* Significant at the 10 percent level. \*\* Significant at the 5 percent level. \*\*\* Significant at the 1 percent level.

Source: Authors' estimations based on data from World Bank Enterprise Surveys (2006-10).

**Table 8. Objective Financial Access Variables by Firm Characteristic**

	(1)	(2)	(3)	(4)
<b>Variable</b>	<b>Loan</b>	<b>Credit constraint</b>	<b>Sales credit</b>	<b>External finance</b>
Small	0.467*** (0.041)	-0.412*** (0.043)	0.187*** (0.035)	0.338*** (0.030)
Medium	0.779*** (0.063)	-0.721*** (0.068)	0.320*** (0.049)	0.572*** (0.038)
Large	0.973*** (0.072)	-0.852*** (0.073)	0.427*** (0.078)	0.747*** (0.045)
Mature	0.097** (0.040)	-0.063* (0.035)	0.055 (0.055)	0.023 (0.037)
Older	0.287*** (0.066)	-0.200*** (0.057)	0.079 (0.063)	0.034 (0.048)
Multi	0.032 (0.051)	-0.128*** (0.036)	0.023 (0.047)	0.007 (0.048)
Manuf	-0.089 (0.062)	0.196*** (0.048)	-0.031 (0.058)	-0.015 (0.048)
Exporter	0.412*** (0.064)	-0.261*** (0.053)	0.084* (0.049)	0.204*** (0.044)
Foreign	-0.101 (0.070)	-0.024 (0.049)	-0.026 (0.050)	-0.157*** (0.043)
Govt	-0.361*** (0.119)	0.199** (0.082)	0.042 (0.099)	-0.118 (0.094)
Constant	-0.325*** (0.104)	-0.071 (0.091)	0.070 (0.063)	-1.039*** (0.070)
Number of observations	34,916	35,663	36,746	36,746

Note: Standard errors (in parentheses) are robust to heteroskedasticity and clustered on countries.

Model:  $FC = b_0 + b_1\text{Small} + b_2\text{Medium} + b_3\text{Large} + b_4\text{Mature} + b_5\text{Older} + b_6\text{Multi} + b_7\text{Manuf} + b_8\text{Exporter} + b_9\text{Foreign} + b_{10}\text{Govt} + e$ .

\* Significant at the 10 percent level. \*\* Significant at the 5 percent level. \*\*\* Significant at the 1 percent level.

Source: Authors' estimations based on data from World Bank Enterprise Surveys (2006-10).

**Table 9. Differences in Effects of Objective Financial Access Variables on Employment Growth by Firm Size and Age**

	Dependent variable: employment growth			
	(1)	(2)	(3)	(4)
	Loan	Credit constraint	Sales credit	External finance
Financial access variable (FC)	0.091*** (0.004)	0.053*** (0.004)	0.106*** (0.012)	0.105*** (0.006)
Small*FC	-0.040*** (0.002)	-0.057*** (0.002)	-0.043*** (0.007)	-0.039*** (0.004)
Medium*FC	-0.051*** (0.003)	-0.065*** (0.004)	-0.057*** (0.008)	-0.056*** (0.004)
Large*FC	-0.069*** (0.003)	-0.078*** (0.007)	-0.066*** (0.009)	-0.073*** (0.005)
Mature*FC	-0.035*** (0.004)	-0.026*** (0.004)	-0.042*** (0.012)	-0.030*** (0.006)
Older*FC	-0.061*** (0.004)	-0.044*** (0.004)	-0.062*** (0.012)	-0.051*** (0.006)
Multi	0.008*** (0.002)	0.006*** (0.002)	0.003 (0.002)	0.004** (0.002)
Manuf	-0.005*** (0.001)	-0.006*** (0.001)	-0.009*** (0.001)	-0.009*** (0.001)
Exporter	0.009*** (0.002)	0.003 (0.002)	0.001 (0.002)	0.004* (0.002)
Foreign	0.003 (0.002)	0.003 (0.002)	0.000 (0.002)	0.001 (0.002)
Govt	-0.035*** (0.005)	-0.041*** (0.005)	-0.046*** (0.005)	-0.042*** (0.005)
Constant	0.045*** (0.001)	0.055*** (0.001)	0.055*** (0.001)	0.048*** (0.001)
Adjusted R-squared	0.090	0.065	0.095	0.078
Number of observations	34,894	35,641	36,722	36,722
Number of countries	95	96	96	96

Note: Standard errors (in parentheses) are robust to heteroskedasticity and clustered on countries.

Model:  $EG = b_0 + b_1FC + b_2Small*FC + b_3Medium*FC + b_4Large*FC + b_5Mature*FC + b_6Older*FC + b_7Multi + b_8Manuf + b_9Exporter + b_{10}Foreign + b_{11}Govt + Country\ Fixed\ Effects + e$ .

\* Significant at the 10 percent level. \*\* Significant at the 5 percent level. \*\*\* Significant at the 1 percent level.

Source: Authors' estimations based on data from World Bank Enterprise Surveys (2006-10).

**Table 10. Differences in Effects of Objective Financial Access Variables on Employment Growth by Firm Size and Age across Regions**

Dependent variable: employment growth

	Loan				Credit constraint				Sales credit				External finance			
	AFR	EAP	ECA	LAC	AFR	EAP	ECA	LAC	AFR	EAP	ECA	LAC	AFR	EAP	ECA	LAC
Financial access (FC)	0.063*** (0.007)	0.061*** (0.011)	0.108*** (0.008)	0.123*** (0.008)	0.044*** (0.004)	0.090*** (0.012)	0.044*** (0.010)	0.071*** (0.014)	0.056*** (0.018)	0.077*** (0.034)	0.109*** (0.020)	0.140*** (0.021)	0.070*** (0.010)	0.089*** (0.017)	0.108*** (0.012)	0.136*** (0.011)
Small*FC	-0.026*** (0.004)	-0.033*** (0.007)	-0.035*** (0.004)	-0.054*** (0.004)	-0.049*** (0.003)	-0.076*** (0.008)	-0.043*** (0.006)	-0.066*** (0.006)	-0.019*** (0.012)	-0.051*** (0.031)	-0.031*** (0.013)	-0.069*** (0.012)	-0.027*** (0.007)	-0.018 (0.014)	-0.033*** (0.006)	-0.057*** (0.006)
Medium*FC	-0.036*** (0.005)	-0.045*** (0.008)	-0.057*** (0.005)	-0.057*** (0.005)	-0.049*** (0.006)	-0.082*** (0.011)	-0.067*** (0.008)	-0.064*** (0.010)	-0.026*** (0.014)	-0.057*** (0.037)	-0.051*** (0.014)	-0.086*** (0.015)	-0.035*** (0.007)	-0.039*** (0.014)	-0.058*** (0.007)	-0.071*** (0.007)
Large*FC	-0.047*** (0.008)	-0.069*** (0.009)	-0.084*** (0.006)	-0.069*** (0.006)	-0.051** (0.021)	-0.111*** (0.014)	-0.070*** (0.011)	-0.065*** (0.016)	-0.079*** (0.023)	-0.024*** (0.046)	-0.067*** (0.015)	-0.087*** (0.016)	-0.057*** (0.011)	-0.061*** (0.017)	-0.080*** (0.008)	-0.083*** (0.008)
Mature*FC	-0.039*** (0.007)	-0.018 (0.011)	-0.035*** (0.008)	-0.043*** (0.008)	-0.018*** (0.004)	-0.040*** (0.013)	-0.037*** (0.010)	-0.035** (0.014)	-0.033*** (0.020)	0.012** (0.033)	-0.043*** (0.019)	-0.049*** (0.022)	-0.037*** (0.010)	-0.025 (0.018)	-0.024** (0.012)	-0.038*** (0.011)
Older*FC	-0.062*** (0.007)	-0.037*** (0.011)	-0.059*** (0.008)	-0.076*** (0.008)	-0.037*** (0.005)	-0.052*** (0.012)	-0.058*** (0.011)	-0.063*** (0.014)	-0.036*** (0.021)	-0.036*** (0.031)	-0.069*** (0.020)	-0.073*** (0.022)	-0.048*** (0.011)	-0.055*** (0.018)	-0.049*** (0.012)	-0.063*** (0.011)
Multi	0.001 (0.003)	0.001 (0.006)	0.014*** (0.005)	0.012*** (0.004)	0.002 (0.003)	-0.001 (0.006)	0.008* (0.005)	0.006 (0.004)	-0.003 (0.003)	-0.006 (0.006)	0.008*** (0.004)	0.006*** (0.004)	-0.001 (0.003)	-0.005 (0.006)	0.010** (0.004)	0.007* (0.004)
Manuf	0.00002 (0.002)	0.001 (0.005)	-0.014*** (0.003)	-0.002 (0.003)	0.001 (0.002)	-0.001 (0.005)	-0.015*** (0.003)	-0.006** (0.003)	-0.003 (0.002)	-0.004 (0.004)	-0.017*** (0.003)	-0.007 (0.003)	-0.003 (0.002)	-0.004 (0.004)	-0.017*** (0.003)	-0.006** (0.003)
Exporter	0.004 (0.004)	-0.007 (0.006)	0.011*** (0.004)	0.020*** (0.004)	-0.002 (0.004)	-0.008 (0.006)	0.003 (0.004)	0.012*** (0.004)	-0.005* (0.004)	-0.014 (0.006)	0.004*** (0.004)	0.012*** (0.004)	-0.003 (0.004)	-0.011* (0.006)	0.006 (0.004)	0.014*** (0.004)
Foreign	-0.003 (0.003)	0.003 (0.006)	0.017*** (0.005)	0.004 (0.005)	-0.003 (0.003)	0.006 (0.006)	0.012** (0.005)	0.004 (0.005)	-0.008 (0.003)	0.002 (0.005)	0.011*** (0.005)	0.004 (0.005)	-0.007*** (0.003)	0.002 (0.005)	0.013*** (0.005)	0.006 (0.005)
Govt	-0.036*** (0.010)	-0.008 (0.011)	-0.041*** (0.006)	-0.031 (0.020)	-0.041*** (0.009)	-0.017 (0.011)	-0.048*** (0.006)	-0.036* (0.021)	-0.048*** (0.009)	-0.026 (0.011)	-0.051*** (0.006)	-0.036* (0.020)	-0.044*** (0.009)	-0.019* (0.011)	-0.047*** (0.006)	-0.032 (0.020)
Constant	0.068*** (0.002)	0.024*** (0.004)	0.028*** (0.003)	0.033*** (0.004)	0.063*** (0.002)	0.025*** (0.004)	0.056*** (0.002)	0.058*** (0.003)	0.070*** (0.002)	0.030*** (0.003)	0.049*** (0.002)	0.053*** (0.002)	0.068*** (0.002)	0.026*** (0.003)	0.038*** (0.002)	0.042*** (0.003)
Adjusted R-squared	0.069	0.060	0.099	0.097	0.062	0.062	0.070	0.045	0.083	0.086	0.090	0.092	0.055	0.056	0.082	0.079
Number of observations	10,358	4,100	9,527	9,949	10,636	4,076	9,907	10,067	10,878	4,431	10,237	10,203	10,878	4,431	10,237	10,203
Number of countries	37	10	30	15	38	10	30	15	38	10	30	15	38	10	30	15

Note: Standard errors (in parentheses) are robust to heteroskedasticity and clustered on countries. Regressions for the Middle East and North Africa and South Asia are excluded because of insufficient data.

Model:  $EG = b_0 + b_1FC + b_2Small*FC + b_3Medium*FC + b_4Large*FC + b_5Mature*FC + b_6Older*FC + b_7Multi + b_8Manuf + b_9Exporter + b_{10}Foreign + b_{11}Govt + Region + Country Fixed Effects + e$ .

\* Significant at the 10 percent level. \*\* Significant at the 5 percent level. \*\*\* Significant at the 1 percent level.

Source: Authors' estimations based on data from World Bank Enterprise Surveys (2006-10).



**Table 11. Effect of Combined Objective Financial Access Variables on Employment Growth by Firm Characteristic and by Region**

		Dependent variable: employment growth													
Variable	World	By size				By age			By sector			By region			
		Micro	Small	Medium	Large	Young	Mature	Older	Manuf ring	Sales	Services	AFR	EAP	ECA	LAC
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Small	-0.052*** (0.002)					-0.082*** (0.006)	-0.051*** (0.002)	-0.044*** (0.002)	-0.060*** (0.002)	-0.037*** (0.003)	-0.056*** (0.004)	-0.046*** (0.002)	-0.058*** (0.005)	-0.042*** (0.003)	-0.061*** (0.003)
Medium	-0.067*** (0.002)					-0.113*** (0.010)	-0.071*** (0.003)	-0.054*** (0.003)	-0.080*** (0.003)	-0.041*** (0.005)	-0.065*** (0.005)	-0.056*** (0.004)	-0.080*** (0.006)	-0.065*** (0.004)	-0.067*** (0.004)
Large	-0.091*** (0.003)					-0.137*** (0.019)	-0.089*** (0.005)	-0.080*** (0.004)	-0.110*** (0.004)	-0.032*** (0.008)	-0.082*** (0.008)	-0.078*** (0.007)	-0.107*** (0.008)	-0.093*** (0.005)	-0.085*** (0.006)
Mature	-0.030*** (0.003)	-0.036*** (0.003)	-0.016*** (0.005)	-0.014 (0.009)	-0.017 (0.018)				-0.038*** (0.004)	-0.025*** (0.004)	-0.019*** (0.005)	-0.024*** (0.003)	-0.021*** (0.007)	-0.041*** (0.006)	-0.037*** (0.006)
Older	-0.053*** (0.003)	-0.064*** (0.003)	-0.038*** (0.005)	-0.032*** (0.009)	-0.043** (0.018)				-0.060*** (0.004)	-0.047*** (0.005)	-0.040*** (0.006)	-0.046*** (0.004)	-0.036*** (0.007)	-0.065*** (0.006)	-0.065*** (0.006)
Multi	0.014*** (0.002)	0.013*** (0.004)	0.017*** (0.003)	0.012*** (0.004)	0.010* (0.006)	0.009 (0.008)	0.015*** (0.003)	0.014*** (0.003)	0.015*** (0.003)	0.012*** (0.004)	0.014*** (0.005)	0.008*** (0.003)	0.009 (0.006)	0.018*** (0.005)	0.015*** (0.004)
Manuf	-0.001 (0.001)	0.011*** (0.002)	-0.002 (0.002)	-0.018*** (0.004)	-0.032*** (0.006)	0.022*** (0.005)	-0.001 (0.002)	-0.007*** (0.002)				0.007*** (0.002)	0.009* (0.005)	-0.011*** (0.003)	-0.001 (0.003)
Exporter	0.014*** (0.002)	0.028*** (0.006)	0.024*** (0.004)	0.009** (0.004)	-0.001 (0.005)	0.035*** (0.011)	0.011*** (0.003)	0.015*** (0.003)	0.020*** (0.002)	0.017** (0.007)	0.007 (0.006)	0.011** (0.004)	0.009 (0.006)	0.013*** (0.004)	0.022*** (0.004)
Foreign	0.009*** (0.002)	0.006 (0.005)	0.013*** (0.004)	0.008* (0.004)	0.009 (0.006)	0.019** (0.008)	0.014*** (0.003)	0.001 (0.003)	0.010*** (0.003)	0.008* (0.005)	0.011** (0.005)	0.002 (0.003)	0.012** (0.006)	0.020*** (0.005)	0.010** (0.005)
Govt	-0.023*** (0.005)	-0.031* (0.018)	-0.007 (0.010)	-0.020*** (0.007)	-0.028*** (0.009)	-0.030* (0.017)	-0.019** (0.008)	-0.022*** (0.006)	-0.015** (0.006)	-0.032*** (0.012)	-0.032*** (0.008)	-0.024** (0.010)	0.002 (0.010)	-0.028*** (0.006)	-0.024 (0.022)
Loan	0.019*** (0.002)	0.014*** (0.003)	0.023*** (0.003)	0.017*** (0.004)	0.015** (0.007)	0.027*** (0.006)	0.018*** (0.002)	0.017*** (0.002)	0.022*** (0.002)	0.015*** (0.003)	0.017*** (0.004)	0.011*** (0.003)	0.016*** (0.004)	0.023*** (0.003)	0.026*** (0.003)
Credit constraint	-0.009*** (0.002)	-0.003 (0.002)	-0.014*** (0.003)	-0.017*** (0.005)	-0.018** (0.008)	-0.005 (0.006)	-0.010*** (0.002)	-0.008*** (0.002)	-0.009*** (0.002)	-0.010*** (0.003)	-0.007* (0.004)	-0.002 (0.002)	0.003 (0.004)	-0.023*** (0.003)	-0.010*** (0.003)
Sales credit	-0.004 (0.003)	0.001 (0.007)	-0.008 (0.005)	-0.013** (0.006)	0.004 (0.008)	0.011 (0.014)	-0.007 (0.005)	-0.006 (0.004)	-0.004 (0.004)	-0.007 (0.006)	-0.003 (0.007)	-0.002 (0.006)	0.006 (0.012)	-0.006 (0.005)	-0.003 (0.005)
External finance	0.036*** (0.002)	0.034*** (0.004)	0.042*** (0.003)	0.030*** (0.004)	0.025*** (0.006)	0.032*** (0.008)	0.035*** (0.003)	0.037*** (0.003)	0.036*** (0.002)	0.036*** (0.004)	0.036*** (0.004)	0.019*** (0.004)	0.036*** (0.006)	0.038*** (0.003)	0.041*** (0.003)
Constant	0.105*** (0.003)	0.106*** (0.003)	0.035*** (0.005)	0.036*** (0.010)	0.041** (0.019)	0.102*** (0.005)	0.077*** (0.002)	0.048*** (0.003)	0.112*** (0.004)	0.087*** (0.005)	0.091*** (0.006)	0.107*** (0.004)	0.073*** (0.007)	0.109*** (0.006)	0.112*** (0.007)
Adjusted R-squared	0.135	0.107	0.100	0.097	0.105	0.130	0.115	0.100	0.151	0.116	0.130	0.119	0.122	0.143	0.135
Number of observations	34,524	13,169	13,060	5,739	2,527	3,734	16,387	14,403	21,675	7,978	4,870	10,270	3,971	9,423	9,911
Number of countries	95	95	95	94	89	95	95	95	95	95	95	37	10	30	15

Note: Standard errors (in parentheses) are robust to heteroskedasticity and clustered on countries. Regressions for the Middle East and North Africa and South Asia are excluded because of insufficient data.

Model:  $EG = b_0 + b_1\text{Small} + b_2\text{Medium} + b_3\text{Large} + b_4\text{Mature} + b_5\text{Older} + b_6\text{Multi} + b_7\text{Manuf} + b_8\text{Exporter} + b_9\text{Foreign} + b_{10}\text{Govt} + b_{11}\text{Loan} + b_{12}\text{Credit Constraint} + b_{13}\text{Sales Credit} + b_{14}\text{External Finance} + \text{Country Fixed Effects} + e$

\* Significant at the 10 percent level. \*\* Significant at the 5 percent level. \*\*\* Significant at the 1 percent level.

Source: Authors' estimations based on data from World Bank Enterprise Surveys (2006-10).

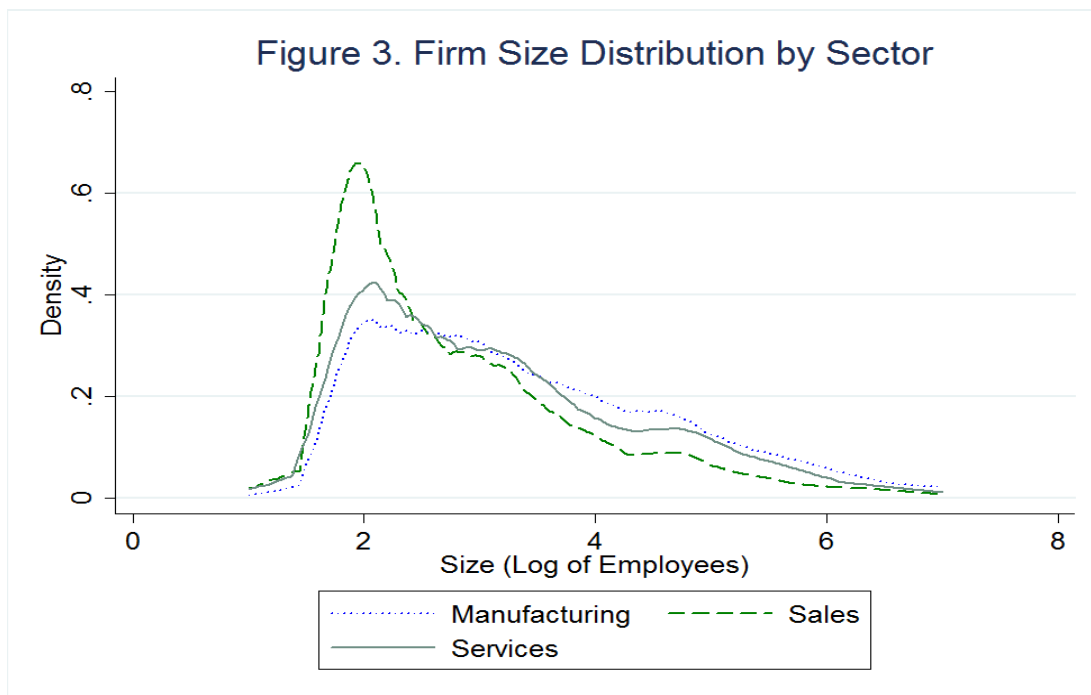
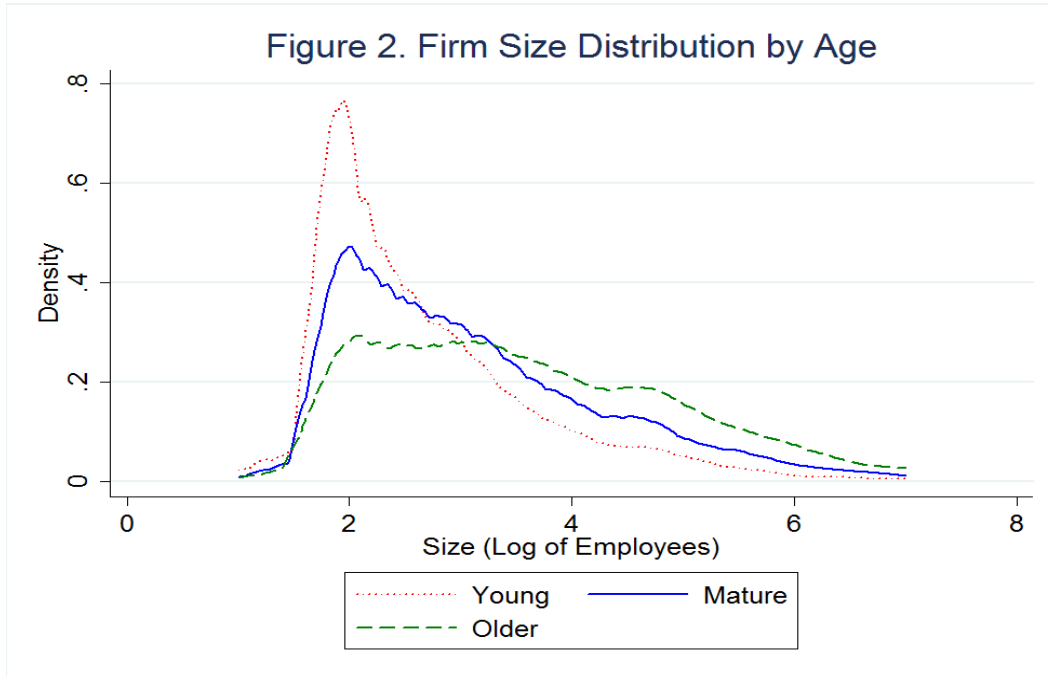


Figure 4. Firm Size Distribution by Region

All Sectors

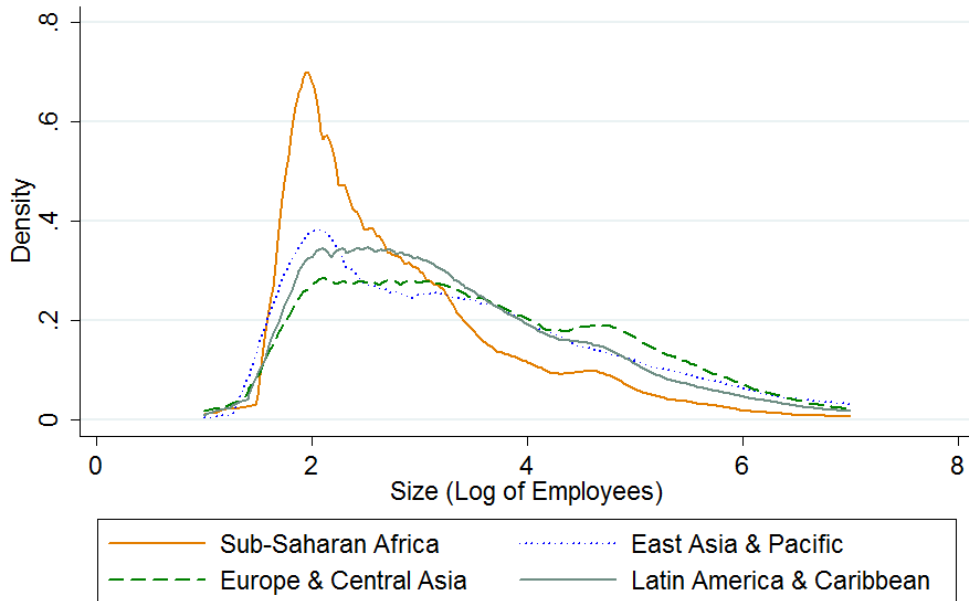
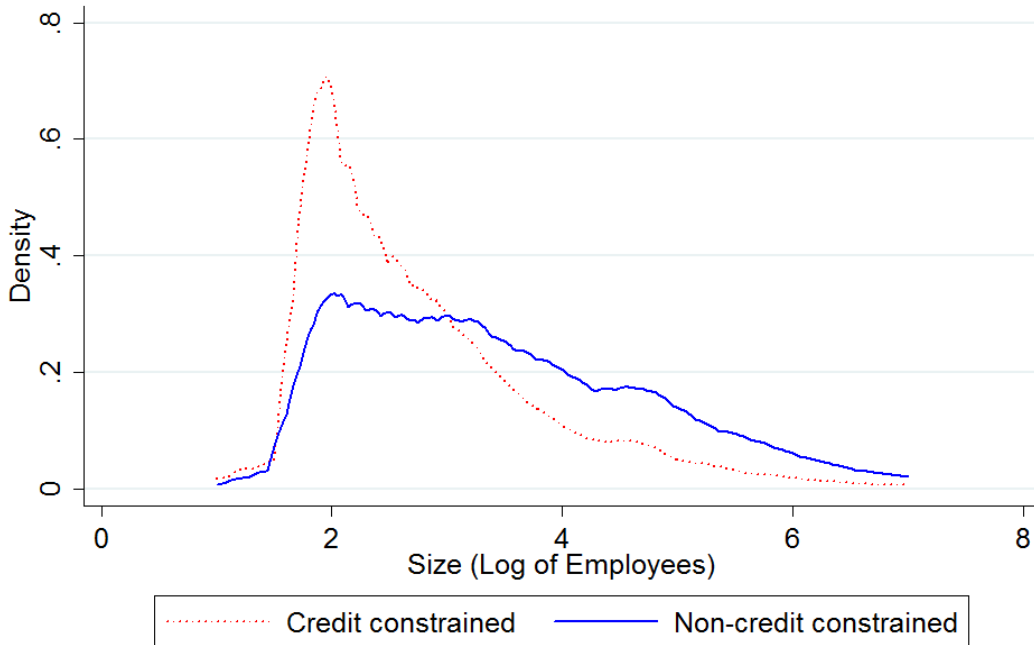
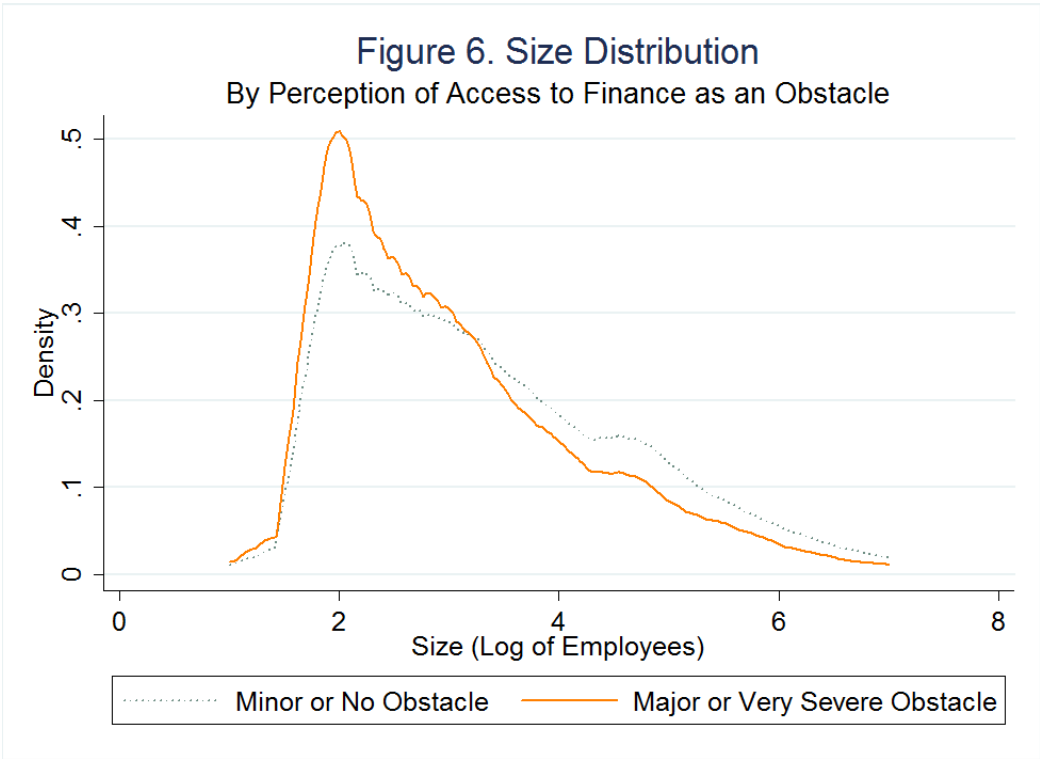


Figure 5. Size Distribution

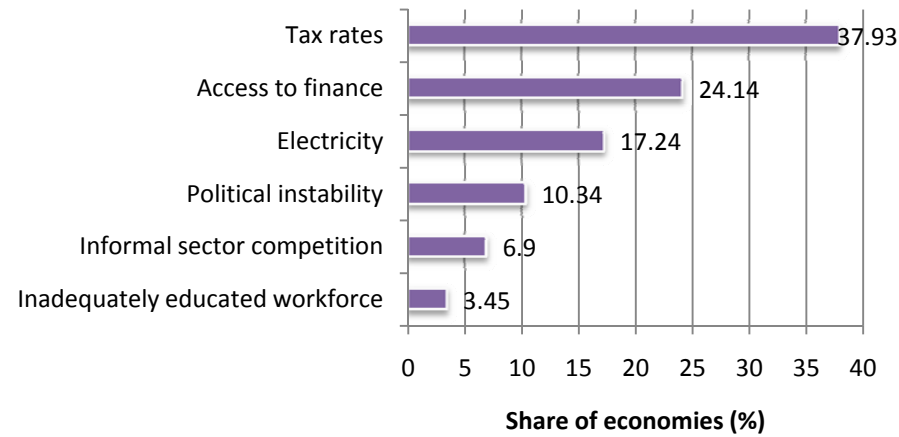
Credit-Constrained and Non-Credit Constrained Firms



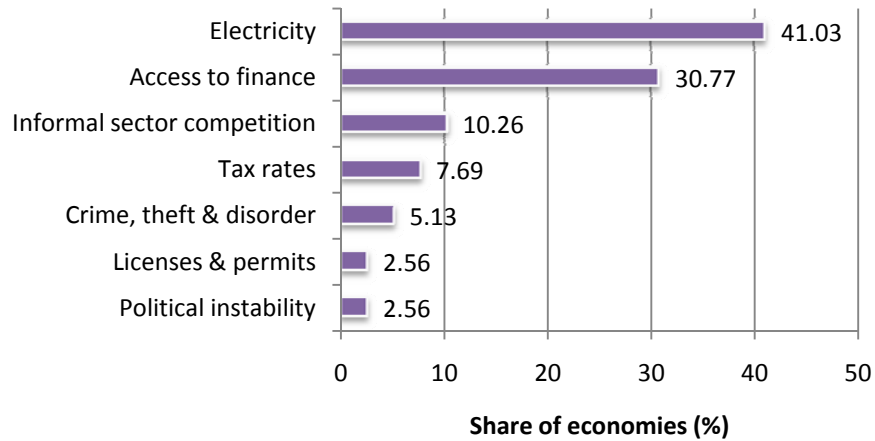


# Appendix

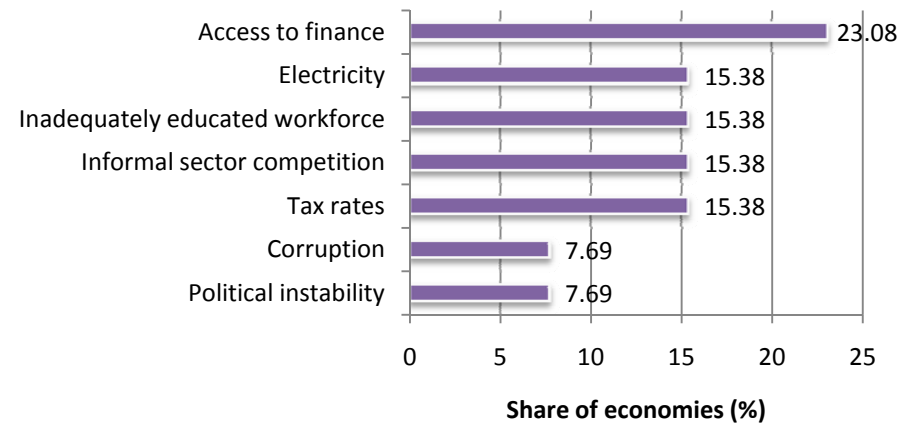
## Europe and Central Asia



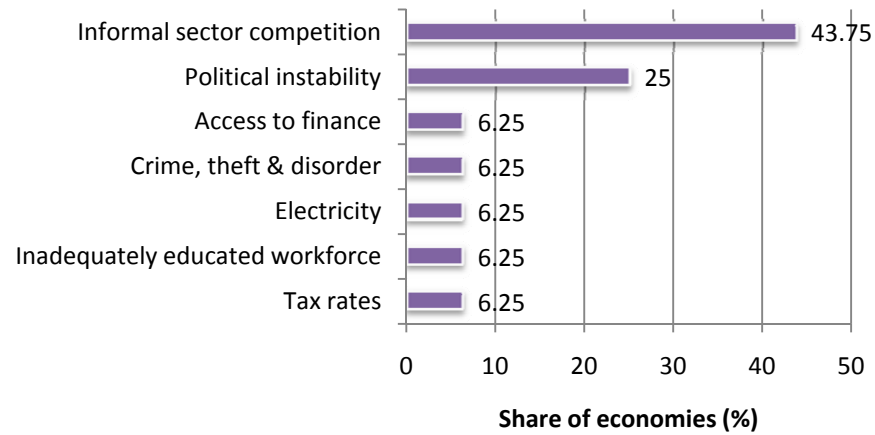
## Sub-Saharan Africa



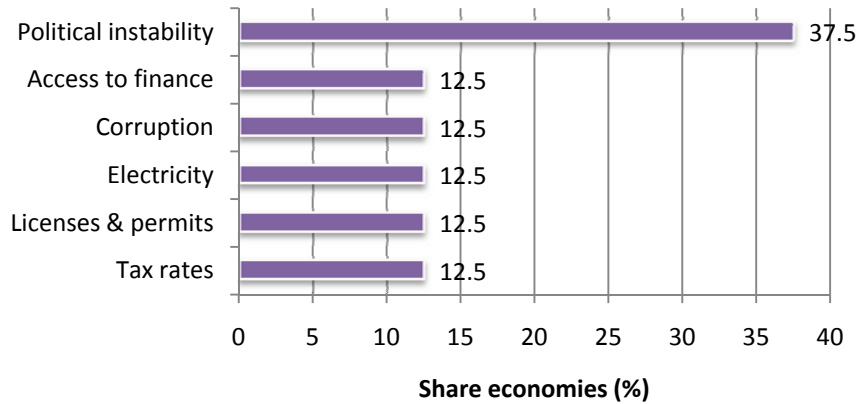
## East Asia and Pacific



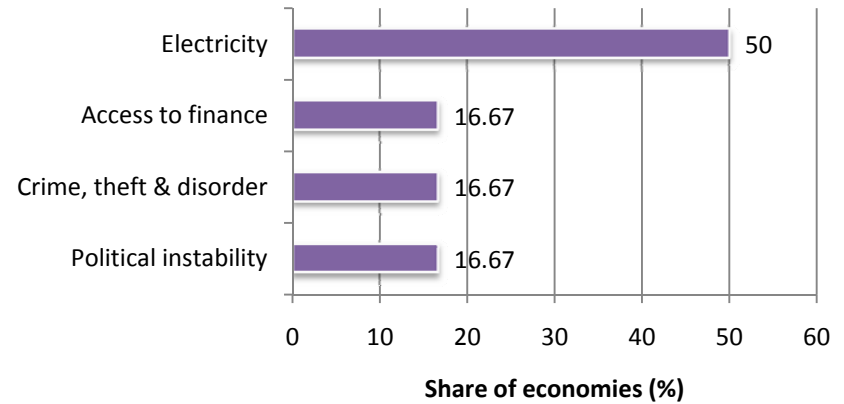
### Latin America and the Caribbean



### Middle East and North Africa



### South Asia



Source: World Bank Enterprise Surveys (2006–10).

**Table A.1 Top Constraints Cited by Enterprises, by Region and Country**

Country and survey year	Frequency (%)	First Most cited constraint	Frequency (%)	Second Most Cited Constraint	Frequency (%)	Third Most Cited Constraint
<b>AFRICA</b>						
Angola, 2006	36.8	Electricity	12.5	Corruption	11.6	Access to Finance
Benin, 2009	18.2	Access to Finance	15.0	Electricity	14.6	Practices Informal Sector
Botswana, 2006	24.6	Access to Finance	11.8	Practices Informal Sector	11.0	Crime, Theft & Disorder
Burkina Faso, 2009	35.5	Access to Finance	17.7	Tax Rates	10.8	Practices Informal Sector
Burundi, 2006	41.3	Electricity	16.0	Access to Finance	14.3	Political instability
Cameroon, 2009	24.9	Practices Informal Sector	19.4	Tax Administration	16.6	Access to Finance
Cape Verde, 2009	17.1	Practices Informal Sector	13.1	Access to Finance	11.0	Electricity
Chad, 2009	29.5	Political instability	23.8	Electricity	13.5	Corruption
Congo, Rep., 2009	31.9	Electricity	15.6	Access to Finance	15.5	Political instability
Côte d'Ivoire, 2009	45.2	Access to Finance	28.0	Political instability	7.5	Corruption
Congo, Dem. Rep., 2006	46.5	Electricity	14.9	Access to Finance	9.6	Tax Rates
Eritrea, 2009	28.7	Licenses & Permits	24.1	Political instability	17.0	Access to Land
Gabon, 2009	23.4	Electricity	14.6	Transportation	10.3	Corruption
Gambia, The, 2006	54.5	Electricity	11.7	Access to Finance	6.5	Tax Rates
Ghana, 2007	48.8	Electricity	33.1	Access to Finance	6.3	Tax Rates
Guinea, 2006	64.3	Electricity	10.3	Transportation	8.3	Access to Finance
Guinea-Bissau, 2006	47.1	Electricity	20.1	Access to Finance	7.7	Political instability
Kenya, 2007	21.7	Tax Rates	13.5	Access to Finance	12.0	Practices Informal Sector
Lesotho, 2009	15.9	Access to Finance	14.7	Corruption	11.2	Tax Rates
Liberia, 2009	39.8	Access to Finance	17.4	Crime, Theft & Disorder	13.3	Electricity
Madagascar, 2009	18.6	Electricity	15.4	Practices Informal Sector	13.9	Crime, Theft & Disorder
Malawi, 2009	45.7	Access to Finance	11.4	Transportation	8.9	Practices Informal Sector
Mali, 2007	28.9	Electricity	23.5	Access to Finance	15.1	Tax Rates
Mauritania, 2006	21.6	Access to Finance	14.4	Practices Informal Sector	13.8	Electricity
Mauritius, 2009	30.2	Access to Finance	18.0	Practices Informal Sector	11.3	Electricity
Mozambique, 2007	23.2	Access to Finance	21.4	Practices Informal Sector	9.1	Electricity
Namibia, 2006	21.7	Crime, Theft & Disorder	17.6	Tax Rates	12.1	Access to Finance

Niger, 2009	21.2	Practices Informal Sector	20.3	Access to Finance	15.6	Political instability
Nigeria, 2007	63.6	Electricity	15.5	Access to Finance	7.5	Transportation
Rwanda, 2006	32.9	Electricity	27.4	Tax Rates	13.6	Access to Finance
Senegal, 2007	41.2	Electricity	12.2	Access to Finance	11.0	Access to Land
Sierra Leone, 2009	17.1	Tax Rates	14.8	Access to Finance	14.3	Electricity
South Africa, 2007	40.4	Crime, Theft & Disorder	14.7	Electricity	7.5	Access to Finance
Swaziland, 2006	25.4	Practices Informal Sector	18.5	Crime, Theft & Disorder	15.4	Tax Rates
Tanzania, 2006	73.4	Electricity	9.8	Access to Finance	4.0	Tax Rates
Togo, 2009	23.7	Access to Finance	23.3	Political instability	11.2	Practices Informal Sector
Uganda, 2006	63.6	Electricity	11.3	Tax Rates	8.5	Practices Informal Sector
Zambia, 2007	18.6	Tax Rates	15.3	Practices Informal Sector	14.3	Access to Finance
<b>EAST ASIA AND PACIFIC</b>						
Fiji, 2009	44.4	Political instability	8.8	Labor regulations	8.6	Crime, Theft & Disorder
Indonesia, 2009	47.9	Access to Finance	13.7	Practices Informal Sector	6.9	Political instability
Lao PDR, 2009	36.8	Tax Rates	21.2	Access to Finance	16.5	Inadequately educated workforce
Micronesia, Fed. Sts., 2009	25.2	Inadequately educated workforce	15.8	Electricity	12.6	Transportation
Mongolia, 2009	30.3	Access to Finance	16.0	Tax Rates	10.2	Inadequately educated workforce
Philippines, 2009	26.4	Practices Informal Sector	14.8	Access to Finance	13.0	Tax Rates
Samoa, 2009	16.9	Tax Rates	13.8	Crime, Theft & Disorder	13.8	Crime, Theft & Disorder
Timor-Leste, 2009	36.3	Electricity	12.7	Crime, Theft & Disorder	12.1	Access to Finance
Tonga, 2009	20.1	Practices Informal Sector	17.0	Corruption	15.6	Tax Rates
Vanuatu, 2009	15.7	Electricity	14.8	Access to Finance	14.3	Crime, Theft & Disorder
Vietnam, 2009	24.7	Access to Finance	19.3	Practices Informal Sector	13.3	Transportation
<b>EUROPE AND CENTRAL ASIA</b>						
Albania, 2007	27.7	Electricity	17.6	Practices Informal Sector	11.0	Corruption
Armenia, 2009	21.8	Practices Informal Sector	16.0	Tax Rates	15.9	Political instability
Azerbaijan, 2009	23.1	Access to Finance	22.2	Tax Rates	18.2	Corruption
Belarus, 2008	25.9	Tax Rates	14.6	Licenses & Permits	14.1	Inadequately educated workforce



Bosnia and Herzegovina, 2009	25.1	Political instability	18.7	Tax Rates	11.4	Practices Informal Sector
Bulgaria, 2009	17.2	Access to Finance	15.2	Practices Informal Sector	13.3	Political instability
Croatia, 2007	18.3	Access to Finance	17.0	Inadequately educated workforce	15.8	Tax Rates
Czech Republic, 2009	20.0	Access to Finance	14.2	Tax Rates	11.8	Inadequately educated workforce
Estonia, 2009	28.8	Inadequately educated workforce	15.9	Political instability	14.7	Practices Informal Sector
Macedonia, FYR, 2009	31.3	Practices Informal Sector	26.9	Access to Finance	6.8	Political instability
Georgia, 2008	18.0	Access to Finance	17.4	Political instability	16.4	Electricity
Hungary, 2009	38.4	Tax Rates	24.2	Political instability	14.2	Tax Administration
Kazakhstan, 2009	26.6	Tax Rates	15.2	Corruption	13.2	Access to Finance
Kosovo, 2009	33.5	Electricity	20.6	Corruption	12.8	Practices Informal Sector
Kyrgyz Republic, 2009	24.5	Electricity	19.9	Access to Finance	11.0	Practices Informal Sector
Latvia, 2009	19.1	Tax Rates	16.7	Political instability	11.3	Tax Administration
Lithuania, 2009	35.2	Tax Rates	12.0	Practices Informal Sector	11.4	Access to Finance
Moldova, 2009	19.5	Access to Finance	15.7	Inadequately educated workforce	10.4	Access to Land
Montenegro, 2009	18.7	Electricity	17.9	Access to Finance	12.7	Practices Informal Sector
Poland, 2009	22.0	Tax Rates	15.6	Inadequately educated workforce	13.8	Practices Informal Sector
Romania, 2009	27.7	Tax Rates	20.7	Inadequately educated workforce	19.9	Access to Finance
Russian Federation, 2009	17.2	Tax Rates	16.9	Access to Finance	15.4	Inadequately educated workforce
Serbia, 2009	20.7	Political instability	19.9	Practices Informal Sector	17.8	Access to Finance
Slovak Republic, 2009	16.2	Tax Rates	13.3	Informal Sector Competition	12.8	Informal Sector Competition
Slovenia, 2009	20.0	Tax Rates	19.2	Access to Finance	17.4	Practices Informal Sector
Tajikistan, 2008	24.8	Electricity	22.5	Tax Rates	17.5	Access to Finance
Turkey, 2008	25.9	Access to Finance	18.2	Tax Rates	17.5	Political instability
Ukraine, 2008	23.2	Political instability	17.5	Tax Rates	10.6	Corruption
Uzbekistan, 2008	23.6	Tax Rates	17.9	Access to Finance	9.2	Inadequately educated workforce

<b>LATIN AMERICA AND THE CARIBBEAN</b>						
Argentina, 2006	16.5	Political instability	15.7	Access to Finance	15.4	Labor regulations
Bolivia, 2006	30.3	Political instability	28.1	Practices Informal Sector	8.0	Corruption
Brazil, 2009	32.8	Tax Rates	13.2	Tax Administration	12.7	Access to Finance
Chile, 2006	18.5	Practices Informal Sector	15.3	Electricity	14.3	Crime, Theft & Disorder
Colombia, 2006	34.6	Practices Informal Sector	12.9	Crime, Theft & Disorder	12.5	Tax Rates
Ecuador, 2006	28.4	Political instability	18.3	Corruption	14.2	Access to Finance
El Salvador, 2006	31.3	Crime, Theft & Disorder	15.3	Practices Informal Sector	13.3	Corruption
Guatemala, 2006	21.0	Practices Informal Sector	20.0	Crime, Theft & Disorder	10.1	Political instability
Honduras, 2006	19.2	Access to Finance	19.2	Corruption	15.6	Crime, Theft & Disorder
Mexico, 2006	19.0	Practices Informal Sector	17.9	Corruption	10.6	Tax Rates
Nicaragua, 2006	26.0	Political instability	17.3	Access to Finance	16.6	Electricity
Panama, 2006	30.6	Electricity	14.6	Tax Rates	10.8	Corruption
Paraguay, 2006	25.8	Practices Informal Sector	21.0	Access to Finance	14.9	Corruption
Peru, 2006	22.1	Practices Informal Sector	17.9	Tax Administration	17.0	Political instability
Uruguay, 2006	32.4	Practices Informal Sector	20.5	Tax Rates	12.0	Access to Finance
Venezuela, RB, 2006	29.2	Inadequately educated workforce	27.9	Crime, Theft & Disorder	10.0	Corruption
<b>SOUTH ASIA</b>						
Yemen, Rep., 2010	32.1	Electricity	26.6	Corruption	7.7	Political instability
Afghanistan, 2008	20.0	Crime, Theft & Disorder	17.9	Electricity	16.8	Access to Finance
Bhutan, 2009	21.7	Access to Finance	12.5	Tax Rates	10.5	Inadequately educated workforce
Nepal, 2009	62.1	Political instability	26.5	Electricity	2.6	Labor regulations

Source: World Bank Enterprise Surveys.