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Article

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Size Matters: Entrepreneurship and Institutions

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Abstract. *Encouraging the growth of firms is a priority for many governments, so identifying the factors that keep firms small is extremely important for public policy. One of these factors might be the poor quality of institutions. In this paper, I test whether institutions such as corruption, law and order, regulations, bureaucracy, investment friendliness of the government and property rights affect the number micro, small and medium firms and their rate of growth. This paper uses data on micro, small, and medium enterprises (MSME's) from the International Finance Corporation and firm growth data from the World Bank's Enterprise Surveys. It shows that better institutions increase the number of medium firms and encourage their growth, but do not have an effect on the number or growth of micro, small or large firms. These results suggest that changes in public policies are needed to improve institutions and foster the survival and growth of medium firms.*

Keywords: *firms, firm size, firm growth, institutions.*

Introduction

Small firms in developing countries allow their owners to be independent and to make a living, but they do not correspond to the most efficient scale of production (Little, 1987). They create social opportunities, contribute to poverty alleviation, create some jobs, but they rarely create new products or services, lead to productivity improvement, innovate, attract new customers, or create new markets. The problem is that in many developing countries, there are many micro firms, but much fewer larger ones.

Figure 1 shows the average number of micro, small, medium[1] enterprises per 1000 inhabitants for developed and developing[2] countries. For both categories of countries, there are more micro firms than small firms and more small firms than medium firms. However, the large difference between the two categories of countries is that while there is one small firm for every

[1] Micro enterprises have one to four employees for most countries, small ones have five to 19 employees and medium firms have in general between 20 and 49 employees.
[2] The developed countries are the ones labeled high income OECD or high income non-OECD in the World Development Indicators of the World Bank. Developing countries are the ones labeled lower middle income, higher middle income and low income.

10 micro firms in developed countries, there is only one small firm for every 14 micro ones in developing countries. Also, in developed countries, there is one medium firm for every 40 micro firms, and in developing countries, there is only one medium firm for every 49 micro firms. Thus, there are considerably more micro firms relative to the larger firms in developing countries than in developed countries.

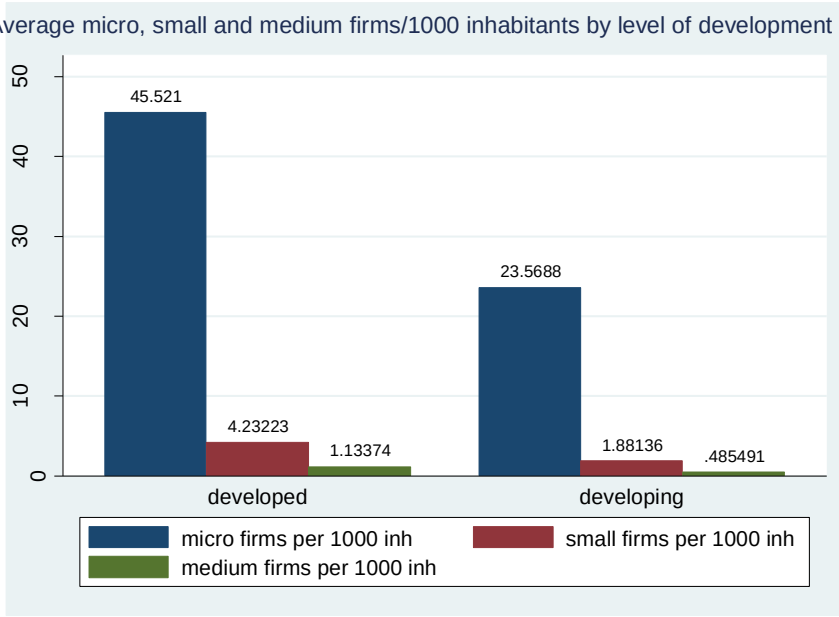

Figure 1. Average number of micro, small and medium firms per 1000 inhabitants for developed and developing countries

Why? Is it possible that something in these countries stops firms from growing and becoming more productive and innovative? Are there factors that affect only firms that reach a certain size, hindering their further growth? Poor institutions might affect firms differently depending on their size and possibly keep most firms small and unproductive.

This paper looks at the effects of institutional quality such as corruption levels, bureaucracy, law and order, regulations, investment friendliness of the government, and property rights on the number and growth of firms of different sizes. I use MSME data from the International Finance Corporation and firm growth data from the World Bank's Enterprise Surveys. I estimate a comprehensive measure of institutional quality from the six different measures and use an instrumental variable approach. I find that higher institutional quality leads to more medium firms, but has no effect on the number of micro or small firms. Institutional quality leads higher sales

growth and labor productivity growth for medium firms, but it does not affect the growth of small or large firms.

The study is organized as follows: Section 2 reviews the relevant literature on entrepreneurship, Section 3 summarizes how the variables are measured, Section 4 shows the econometric model, Section 5 presents the regression results and Section 6 concludes.

Literature review

This paper adds mostly to the literature on the role of institutions on different categories of firms. First, there are studies that look at the effects of institutions in general on entrepreneurship. Schiffer and Weder (2001) look at different institutional obstacles as they are perceived by firms. They find that small firms think they face greater business environment obstacles than medium and large firms. Unlike this paper, I do not use the perceived institutional obstacles as they can be biased, instead I use more objective data to measure the different institutions and find that medium firms are hurt the most by bad institutions. The difference in results could be attributed to the bias in the answers of the small firm owners who feel that are facing greater obstacles than the larger firms. A second study that looks at institutions in general is Sanandaji and Leeson (2012). They look at institutions and entrepreneurship measured as number of billionaires per million inhabitants and self-employment in one country in a correlation analysis. Unlike this study that shows only descriptive statistics and correlation graphs, I use measures of the number and growth of micro, small, medium and large firms in a regression analysis. Also, my data on different size firms provides a better picture on different types of entrepreneurship than the self-employment data used in Sanandaji and Leeson (2012).

Second, there are studies that investigate the effects of specific aspects of the institutional setting such as corruption, law and order, regulations, bureaucracy, and economic institutions. Aidis, Estrin and Mickiewicz (2009) find that corruption is related to entrepreneurial entry, especially for low income countries. Fisman and Svensson (2007) find that both the tax rates and bribery are negatively correlated with firm growth in Uganda. Foellmi and Oechslin (2007) find that credit market imperfections generate rents for the incumbent entrepreneurs and create incentives for corrupt behavior by state officials. The authors conclude that if borrowing is limited, bribes prevent poorer, but talented individuals from becoming self-employed. I also include corruption as one of the aspects of the institutional setting and find a differential effect of institutions on firms, depending on their size.

Corruption can also affect firms through political institutions. In "Politicians and Firms", Shleifer and Vishny (1994) find that when managers control firms, politicians use bribes to make them to pursue political objectives. When politicians control firms, managers use bribes to make them not to push firms to pursue political objectives. In the same spirit, Faccio (2010) studies the differences between politically connected and non-connected firms and shows that the market share of connected firms increases with corruption. The author also concludes that the productivity of connected firms decreases with the level of corruption and that in countries with higher corruption, while connected firms are inefficient, connections provide the benefits that allow them to compensate for any lack of skills. In my paper, large firms are not affected by institutions (including corruption) probably because the negative effects of bad institutions are mitigated by the benefits earned through bribing politicians or through political connections.

Ufere, Perelli, Boland and Carlsson (2012) use interviews with CEO's of firms and find that entrepreneurs, rather than being victims of bribe demanded by government agents, are themselves active perpetrators of bribery. My paper claims that large firms are not affected by bad institutional settings because they might have the resources to bribe officials to circumvent bad regulations, bureaucracy, or poor legal enforcement.

Clarke (2011) shows that firms pay lower bribes than previously thought because owners misreport the payments in surveys. This is one of the reasons I am using a corruption measure estimated by PRS Group, a commercial provider of political and country risk forecasts, rather than the perceived (and possibly biased) level of corruption from entrepreneurs' surveys.

The impartiality of the legal system and the observance of the law play important roles in the decision to become an entrepreneur and in the performance of firms because they insure that contracts are enforced, that loans are extended to good businesses, and that bankruptcy laws are correctly applied. Aidis *et al.* (2009) find that the rule of law enhances entrepreneurial activity. Antunes, Cavalcanti and Villami (2008) show that when the level of enforcement decreases, output per capita and the credit to output ratio decrease as well. They also find that there are more or less productive entrepreneurs in the economy. They explain that as weaker contract enforcement leads to a fall in the demand for loans for a given interest rate, entrepreneurs decrease working capital and firm size shrinks. Bonini and Alkan (2012) show that the legal systems play an important role in explaining the variance of venture capital investments around the world. Chemin (2009) looks a Pakistani judicial reform that provided judges with

more training and finds that as judges disposed of a quarter more cases, the entry rate of new firms increased by half. In my paper, I also include measures of the quality of the legal system by using the variable law and order from the PRS Group in the composite institutions variable.

The regulatory and institutional environment hampers small firm growth in developing countries, according to the World Bank (2006). Fafchamps (1994) claims that dual industrial structure in African firms is driven by the fact that large African firms benefit from returns to size and government policies, while micro enterprises take advantage of special market niches, lower labor costs, and their ability to bypass laws and regulations. Medium firms are too small to capture returns to size and qualify for government support, but they are too large to avoid laws, regulations, and problems with labor motivation. In this paper, I also find that institutional quality including regulations have a large effect on medium firms and no significant effect on firms of other size.

In addition to regulations, bureaucracy can also hurt businesses. In many developing countries, numerous unclear regulations translate into large business costs. Grilo and Thurik (2008) find that perception of administrative complexities plays a negative role for high levels of entrepreneurship. Klapper, Laeven and Rajan (2006) find that regulations hamper the creation of new firms. These regulations determine new entrants to be larger and cause incumbent firms in naturally high-entry industries to grow more slowly. I also include in my analysis a measure of regulation from Freedom of the World and also consider the possibility that regulations have different effects on firms of different sizes.

The quality of the economics, monetary and financial institutions is very important. Foreign and domestic entrepreneurs are weary of starting a business if the monetary policy is not independent, if there is instability in the country, if there are doubts that the country can play its debts or if the government is unfriendly towards businesses. Bjørnskov and Foss (2008) show that sound money (interference in law and politics and integrity of the legal system) is positively correlated with entrepreneurship. I also include a measure of investment friendliness (a measure of business friendliness of government policies).

Data

I use four categories of data in this study: micro, small and medium enterprise data from the International Finance Corporation (IFC) micro

enterprise dataset (Kozak, 2007), firm growth data from the Enterprise Surveys (World Bank, 2013b), institutional data from the International Risk Guide dataset (PRS Group, 2013) and from the Freedom of the World (Gwartney, Lawson & Hall, 2012) and finally, other controls from the World Development Indicators (World Bank, 2013b) and from a new international tax dataset from Petrescu (2012a).

The IFC enterprise data is compiled from multiple sources, mostly from various Census and other country level surveys. From this dataset, I use the micro variable that measures the number of micro enterprises per 1,000 inhabitants. A micro enterprise is a firm that has few employees. Micro enterprises have one to four employees for most countries, except for a small number of countries where micro enterprises can have up to 200 employees. The small variable measures number of small enterprises per 1,000 inhabitants. Small enterprises have five to 19 employees for most countries, except for some countries like the Philippines where they can have up to 99 employees. Finally, medium measures number of medium enterprises per 1,000 inhabitants. These firms have in general between 20 and 49 employees, though for some countries like Finland, they can have up to 499 employees. In my sample, countries have on average 36.18 micro firms per 1,000 inhabitants, 3.22 small firms per 1,000 inhabitants and .87 firms per 1,000 inhabitants. Table 1 shows the summary statistics of these variables.

Table 1. Descriptive statistics for dependent and independent variables

	Obs.	**Mean**	**Std. De.**	**Min.**	**Max.**
micro	402	36.18	39.13	0.02	225.32
small	396	3.22	3.12	0.009	17.23
labor growth small	135	0.12	11.43	-46.4	65.5
sales growth small	137	4.63	11.87	-42.2	72.4
medium	404	0.87	1.60	0	17.36
labor growth medium	125	-1.35	11.14	-54.9	54.3
sales growth medium	127	5.35	11.63	-37.9	59.5
labor growth large	79	0.71	8.52	-16.3	29.8
sales growth large	84	7.00	9.60	-12.2	50.9
corruption	3567	3.01	1.36	0	6
law and order	3480	3.71	1.46	0	6
regulations	2009	6.40	1.23	1	9.4
bureaucracy	3567	2.14	1.18	0	4
investment friendliness	3480	7.34	2.60	0	12
property rights	1962	5.52	1.82	1.1	9.6
institutions	1525	5.49	2.16	0	10
instrument	1512	5.48	1.83	2.38	8.36
credit	6922	49.80	45.65	-72.99	340.92
corporate rate	3694	30.99	13.08	0	75

personal rate	3265	35.53	17.91	0	150
inflation	7907	36.67	456.71	-49.42	26762.02
ln(gdp/cap)	7988	7.65	1.60	3.99	11.59

Source: Kozak (2007), Petrescu (2012a), PRS Group (2013) Gwartney *et al*. (2012) and World Bank (2013a, b).

The Enterprise Surveys (World Bank, 2013a) complies data from surveys ran on 130,000 firms of different sizes in 135 countries starting with 2002. I use the country level data on sales growth rates and labor productivity growth rates for small, medium and large firms. The dataset does not provide these aggregate variables for micro firms.

I use six variables from the International Country Risk Guide and from Freedom of the World (corruption, law and order, regulations, bureaucracy, investment friendliness and property rights). The variable corruption measures the lack of corruption, so higher numbers mean less corruption. It is "a measure of corruption within the political system that is a threat to foreign investment by distorting the economic and financial environment, reducing the efficiency of government and business by enabling people to assume positions of power through patronage rather than ability, and introducing inherent instability into the political process" according to the PRS Group (2013). It varies from zero to six, with countries such as Bangladesh, Indonesia, or Liberia taking the value zero and countries like Canada, Denmark, or Finland taking the value six. Developing countries are more corrupt than developed countries with a corruption score of only 2.47 relative to a much higher score of 4.12 in developed countries.

Law and order represents "two measures comprising one risk component. Each sub-component equals half of the total. The 'law' sub-component assesses the strength and impartiality of the legal system, and the 'order' sub-component assesses popular observance of the law" according to the PRS Group (2013). It varies between zero and six, where zero means poor law and order and six means excellent law and order. Countries such as Congo, Dem. Rep, Somalia, or Sri Lanka have a score of zero and countries such as Iceland, Luxembourg, or Spain have a score of six. On average, the developing countries have poorer legal institutions than developed countries with an average score of 3.04 compared to a higher one of 5.06 in developed countries.

The Freedom of the World variable for regulations measures regulations of credit, labor and business. The index varies between one and 9.4 and high numbers means better regulations.

The property rights index from the Freedom of the World measures the legal structure and security of the property rights. It is a composite index of judicial independence, impartial counts, protection of intellectual property, military interference in rule of law and the political process and the integrity of the legal system. The measure varies between 1.1 and 9.6 and higher values represent better property rights.

The variable bureaucracy measures bureaucracy quality. The PRS Group (2013) describes it as follows: "institutional strength and quality of the bureaucracy is a shock absorber that tends to minimize revisions of policy when governments change." It varies from zero to four, with higher values meaning lower bureaucracy. Countries such as Angola, El Salvador, or Ethiopia take value zero and countries like Switzerland, United Kingdom or United States take value four. Developing countries are more bureaucratic than developed countries with an average bureaucracy quality of only 1.57 compared to 3.33 in developed countries.

Investment friendliness is a measure of the government's attitude toward inward investment as determined by four components: the risk to operations, taxation, repatriation, and labor costs. It varies from 0 to 12, where higher numbers mean a better attitude toward investment. Countries like Switzerland, United States and United Kingdom score 12 out of 12.

However, these six variables are highly correlated and thus, one cannot distinguish the individual effects of one variable in a regression. Table 2 shows the correlation matrix for these six variables. Thus, I use the information from these six variables and create one comprehensive institutions variable. I fit a principal factor model on the z-scores of the six variables and I estimate the first factor. I take only the first factor because it has the eigenvalue of 3.94, the only factor with an eigenvalue above one (considered a critical value, below which the factors do not offer additional information). The overall Kaiser-Meyer-Olkin (KMO) of sampling adequacy for the first factor is .83 and the KMO for each variable is above .78. The KMO varies between 0 and 1, and an overall value of .83 is considered a "meritorious" value showing that the variables have enough in common to warrant factor analysis. The first factor is rescaled from a scale from 0 to 10, where 0 represents poor institutions and 10, good institutions. On average, Congo, Dem. Rep has the lowest average of .80 and New Zealand has the highest average of 9.64.

Table 2. Correlation between institutional measures

	corruption	law and order	regula-tions	bureau-cracy	business friendliness	property rights
corruption	1					
law and order	0.6496	1				
regulations	0.3376	0.4226	1			
bureaucracy	0.6672	0.6323	0.5131	1		
business friendliness	0.3627	0.4722	0.6241	0.5516	1	
property rights	0.7067	0.845	0.5714	0.766	0.5965	1

Source: PRS Group (2013) and Gwartney *et al.* (2012)

I also construct an instrument for the above institutions indicator by averaging the institutions values for countries from the same income group as the country analyzed. I use the World Bank's classification of countries into: low income, lower middle income, upper middle income, high income OECD and high income non-OECD. For a country k in year t, the instrument is the average value for the institutions variable for all the other countries than k in the same income group as k in year t. The mean value for the variable instrument is 5.48 and it varies from 2.38 to 8.36.

The fourth category is macroeconomic controls. The tax data measure the highest marginal personal and corporate income tax rates. On average, developing countries have higher top rates for corporate taxes (32.76% relative to 28.26%) and higher top rates for personal taxes (36.31% relative to 34.22%) than developed countries. This can be easily explained due to the inability of most developing countries to collect tax revenue which constantly leads them to raise taxes to reach a particular level of tax revenue per GDP. Other controls are ln(GDP/capita), inflation, the inflation rate based on the GDP deflator, and credit, the domestic credit as percentage of GDP.

Although macro level data from all sources cover 232 countries and 53 years, the final number of observations used in the analysis is very small. The number of observations in some regressions is that small in large part because the aggregate Enterprise Surveys data have few observations for the growth variables.

Model

Using these data, I estimate the effects of institutions on the number of micro, small, and medium enterprises per 1,000 inhabitants, on the labor

productivity growth and sales growth for small, medium and large firms. Specifically, I estimate a fixed effects model of the form:

$$(1) \quad firms_{k,t} = \beta_0 + \beta_1 institutions_{k,t} + \beta_2 credit_{k,t} + \beta_3 corporate\ rate_{k,t} + \beta_4 personal\ rate_{k,t} + \beta_5 inflation_{k,t} + \beta_6 lnGDP/cap_{k,t} + \vartheta_t + \theta_k + \varepsilon_{k,t}$$

where k is the index for country and t is the index for year. Firms stand for the number of micro firms per 1000 inhabitants, number of small firms per 1000 inhabitants, labor productivity growth for small firms, sales growth for small firms, number of medium firms per 1000 inhabitants, labor productivity growth for medium firms, sales growth for medium firms, labor productivity for large firms, and sales growth for large firms. I include also year dummies ϑ_t and country fixed effects θ_k. $\varepsilon_{k,t}$ is the error term.

I estimate (1) separately for firms of different sizes because I expect institutions to affect companies in different ways depending on their size. Each of the six variables used in the comprehensive institutions measure describes an important aspect of the institutional settings that affect firms. I include in the analysis corruption levels because I expect that corruption increases the costs of doing business for some firms. However, there might be two opposing effects of corruption on large firms: first, negative ones due to the increase in costs because of extortion by corrupt officials or due to unfair competition from other firms that use bribes to obtain unfair advantages and second, a positive one due to unfair advantages earned illegally through large bribes or political connections that only large firms can afford.

Low quality legal systems can harm firms by making starting and operating a firm very difficult. It is likely that these negative effects are smaller for smaller firms because they interact less with the legal system especially if they operate partially underground. As they grow, medium firms start having more contracts to reinforce, more legal hurdles to overcome and they interact more often with the legal system and can be hurt by slow legal processes or corrupt practices of judges. Very large firms are likely to have the resources to hire expensive lawyers or to bribe judges to avoid the negative effects of a bad legal sector.

Regulations are not likely to affect very small firms because they usually do not have to abide by regulations. Cumbersome regulation can translate into a large business cost for firms as they grow. Medium firms need to abide by regulations, but they do not have the resources necessary to disentangle unclear regulations and thus, they are harmed the most by regulations. Unlike medium firms, larger firms might be able to afford to hire outside

consultants, to bribe regulators, or even to bribe politicians to change regulations in their favor and thus are hurt less by these institutions.

Bureaucracy is likely to negatively affect both the number of businesses and their growth. Micro and small firms have less paperwork due to their size and due to the fact they perform mostly underground. Medium firms deal with more red tape that translate into a higher business cost. Large firms have to cope with even higher bureaucracy, but this can serve both as a business cost and as a benefit if they can use the vast amount of red tape to hide irregularities in a bad institutional environment.

Investment friendliness describes the government's attitude towards businesses and the policies targeting the business sector. Micro and small firms are probably affected very little by these policies since they operate entirely or partially underground. Large firms might be able to weather bad policies and maybe even try to influence them through bribing politicians. Medium firms are left to cope with bad policies and an unfriendly investment environment and thus, are hit the most by investment friendliness.

Property rights are not essential for micro and small firms that might not immediately apply for patents. Also since they mostly operate underground, property rights are not relevant to them. However, as firms grow and might want to move into the formal sector and to innovate, property rights start to matter. Very large firms could find the resources to avoid the negative effects of bad property rights through support from the corrupt officials or even by exploiting bad property rights rules to their advantage in a bad institutional environment. Thus, the quality of property rights affects mostly medium firms that want to innovate, but they cannot do it properly because their ideas are not properly protected.

Credit is a proxy for the easiness with which firms can obtain financing. The easier it is to access bank credit, the easier it is to open a small business. Thus, the effect of credit on the number of firms is likely to be positive. Access to credit is important for firms of all sizes, though probably less important for small firms that operate underground and have no opportunity to access credit.

High corporate and personal income tax rates are likely to have a negative effect on the number of firms. Micro and small firms might be able to escape the tax authorities and evade more and thus, the effects of taxes on these types of firms could be smaller. Large firms might have the ability to use complicated accounting techniques to avoid taxes and thus, the tax effect might be small as well. Taxes might have a large effect on medium firms if

they are large enough to be observed by tax officials and do not have the resources to pay bribes to corrupt tax authorities (Petrescu, 2012b).

Inflation might affect the number of micro and small firms positively, as people don't want to be wage employed when inflation is high because wage income adjusts slower to inflation compared to self-employment income. The effect of inflation on the growth of firms is likely to be negative because it creates instability that can hurt businesses.

Finally, higher GDP per capita is likely to lead to more firms of all sizes. As the economy is booming, there are more business opportunities, there is more entry and more firm growth.

I include country fixed effects because I use a wide range of countries in the analysis and there might be characteristics of the countries that I do not capture in the control variables. I also include time dummies, there might be worldwide events that affect the emergence and growth of firms in the 25-year interval covered in the analysis.

Since institutions and the dependent variables are likely to be endogenous, I use an instrumental variable approach. I instrument institutions with mean institutions of the other countries in the same income group, instrument. The instrument is correlated with the institutions variable because countries in the same income group are likely to be in similar stages of institutional development. The instrument is unlikely to affect the number or growth of firms through other channels than through the quality of the institutions in the country. The first stage regression for this approach is:

$$(2)\ \text{institutions}_{k,t} = \beta_0 + \beta_1 \text{instrument}_{k,t} + \beta_2 \text{credit}_{k,t} + \beta_3 \text{corporate rate}_{k,t} + \beta_4 \text{personal rate}_{k,t} + \beta_5 \text{inflation}_{k,t} + \beta_6 \ln \text{GDP/cap}_{k,t} + \vartheta_t + \theta_k + \varepsilon_{k,t}$$

Results

I show the effects of institutions on micro firms in Table 3. All specifications have country fixed effects, year dummies and robust standard errors. The first column shows that institutions do not affect the number of micro enterprises per 1,000 inhabitants if we control for credit, corporate and personal income tax rates, inflation, and GDP growth. Since the number of firms and the quality of institutions can be endogenous, I use an instrument for the quality of institutions, instrument. The second column shows the first stage of this specification. The coefficient of the instrument is positive and statistically significant at 1% level showing a high degree of correlation of the instrument with the endogenous variable. The F-statistic is over ten. The next

column shows the second stage of the regression with average institutional quality in the same income group as an instrument for institutional quality. Even after the endogeneity is addressed, the effects of institutions on the number of micro enterprises per 1000 inhabitants is not statistically different from zero. As predicted, these micro firms operate under the radar, do not have to interact with public institutions too often or abide by regulations and thus, a poor institutional environment do not affect them significantly. I am not able to look at the effects of institutions on the growth of micro enterprises because the Enterprise Surveys do not report the aggregate values for the growth of micro enterprises.

Table 3. Effects of institutions on micro enterprises

	(1) micro	**(2) institutions**	**(3) micro**
institutions	-1.50 (2.42)		57.53 (36.89)
instrument		0.64 (0.19)***	
credit	-0.23 (0.18)	0.0009 (0.001)	-0.06 (0.19)
corporate rate	-0.04 (0.21)	0.002 (0.004)	0.21 (0.62)
personal rate	0.08 (0.41)	-0.01 (0.004)***	0.63 (0.86)
inflation	-0.56 (0.35)	-0.0001 (0.0001)	0.09 (0.78)
ln(gdp/cap)	14.89 (21.50)	1.12 (0.39)***	-121.74 (97.16)
Country-fixed effects	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
R-sq. (overall)	0.0269	0.7175	0.0001
Observations	214	1158	214

Source: Author's calculations.
Note: Standard errors in parentheses. Significance of coefficients is shown as follows: * at 10%; ** at 5%; *** at 1%.

Next, in Table 4, I present the effects of institutions on small firms.

Table 4. The effects of institutions on small firms

	(1) small	**(2) labor growth small**	**(3) sales growth small**	**(4) institu-tions**	**(5) small**	**(6) labor growth small**	**(7) sales growth small**
institutions	0.61 (0.34)*	20.25 (7.76)***	23.57 (7.75)***		102.07 (1745.39)	28.08 (26.29)	27.11 (26.51)
instrument				0.64 (0.19)***			
credit	0.01 (0.009)	-0.23 (0.29)	-0.14 (0.29)	0.0009 (0.001)	0.15 (2.44)	-0.26 (0.38)	-0.15 (0.38)

corporate rate	-0.01 (0.02)	1.41 (1.23)	1.95 (1.25)	0.002 (0.004)	0.43 (7.79)	1.76 (2.001)	2.11 (2.01)
personal rate	0.08 (0.04)*	-0.38 (0.29)	-0.42 (0.29)	-0.01 (0.004)***	1.05 (16.81)	-0.40 (0.32)	-0.43 (0.33)
inflation	-0.03 (0.04)	0.46 (0.37)	0.45 (0.34)	-0.0001 (0.0001)	0.57 (10.55)	0.69 (0.89)	0.55 (0.90)
ln(gdp/cap)	3.50 (2.34)	-55.23 (33.20)*	-45.45 (37.33)	1.12 (0.39)***	-106.77 (1898.91)	-70.49 (65.58)	-52.35 (66.13)
Country-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sq. (overall)	0.1508	0.0338	0.0491	0.7175	0.0664	0.0336	0.0456
Observations	208	68	69	1158	208	68	69

Source: Author's calculations.

Note: Standard errors in parentheses. Significance of coefficients is shown as follows: * at 10%; ** at 5%; *** at 1%.

The fixed effects specification in column (1) shows that an increase of one point in the institutions leads to an increase of .61 firms per 1,000 inhabitants. One point increase in institutions is equivalent to improving the institutions of Congo, Dem. Rep. to be at the level of Zimbabwe. Such a change leads to an increase of .61 small firms per 1,000 inhabitants or an increase of 31,103 firms for Congo, Dem. Rep. Alternatively, an increase of one standard deviation in institutions leads to an increase of 0.42 standard deviations in number of small enterprises per 1,000 inhabitants.

In columns (2-3), I estimate the effects of institutions on labor productivity and sales growth for small firms using the Enterprise Surveys aggregate measures. Columns (2) and (3) show that an increase in institutions leads to an increase of labor productivity growth and sales growth. The effects are large since an increase of one point in the quality of institutions leads to an increase of 20.25% in labor productivity and 23.57% in sales growth for small firms. However, this positive result might be the outcome of endogeneity, so I use the same instrument as before to correct for this problem.

Column (4) shows the first stage regression (the same as in the previous table) and columns (5-7) show the second stages for the specifications with number of small enterprises per 1,000 inhabitants, labor productivity growth and sales growth as dependent variables. In these specifications, the coefficients of the institutions remain positive, but they are not significant at 10% level. Thus, institutions are not a significant determinant of the number of small firms or of small firm growth.

In Table 5, I investigate if the quality of institutions affects medium firms. First, the quality of institutions seems to affect positively the number of medium enterprises per 1,000 inhabitants in a fixed effects specification. An increase of one point in the quality of institutions leads to an increase of .31 medium firms per 1,000 inhabitants. Institutions also increase the labor productivity growth by 26.39% and the sales growth by 28.39%. This time, even after I instrument with the average institutions in the same income group, the effects remain positive and significant. The magnitudes of the effects are much larger than in the columns (1-3). One point increase in the institutions variable leads to an increase of 2.28 medium firms per 1,000 inhabitants, 50.79% in labor productivity growth and 58.20% in sales growth. Thus, improving the institutions of Congo, Dem. Rep. to be at the level of the ones in Zimbabwe leads to an increase of 2.28 medium firms per 1,000 inhabitants or an increase of 116,255 medium firms in Congo, Dem. Rep. It seems that medium firms are very sensitive to the institutional environment and moderate improvements in institutions can lead to more medium firms and higher growth.

Table 5. The effects of institutions on medium firms

	(1) medium	**(2) labor growth medium**	**(3) sales growth medium**	**(4) institu-tions**	**(5) medium**	**(6) labor growth medium**	**(7) sales growth medium**
institutions	0.31 (0.14)**	26.39 (6.22)***	28.39 (6.77)***		2.28 (1.39)*	50.79 (28.70)*	58.20 (35.04)*
instrument				0.64 (0.19)***			
credit	0.0004 (0.005)	0.13 (0.16)	0.17 (0.21)	0.0009 (0.001)	0.007 (0.007)	0.03 (0.41)	0.05 (0.51)
corporate rate	0.0002 (0.009)	4.63 (1.10)***	5.32 (1.19)***	0.002 (0.004)	0.003 (0.02)	5.73 (2.18)***	6.66 (2.66)**
personal rate	-0.02 (0.01)	-0.01 (0.15)	0.03 (0.17)	-0.01 (0.004)***	-0.03 (0.03)	-0.08 (0.35)	-0.05 (0.43)
inflation	-0.0004 (0.01)	1.06 (0.27)***	1.12 (0.28)***	-0.0001 (0.0001)	-0.01 (0.02)	1.79 (0.97)*	2.01 (1.19)*
ln(gdp/cap)	2.24 (0.90)**	-41.41 (22.51)*	-19.69 (30.77)	1.12 (0.39)***	-1.13 (2.87)	-88.92 (71.58)	-77.74 (87.40)
Country-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sq. (overall)	0.0044	0.0467	0.0458	0.7175	0.0002	0.0488	0.0588
Observations	210	70	70	1158	210	70	70

Source: Author's calculations.
Note: Standard errors in parentheses. Significance of coefficients is shown as follows: * at 10%; ** at 5%; *** at 1%.

Finally, in Table 6, I look at the effects of institutions on large firms. Since the IFC data does not contain information on large firms, I look only at the effects of institutions on firm growth. The institutional quality does not seem to affect the labor productivity or sales growth of large firms in the fixed effects model. The results do not change once I use an instrument for institutions.

Table 6. The effects of institutions on large firms

	(1) Labor growth large	(2) Sales growth large	(3) Institutions	(4) Labor growth large	(5) Sales growth large
institutions	2.04 (8.46)	-0.17 (9.85)		-7.83 (64.14)	33.09 (296.10)
instrument			0.64 (0.19)***		
credit	0.06 (0.23)	0.52 (0.39)	0.0009 (0.001)	0.21 (1.17)	0.27 (2.26)
corporate rate	-0.40 (1.70)	1.73 (1.23)	0.002 (0.004)	-0.98 (4.27)	3.76 (18.17)
personal rate	-0.20 (0.19)	0.14 (0.21)	-0.01 (0.004)***	-0.12 (0.60)	0.003 (1.29)
inflation	1.24 (0.93)	0.23 (0.38)	-0.0001 (0.0001)	0.20 (7.09)	1.45 (10.87)
ln(gdp/cap)	-21.60 (34.64)	-2.26 (36.95)	1.12 (0.39)***	0.53 (152.57)	-66.16 (571.96)
Country-fixed effects	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
R-sq. (overall)	0.0011	0.0002	0.7175	0.0342	0.0346
Observations	55	60	1158	55	60

Source: Author's calculations
Note: Standard errors in parentheses. Significance of coefficients is shown as follows: * at 10%; ** at 5%; *** at 1%.

Conclusions and policy implications

This paper investigates the effects of various types of institutions (corruption, legal system, regulations, bureaucracy, investment friendliness and property rights) on the stock of firms and on the growth of firms. It constructs a comprehensive measure based on these six types of institutions. It concludes that an increase of one point in the quality of institutions (equivalent to raising the quality of the Congolese institutions to the level of Zimbabwean institutions) leads to an increase of 2.28 firms per 1,000 inhabitants, 50.79% improvement in labor productivity growth and 58.20%

increase in sales growth for medium firms. Institutions do not play a significant role in determining the number of micro or small firms. They also do not seem to affect the growth of small or large firms.

The implications of these results are important for public policy in developing countries. The usual pro-entrepreneurship measures such as private credit to businesses do not encourage firm creation and they do not stimulate firm growth if institutions are bad. Strengthening institutions is an important step in encouraging the development of medium firms. Failing to improve the quality of the institutions could lead to more medium firms exiting, leaving on the market only large firms with a lot of market power that have incentives to extract rents and little incentives to innovate and create growth and micro firms that do not create significant employment and do not operate entirely in the formal sector and thus do not pay many taxes.

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