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# Investment climate and employment growth: The impact of access to finance, corruption and regulations across firms

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**INVESTMENT CLIMATE AND EMPLOYMENT GROWTH:  
THE IMPACT OF ACCESS TO FINANCE,  
CORRUPTION AND REGULATIONS ACROSS FIRMS**

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## **Abstract**

Using firm level data on 70,000 enterprises in 107 countries, this paper finds important effects of access to finance, business regulations, corruption, and to a lesser extent, infrastructure bottlenecks in explaining patterns of job creation at the firm level. The paper focuses on how the impact of the investment climate varies across sizes of firms. The differences across size categories come from two sources. First, objective conditions of the business environment do vary systematically by firm types. Micro and small firms have less access to formal finance, pay more in bribes than do larger firms, and face greater interruptions in infrastructure services. Larger firms spend significantly more time dealing with officials and red tape. Second, even controlling for these differences in objective conditions, there is evidence of significant non-linearities in their impact on employment growth. The results suggest strong composition effects: A weak business environment shifts downward the size distribution of firms. In the case of finance and business regulations this occurs by reducing the employment growth of all firms, particularly micro and small firms. On the other hand, corruption and poor access to infrastructure reduce employment growth by affecting the growth of medium size and large firms. With significant differences between firms with less than 10 employees and SMEs, these results indicate significant reforms are needed to spur micro firms to grow into the ranks of the SMEs.

## 1. Introduction

An issue of particular relevance for economic growth is how the development of markets and institutional infrastructure influence the growth of firms. This issue is even more important in developing countries, where markets and institutional infrastructure are less developed. A related concern is whether an adverse business environment shifts the size distribution of firms, affecting the size, the efficiency and the dynamism of the business sector. This paper uses firm-level data on approximately 70,000 enterprises in 102 developing countries and five high-income economies to assess the effects of the broader business environment on employment growth by firms, focusing on the size dimension.

There are a number of recent studies that assess the effect of different dimensions of the business environment on firms' performance. Several examine the effect of employment regulations on firms' adjustment and on labor market outcomes more generally.<sup>1</sup> Others look at the effect of regulations of entry of firms on firm creation and growth.<sup>2</sup> A number of them investigate the importance of access to finance for firm development and growth.<sup>3</sup> Overall, these studies indicate that regulations on labor, barriers of entry for firms, and financing conditions can have a direct impact on firms' employment decisions. However, other aspects of the business environment can affect these decisions as well, raising costs and risks associated with doing business or by creating barriers to competition. By affecting the overall growth prospects, issues from the quality of infrastructure, the strength of property rights, the nature and enforcement of business regulations and the overall openness in the management of public resources can all affect firms' growth (World Bank, 2004a). This paper looks at the joint and relative importance of a number of dimensions of the business environment on firms' growth.

A common theme emphasized in many of these studies is that the effect of the business environment may not be neutral across firm size. Market failures, or policy created distortions can create fixed costs in the operation of business creating cost disadvantages for smaller firms. The costs of dealing with credit market information imperfections or with a complex and non-transparent regulatory environment are some examples of such non-linearities. Large firms may

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<sup>1</sup> A few recent examples are: Botero et al. (2003), Besley and Burgess (2004), Almeida and Carneiro (2005), Haltiwanger, Scarpetta and Schweiger (2006), Micco and Pagés (2006), Petrin and Sivadasan (2006) and Autor, Kerr and Kugler (2007).

<sup>2</sup> For example: Djankov et al (2003) and Klapper, Laeven and Rajan (2004).

<sup>3</sup> For example: Beck, Demirgüç-Kunt and Maksimovic (2005), Demirgüç-Kunt and Maksimovic (1998), Rajan and Zingales (1998), Galindo and Micco (2005).

also have more political influence and shape regulations and policies in their favor. On the other hand, smaller firms may benefit from lax enforcement of regulations or lower harassment from corrupted public officials. Across the world, a sizeable amount of public resources are devoted to the development of micro, small and medium firms, yet unlocking potential constraints to their performance is another, perhaps equally effective, development strategy.

This paper makes a number of contributions. Using newly available data from the World Bank's Enterprise Surveys (ES), the paper uses comparable firm-level data from over 100 countries. In addition to information contained in most firm-level data surveys (employment, investment, sales), these data includes measures of multiple dimensions of the business environment both objective and subjective at the individual firm level. This paper explores whether such measures vary across types of firms as well as whether a given set of conditions have a differential impact on performance across different types of firms. It emphasizes the importance of looking at variations within countries, in particular exploring how size, but also age, sector and ownership affect results.

Differential effects across firms of different size can stem from two sources. First, there can be differences in the underlying objective conditions faced by firms. The paper does find that micro and small firms have less access to formal finance, face significantly greater interruptions in infrastructure services, and pay more in bribes—as a percentage of sales—than do larger firms. Larger firms spend significantly more time dealing with officials and red tape. Second, the same conditions can potentially have differential or non-linear effects on employment growth by size. Thus, it could be that the same extent of external finance is more beneficial to smaller firms or that the same extent of power outages is less damaging to smaller firms. Indeed, the paper does find that for finance, business regulations and corruption there are non-linear effects, with smaller effects for infrastructure variables.

Taken together, the overall impact of the business environment on firm growth has significant size effects. The paper focuses on four main areas: access to finance, the regulatory environment, corruption and access to infrastructure. The results indicate significant differences across size categories of firms—both in terms of differences in objective conditions faced by firms, and non-linearities in the impact of these conditions. Poor access to finance, insufficient or poorly developed business regulations, corruption, and infrastructure bottlenecks all shift the size distribution of firms downward. Lack of finance and insufficient or ineffective business

regulations reduce employment growth in all firms, but especially in micro and small ones. Corruption and poor infrastructure create growth bottlenecks for medium and large firms.

The results also show the importance of distinguishing between micro (less than 10 employees) and small firms (11-50 employees). Results show significant differences in the marginal effects across these two size categories for finance, regulatory environment and corruption. These differences extend to including the average differences in the objective conditions facing these firms in assessing the overall impact of the business environment (i.e., evaluating the marginal effect at the average value of objective conditions for each size category of firms). However, either excluding micro firms or combining them with small firms in a single category loses the differential impact for finance and regulatory environment between the smaller firms and larger ones, diluting the message that smaller firms would benefit from business environment reforms.

There are some methodological issues that need to be addressed, including potential measurement error, omitted variable bias and endogeneity. The analysis is conducted with individual survey dummies so that the variation being exploited is within country and survey. In addition to controlling for some potentially important omitted variables, this also controls for fixed effects across surveys. Furthermore, to control for possible differences in demand conditions, a fuller set of country-industry dummies are included. Incorporating multiple dimensions of the broader business environment simultaneously deals seriously with concerns of omitted variable bias of papers that include only a single dimension, such as labor regulations or finance.

To address potential endogeneity, this paper takes two steps. First, it relies on objective rather than subjective measures of the business environment. Thus, instead of using the extent to which firms complain about finance or electricity, it uses information on the actual access to trade credit or bank loans, and the frequency of outages and the costs associated with these outages. Second, it uses location-sector-size averages (minus individual firms' own responses) of the business environment measures rather than individual firms' own responses. This captures the broader environment in which the firm operates and allows the individual firm's own contribution to the average to be excluded. To ensure adequate numbers of firms in each location-sector-size cell average, if there were fewer than four observations dimensions were

combined for those firms in the small cell. The approach also has the benefit of not losing those observations where a firm did not answer all the individual investment climate questions.<sup>4</sup>

The paper is structured as follows. Section 2 reviews the related literature. Section 3 describes the data. Section 4 examines how reported constraints vary by types of firms, emphasizing the different patterns across different sizes of firms. Section 5 then looks at how objective variables vary across firms, verifying that the subjective responses do reflect actual variations in the conditions experienced by different types of firms. Including lagged performance variables in these regressions reinforces the need to address endogeneity—and indicate the likely directions that employment growth might have on different dimensions of the business environment. Section 6 describes the impact of objective conditions on employment growth using location-sector-size averages instead of individual firm responses. Section 7 conducts a number of robustness checks. Section 8 concludes.

## 2. Literature Review

There is a growing literature that assesses the effects of the set factors, policies and institutions, commonly known as business environment, on the performance of firms and economic growth.<sup>5</sup> The methodologies used by these studies are very diverse. A number of studies have focused on cross-country variation to identify the effect of labor regulations (Botero et al, 2004; Heckman and Pagés, 2004), regulation of entry (Djankov et al., 2002) or a wide set of regulations (Loayza, Oviedo and Servén, 2005). These studies relate objective (*de jure*) measures of regulation at the country level to aggregate country outcomes. Although the results are suggestive of the importance of appropriate regulations for business development, they suffer from important methodological constraints ranging from omitted variable bias to endogeneity concerns.

Another group of studies employ a difference-in-differences method first developed by Rajan and Zingales (1998). These studies analyze the effect of different aspects of the business environment at the country-industry level. The underlying idea behind this method is that if a

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<sup>4</sup> This approach is very similar to using location-sector-size dummies as instruments (except that the firm's own value is not excluded in this calculation, the number of observations averaged in a cell may be very small, and the additional observations cannot be recovered if a single investment climate variable is not available.). The test of overidentifying restrictions could not be estimated using the full specification due to the large number of dummies and instruments. However, in specifications not using a full set of country-industry dummies, the restrictions could not be rejected at the 0.3 level.

<sup>5</sup> Such set of conditions and policies is sometimes also referred as competitiveness (World Competitiveness Report, 2006-2007)



certain condition is restrictive for business development or growth, industries that are extremely sensitive to that condition should be relatively more affected than others, and be relatively less developed in countries where this issue is more restrictive. Rajan and Zingales (1998)) show that industries that inherently require a high share of external financing grow faster in financially developed markets. Beck et al. (2004) find that industries with higher shares of small firms grow disproportionately faster with greater financial development using the US industry size distribution as the ‘natural’ benchmark. Klapper, Laeven and Rajan (2004) show that industries in which, due to structural or technological reasons firm entry is more important, exhibit less growth in countries with important restrictions to firm entry. Finally, Micco and Pagés (2006) show that industries that are inherently more volatile create fewer jobs and are less developed in countries with very restrictive hiring and firing regulations.

While improving on cross-country studies, the former studies suffer from three potential shortcomings that can be addressed in our study. First, in most cases variation in business environment conditions is captured with country level variables that reflect *de jure* regulations or conditions, that is, the procedures and costs that would be incurred if firms fully complied with what is on the books. However, there can be large gaps between what is on the books and what is experienced on the ground. This is particularly true in lower income countries and those with higher levels of corruption. (Hallward-Driemeier and Aterido, 2007; Kaufmann and Kraay, 2004). In that regard, is desirable to have measures of de facto regulation.

Second, it is important to explore variation in the business environment not only across countries but also within country boundaries—across sub-national areas and especially, across firm size and ownership.<sup>6</sup> Having disaggregated variables allows for hypotheses to be tested without having to assume that one country is the benchmark or “best” case against which to compare other countries.

Third, with a few exceptions, studies tend to focus on one given factor or policy, such as firing and hiring regulations, regulations on new businesses, or restricted access to finance. They are, therefore, potentially liable to omitted variable bias, as other non-considered aspects of the business environment can also affect firms’ decisions. While we look at the effects of individual

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<sup>6</sup> A few studies assess differences in business environment conditions within countries. Besley and Burgess (2004) and Ahmad and Pagés (2007) exploit differences in labor market regulations across Indian states to assess how different labor market regulations affect economic performance across Indian states. Almeida and Carneiro (2005) assess the effect of variation of enforcement in labor regulations within Brazil.

dimensions of the investment climate, our focus is on regressions that combine multiple dimensions in a single regression. This not only addresses potential bias in the estimates, it allows one to test directly which dimensions have the biggest impact on firm performance.

A number of recent studies make use of the World Business Environment Survey (WBES)—a firm-level dataset with 4,000 firms across 54 countries<sup>7</sup>—to study the effect of the business environment on firm growth. Using subjective firm-level data measures of the business environment these studies show the importance of finance, corruption and property rights (Batra, Kaufman and Stone, 2003; Ayyagari et al., 2006). Some other studies examine the relationship between business environment and firm growth for individual or a small group of countries (Dollar, Hallward-Driemeier and Megistae, 2005, for India, Pakistan, Bangladesh and China; Fisman and Svensson, 2007, and Rienikka and Svensson, 2002, for Uganda; and Bigsten and Soderbom, 2006, which reviews the literature for Africa).

One central area of focus for this paper is whether there are significant differences in the impact across firm types, particularly by firm size. The literature has largely examined this issue with regard to access to finance, generally finding smaller firms are more constrained (Galindo and Micco, 2005; Love and Mylenko (2003) and IADB (2007). Beck, Demirgüç-Kunt and Maksimovic (2005) is of particular interest here, as these authors include additional measures of corruption and property rights using a firm-level dataset with 4,000 firms in 54 countries. Using firms' perceptions on potential constraints, they also find patterns across countries, with small firms benefiting most from greater financial and institutional development. Our paper expands on this work in several dimensions. It looks at employment growth as well as sales growth, and it nearly doubles the number of countries covered, with country samples approximately five to 10 times larger. Whereas Beck, Demirgüç-Kunt and Maksimovic (2005) use subjective firm responses as measures of the business environment at the firm level, we include more objective measures (i.e., time spent with officials dealing with permits and licenses rather than a ranking of how burdensome red tape is on a scale of 1-5). We also recognize that measures of constraints could well be endogenous and thus control for this possibility throughout the paper. We also use narrower bands on firm size categories, which leads to some interesting extensions on their

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<sup>7</sup> The World Business Environment Survey is a precursor to the World Bank's Enterprise Survey. The earlier round primarily collected perception data regarding constraints and some information on firm performance. In some regions firms only provided information on their employment range, i.e., small, medium, large, making it impossible to use that data to study differences between small firms below and above 10 employees.

result. By including a “micro” category of firms with fewer than 10 employees, we find significant differences between them and small firms (11-50 workers). We also find that smaller firms benefit most from improved access to finance, but that this is particularly true for micro firms. Broadening the “small” definition actually loses the significance of the differential impact of small and large firms. We also find a more nuanced set of results on corruption. While bribe payments reduce growth of all firms, a more pervasive culture of bribes actually raises the relative rates of growth of micro firms.

We also look at how results vary across country groupings, focusing on income levels and find significant results, particularly for finance. We thus confirm and expand the set of results, showing how the impact of investment climate conditions vary across firms, indicating ways in which firms can benefit most from reforms.

### 3. The Data

Our study is primarily based on the World Bank Enterprise Surveys (ES), a newly available collection of firm-level datasets for 102 developing countries as well as five high-income countries.<sup>8</sup> Questionnaires are administered within a framework of common guidelines in the design and implementation.<sup>9</sup> The dataset is assembled using the *core survey*, which is a module of identical questions included in all questionnaires, thereby enabling cross-country analyses.

The data include 69,305 firms from 107 countries in six different regions surveyed during the period 2000-2006.<sup>10</sup> Several countries have now conducted a second or third survey.<sup>11</sup> The median sample size is 350 firms, with several large countries having substantially larger samples (Brazil, China, India, Turkey and Vietnam have samples over 1,500; see Table A1 in the annex.) The sample of firms in each country is stratified by size, sector and location.<sup>12</sup> Because of this

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<sup>8</sup> The terms Enterprise Surveys includes BEEPS, Investment Climate Surveys and RPED surveys.

<sup>9</sup> From <http://rru.worldbank.org/InvestmentClimate/Methodology.aspx>

<sup>10</sup> The exact set of questions asked does have some variation across countries, particularly among the earlier surveys, so regressions with multiple investment climate variables are based on a smaller set of approximately 48,000 firms in 80 countries.

<sup>11</sup> While efforts are shifting to building a panel dataset, most repeat surveys have been additional cross-sections. There are approximately 2,000 firms that enter twice in the dataset.

<sup>12</sup> From <http://www.enterprisesurveys.org/Methodology/default.aspx#weights>: ES have been conducted following simple random sampling or random stratified sampling. In a simple random sample, all members of the population have the same probability of being selected and no weighting of the observations is necessary. In a stratified random sample, all population units are grouped within homogeneous groups and simple random samples are selected within each group

stratification, large enterprises are in general over-sampled in the ESs compared to their share in the number of firms, but not in terms of their contribution to GDP. The unit of analysis is the “Establishment” in the manufacture and service sectors.<sup>13</sup> Most firms are registered with local authorities, although they may be only in partial compliance with labor and tax authorities.

The ES data was developed to provide information on aspects of the investment climate faced by firms as well as information on firms’ performance. It contains subjective and objective information on the business climate faced by individual firms. Regarding subjective measures, there is one question that asks firm managers the extent to which various aspects of the investment climate are perceived as obstacles to firms’ operations and growth on a scale of 0 (no constraint) to 4 (very severe). These perceptions are useful, as they implicitly include a measure of impact. Firms are not asked to evaluate an issue in isolation, but rather in terms of how it affects their ability to operate and grow their business. Thus, areas that may be associated with long delays or high costs—but that are of marginal interest to the firm or for which alternatives are available—are not likely to score high on these constraints rankings. They also give some insight into the likely areas where constraints are likely to be different by size of firm. Access to finance, corruption, regulations and infrastructure are among the issues with the biggest relative differences across size of firms, and particular attention is therefore focused on these dimensions in their impact on firm growth.

However, there are potential drawbacks to using subjective data. There is a concern that firms’ perceptions of the business environment reflect differences in firm types or firms’ performance. It is well known that successful entrepreneurs are by nature more adept at responding to opportunities and overcoming barriers, and they may also see their environment as less limiting than less successful entrepreneurs. We control for this by including firm characteristics and measures of firm performance directly in the regression. We also control for individual effects by looking at relative rankings. Respondents rank 17 issues on the same scale. De-meaning the responses gives the relative importance of the issue to that firm. How well these subjective rankings reflect actual conditions can also be tested for. Using 104 countries, Hallward-Driemeier and Aterido (2007) find that the subjective rankings are highly correlated

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<sup>13</sup> In Europe and Central Asia, the unit is the “firm.” In all other regions it is the plant or establishment. As over 90 percent are single-plant firms, the distinction is not likely to affect the results.

with objective measures in 16 of the 17 variables.<sup>14</sup> The subjective rankings are also significantly correlated with external sources, including Doing Business indicators. Pierre and Scarpetta (2004) use 38 countries and confirm that countries with more restrictive labor regulations are associated with higher shares of firms reporting labor regulations as constraining.

The dataset also contains a set of objective measurements or time or monetary *costs* of those same perceived aspects of the investment climate as they are being experienced by the firm. The larger set of variables that measure finance, infrastructure, regulations and corruption are in the Appendix.<sup>15</sup> Our analysis uses subjective measures to gauge the relative importance of each issue to a firm, and then uses the larger set of objective variables to measure the effect of the business environment on employment growth. Endogeneity is likely to be more of a concern if one were to use the perception data as independent variables. However, there is still some concern that endogeneity is important in more objective measures too. The growth of the firm is likely to affect whether the firm receives external finance and may well affect the extent to which it needs to interact with officials or be subject to demands for “additional payments.” To control for this, we use country-city-sector-size averages in place of the firm’s own values of the investment climate variables. Averages are calculated based on actual size at period  $t$  and should capture the environment in which a firm of a given size operates in period  $t$  while still excluding the firm’s own values. Using averages also allows for some observations to be kept despite one or more investment climate variables not being reported. As some country-city-sector-size cells are small, a particular dimension was collapsed to ensure at least three firms other than the firm in question were used in calculating the averages. In our estimates, we allow for clustering of the error terms at the country-city-sector-size level.

The dataset includes information on many firm characteristics such as size, age, location, export activity, ownership, and industry. This is an important feature of the data, which allows expanding previous cross-country analyses attempting to assess the economic impact of institutions. Institutions can differently affect different types of firms. Small firms, for instance, face different constraints than large firms, and a capital-intensive manufacture firm may face different restraints than a service-oriented firm. Likewise the degree of impact that a particular business constraint has on a firm’s performance can be different for different types of firms. The

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<sup>14</sup> The one exception was finance; those with loans complained more about the cost of finance than those without loans.

<sup>15</sup> See Table A2 for summary statistics of the list of investment climate variables: perceptions and costs

firm characteristics used in this study include: five size classes (*micro* 1-10 permanent employees, *small* 11-50, *medium* 51-200, *large* 201-500, and *very large* firms -more than 500 employees); three age categories (*young* 1-5 years, *mature* 6-15, and *older*—more than 15); two location types (*capital* or cities with 1 million population and cities with population less than 1 million); ownership (whether *foreign* or *government* represents 10 percent or more of ownership); whether the firm is an *exporter* (10 percent or more of sales); and a two-digit *industry* classification.

The sample contains a large proportion of small firms (63 percent, including 29 percent micro and 34 percent small firms); only 14 percent are large and very large firms. The sample also consists largely of young firms; 64 percent of the firms have been in operation only 15 years or less (19 percent of the dataset five or fewer years and 45 percent between six and 15 years).<sup>16</sup> According to the 10-percent thresholds noted above, 13 percent of the firms are foreign-owned, 7 percent are state-owned firms, and 20 percent of firms are exporters. By industry, 31 percent of the sample includes capital-intensive manufacturing, 34 percent includes labor-intensive manufacturing, and 27 percent consists of services.<sup>17</sup>

We focus on the employment growth of permanent workers as our outcome variable of interest. We use permanent employment because this is most likely to reflect long-run determinants of performance, because it more closely reflects the concerns of policymakers and because there are differences in the consistency of reporting across some countries. Our measure of *employment growth* is the change in the enterprise's *permanent* employment during the period  $t$  and three years before, divided by the firm's simple average of permanent workers during the same period.<sup>18</sup> The measure is symmetric around zero and bounded by values -2, and +2. While monotonically related to the conventional growth rate and a second order approximation of the logarithmic first difference, this measure allows computing meaningful growth rates for firms suffering sharp expansions or contractions, avoiding any arbitrary treatment of outliers. Thus, even when by construction our sample does not have entry or exit of firms, some firms experience sharp changes in employment due to its early/late stage of development. Young, small firms may experience very large growth in their labor force; Bankrupt firms or firms on the

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<sup>16</sup> See Table A3 for a complete stratification of sample by firm characteristics

<sup>17</sup> The remaining 8 percent represents activity. Classification adapted from PADI (Programa de Análisis de la Dinámica Industrial), ECLAC. See Katz and Stumpo (2001).

<sup>18</sup> This measure has been extensively used to measure job creation and job destruction (see Davis and Haltiwanger, 1992, and Davis, Haltiwanger and Schuh, 1999)

verge of closure may suffer very large contractions prior to their final exit from the market. Due to data availability, employment growth refers to different periods for different firms.

The regressions include individual country survey dummies. Thus the focus is on the within-country variations rather than across countries. This decision reflects several factors. First, there is substantial variation of investment climate indicators within countries and we want to test if its impact is significant. Second, it controls for potential omitted variables at the country level. Third, it could control for some possible measurement errors or differences in implementation across countries. As Haltiwanger and Schweiger (2005) note, there are some countries with particularly high net employment rates. However, there is a strong country-specific component, such that country effects yield relative magnitudes of job creation and employment growth. He also noted that the relationships of employment variations between size and age classes appear right. Thus, small and younger firms have higher job creation and destruction than older and larger firms within the country, when considering total employment. Therefore, statistical methods that remove country level are appropriate to draw conclusions within countries on the difference of the impact of Investment Climate on different types of firms. To account for differences in demand conditions and productive structure, the regressions also include a full set of industry-country dummies.

Table 1 reports the mean and standard deviation of the *employment growth* measure for all relevant variables in the sample. There is positive employment growth across all firm sizes and income levels. The average firm level employment growth, according to our measure, is 0.103; small and medium firms grew over the average, while micro and large firms grew below average. Likewise, younger firms (0.193) grew faster than middle-age (0.10) and mature firms (0.03).

#### **4. Which Dimensions are Reported to be Most Constraining? Variations in Subjective Investment Climate Constraints by Firms**

The ranking of potential constraints on the operations and growth of their business provide a useful starting point in identifying areas of the investment climate that is worth investigating as well as indicating areas where there are significant differences across types of firms. The questions are asked in the same way so that it is possible to look at relative rankings (see Table 2 for a description of these and the rest of business environment variables used in this study).

Having the long list of issues allows for an individual fixed effect to be controlled for. This removes concerns about different degrees of optimism or pessimism across individuals, as well as any fixed effect stemming from their performance.

Table 3 reports the regressions of the relative ranking<sup>19</sup> of key constraints on a large set of individual firm characteristics at time  $t$ , lagged performance ( $t-1$ ), sector dummies and country dummies. The growth measure is lagged to have it be pre-determined, but the claims here are not causal. We are simply interested in describing the patterns across firms.

It is striking that differences across current size are not consistent across subject areas. Looking at the relative rankings of constraints, there are a number of areas that constrain the micro firms more than their larger counterparts. These are: cost of and access to finance, infrastructure (electricity) and corruption.<sup>20</sup> By far the biggest difference is in access to finance (Column 1). Whereas finance ranks among the top two issues for micro and small firms, it is sixth for large firms. The average demeaned level of complaint is 0.32 (i.e., 0.32 units above the average level of complaint), it is 0.05 units lower for small firms compared to micro, while it falls more than 0.13 units for medium firms, and by 0.2 units for large and very large firms.<sup>21</sup>

Infrastructure is another area where small firms report the greatest relative constraints, particularly for electricity (Column 5). The average relative complaint is -0.04, but it declines a further 0.045 units for larger firms. Smaller firms are more likely to be in areas without access to electricity or to be dependent on an unreliable public grid, given that they lack the scale economies to make a generator cost effective.

A final area where micro and small firms are relatively more likely to report the issue as a top constraint is corruption (Column 4). For very large firms, the rate falls by 0.075 units, from an average of 0.28 to 0.205. This could reflect the fact that small firms face little recourse to demands for bribes and thus they are easier targets for officials seeking additional funds. To the extent that many are operating semi-informally they may face the need to pay bribes to avoid higher penalties associated with non-compliance of tax or regulatory requirements. It is also

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<sup>19</sup> The relative value results from subtracting the mean value of all the obstacles from each individual answer. Consistency of regulations (in column 5) is part of a different set of questions and cannot be examined in relative terms.

<sup>20</sup> Tax rates and administration, competition from informal firms and crime were other areas where smaller firms report relatively greater constraints. However, as we do not have as good objective measures corresponding to these issues, we concentrate on finance, corruption and reliable infrastructure.

<sup>21</sup> Units here refer to a relative measure defined as  $y-x$  where  $y$  and  $x$  can take values between 1 to 4 and therefore  $y-x$  can take values between -3 and 3.



likely that bribes for particular services are a fixed sum, which will represent a higher share of costs for small firms.

In turn, larger firms report being relatively more constrained by labor regulations (Column 3). This could reflect higher exposure to enforcement—an issue examined in the next section—or higher constraints on their activity. The differences are large, with the relative complaint for large firms at about 0.20 units larger than for micro firms. The extent of the relative constraint increases monotonically with size, consistent with enforcement increasing with firm size.<sup>22</sup> Yet, large firms are also relatively more likely to report regulations as being applied consistently (Column 2). It would then appear that micro and small firms are less constrained by (labor) regulations but are subjected to a higher degree of discretion in the application of labor and other regulations. Higher discretion may be related to corruption, which also appears as a top constraint for the smaller firms.

In most cases, the patterns with *firm age* mirror fairly closely those of size. Younger firms are relatively more constrained by the cost and access to finance and by electricity shortages.

## **5. Variations in Objective Investment Climate Conditions by Firms**

Differences in perceived constraints could be due to differences in the objective conditions facing firms and/or due to differential impacts of the same condition on different firm's performance. Looking how objective measures vary across different types of firms there is a lot of evidence that the former is true. This is also borne out by significant correlations between the constraints and related objective measures. Within each of the categories for which we have objective data, firms with the greatest delays and greatest costs are significantly more likely to rank these issues as constraining (Hallward-Driemeier and Aterido, 2007). The next section then looks at the extent to which the overall constraint affects performance as well as whether there are non-linearities in these effects.

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<sup>22</sup> In unreported results, we also find that overall, micro firms report a lower level of constraints than larger firms. This finding is consistent with the view that many small firms remain very small or operate in the informal economy as a way to avoid higher regulatory burdens. It raises the challenge of how to increase the incentives of micro firms to grow and to comply with more of the regulatory requirements.

Table 4 reports how the objective measures of the investment climate vary across types of firms. The table uses several variables within the same area of the business environment, i.e., multiple measures of access to finance, corruption, regulations, and infrastructure. The aim is to show the consistency of results across the variables in the same general area. In later regressions, a variable from each section will be regressed in combination with variables from the other areas of the business environment, with substitutions made to indicate the robustness of the results.

Table 4 demonstrates that there are significant differences across firms in most of the variables in each of the four areas of the investment climate. Again, the focus is on differences across firms of different size, measured by the level of employment at the time of the survey. Micro firms have reported finance as particularly constraining and indeed, controlling for firm characteristics and country dummies, large firms are 30 percent more likely to have overdraft facilities and the share of investments financed by formal bank loans is 14 percent higher (or 50 percent more than small firms given retained earnings finance more than two-thirds of investments). Access to formal financing of working capital is also significantly different, with large firms' levels triple that of small firms and quadruple that of micro firms. What is interesting is that the share of sales sold on credit is significantly lower for micro firms, but there are then no further differences across sizes of firms.

Corruption was another area where smaller firms complained more, and the objective numbers show that small firms are slightly more likely to pay bribes than either micro firms or large firms. However the real issue is that the size of bribes as a share of sales is almost one-third higher for small and microfirms relative to medium and large firms. This can reflect fixed payments being relatively larger for small firms, or that they have less recourse to avoid making payments. The payments may also be correlated with the degree of compliance with regulations; micro and small firms may not meet all of the requirements and have to pay officials to maintain this position.

Larger firms reported being relatively more constrained by labor inspections and the objective data shows that enforcement does increase with firm size, as shown by higher frequency or length of visits by labor inspectors. This is also true of inspections overall, where large firms spend 121 percent more time in such inspections relative to micro firms. There is also evidence that large firms spend more time dealing with government authorities. On the flip side,

larger firms report less delays in getting through customs; either because with larger or more regular shipments the clearance procedures are easier, or because larger firms are able to seek better treatment (possibly including the payment of “grease” money).

For infrastructure, the frequency of outages hits small and medium firms hardest and very large firms the least. In addition, the costs of these outages, as a percentage of sales, are relatively larger for micro and small firms. They are less likely to have alternative sources of electricity (given the costs of owning and operating a generator). It is also possible that larger firms have a greater choice among possible locations and thus chose to operate in areas with more reliable electricity, a hypothesis that is tested for below.

## 6. Impact of Investment Climate Conditions on Firm Employment Growth

This section examines the impact of different measures of the investment climate on employment growth, controlling for individual firm characteristics, a full set of country specific industry dummies and survey fixed effects.<sup>23</sup> As mentioned above, the possible endogeneity of the reported business climate indicators is accounted for by (i) measuring business climate with objective rather than subjective indicators, and (ii) averaging the reported measures by firm location, industry and size cells, without using the firm’s own response. The specification is as follows:

$$\begin{aligned}
 Empg_{ijct,t-3} = & \beta_0 small_{ijct-3} + \beta_1 medium_{ijct-3} + \beta_2 large_{ijct-3} + \beta_3 IC\ variable_{kt-3} + \\
 & + \beta_4 small_{ijct-3} * IC\ variable_{-i,k} + \beta_5 medium_{ijct-3} * IC\ variable_{-i,k} + \beta_6 large_{ijct-3} * IC\ variable_{-i,k} \\
 & + \beta_7 foreign_{ijc} + \beta_8 foreign_{ijc} * IC\ variable_{-i,k} + \beta_9 exporter_{ijc} + \beta_{10} exporter_{ijc} * IC\ variable_{-i,k} \\
 & + \beta_{11} mature_{ijct-3} + \beta_{12} older_{ijct-3} + \beta_{13} government_{ijc} + \beta_{14} small\_noncapital_{ijc} + \\
 & \beta_{15} ControlEG(1)_{ijct} + \beta_{16} ControlEG(2)_{ijct} + \lambda_j + \lambda_c * \lambda_t + \lambda_j * \lambda_c * \lambda_t + \varepsilon_{ijct}
 \end{aligned}$$

where  $Empg_{ijct,t-3}$  refers to the growth of employment of firm  $i$  in industry  $j$  in country  $c$  between period  $t$  and  $t-3$ ,  $small$  refers to firms between 11 and 50 employees,  $medium$  refers the firms between 51 and 200 and  $large$  to firms above 200 employees. To avoid a possible feedback from employment growth to size, size categories are measured at the initial period of observation (generally three years before, but in a few cases, identified by *Control EG(1)* and *Control EG(2)*,

<sup>23</sup> Given that in many instances we have more than one survey per country, the specification includes a whole set of individual country-year survey dummies.

two or one period before, respectively). The omitted category is *micro* enterprises employing between 1 and 10 employees. Age of the firm is specified in three categories: *young*, from 1 to 5 years old, *mature*, between 5 and 15 years old and *older*, above 15 years old. Similarly, *Foreign* takes the value of 1 in firms with more than 10 percent participation of foreign capital and *exporter* identifies firms that export more than 10 percent of their sales at the time of the survey. *Government* identifies firms with participation of more than 10 percent from the government, and *small\_noncapital* identifies firms that are in small cities (less than one million habitants) and are not in a capital city.

Additionally, different investment climate variables are interacted with selected relevant firms' characteristics to assess differences in the effect of business climate indicators across different types of firms.  $ICvariable_{-i,k}$  refers to an investment climate constraint, such as poor infrastructure, or low enforcement of property rights, in city-sector-size-country cell  $k$ , with the average excluding the firm's own response. It should be noted that the IC averages are calculated based on current sizes, but when included as explanatory variables, they are matched based on the initial size of a firm. For example, if a firm was a micro firm three years ago, and three years later, at the time of the survey, the firm has become small, the objective IC of this firm enters in the computation of the average IC for small firms in cell  $k$ . Yet in the regression employment growth of firm  $i$  is associated with the average IC corresponding to firms' initial size category. In the former example, the above-mentioned firm would be matched to the average IC for micro firms. This assumes that within cell  $k$ , the conditions that matter for employment growth are those prevalent in the past, and that objective conditions remain constant over time. These hypotheses are convenient because they prevent reverse causality from employment growth to the IC conditions, as firms may choose to grow/or not grow to face a determined set of IC.

Reassuringly, correlates of employment growth behave in the expected manner. Firm characteristics, sectors and industry-country dummies are included in the tables, but not reported due to space constraints. Employment growth declines monotonically with firm size and age. Firms that export and firms with foreign participation grow faster than firms that do not export or are domestically owned. Sectors such as leather, garments, wood & furniture as well as trade (retail and wholesale) and hotels and restaurants grow at a slower rate than textiles (the omitted sector category) while sectors such as agro-industry, beverages, chemicals and pharmacy, the manufacturing of paper, construction, and quarrying and mining grow faster.

Table 5 shows the effects of the investment climate variables on employment growth. It includes these variables one at a time to illustrate the robustness of the results across different variables in the same subject area. However, while survey dummies control for a large host of unobservable number of country and year characteristics, concerns that omitted variable bias drives the results still remain. After all, environments characterized by ineffective business regulations, or high incidence of corruption are also often characterized by poor infrastructure or low access to finance. To overcome some of these concerns, we control for different indicators of business climate conditions and their interactions with firm size simultaneously. Results are reported in Table 6. Tables 8 and 9 show the robustness of results using alternative variables.

Results in Table 5 and 6 indicate that the effects of investment climate shortcomings differ substantially across firm size. They also suggest strong composition effects: A weak business environment shifts downward the size distribution of firms. However, the channels by which this happens change across business environment dimensions.

#### *Access to Finance*

The impact of better access or lower cost of finances on firms' growth has been studied by a number of authors.<sup>24</sup> Beck, Demirgüç-Kunt and Maksimovic (2005) argue that financial access should favor small firms. In their work, they find that firms' self reported constraints on access and cost to finance are associated with lower growth of small firms (relative to large firms). The results presented here use the actual access firms have to different types of finance, from trade credit to formal financing of working capital and investments, averaging across location-sector-size cells and excluding the own firm's response to minimize possible endogeneity problems. Table 4 showed that there are differences in the amounts of finance available, which could already explain why smaller firms are more likely to complain about finance (Table 3). Here, we test whether, even for the same amount of financing, the impact would be different across different types of firms. The results show that it is. It is indeed the smallest (micro) firms that gain the most. Larger firms also gain, but the benefit is about half that enjoyed by micro firms. Interestingly, this effect seems to hold both for simpler forms of finance—such as sales on credit or overdraft facilities—as well as the more sophisticated bank instruments, such as external financing for investments.

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<sup>24</sup> See for example, Rajan and Zingales (1998), Demirgüç-Kunt and Maksimovic (1998) and Beck Demirgüç-Kunt and Maksimovic (2005).

Our results also indicate a difference in impact between exporters and non-exporters.<sup>25</sup> Improved access to capital markets appears to favor the growth of non exporters companies relative to the growth of companies that cater to the international market. This suggests that either exporting firms are better connected to international capital markets and therefore less dependent on the mobilization of domestic funds, or, instead, that exporting firms in developing countries are in sectors that are intrinsically less dependent on external capital.

### *Regulatory Environment*

Measures of regulatory environment from Tables 5, 6 and 9 show two trends. First, they reinforce the importance of the consistency of enforcement. Consistent enforcement is found to help the growth of all firms, with particular benefits to small firms (Table 5, row 11). This is particularly encouraging given small firms are the ones that are entering into greater regulatory requirements. They also underscore that not all interactions with officials are detrimental. They imply that some interactions with officials indicate firms are likely accessing needed services, or that there is a public good component in increased enforcement of labor regulations or regulations in general. Second, there are costs associated with pure red tape and bureaucratic delays. This is seen most clearly in the costs of delays clearing customs (Table 5, rows 9-10). Such delays do hurt all firms but the micro ones. Since very few micro firms engage in international trade, they may benefit from the difficulties of competitor firms in getting goods through customs.

What is interesting is that both of these effects can be seen in a broad measure of regulatory environment, namely the share of time managers spend with officials dealing with licensing, permits, regulations, etc. The overall effect is positive, consistent with some enforcement being helpful; rather than being a pure measure of regulatory burdens and red tape, time spent with authorities may also reflect being engaged with the state and accessing some public goods. What is striking is that this is strongest for micro firms. Nonetheless, there are limits. Including a quadratic term (Table 6, Column 5) shows that the benefits are offset as the overall time managers spend with officials climbs. For small firms, the marginal contribution starts to fall at the 15 percent mark. More than 20 percent of firms are in the range where the marginal contribution is negative and 10 percent where the overall effect is negative.

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<sup>25</sup> Results are not reported due to space constraints. Results are available upon request.

### *Corruption*

The composition effect is also very strong in environments with a high incidence of corruption. Corruption hampers employment growth in small, medium and large firms. This is true regardless of whether corruption is measured as incidence of bribes, bribes as percentage of sales, incidence of “gifts” to government officials, or gifts as percentage of government contracts. Moreover, for at least one of the measures—incidence of bribes—the effect of corruption is to increase the growth of micro firms. (Table 5 rows 12-15). The latter effects remain when other dimensions of the business environment are included in the specification (Table 6, row 1).

The effect of corruption is large. It is estimated that an increase in the incidence of bribes of 10 percentage points reduces the employment rate of large firms by approximately 1.4 points, and increases the growth rate of micro firms by 1.4 percent (see Table 5, row 12).

### *Infrastructure*

Losses associated with the power outages hurt all firms, with larger firms hurt relatively more (Table 5, row 17). With more sophisticated production processes, the same interruption may serve to raise the defect rates in a larger batch of output, or customers may be more sensitive to delays in production. What is interesting, however, is that the response to the frequency of outages is slightly different and indicates ways that firms respond to situations of unreliable power. When included as the only investment climate constraint, the number of days without power (or without water) serve to favor the growth of micro firms. This may be due to the fact that many of the smallest firms chose production technologies that are less dependent on electricity and are more labor intensive, so that outages actually favor their growth. However, when infrastructure measures are included with the other investment climate measures (Tables 6, 8 and 9), the differences in effects across sizes of firms lose significance for all categories except medium firms. Instead, the detrimental impact of outages is felt more keenly by exporters and domestically owned firms regardless of size.

### *Testing for Significance of Overall Impact*

These results show both that there are differences in the objective conditions facing firms and that even the same objective conditions can translate into different impacts on firm employment growth. To assess the overall impact combining the two types of differences, linear combination tests are conducted. For each subject area, the first three tests assess whether the investment climate variable has a significant impact on small, medium and large firms respectively. The next three tests assess whether the combined (overall) impact of differences in objective conditions and differences in the impact of equal conditions, differs across firm size. That is, they test whether the following linear combinations hold  $\beta_{size_v} \overline{IC}_{size_v} - \beta_{size_w} \overline{IC}_{size_w} = 0$ , where  $\beta_{size_v}$  is the coefficient of the size-investment climate interactions for a given size  $v$ , presented in Table 6, column 1, and  $\overline{IC}_{size_v}$  is the sample average value of a given investment climate variable for size  $v$ . The first test assesses whether the overall impact on large firms is significantly different from that of micro firms, followed by whether it is between small and micro and finally, between large and small.

The results, presented in the last column of table 6, indicate that the coefficients for finance and regulations, presented in column (1) are significant for all size classes, while the impact of bribes is significant for medium-sized and large firms and the effect of infrastructure is only significant on medium-sized firms.

Regarding overall effects, for finance, while the effect of improved access to finance is significant across all firms, and larger for micro enterprises, the overall effect is influenced by the fact that access to finance increases with firm size. Overall, the combination of both effects implies that small firms end up benefiting more, because they have higher access to finance than micro firms.

For management time, the difference in overall impact between large and micro is statistically significant. Micro firms have lower levels of interactions and have higher marginal benefits from these interactions, while larger firms are facing the diminishing returns to even more interactions with officials. However, the difference in impact between large and small is not significant. This raises the importance of differentiating between size classes at the lower end of the distribution, something that is examined in greater detail below.



For bribes, there is an important distinction between the impact of the pervasiveness of corruption and the actual costs of corruption (Table 9, comparing columns 1, 2 and 3). The impact of the pervasiveness of corruption hits larger firms relatively more, with smaller overall effects on medium and small firms (Table 6, column 6). However, taking into account the actual cost of bribes—and the fact that proportionally they are greater for small firms—the impact is actually most detrimental on small firms (Table 9, test column 3). With micro firms actually less hurt than small firms by both the incidence and costs of bribes, this is another area where allowing for differentiated effects at the lower end of the size distribution is important.

#### *Addressing Endogeneity*

Table 6 also includes a number of specifications to address endogeneity concerns. The second column includes estimates for the four measures of the investment climate, using the firms' own responses as independent variables. These results will likely be affected by feedback from a firm's growth experience. In order to properly compare coefficients, results with city-sector-size averages (minus the firm's own response), keeping the same sample size as in column (2), are included in column (3). In addition to addressing endogeneity concerns, the benefit of using cell averages instead of individual firm values is that it allows the sample to be increased to include firms that failed to provide an answer to one or more of the investment climate questions. The results with the expanded sample (column 1) are very similar to the results in column (3), showing that the results are robust to changes in the sample.

Comparing the coefficients from the second and third columns gives some indication of the extent to which there is a feedback from employment growth to individual responses to investment climate measures. However, it should also be noted that the specifications are measuring slightly different things and should thus be interpreted slightly differently. The individual responses are significantly correlated with the cell averages, so the averages do serve as a proxy. However, including the averages directly in the regression is really a test of the importance of the broader investment climate experienced by similar types of firms to a firm's growth. The effect of the environment may indeed have larger effects.

In considering the possible feedback from employment growth to measures of the investment climate, a case could be made for feedback to occur in either direction, making it an empirical question as to which force is likely to dominate. For finance, one would expect that

firms that are growing would be better able to qualify for financing, making it more likely that they would have external loans from banks. On the other hand, firms that are growing are also likely to have higher revenues and retained earnings, making the need to secure external financing less acute. Measures of lagged expansion included in the regressions presented in Table 4 (objective conditions experienced by firms), indicate that contracting firms are actually more likely to have external financing than expanding firms, and both are more likely than stable firms to have external financing. Cell average yields substantially higher benefits of finance than what would be estimated with individual firm level values. This suggests a negative feedback from employment growth to external finance, which if not accounted for reduces the estimated effect of access to finance on firm growth. It may also reflect a positive effect of improved access to finance in other firms.

For corruption and interactions with government officials there are two potential channels. On the one hand, growing firms may be targets for more demands for additional payments and may need to get more permissions to expand their operations. On the other hand, these firms may have greater recourse to avoiding demands for payments, and many of the more time-consuming interactions may have to do with downsizing, such as restrictions on firing workers or filing for protection from creditors. Again, looking at lagged growth, it is the contracting firms that report significantly more demands for bribes, more frequent inspections and longer times dealing with officials. In both cases, the coefficient for micro firms is positive but larger when using IC averages. This suggests a negative feedback from employment growth to corruption and regulations.

The feedback from employment growth to infrastructure is less clear. It is possible that growing firms would have greater access to private solutions to failures in the public grid so that controlling for endogeneity would raise the impact yet results do not suggest such effect as the coefficient on power failures declines when using IC-variables. Growth externalities across firms that fail to secure power may be driving this result.

There is another dimension along which endogeneity may matter, namely whether there is a selection bias such that better performing firms select into better locations. To address this, the regression is repeated, excluding those firms that are most likely to be mobile or choosing among a number of locations in setting up their business. Column 4 in Table 6 thus excludes foreign-owned firms and large firms, only including smaller domestic firms. Results hold,

except for infrastructure, where the effect of medium-sized firms ceases to be statistically significant.

### *Alternative Definitions of Firm Size*

Table 7 examines how sensitive our results are to the size category definitions and the importance of the inclusion of firms with fewer than 10 employees. The results indicate that there is a sharp divide between the effects of investment climate constraints on micro firms on one side and small, medium and large firms on another. This insight can be lost if “small” firms are either defined so broadly as to encompass micro firms, or simply exclude them.

To explore the differences within the smaller sizes of firm, Table 7 shows the results of (1) excluding firms with fewer than five employees (column 1), (2) combining the remaining micro and small into a single category (column 2), and (3) excluding all micro altogether (column 3). Excluding firms with fewer than five employees from the sample hardly alters the results, indicating that firms in the 1-4 employee range behave similar to firms in the 5-10 (see Table 7, column 1, and Table 6, column 1).

Excluding firms with fewer than 5 employees and combining the remaining micro and small firms into a single category (column 2), mutes a number of messages. It is still the case that it is the smallest category of firms that benefit most from additional access to finance, but now the overall effect is smaller, as are the differences across size groups. The effects of regulations are also different; the direct effect remains, but there is now no significant differences across size categories in terms of coefficients or overall impact; the expanded definition of “small” masks the differential impact between those with less or more than 10 employees. The differential impact of bribes is also more muted. Omitting all micro firms altogether (column 3) provides very similar results; combining firms with 5-10 employees has an effect similar to that of excluding them altogether, losing the richness of the differences of the impact on micro and small firms.

## **7. Robustness**

The paper examines two issues in testing for the robustness of the results. First it looks at the effects of using other investment climate variables to measure access to finance in the multiple constraints specifications. Second, it looks to see how sensitive the results are to the exclusion of a particular income group or regions.

### *Different Investment Climate Variables*

Table 8 and 9 extend the results by substituting other variables within the four basic investment climate areas. The results remain strong. Given the large number of possible combinations, we focused on issues of finance (Table 8) and on issues of regulations and corruption (Table 9); differences in the regulation variables have been discussed above. Comparing columns (1), (2) and (3) in Table 8 demonstrates that each measure of finance is associated with benefits that decline with size. Across measures, the benefits appear largest for access to external working capital. Firms may be more likely to take on additional workers if they are able to pay wages on a regular basis even in the face of uncertain cash flows. In terms of overall impact, all three indicate significant differences in comparing micro and small firms, but not between micro and large or small and large firms.

### *Different Samples*

One important concern in cross-country analysis is that some outlier countries or regions drive the results. This issue is addressed here by examining the robustness of the results to the exclusion of one group of countries at the time (see table 10). Results are found to be very robust. Excluding Eastern Europe and Central Asia (ECA) reduces somewhat the impact of finance. It remains positive, but smaller and without the same variation across sizes of firms when that region is excluded. Thus, that larger firms benefit somewhat less from greater access to finance seems predominantly an effect in that region. The positive impact of bribes in promoting micro firms is somewhat sensitive to the exclusion of regions, although the level of significance is generally below 15 percent. Overall, the tables confirm that around the world, better access to finance and better business regulations is associated with higher firm growth for all firms, while lower corruption and, to a lesser extent, better access to infrastructure are associated with higher employment growth in medium-sized and large firms.

## **8. Conclusion**

This paper has provided new evidence of the role of the investment climate on employment growth. The results indicate significant differences across size categories of firms—both in terms of differences in objective conditions faced by firms and in terms of non-linearities in the impact

of these conditions. Low access to finance, corruption, poorly developed business regulations and infrastructure bottlenecks shift downward the size distribution of employment. Low access to finance and ineffective business regulations reduce the growth of all firms, especially micro and small firms. Corruption and poor infrastructure create growth bottlenecks for medium and large firms. The results also reinforce the importance of differentiating the impact across size classes of firms that allow for the micro firms (less than 10 employees) to be different from “small” firms.

This paper confirms previous results on the importance of access to finance for micro and small firms. It contributes to the existing knowledge in finance in various fronts. It shows that the impact on employment growth of an extra unit of external finance is highest for these firms. It also compares the effects of different forms of financing on employment growth and finds that access to working capital has the highest effects of all. Firms may be more likely to take on additional workers if they are able to pay wages on a regular basis even in the face of uncertain cash flows.

What are the aggregate implications of these findings for the size, efficiency and dynamism of the business sector in developing countries? Regarding size, our estimates suggest that a weak investment climate reduces overall employment in the business sector. By way of example, in Argentina and Mexico increasing the share of external financing for investments by 10 percentage points would increase overall employment by 5 percentage points. The same increase in finance for working capital would raise employment by 8 percentage points. In Argentina, reducing the incidence of corruption by 10 percentage points would increase overall employment in the business sector by 0.5 percentage points.<sup>26</sup>

Concerning the efficiency and dynamism of the business sector, we can only make some tentative points. As pointed out by Tybout (2000), it is not necessarily the case that small firms are less efficient than large firms as long as they concentrate in the production of goods and services with limited returns to scale. Yet, even if that is the case, our findings may have a bearing on the dynamism and growth of the business sector. When the business climate is weak, firms may be confined to industries with limited innovation and growth opportunities. In addition, a larger share of firms may remain informal or semi-informal, reducing the capacity of

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<sup>26</sup> These computations make use of data on the size distribution of employment obtained from the database used by Barstelman, Haltiwanger and Scarpetta (2004 and 2005)

the state of collecting taxes and paying for fundamental inputs for development such as education.

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**TABLE 1: EMPLOYMENT GROWTH BY FIRM CHARACTERISTICS**

Income Level	Low		Lower-middle		Upper-middle		High		Total	
	mean	median	mean	median	mean	median	mean	median	mean	median
<b>size 1-10</b>	0.08	0.00	0.05	0.00	0.03	0.00	0.03	0.00	0.051	0.00
<b>size 11-50</b>	0.12	0.00	0.11	0.00	0.15	0.09	0.10	0.00	0.120	0.00
<b>size 51-200</b>	0.11	0.02	0.11	0.02	0.14	0.08	0.10	0.07	0.117	0.04
<b>size 201-500</b>	0.10	0.01	0.08	0.00	0.14	0.06	0.08	0.00	0.095	0.02
<b>size + 500</b>	0.10	0.02	0.05	0.00	0.12	0.04	0.08	0.00	0.074	0.00
<b>age 1-5</b>	0.19	0.04	0.23	0.07	0.25	0.12	0.14	0.00	0.21	0.05
<b>age 6-15</b>	0.10	0.00	0.10	0.00	0.11	0.00	0.07	0.00	0.10	0.00
<b>age +16</b>	0.03	0.00	0.01	0.00	0.05	0.00	0.02	0.00	0.03	0.00
<b>Total</b>	0.10	0.00	0.09	0.00	0.11	0.00	0.06	0.00	0.09	0.00

**TABLE 2: VARIABLE DESCRIPTION**

Name of the variable	Description	mean	sd
IC-Subjective Finance	Access/cost of finance is a firm's constraint rank 0-4 (demeaned <sup>1</sup> )	0.32	1.1
Consistency of Regulations	Officials interpretation of regulations is consistent <sup>2</sup>	3.30	1.50
IC-Subjective Labor Regulations	Labor regulations is a problem to operations rank 0-4 (demeaned <sup>1</sup> )	-0.24	0.99
IC-Subjective Corruption	Corruption is a problem to operations rank 0-4 (demeaned <sup>1</sup> )	0.28	1.1
IC-Subjective Electricity	Electricity is a problem to operations rank 0-4 (demeaned <sup>1</sup> )	-0.04	1.27
Overdraft	Firm has overdraft facility (yes-no)	0.45	0.50
Sh-sales-cr	Percentage of sales sold on credit	42.00	40.00
Sh-work.capital-fin	Percentage of working capital financed externally	14.00	27.00
Sh-invest-fin	Percentage of investments financed externally	20.00	34.00
Days-license	Delay to obtain an operating license -last two years (log-days)	24.00	68.00
Mng-time	% of management's time dealing with government regulations	9.20	14.00
Days-inspections	Total days spent on inspections during last year (log)	13.00	28.00
Days-imports	Average days to obtain imports from point of entry -last year (log)	8.30	14.00
Days-exports	Average days to get exports cleared thru customs -last year (log)	5.00	8.80
Days-labor-inspections	Total days spent on labor inspections last year (log)	3.27	10.42
Bribe y-n	Firms in comparable activities bribe to get things done (yes-no)	0.39	0.49
Bribe (%)	Percentage of sales on bribes to get things done by similar firms	1.80	5.70
Gift y-n	Similar firms give gifts to officials during inspections (yes-no)	0.37	0.48
Gift (%) govt contract	% of government contracts on bribes by comparable firms	2.50	6.50
Days-no power	Power outages experienced during the last year (log-days)	18.00	56.00
Loss power %	Percentage of sales lost due to power outages during last year	4.80	9.60
Days no water	Days of interrupted water supply during last year (log)	8.40	41.00

<sup>1</sup> Perceptions are deviation from respondent's average constraints across all 18 issue areas

<sup>2</sup> Rank: 1disagree - 6 agree

**TABLE 3: SUBJECTIVE (PERCEIVED) BUSINESS CONSTRAINTS BY FIRM CHARACTERISTICS**

$$IC_{subjective} = \alpha + \beta_1 small + \beta_2 medium + \beta_3 large + \beta_4 v.large + \beta_5 mature + \beta_6 older + \beta_7 smallcity + \beta_8 exporter + \beta_9 foreign + \beta_{10} government + (\beta_{11}-\beta_{32}) * industry_{2-22} + (\beta_{33}-\beta_{185}) * survey-country-year + \varepsilon$$

	(1) Finance <sup>1</sup>	(2) Consistency of regulations <sup>2</sup>	(3) Labor regulations <sup>1</sup>	(4) Corruption <sup>1</sup>	(5) Electricity <sup>1</sup>
small	-0.050*** (0.012)	0.082*** (0.019)	0.053*** (0.010)	-0.012 (0.012)	-0.023* (0.012)
medium	-0.136*** (0.014)	0.142*** (0.022)	0.121*** (0.013)	-0.039*** (0.014)	-0.030** (0.015)
large	-0.203*** (0.018)	0.257*** (0.028)	0.166*** (0.017)	-0.050*** (0.018)	-0.035* (0.019)
v.large	-0.207*** (0.022)	0.264*** (0.033)	0.198*** (0.021)	-0.075*** (0.022)	-0.045* (0.023)
mature	-0.001 (0.013)	-0.026 (0.019)	0.021** (0.011)	0.023* (0.012)	-0.022* (0.013)
older	-0.041*** (0.014)	0.004 (0.022)	0.034*** (0.012)	0.008 (0.014)	-0.001 (0.015)
exporter	-0.030*** (0.012)	0.195 (0.128)	0.035*** (0.011)	-0.022* (0.012)	-0.024* (0.013)
foreign	-0.304*** (0.014)	0.100*** (0.016)	0.032*** (0.012)	0.009 (0.014)	0.014 (0.014)
Observations	55182	42673	55770	55027	56683
R-squared	0.14	0.15	0.16	0.15	0.28

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Omitted variables (micro 1-10, young 1-5, capital & city >= 1mn, textiles, Albania 2002)

<sup>1</sup> Perceptions are deviation from respondent's average constraints across all 18 issue areas

<sup>2</sup> rank 1-6; Higher values indicates higher perceived consistency in regulations

**TABLE 4:OBJECTIVE (EXPERIENCED) BUSINESS CONSTRAINTS BY FIRM CHARACTERISTICS**

$$IC_{objective} = \alpha + \beta_1 small + \beta_2 medium + \beta_3 large + \beta_4 v.large + \beta_5 mature + \beta_6 older + \beta_7 smallcity + \beta_8 exporter + \beta_9 foreign + \beta_{10} government + \beta_{11} expanding + \beta_{12} contracting + (\beta_{13}-\beta_{34}) * industry_{2-22} + (\beta_{35}-\beta_{184}) * survey-country-year + \epsilon$$

INVESTMENT CLIMATE (IC variable)	small	medium	large	v.large	mature	older	exporter	foreign	expanding	contracting	Obs.	Rsq
<b>FINANCE</b>												
overdraft (yes/no)	0.102*** (0.006)	0.218*** (0.007)	0.292*** (0.010)	0.296*** (0.011)	0.035*** (0.006)	0.054*** (0.007)	0.050*** (0.006)	0.005 (0.007)	0.024*** (0.008)	-0.010 (0.012)	37175	.33
sh-sales-cr (%)	7.478*** (0.380)	9.864*** (0.478)	9.868*** (0.648)	8.388*** (0.783)	0.955** (0.397)	1.203*** (0.460)	2.896*** (0.415)	4.863*** (0.480)	3.797*** (0.514)	5.174*** (0.748)	56592	.28
sh-work.capital-fin (%)	3.938*** (0.252)	7.757*** (0.352)	10.024*** (0.505)	12.453*** (0.656)	0.455 (0.285)	1.006*** (0.342)	3.333*** (0.330)	-2.374*** (0.365)	2.887*** (0.384)	3.001*** (0.545)	54449	.17
sh-invest-fin (%)	5.478*** (0.429)	9.790*** (0.551)	11.957*** (0.724)	13.799*** (0.879)	1.278*** (0.448)	1.374** (0.539)	2.491*** (0.480)	-3.407*** (0.549)	3.687*** (0.597)	2.612*** (0.885)	36923	.16
<b>REGULATIONS</b>												
days to get business license (log)	0.115*** (0.040)	0.174*** (0.046)	0.082 (0.059)	0.188*** (0.071)	-0.134*** (0.040)	-0.140*** (0.044)	0.015 (0.036)	0.081** (0.038)	0.060 (0.048)	0.114 (0.075)	7968	.33
management time (%)	1.143*** (0.154)	1.794*** (0.195)	1.526*** (0.243)	1.592*** (0.289)	0.252* (0.147)	0.550*** (0.177)	0.700*** (0.158)	0.392** (0.174)	0.493** (0.209)	1.756*** (0.310)	52433	.16
days-inspections (log)	0.471*** (0.028)	0.888*** (0.033)	1.097*** (0.043)	1.211*** (0.052)	0.030 (0.030)	0.037 (0.034)	0.153*** (0.027)	0.139*** (0.032)	-0.004 (0.037)	0.231*** (0.052)	42524	.4
days-labor-inspections (log)	0.471*** (0.039)	0.993*** (0.045)	1.184*** (0.057)	1.321*** (0.068)	0.044 (0.042)	0.073 (0.046)	0.118*** (0.035)	0.182*** (0.044)	-0.018 (0.050)	0.380*** (0.068)	29102	.29
days-imports (log)	-0.046* (0.027)	-0.095*** (0.028)	-0.126*** (0.032)	-0.166*** (0.035)	-0.052** (0.022)	0.011 (0.024)	-0.130*** (0.016)	-0.102*** (0.017)	-0.031 (0.026)	-0.036 (0.038)	16460	.33
days-exports (log)	-0.029 (0.035)	-0.053 (0.035)	-0.096** (0.038)	-0.114*** (0.041)	-0.086*** (0.026)	-0.056** (0.028)	-0.059*** (0.020)	-0.085*** (0.019)	-0.006 (0.029)	-0.088** (0.042)	13461	.23
<b>CORRUPTION</b>												
bribe (yes/no)	0.031*** (0.006)	0.022*** (0.007)	0.009 (0.009)	0.012 (0.011)	0.003 (0.006)	-0.017** (0.007)	0.022*** (0.006)	-0.013* (0.007)	0.047*** (0.008)	0.065*** (0.011)	42704	.2
bribe (% sales)	-0.021 (0.071)	-0.385*** (0.082)	-0.411*** (0.111)	-0.458*** (0.107)	-0.110 (0.071)	-0.261*** (0.083)	-0.032 (0.068)	-0.121 (0.079)	0.133 (0.085)	0.422*** (0.118)	42704	.11
gift to govt. (yes/no)	0.002 (0.006)	-0.003 (0.007)	-0.022** (0.009)	-0.034*** (0.010)	-0.011** (0.006)	-0.030*** (0.007)	0.016*** (0.005)	-0.013** (0.006)	0.031*** (0.007)	0.040*** (0.010)	41534	.33
gift (% govt contract)	0.194** (0.082)	-0.208** (0.096)	-0.456*** (0.106)	-0.497*** (0.131)	-0.049 (0.087)	-0.306*** (0.100)	-0.078 (0.072)	-0.218** (0.089)	0.194** (0.098)	0.865*** (0.188)	38937	.15
<b>INFRASTRUCTURE</b>												
days-no power (log)	0.170*** (0.032)	0.199*** (0.041)	-0.066 (0.056)	-0.180*** (0.068)	0.146*** (0.036)	0.144*** (0.040)	0.059* (0.035)	-0.081** (0.040)	0.308*** (0.045)	0.200*** (0.065)	50439	.39
loss power (%)	-0.233 (0.163)	-0.966*** (0.185)	-1.317*** (0.221)	-1.636*** (0.231)	0.044 (0.159)	0.067 (0.177)	-0.067 (0.142)	-0.421** (0.170)	0.472** (0.232)	1.216*** (0.374)	25889	.16
days no water (log)	-0.011 (0.033)	-0.106*** (0.040)	-0.247*** (0.051)	-0.293*** (0.062)	0.052 (0.037)	-0.000 (0.041)	-0.012 (0.032)	-0.106*** (0.039)	0.171*** (0.045)	0.049 (0.060)	43456	.22

Robust standard errors in parentheses, clustered by country-size-industry3-city. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Each row reports the results of a regression of an IC-variable on firms characteristics. Only a selection of coefficients reported.

Omitted variables (micro 1-10, young1-5, capital&city>=1mn, textiles, Albania 2002)

**TABLE 5: IMPACT OF INVESTMENT CLIMATE (IC) ON EMPLOYMENT GROWTH (one IC dimension)**

*Firm's employment growth* =  $\alpha + \beta_{1IC} + \beta_{2small*IC} + \beta_{3medium*IC} + \beta_{4large*IC} + \beta_{5mature} + \beta_{6older} + \beta_{7smallcity} + \beta_{8exporter} + \beta_{9foreign} + \beta_{10government} + (\beta_{11}-\beta_{12})*growth-period1-2 + (\beta_{13}-\beta_{34})*industry2-22 + (\beta_{35}-\beta_{184})*survey-country-year + \varepsilon$

IC variable / RHS term	IC	small*IC	medium*IC	large*IC	constant	obs	rsq
<b>FINANCE</b>							
(1) overdraft (yes/no)	0.932*** (0.062)	-0.111** (0.046)	-0.082 (0.061)	-0.020 (0.078)	0.163 (0.103)	38870	.18
(2) sh-sales-cr (%)	0.005*** (0.001)	-0.001* (0.000)	-0.002*** (0.001)	-0.003*** (0.001)	0.343*** (0.053)	57252	.12
(3) sh-work.capital-fin (%)	0.013*** (0.001)	-0.003*** (0.001)	-0.005*** (0.001)	-0.007*** (0.001)	0.480*** (0.045)	55895	.13
(4) sh-invest-fin (%)	0.006*** (0.001)	-0.000 (0.001)	-0.001 (0.001)	-0.002** (0.001)	0.501*** (0.047)	56065	.12
<b>REGULATIONS</b>							
(5) days-license (log)	0.027* (0.016)	-0.018 (0.013)	-0.025 (0.016)	-0.023 (0.016)	0.359*** (0.097)	32049	.13
(6) management time (%)	0.013*** (0.002)	-0.006*** (0.002)	-0.006*** (0.002)	-0.005*** (0.002)	0.445*** (0.057)	55923	.12
(7) days-inspections (log)	0.238*** (0.020)	-0.023 (0.015)	-0.049** (0.019)	-0.064*** (0.024)	-0.221** (0.109)	49007	.14
(8) days-labor-inspections (log)	0.237*** (0.034)	-0.101*** (0.032)	-0.104** (0.041)	-0.136*** (0.044)	0.092 (0.098)	40879	.12
(9) days-exports (log)	0.023** (0.011)	-0.024** (0.010)	-0.029** (0.014)	-0.034** (0.015)	0.553*** (0.051)	57628	.11
(10) days-imports (log)	0.017 (0.011)	-0.029*** (0.011)	-0.023 (0.014)	-0.018 (0.015)	0.552*** (0.051)	58283	.11
(11) Consistency of Regulations	0.043*** (0.015)	0.025 (0.015)	-0.007 (0.020)	-0.006 (0.020)	0.457*** (0.062)	52208	.11
<b>CORRUPTION</b>							
(12) bribe (yes/no)	0.143*** (0.044)	-0.133*** (0.045)	-0.256*** (0.057)	-0.281*** (0.068)	0.533*** (0.061)	50708	.12
(13) bribe (%)	-0.005 (0.003)	-0.011*** (0.003)	-0.019*** (0.005)	-0.019*** (0.006)	0.613*** (0.053)	50708	.12
(14) gift to govt (yes/no)	0.008 (0.041)	-0.050 (0.041)	-0.135** (0.054)	-0.113* (0.066)	0.573*** (0.055)	53545	.11
(15) gift (% govt contract)	0.001 (0.003)	-0.010*** (0.003)	-0.017*** (0.004)	-0.015*** (0.005)	0.572*** (0.056)	51369	.11
<b>INFRASTRUCTURE</b>							
(16) days-no power (log)	0.017** (0.009)	-0.008 (0.007)	-0.023*** (0.008)	-0.017** (0.008)	0.519*** (0.055)	53655	.11
(17) loss power (% sales)	-0.008*** (0.002)	-0.002 (0.002)	-0.005* (0.003)	-0.007* (0.004)	0.506*** (0.089)	49482	.11
(18) days no water (log)	-0.007 (0.006)	-0.009 (0.006)	-0.018** (0.008)	-0.014* (0.008)	0.597*** (0.052)	53993	.11

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

NOTE: IC variable -average country-size-industry3-city

Each row number presents the results of a regression of employment growth on one IC. Only selected coefficients presented

Robust standard errors in parentheses, clustered by country-size-industry3-city

Omitted variables (micro 1-10, young1-5, capital&city>=1mn, textiles, Albania 2002)

**TABLE 6: IMPACT OF INVESTMENT CLIMATE ON EMPLOYMENT GROWTH (4 IC dimensions)**

$\text{Firm's employment growth} = a + \beta_1 \text{IC1} + \beta_2 \text{small*IC1} + \beta_3 \text{medium*IC1} + \beta_4 \text{large*IC1} + \beta_5 \text{IC2} + \beta_6 \text{small*IC2} + \beta_7 \text{medium*IC2} + \beta_8 \text{large*IC2} + \beta_9 \text{IC3} + \beta_{10} \text{small*IC3} + \beta_{11} \text{medium*IC3} + \beta_{12} \text{large*IC3} + \beta_{13} \text{IC4} + \beta_{14} \text{small*IC4} + \beta_{15} \text{medium*IC4} + \beta_{16} \text{large*IC4} + \beta_{17} \text{mature} + \beta_{18} \text{v.mature} + \beta_{19} \text{smallcity} + \beta_{20} \text{exporter} + \beta_{21} \text{foreign} + \beta_{22} \text{government} + (\beta_{23} - \beta_{24}) * \text{growth-period1-2} + (\beta_{25} - \beta_{33} \beta_{24}) * \text{industry\_survey-country-year} + \varepsilon$							
	(1)	(2)	(3)	(4)	(5)		(6)
	basic (IC Average) - all sample	ICfirm level	basic - reduced sample	basic- excluding large & foreign	basic quadratic term in regulation		tests col. (1)
Observations	44208	23162	23162	36707	44208		
<b>sh-invest-fin</b>	0.006*** (0.001)	0.001*** (0.000)	0.008*** (0.001)	0.007*** (0.001)	0.006*** (0.001)	$p(bIC + bICsm = 0)$	0.000
small*sh-invest-fin	-0.000 (0.001)	-0.000 (0.000)	-0.001 (0.001)	-0.000 (0.001)	-0.000 (0.001)	$p(bIC + bIClmed = 0)$	0.000
medium*sh-invest-fin	-0.002** (0.001)	-0.000 (0.000)	-0.003*** (0.001)	-0.002** (0.001)	-0.002** (0.001)	$p(bIC + bIClg = 0)$ $(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - b_{IC} * \text{avg}_{ICmic}$ <i>se</i>	0.021
large*sh-invest-fin	-0.003*** (0.001)	-0.000 (0.000)	-0.003*** (0.001)		-0.003*** (0.001)	$(b_{ICsm} + b_{IC}) * \text{avg}_{ICsm} - b_{IC} * \text{avg}_{ICmic}$ <i>se</i> $(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - (b_{ICsm} + b_{IC}) * \text{avg}_{ICsm}$ <i>se</i>	0.017 0.030 0.011 -0.010 0.017
<b>mng-time</b>	0.015*** (0.002)	0.002*** (0.001)	0.014*** (0.002)	0.014*** (0.002)	0.023*** (0.003)	$p(bIC + bICsm = 0)$ $p(bIC + bICmed = 0)$	0.000 0.000
small*mng-time	-0.008*** (0.001)	-0.003*** (0.001)	-0.009*** (0.002)	-0.006*** (0.001)	-0.011*** (0.004)	$p(bIC + bIClg = 0)$ $(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - b_{IC} * \text{avg}_{ICmi}$ <i>se</i>	0.000 -0.061 0.017
medium*mng-time	-0.009*** (0.002)	-0.002** (0.001)	-0.009*** (0.002)	-0.005** (0.002)	-0.014*** (0.005)	$(b_{ICsm} + b_{IC}) * \text{avg}_{ICsm} - b_{IC} * \text{avg}_{ICmi}$ <i>se</i>	-0.041
large*mng-time	-0.010*** (0.002)	-0.002*** (0.001)	-0.008*** (0.003)		-0.012*** (0.005)	$(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - (b_{ICsm} + b_{IC}) * \text{avg}_{ICsm}$ <i>se</i>	0.012 -0.020
mng-time^2					-0.0003*** (0.0001)	<i>se</i>	0.016
<b>bribe y-n</b>	0.077* (0.043)	0.027** (0.011)	0.120** (0.049)	0.045 (0.045)	0.068 (0.043)	$p(bIC + bICsm = 0)$ $p(bIC + bICmed = 0)$	0.726 0.011
small*bribe y-n	-0.090** (0.038)	-0.037** (0.015)	-0.101** (0.047)	-0.045 (0.037)	-0.088** (0.038)	$p(bIC + bIClg = 0)$ $(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - b_{IC} * \text{avg}_{ICmic}$ <i>se</i>	0.003 -0.073 0.019
medium*bribe y-n	-0.173*** (0.049)	-0.061*** (0.018)	-0.205*** (0.057)	-0.162*** (0.051)	-0.171*** (0.050)	$(b_{ICsm} + b_{IC}) * \text{avg}_{ICsm} - b_{IC} * \text{avg}_{ICmic}$ <i>se</i>	-0.033
large*bribe y-n	-0.193*** (0.051)	-0.037* (0.019)	-0.225*** (0.062)		-0.180*** (0.052)	$(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - (b_{ICsm} + b_{IC}) * \text{avg}_{ICsm}$ <i>se</i>	0.014 -0.040 0.018
<b>days-no power</b>	-0.002 (0.010)	0.008* (0.005)	-0.005 (0.012)	-0.005 (0.011)	-0.002 (0.010)	$p(bIC + bICsm = 0)$ $p(bIC + bICmed = 0)$	0.675 0.018
small*days-no power	-0.002 (0.007)	-0.007 (0.006)	-0.006 (0.009)	-0.001 (0.007)	-0.002 (0.007)	$p(bIC + bIClg = 0)$ $(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - b_{IC} * \text{avg}_{ICmic}$ <i>se</i>	0.144 -0.024
medium*days-no power	-0.020** (0.010)	-0.010 (0.006)	-0.020* (0.011)	-0.014 (0.010)	-0.020** (0.010)	$(b_{ICsm} + b_{IC}) * \text{avg}_{ICsm} - b_{IC} * \text{avg}_{ICmic}$ <i>se</i>	0.019 -0.005
large*days-no power	-0.012 (0.010)	-0.010 (0.007)	-0.012 (0.012)		-0.013 (0.010)	$(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - (b_{ICsm} + b_{IC}) * \text{avg}_{ICsm}$ <i>se</i>	0.013 -0.019
R-squared	0.16	0.17	0.19	0.16	0.16	<i>se</i>	0.017

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

NOTE: IC variable -average country-size-industry3-city

Each column presents the results of a regression of employment growth on multiple IC. Only selected coefficients presented

Robust standard errors in parentheses, clustered by country-size-industry3-city

Omitted variables (micro 1-10, young1-5, capital&city>=1mn, textiles, Albania 2002)

**TABLE 7: IMPACT OF INVESTMENT CLIMATE ON EMPLOYMENT GROWTH (size classes)**

$\text{Firm's employment growth} = a + \beta_1 \text{IC1} + \beta_2 \text{small*IC1} + \beta_3 \text{medium*IC1} + \beta_4 \text{large*IC1} + \beta_5 \text{IC2} + \beta_6 \text{small*IC2} + \beta_7 \text{medium*IC2} + \beta_8 \text{large*IC2} + \beta_9 \text{IC3} + \beta_{10} \text{small*IC3} + \beta_{11} \text{medium*IC3} + \beta_{12} \text{large*IC3} + \beta_{13} \text{IC4} + \beta_{14} \text{small*IC4} + \beta_{15} \text{medium*IC4} + \beta_{16} \text{large*IC4} + \beta_{17} \text{mature} + \beta_{18} \text{v.mature} + \beta_{19} \text{smallcity} + \beta_{20} \text{exporter} + \beta_{21} \text{foreign} + \beta_{22} \text{government} + (\beta_{23} - \beta_{24}) * \text{growth-period1-2} + (\beta_{25} - \beta_{33} \beta_{24}) * \text{industry survey-country-year} + \varepsilon$								
	(1)	(2)	(3)		(4)	(5)	(6)	
	micro(5-10)	small(5-50)	small (11-50)					
	med(51-200)	med (51-500)	med ( 51-200)		tests col.	tests col.	tests col.	
	large(+200)	large (+500)	large(+200)		(1)	(2)	(3)	
Observations	40942	38442	28457					
<b>sh-invest-fin</b>	0.008*** (0.001)	0.006*** (0.000)	0.006*** (0.001)	$p(bIC + bICsm = 0)$	0.000			
small*sh-invest-fin	-0.001 (0.001)			$p(bIC + bICmed = 0)$	0.000	0.000	0.000	
medium*sh-invest-fin	-0.003*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	$p(bIC + bIClg = 0)$ $(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - b_{IC} * \text{avg}_{ICmic}$ <i>se</i>	-0.002	0.018		
large*sh-invest-fin	-0.004*** (0.001)	-0.003*** (0.001)	-0.002*** (0.001)	$(b_{ICsm} + b_{IC}) * \text{avg}_{ICsm} - b_{IC} * \text{avg}_{ICmic}$ <i>se</i>	0.017	0.006	-0.005	
				$(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - (b_{ICsm} + b_{IC}) * \text{avg}_{ICsm}$ <i>se</i>	-0.019	-0.020	-0.015	
					0.017	0.020	0.016	
<b>mng-time</b>	0.016*** (0.002)	0.008*** (0.001)	0.007*** (0.001)	$p(bIC + bICsm = 0)$	0.000			
small*mng-time	-0.009*** (0.001)			$p(bIC + bICmed = 0)$	0.000	0.000	0.000	
medium*mng-time	-0.010*** (0.002)	-0.002 (0.001)	-0.001 (0.001)	$p(bIC + bIClg = 0)$ $(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - b_{IC} * \text{avg}_{ICmi}$ <i>se</i>	-0.066	0.017		
large*mng-time	-0.011*** (0.002)	-0.002 (0.002)	-0.002 (0.002)	$(b_{ICsm} + b_{IC}) * \text{avg}_{ICsm} - b_{IC} * \text{avg}_{ICmi}$ <i>se</i>	-0.052	-0.010	-0.002	
				$(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - (b_{ICsm} + b_{IC}) * \text{avg}_{ICsm}$ <i>se</i>	0.012	0.011	0.012	
					-0.014	-0.011	-0.017	
					0.016	0.020	0.016	
<b>bribe y-n</b>	0.063 (0.045)	-0.002 (0.031)	-0.043 (0.037)	$p(bIC + bICsm = 0)$	0.994			
small*bribe y-n	-0.062 (0.039)			$p(bIC + bICmed = 0)$	0.008	0.001	0.000	
medium*bribe y-n	-0.157*** (0.050)	-0.100*** (0.033)	-0.076** (0.037)	$p(bIC + bIClg = 0)$ $(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - b_{IC} * \text{avg}_{ICmic}$ <i>se</i>	-0.069	0.019		
large*bribe y-n	-0.181*** (0.052)	-0.089* (0.049)	-0.095** (0.045)	$(b_{ICsm} + b_{IC}) * \text{avg}_{ICsm} - b_{IC} * \text{avg}_{ICmic}$ <i>se</i>	-0.022	-0.038	-0.029	
				$(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - (b_{ICsm} + b_{IC}) * \text{avg}_{ICsm}$ <i>se</i>	0.015	0.013	0.014	
					-0.047	-0.036	-0.037	
					0.018	0.020	0.018	
<b>days-no power</b>	-0.003 (0.011)	-0.010 (0.008)	-0.012 (0.009)	$p(bIC + bICsm = 0)$	0.294			
small*days-no power	-0.007 (0.008)			$p(bIC + bICmed = 0)$	0.006	0.005	0.003	
medium*days-no power	-0.023** (0.010)	-0.012* (0.006)	-0.015** (0.007)	$p(bIC + bIClg = 0)$ $(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - b_{IC} * \text{avg}_{ICmic}$ <i>se</i>	-0.032	0.019		
large*days-no power	-0.016 (0.010)	0.002 (0.010)	-0.007 (0.008)	$(b_{ICsm} + b_{IC}) * \text{avg}_{ICsm} - b_{IC} * \text{avg}_{ICmic}$ <i>se</i>	-0.014	-0.025	-0.030	
				$(b_{IClg} + b_{IC}) * \text{avg}_{IClg} - (b_{ICsm} + b_{IC}) * \text{avg}_{ICsm}$ <i>se</i>	0.014	0.013	0.014	
					-0.017	0.003	-0.014	
small	-0.024 (0.026)				0.017	0.019	0.017	
medium	0.001 (0.033)	-0.015 (0.023)	0.011 (0.027)					
large	-0.041 (0.034)	-0.102*** (0.038)	-0.036 (0.032)					
R-squared	0.16	0.13	0.14					

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

NOTE: IC variable -average country-size-industry3-city

Robust standard errors in parentheses, clustered by country-size-industry3-city.



**TABLE 8: IMPACT OF INVESTMENT CLIMATE ON EMPLOYMENT GROWTH (other FINANCE INDICATORS)**

$$Firm's\ employment\ growth = a + \beta_1 IC1 + \beta_2 small*IC1 + \beta_3 medium*IC1 + \beta_4 large*IC1 + \beta_5 IC2 + \beta_6 small*IC2 + \beta_7 medium*IC2 + \beta_8 large*IC2 + \beta_9 IC3 + \beta_{10} small*IC3 + \beta_{11} medium*IC3 + \beta_{12} large*IC3 + \beta_{13} IC4 + \beta_{14} small*IC4 + \beta_{15} medium*IC4 + \beta_{16} large*IC4 + \beta_{17} mature + \beta_{18} v.mature + \beta_{19} smallcity + \beta_{20} exporter + \beta_{21} foreign + \beta_{22} government + (\beta_{23}-\beta_{24})*growth-period1-2 + (\beta_{25}-\beta_{324})*industry\_survey-country-year + \epsilon$$

	(1)	(2)	(3)		tests col.	tests col.	tests col.
Finance variable	sh-invest-fin	sh-sales-cr	sh-wk.cap.- fin		(1)	(2)	(3)
Observations	44208	44208	44208				
<b>FINANCE</b>	0.006*** (0.001)	0.006*** (0.001)	0.014*** (0.001)	$p(bIC + bICsm = 0)$	0.000	0.000	0.000
				$p(bIC + bICmed = 0)$	0.000	0.000	0.000
small*FINANCE	-0.000 (0.001)	-0.001 (0.001)	-0.003*** (0.001)	$p(bIC + bIClg = 0)$	0.000	0.000	0.000
				$(b_{IClg}+b_{IC})^*avg_{IClg} - b_{IC}^*avg_{ICmic}$	0.021	-0.040	0.023
medium*FINANCE	-0.002** (0.001)	-0.002*** (0.001)	-0.005*** (0.001)	<i>se</i>	0.017	0.023	0.018
				$(b_{ICsm}+b_{IC})^*avg_{ICsm} - b_{IC}^*avg_{ICmic}$	0.030	0.057	0.037
large*FINANCE	-0.003*** (0.001)	-0.003*** (0.001)	-0.008*** (0.001)	<i>se</i>	0.011	0.019	0.012
				$(b_{IClg}+b_{IC})^*avg_{IClg} - (b_{ICsm}+b_{IC})^*avg_{ICsm}$	-0.010	-0.098	-0.014
				<i>se</i>	0.017	0.023	0.019
<b>mng-time</b>	0.015*** (0.002)	0.014*** (0.002)	0.014*** (0.002)	$p(bIC + bICsm = 0)$	0.000	0.000	0.000
				$p(bIC + bICmd = 0)$	0.000	0.000	0.000
small*mng-time	-0.008*** (0.001)	-0.006*** (0.001)	-0.008*** (0.001)	$p(bIC + bIClg = 0)$	0.000	0.000	0.009
				$(b_{IClg}+b_{IC})^*avg_{IClg} - b_{IC}^*avg_{ICmi}$	-0.061	-0.045	-0.065
medium*mng-time	-0.009*** (0.002)	-0.007*** (0.002)	-0.009*** (0.002)	<i>se</i>	0.017	0.017	0.017
				$(b_{ICsm}+b_{IC})^*avg_{ICsm} - b_{IC}^*avg_{ICmi}$	-0.041	-0.030	-0.045
large*mng-time	-0.010*** (0.002)	-0.008*** (0.002)	-0.010*** (0.002)	<i>se</i>	0.012	0.011	0.011
				$(b_{IClg}+b_{IC})^*avg_{IClg} - (b_{ICsm}+b_{IC})^*avg_{ICsm}$	-0.020	-0.015	-0.020
				<i>se</i>	0.016	0.016	0.017
<b>bribe y-n</b>	0.077* (0.043)	0.029 (0.040)	0.103** (0.040)	$p(bIC + bICsm = 0)$	0.726	0.131	0.781
				$p(bIC + bICmed = 0)$	0.011	0.001	0.005
small*bribe y-n	-0.090** (0.038)	-0.085** (0.037)	-0.113*** (0.037)	$p(bIC + bIClg = 0)$	0.003	0.009	0.015
				$(b_{IClg}+b_{IC})^*avg_{IClg} - b_{IC}^*avg_{ICmic}$	-0.073	-0.053	-0.076
medium*bribe y-n	-0.173*** (0.049)	-0.158*** (0.048)	-0.208*** (0.048)	<i>se</i>	0.019	0.019	0.020
				$(b_{ICsm}+b_{IC})^*avg_{ICsm} - b_{IC}^*avg_{ICmic}$	-0.033	-0.033	-0.041
large*bribe y-n	-0.193*** (0.051)	-0.138*** (0.052)	-0.203*** (0.052)	<i>se</i>	0.014	0.014	0.014
				$(b_{IClg}+b_{IC})^*avg_{IClg} - (b_{ICsm}+b_{IC})^*avg_{ICsm}$	-0.040	-0.021	-0.036
				<i>se</i>	0.018	0.019	0.019
<b>days-no power</b>	-0.002 (0.010)	0.004 (0.010)	-0.002 (0.009)	$p(bIC + bICsm = 0)$	0.675	0.832	0.541
				$p(bIC + bICmed = 0)$	0.018	0.070	0.012
small*days-no power	-0.002 (0.007)	-0.006 (0.008)	-0.004 (0.007)	$p(bIC + bIClg = 0)$	0.144	0.237	0.335
				$(b_{IClg}+b_{IC})^*avg_{IClg} - b_{IC}^*avg_{ICmic}$	-0.024	-0.030	-0.015
medium*days-no power	-0.020** (0.010)	-0.021** (0.010)	-0.021** (0.010)	<i>se</i>	0.019	0.020	0.019
				$(b_{ICsm}+b_{IC})^*avg_{ICsm} - b_{IC}^*avg_{ICmic}$	-0.005	-0.011	-0.007
large*days-no power	-0.012 (0.010)	-0.016 (0.011)	-0.007 (0.010)	<i>se</i>	0.013	0.015	0.013
				$(b_{IClg}+b_{IC})^*avg_{IClg} - (b_{ICsm}+b_{IC})^*avg_{ICsm}$	-0.019	-0.019	-0.007
small	-0.080*** (0.025)	-0.077*** (0.027)	-0.053** (0.023)	<i>se</i>	0.017	0.019	0.018
medium	-0.057* (0.030)	-0.032 (0.034)	-0.038 (0.027)				
large	-0.109*** (0.032)	-0.071** (0.035)	-0.082*** (0.031)				
R-squared	0.16	0.16	0.17				

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

NOTE: IC variable -average country-size-industry3-city

Robust standard errors in parentheses, clustered by country-size-industry3-city.

Omitted variables (micro 1-10, young1-5, capital&city>=1mn, textiles, Albania 2002)

**TABLE 9: IMPACT OF INVESTMENT CLIMATE ON EMPLOYMENT GROWTH (other regulatory and corruption indicators)**

$$Firm's\ employment\ growth = a + \beta_1 IC_1 + \beta_2 small*IC_1 + \beta_3 medium*IC_1 + \beta_4 large*IC_1 + \beta_5 IC_2 + \beta_6 small*IC_2 + \beta_7 medium*IC_2 + \beta_8 large*IC_2 + \beta_9 IC_3 + \beta_{10} small*IC_3 + \beta_{11} medium*IC_3 + \beta_{12} large*IC_3 + \beta_{13} IC_4 + \beta_{14} small*IC_4 + \beta_{15} medium*IC_4 + \beta_{16} large*IC_4 + \beta_{17} mature + \beta_{18} v.mature + \beta_{19} smallcity + \beta_{20} exporter + \beta_{21} foreign + \beta_{22} government + (\beta_{23}-\beta_{24})*growth-period1-2 + (\beta_{25}-\beta_{33}24)*industry\_survey-country-year + \epsilon$$

Regulation/Corruption variable	(1) Consistency regulations	(2) days-import	(3) bribe (% sales)		tests col. (1)	tests col. (2)	tests col. (3)
Observations	44208	44208	44208				
<b>sh-invest-fin</b>	0.006*** (0.001)	0.006*** (0.001)	0.006*** (0.001)	$p(bIC + bICsm = 0)$	0.000	0.000	0.000
small*sh-invest-fin	-0.000 (0.001)	0.000 (0.001)	-0.000 (0.001)	$p(bIC + bIClg = 0)$	0.000	0.000	0.000
medium*sh-invest-fin	-0.002* (0.001)	-0.002* (0.001)	-0.001* (0.001)	$(b_{IClg}+b_{IC})^*avg_{IClg} - b_{IC}^*avg_{ICmic}$ se	0.026	0.027	0.024
large*sh-invest-fin	-0.002*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	$(b_{ICsm}+b_{IC})^*avg_{ICsm} - b_{IC}^*avg_{ICmic}$ $(b_{IClg}+b_{IC})^*avg_{IClg} - (b_{ICsm}+b_{IC})^*avg_{ICsm}$ se	0.030	0.034	0.032
<b>REGULATIONS</b>	0.047*** (0.014)	0.011 (0.011)	0.015*** (0.002)	$p(bIC + bICsm = 0)$	0.000	0.038	0.000
small*regulation	0.034*** (0.014)	-0.031*** (0.011)	-0.007*** (0.001)	$p(bIC + bICmd = 0)$ $p(bIC + bIClg = 0)$	0.000	0.788	0.000
medium*regulation	0.006 (0.018)	-0.007 (0.015)	-0.009*** (0.002)	$(b_{IClg}+b_{IC})^*avg_{IClg} - b_{IC}^*avg_{ICmi}$ se	0.062	-0.023	-0.059
large*regulation	0.014 (0.017)	-0.013 (0.016)	-0.010*** (0.002)	$(b_{ICsm}+b_{IC})^*avg_{ICsm} - b_{IC}^*avg_{ICmi}$ $(b_{IClg}+b_{IC})^*avg_{IClg} - (b_{ICsm}+b_{IC})^*avg_{ICsm}$ se	0.116	-0.058	-0.035
<b>CORRUPTION</b>	0.112** (0.044)	0.107** (0.003)	-0.009*** (0.003)	$p(bIC + bICsm = 0)$	0.366	0.909	0.000
small*corruption	-0.079** (0.039)	-0.103** (0.041)	-0.010** (0.004)	$p(bIC + bICmd = 0)$ $p(bIC + bIClg = 0)$	0.138	0.044	0.001
medium*corruption	-0.169*** (0.051)	-0.184*** (0.051)	-0.012** (0.006)	$(b_{IClg}+b_{IC})^*avg_{IClg} - b_{IC}^*avg_{ICmic}$ se	0.025	0.008	0.000
large*corruption	-0.198*** (0.052)	-0.209*** (0.052)	-0.013** (0.006)	$(b_{ICsm}+b_{IC})^*avg_{ICsm} - b_{IC}^*avg_{ICmic}$ $(b_{IClg}+b_{IC})^*avg_{IClg} - (b_{ICsm}+b_{IC})^*avg_{ICsm}$ se	0.019	0.019	0.008
<b>days-no power</b>	-0.001 (0.010)	-0.003 (0.010)	0.006 (0.009)	$p(bIC + bICsm = 0)$	0.366	0.909	0.000
small*days-no power	0.000 (0.008)	0.004 (0.008)	-0.002 (0.007)	$p(bIC + bICmd = 0)$ $p(bIC + bIClg = 0)$	0.138	0.044	0.001
medium*days-no power	-0.015 (0.010)	-0.016 (0.010)	-0.027*** (0.009)	$(b_{IClg}+b_{IC})^*avg_{IClg} - b_{IC}^*avg_{ICmic}$ se	0.025	0.008	0.000
large*days-no power	-0.004 (0.010)	-0.007 (0.010)	-0.021** (0.009)	$(b_{ICsm}+b_{IC})^*avg_{ICsm} - b_{IC}^*avg_{ICmic}$ $(b_{IClg}+b_{IC})^*avg_{IClg} - (b_{ICsm}+b_{IC})^*avg_{ICsm}$ se	0.019	0.019	0.017
small	-0.254*** (0.054)	-0.085*** (0.030)	-0.104*** (0.021)	se	0.000	0.008	-0.002
medium	-0.148** (0.068)	-0.105*** (0.035)	-0.102*** (0.028)	se	0.014	0.014	0.014
large	-0.241*** (0.064)	-0.155*** (0.036)	-0.153*** (0.030)	se	-0.009	-0.022	-0.038
R-squared	0.15	0.15	0.16		0.018	0.017	0.016

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

NOTE: IC variable -average country-size-industry3-city

Robust standard errors in parentheses, clustered by country-size-industry3-city.

Omitted variables (micro 1-10, young1-5, capital&city>=1mn, textiles, Albania 2002)

TABLE 10: ROBUSTNESS: BASIC SPECIFICATION OMITTING ONE INCOME GROUP OR REGION

$Firm's\ employment\ growth = a + \beta_1 IC1 + \beta_2 small*IC1 + \beta_3 medium*IC1 + \beta_4 large*IC1 + \beta_5 IC2 + \beta_6 small*IC2 + \beta_7 medium*IC2 + \beta_8 large*IC2 + \beta_9 IC3 + \beta_{10} small*IC3 + \beta_{11} medium*IC3 + \beta_{12} large*IC3 + \beta_{13} IC4 + \beta_{14} small*IC4 + \beta_{15} medium*IC4 + \beta_{16} large*IC4 + \beta_{17} mature + \beta_{18} v.mature + \beta_{19} smallcity + \beta_{20} exporter + \beta_{21} foreign + \beta_{22} government + (\beta_{23}-\beta_{24})*growth-period1-2 + (\beta_{25}-\beta_{33}24)*industry\_survey-country-year + \epsilon$											
	INCOME LEVEL OMITTED				REGION OMITTED						
	(1) low	(2) lower	(3) upper	(4) high	(5) AFR	(6) EAP	(7) ECA	(8) EHI	(9) LAC	(10) MENA	(11) SAS
Observations	35076	30781	31807	41449	39648	42382	27165	43028	36564	44935	44504
sh-invest-fin	0.006*** (0.001)	0.006*** (0.001)	0.005*** (0.001)	0.008*** (0.001)	0.007*** (0.001)	0.006*** (0.001)	0.004*** (0.001)	0.008*** (0.001)	0.007*** (0.001)	0.007*** (0.001)	0.014*** (0.002)
small*sh-invest-fin	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.002** (0.001)	-0.000 (0.001)	-0.000 (0.001)	0.001 (0.001)	-0.002* (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.006*** (0.001)
medium*sh-invest-fin	-0.002** (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.004*** (0.001)	-0.002** (0.001)	-0.002*** (0.001)	0.000 (0.001)	-0.004*** (0.001)	-0.002** (0.001)	-0.002*** (0.001)	-0.007*** (0.002)
large*sh-invest-fin	-0.003*** (0.001)	-0.003*** (0.001)	-0.002* (0.001)	-0.005*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	0.000 (0.001)	-0.005*** (0.001)	-0.004*** (0.001)	-0.003*** (0.001)	-0.007*** (0.002)
mng-time	0.014*** (0.002)	0.015*** (0.002)	0.014*** (0.002)	0.012*** (0.002)	0.014*** (0.002)	0.013*** (0.002)	0.015*** (0.002)	0.013*** (0.002)	0.012*** (0.002)	0.014*** (0.002)	0.053 (0.041)
small*mng-time	-0.006*** (0.002)	-0.007*** (0.002)	-0.008*** (0.002)	-0.005*** (0.001)	-0.006*** (0.002)	-0.006*** (0.001)	-0.009*** (0.002)	-0.005*** (0.001)	-0.003 (0.002)	-0.007*** (0.001)	-0.054 (0.036)
medium*mng-time	-0.007*** (0.002)	-0.008*** (0.002)	-0.008*** (0.002)	-0.005*** (0.002)	-0.007*** (0.002)	-0.007*** (0.002)	-0.010*** (0.002)	-0.005*** (0.002)	-0.004* (0.002)	-0.008*** (0.002)	-0.167*** (0.048)
large*mng-time	-0.008*** (0.002)	-0.012*** (0.002)	-0.006** (0.003)	-0.005** (0.002)	-0.008*** (0.002)	-0.009*** (0.002)	-0.011*** (0.003)	-0.006*** (0.002)	-0.005* (0.002)	-0.008*** (0.002)	-0.216*** (0.050)
bribe y-n	0.012 (0.050)	0.114** (0.051)	0.068 (0.048)	0.050 (0.042)	0.064 (0.048)	0.040 (0.042)	0.096* (0.057)	0.070* (0.041)	0.094** (0.045)	0.064 (0.042)	0.006*** (0.001)
small*bribe y-n	-0.078* (0.044)	-0.087** (0.042)	-0.037 (0.045)	-0.071* (0.038)	-0.087** (0.042)	-0.085** (0.038)	-0.013 (0.046)	-0.075** (0.037)	-0.125*** (0.042)	-0.087** (0.037)	-0.000 (0.001)
medium*bribe y-n	-0.170*** (0.057)	-0.151*** (0.055)	-0.151** (0.059)	-0.170*** (0.049)	-0.205*** (0.055)	-0.180*** (0.049)	-0.065 (0.060)	-0.173*** (0.048)	-0.192*** (0.052)	-0.178*** (0.048)	-0.002** (0.001)
large*bribe y-n	-0.236*** (0.059)	-0.178*** (0.057)	-0.153** (0.061)	-0.189*** (0.052)	-0.216*** (0.057)	-0.177*** (0.050)	-0.165** (0.064)	-0.200*** (0.051)	-0.201*** (0.055)	-0.195*** (0.050)	-0.003*** (0.001)
days-no power	-0.005 (0.011)	0.013 (0.014)	0.006 (0.010)	-0.011 (0.010)	-0.004 (0.010)	-0.002 (0.010)	0.038** (0.015)	-0.009 (0.010)	0.005 (0.010)	0.002 (0.010)	0.001 (0.010)
small*days-no power	0.008 (0.009)	-0.011 (0.009)	-0.014* (0.008)	0.003 (0.007)	0.001 (0.008)	-0.001 (0.007)	-0.011 (0.008)	0.001 (0.007)	-0.018** (0.008)	-0.004 (0.008)	-0.001 (0.007)
medium*days-no power	-0.009 (0.012)	-0.035*** (0.012)	-0.024** (0.011)	-0.009 (0.010)	-0.014 (0.011)	-0.014 (0.010)	-0.031*** (0.011)	-0.012 (0.010)	-0.034*** (0.011)	-0.022** (0.010)	-0.022** (0.010)
large*days-no power	-0.010 (0.013)	-0.028** (0.012)	-0.017 (0.011)	0.002 (0.010)	-0.008 (0.011)	-0.010 (0.010)	-0.015 (0.012)	-0.003 (0.010)	-0.025** (0.011)	-0.015 (0.010)	-0.020* (0.011)
R-squared	0.15	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.15	0.16	0.16

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

NOTE: IC variable -average country-size-industry3-city

Robust standard errors in parentheses, clustered by country-size-industry3-city.

Omitted variables (micro 1-10, young1-5, capital&city>=1mn, textiles, Albania 2002)

TABLE A1: DATASET

country-year	N. obs.	Percent	country-year	N. obs.	Percent	country-year	N. obs.	Percent
Albania2002	170	0.25	Georgia2005	200	0.29	Oman2003	337	0.49
Albania2005	204	0.29	Germany2005	1,196	1.73	Pakistan2002	965	1.39
Algeria2002	557	0.8	Greece2005	546	0.79	Panama2006	604	0.87
Angola2006	540	0.78	Guatemala2003	455	0.66	Paraguay2006	613	0.88
Argentina2006	1,063	1.53	Guinea-Bissau2006	296	0.43	Peru2002	576	0.83
Armenia2002	171	0.25	Guinea-Conakry2006	327	0.47	Peru2006	632	0.91
Armenia2005	351	0.51	Guyana2004	163	0.24	Philippines2003	716	1.03
Azerbaijan2002	170	0.25	Honduras2003	450	0.65	Poland2002	500	0.72
Azerbaijan2005	350	0.51	Hungary2002	250	0.36	Poland2003	108	0.16
Bangladesh2002	1,001	1.44	Hungary2005	610	0.88	Poland2005	975	1.41
Belarus2002	250	0.36	India2000	895	1.29	Portugal2005	505	0.73
Belarus2005	325	0.47	India2002	1,827	2.64	Romania2002	255	0.37
Benin2004	197	0.28	Indonesia2003	713	1.03	Romania2005	600	0.87
Bhutan2001	98	0.14	Ireland2005	501	0.72	Russia2002	506	0.73
BiH2002	182	0.26	Jamaica2005	94	0.14	Russia2005	601	0.87
BiH2005	200	0.29	Kazakhstan2002	250	0.36	Rwanda2006	340	0.49
Bolivia2000	671	0.97	Kazakhstan2005	585	0.84	SaudiArabia2005	681	0.98
Bolivia2006	613	0.88	Kenya2003	284	0.41	Senegal2003	262	0.38
Botswana2006	444	0.64	Kosovo2003	329	0.47	Serbia2001	402	0.58
Brazil2003	1,642	2.37	Kyrgyzstan2002	173	0.25	Serbia2003	408	0.59
Bulgaria2002	250	0.36	Kyrgyzstan2003	102	0.15	Slovakia2002	170	0.25
Bulgaria2004	548	0.79	Kyrgyzstan2005	202	0.29	Slovakia2005	220	0.32
Bulgaria2005	300	0.43	Laos2005	246	0.35	Slovenia2002	188	0.27
BurkinaFaso2006	51	0.07	Latvia2002	176	0.25	Slovenia2005	223	0.32
Burundi2006	407	0.59	Latvia2005	205	0.3	SouthAfrica2003	603	0.87
Cambodia2003	503	0.73	Lebanon2006	354	0.51	SouthKorea2005	598	0.86
Cameroon2006	119	0.17	Lesotho2003	75	0.11	Spain2005	606	0.87
CapeVerde2006	47	0.07	Lithuania2002	200	0.29	SriLanka2004	452	0.65
Chile2004	948	1.37	Lithuania2004	239	0.34	Swaziland2006	429	0.62
China2002	1,548	2.23	Lithuania2005	205	0.3	Syria2003	560	0.81
China2003	2,400	3.46	Madagascar2005	293	0.42	Tajikistan2002	176	0.25
Colombia2006	1,000	1.44	Malawi2005	160	0.23	Tajikistan2003	107	0.15
CostaRica2005	343	0.49	Malaysia2002	902	1.3	Tajikistan2005	200	0.29
Croatia2002	187	0.27	Mali2003	155	0.22	Tanzania2003	276	0.4
Croatia2005	236	0.34	Mauritania2006	361	0.52	Tanzania2006	484	0.7
Czech Rep.2002	268	0.39	Mauritius2005	212	0.31	Thailand2004	1,385	2
Czech Rep.2005	343	0.49	Mexico2006	1,480	2.14	Turkey2002	514	0.74
DRC2006	444	0.64	Moldova2002	174	0.25	Turkey2005	1,880	2.71
DominicanRepublic2005	250	0.36	Moldova2003	103	0.15	Uganda2003	300	0.43
Ecuador2003	453	0.65	Moldova2005	350	0.51	Uganda2006	663	0.96
Egypt2004	977	1.41	Mongolia2004	195	0.28	Ukraine2002	463	0.67
Egypt2006	996	1.44	Montenegro2003	100	0.14	Ukraine2005	594	0.86
ElSalvador2003	465	0.67	Morocco2000	859	1.24	Uruguay2006	621	0.9
Estonia2002	170	0.25	Morocco2004	850	1.23	Uzbekistan2002	260	0.38
Estonia2005	219	0.32	Mozambique2002	194	0.28	Uzbekistan2003	100	0.14
Ethiopia2002	427	0.62	Namibia2006	429	0.62	Uzbekistan2005	300	0.43
FYROM2002	170	0.25	Nepal2000	223	0.32	Vietnam2005	1,650	2.38
FYROM2005	200	0.29	Nicaragua2003	452	0.65	Yugoslavia2002	250	0.36
Gambia2006	301	0.43	Niger2006	125	0.18	Yugoslavia2005	300	0.43
Georgia2002	174	0.25	Nigeria2001	232	0.33	Zambia2002	207	0.3
<b>Total</b>							<b>69,305</b>	<b>100</b>

Region	Freq.	Percent	Income	Freq.	Percent
East Asia & Pacific	10,856	15.66	HighIncome: OECD	3,952	5.7
Europe & CentralAsia	20,191	29.13	HighIncome: non-OECD	1,092	1.58
Europe High Income	3,354	4.84	Low Income	17,282	24.94
Latin America & Caribbean	13,588	19.61	Lower Middle Income	30,286	43.7
Middle East & North Africa	6,171	8.90	Upper Middle Income	16,693	24.09
South Asia	5,461	7.88			
Sub-Saharan Africa	9,684	13.97			
<b>Total</b>	<b>69,305</b>	<b>100.00</b>	<b>Total</b>	<b>69,305</b>	<b>100</b>

**TABLE A2: STRATIFICATION OF DATA BY FIRM CHARACTERISTICS**

<b>SIZE CLASSES</b>				<b>AGE CLASSES</b>			
<b>size</b>	<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>	<b>age</b>	<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>
micro 1-10	20,289	29.27	29.27	young 1-5	13,286	19.17	19.17
small 11-50	23,770	34.3	63.57	mature 6-15	30,871	44.54	63.71
medium 51-200	13,211	19.06	82.63	older +16	24,400	35.21	98.92
large 201-500	5,650	8.15	90.79	unknown	748	1.08	100
very large +500	3,904	5.63	96.42	Total	69,305	100	
unknown	2,481	3.58	100				
Total	69,305	100					

  

<b>EXPORT ACTIVITY</b>				<b>FOREIGN OWNERSHIP</b>			
	<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>		<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>
non-exporter	53,639	77.4	77.4	domestic	59,622	86.03	86.03
exporter	13,609	19.64	97.03	foreign	8,806	12.71	98.73
unknown	2,057	2.97	100	unknown	877	1.27	100
Total	69,305	100		Total	69,305	100	

  

<b>EXPORT-FOREIGN (frequency)</b>				<b>LOCATION</b>				
	<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>		<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>	
		domestic	foreign	Total	capital/+1mn	36,623	52.84	52.84
non-exporter	48,500	4,852	53,352	small city	27,200	39.25	92.09	
exporter	9,664	3,713	13,377	unknown	5,482	7.91	100	
Total	58,164	8,565	66,729	Total	69,305	100		

  

<b>INDUSTRY 2-DIGIT</b>				<b>INDUSTRY-CLASSIFICATION</b>			
	<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>		<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>
Textiles	4,488	6.48	6.48	capital-intense	21,263	30.68	65
Leather	1,255	1.81	8.29	labor-intense	23,783	34.32	34.32
Garments	7,105	10.25	18.54	services	18,791	27.11	92.11
Agroindustry	7,150	10.32	28.86	unknown	5,468	7.89	100
Beverages	1,764	2.55	31.4	Total	69,305	100	
Metals&Machin	6,269	9.05	40.45				
Electronics	2,150	3.1	43.55				
Chem&Phamar	3,693	5.33	48.88				
Construction	3,519	5.08	53.95				
Wood&Furnit	3,847	5.55	59.51				
Non-metal&plastic	3,292	4.75	64.26				
Paper	677	0.98	65.23				
BusServices	2,953	4.26	69.49				
Other-Manufact	1,803	2.6	72.09				
Adds-Marketing	693	1	73.09				
otherservices	2,544	3.67	76.77				
Retail&wholesale	8,821	12.73	89.49				
Hotel&Restaurants	2,275	3.28	92.78				
Transport	1,505	2.17	94.95				
Mining&quarring	240	0.35	95.29				
OtherTransportEquip	1,553	2.24	97.53				
unknown	1,709	2.47	100				
Total	69,305	100					