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### **ABSTRACT**

We examine the productivity of informal firms (those that are not registered with the government) in 24 African countries using field work and World Bank firm level data. We find that productivity jumps sharply if we compare small formal firms to informal firms, and rises rapidly with the size of formal firms. Critically, informal firms appear to be qualitatively different than formal firms: they are smaller in size, produce to order, are run by managers with low human capital, do not have access to external finance, do not advertise their products, and sell to largely informal clients for cash. Informal firms thus occupy a very different market niche than formal firms do, and rarely become formal because there is very little demand for their products from the formal sector.

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## ***I. Introduction.***

Informal economic activity is pervasive in developing countries. It includes both output produced by firms that are not registered with the government, and output by registered firms that is sold for cash and is not reported to the government. Unregistered firms might be entirely unknown to the government, or might be registered with some authorities (such as municipalities) and not others (such as tax). Employees of informal firms rarely have formal employment contracts, or pay taxes. Altogether, unofficial output often accounts for half or more of the total in a developing country. Informality declines sharply as countries grow.

The prevalence of informality in poor countries raises a number of important questions for economic development. Are informal firms just like formal firms, except that they fail to register because of the ominous tax and regulatory burdens? Are they as productive as formal firms? Do they sell the same kinds of output? Should informality be fought because it provides unfair competition for formal firms, as Farrell (2004) expressing the views of the McKinsey Global Institute has argued, or encouraged because it creates employment where there would be none otherwise? What are the basic characteristics of informal firms?

In an earlier article (La Porta and Shleifer 2008), we have presented evidence that informal firms are qualitatively different from formal firms. In particular, they are much smaller and much less productive. Their managers have much less human capital than do managers of formal firms. They sell to very different customers, who are predominantly themselves informal. They do not advertise, have less capital, and rely to a smaller extent on public goods such as police protection. Very few of the formal firms have been previously informal, inconsistent with the view that formality is a later stage of a firm's life cycle, as its business grows.

In our earlier paper, we referred to this as the dual theory of informality, inspired by the ideas of dual economy and the big push in development economics (e.g., Harris and Todaro 1970, Murphy, Shleifer and Vishny 1989). According to these models, the source of economic growth and transformation to modernity is the creation of large formal firms, often taking advantage of increasing returns technologies. Informal firms operate in the so-called dual economy, providing subsistence to their owners and employees, but not being productive enough to become a source of economic progress. Our research points to an intimate connection between duality and informality.

In this paper, we seek to extend and deepen this analysis, with a particular emphasis on African countries. There are three reasons for doing so. First, Africa is one of the poorest regions in the world, and informality is the dominant form of economic activity. Moreover, informality in Africa, as in other

very poor countries, may take more dramatic forms than in middle income countries such as Brazil, where it largely consists of tax evasion in cash transactions. Second, since we wrote our paper, the World Bank has made available a great deal of new data from its Enterprise Surveys, including for African countries, so we can significantly expand the analysis. Third, we have had the opportunity to make research trips to Madagascar, Mauritius, and Kenya, and to visit a modest number of formal and informal firms to make comparisons. Our particular focus was on furniture makers, although we visited several other types of business. The idea was to gain a more subtle understanding of the working of the informal economy, and in particular to put more meat on the statistical bones of Enterprise Surveys.

The results we obtain from this investigation confirm many of our earlier findings, but add a new and potentially crucial element to the story. Specifically, the strong impression we obtained from country visits is a substantial difference in the quality of goods sold by informal and formal firms. The lower product quality of informal firms might be the unifying factor of the dual theory: it explains how smaller size, production to order rather than mass production, lower human capital of the managers, lower use of capital, the absence of advertising, and sales to largely informal retail clients for cash all go together. Informal firms can only supply low quality inexpensive goods, but fortunately their customers demand low quality inexpensive goods. Informal firms thus occupy a very different market niche than formal firms do, and rarely become formal precisely because there is very little demand for their products from the formal sector. Quality segments the economy. This idea of quality segmentation of markets is known international trade as the Linder effect, according to which poor countries trade with other poor countries rather than with the rich ones (see Murphy and Shleifer 1997 for a model), but as far as we know the relevance of this phenomenon to informality and development has not been emphasized.

In the next section of the paper, we briefly review some observations from our visits to formal and informal firms in Madagascar, Mauritius, and Kenya. In Section 3, we describe the main data we use in the paper and present some information on the characteristics of formal and informal firms. Section 4 presents the main results on the productivity of formal and informal firms. Section 5 focuses on obstacles to doing business. Section 6 concludes.

## ***II. Country visits.***

As part of this project, we conducted three country visits. La Porta went to Madagascar and Mauritius in October 2008, while Shleifer went to Kenya in March 2009. La Porta stayed in capital cities; Shleifer went to Busia in Western Kenya as well as to Nairobi. Both visits were conducted in conjunction with World Bank's implementation of its Enterprise Surveys. In all three countries, we have visited a

substantial number of both formal and informal firms, largely to discuss business with their owners rather than collect statistical data. We have visited businesses in several lines of activity, including metalworking, retail, garment manufacturing, shoe manufacturing, and food service, but our particular interest was in furniture making and retail. Altogether, we visited about a dozen establishments manufacturing and/or retailing furniture in the three countries.

There are several reasons to be interested in furniture in a study of informality. First, furniture is a nearly universally demanded good, so one can consider markets for furniture in just about every country. Second, furniture is demanded by the rich and the poor alike, as well as by firms, so it is produced and sold both formally and informally. Third, furniture is typically made of wood, and is therefore heavy. As a consequence, much of the furniture is locally made rather than imported. We say much because, as we discovered, even in poor African countries a growing amount of furniture is imported from China and Malaysia; this furniture tends to require assembly rather than being sold as a finished product. Fourth, and perhaps most important, furniture can be of higher and lower quality, and, furthermore, the production of higher quality furniture is typically more capital intensive. A producer needs machines to make wood panels that are smooth, polished, and nicely fitting together. Finally, furniture can be and often is produced by relatively small firms. While there are some increasing returns from producing standardized products, furniture is not like bottle or automobile manufacturing, in which increasing returns concentrate production in very large firms.

We visited both furniture makers and retailers, and tried to find out about manufacturing when the initial business we approached was retail. We used our guides to help us find both formal and informal firms. We were explicitly looking for firms of some size rather than the equivalent of street hawkers. Most businesses combine retail and production in the same location, although in a few instances even informal retailers had their workshops elsewhere (nearer to where the workers live). We did not go to any very large furniture firms (and we doubt those exist in the countries we visited).

To give a sense of the firms we visited, begin with four furniture makers in Madagascar. The first was a small informal store at one end of a street market in a poor neighborhood of Antananarivo, looking like an abandoned house. There were three beds on display, but the dressers, which were the most popular item according to the shop keeper, were not available. Beds for children sold for \$50, those for adults for \$75. The shop keeper, who seemed idle but reluctant to talk, said the shop was supplied by two informal workshops at the outskirts of town.

The second furniture maker had a workshop behind a wooden fence in the middle of a slum. A larger establishment, it had 6 permanent workers, all family members, and hired temporary employees

when there was demand (at the time of the visit, they had 10). All production was to order. The owner said that the business was registered, which the translator suggested was consistent with its having an industrial electrical connection. The business operated 4 machines, but manufacturing seemed very primitive (wood cut only in straight lines, visible nails in chairs). At the time of the visit, the workshop was working on a 200 piece order for a hotel, and could generally produce 18-20 pieces a week.

The third furniture maker was a small workshop with 3 people outside town on the side of the main road. All production, again, was to order, but the owner had a catalog with pictures. The owner first said he was unregistered because he was still learning the business, but then said he was registered. The store sold armchairs for \$250, beds for \$120-\$150 in pine and \$200-\$250 in palissandre, a more expensive wood.

The most interesting furniture maker in Madagascar was the fourth one, largely because there was a line of 50 beds displayed along the street, made in two workshops across the street. The owner initially said that the 7 year old business was unregistered, but then said he was registered because he paid “professional tax.” The workshops looked extremely primitive, but had a couple of simple machines. The owner said that a new lathe costs about \$1600, but could be assembled from components for \$400 (the cost of 6 beds in the owner’s words), yet he could not find the money to do that. He also complained he could not grow because he lacked capital, but then estimated the value of his inventory at \$3300. He said he sells 2-3 beds per week for \$170 each, but makes another every time he sells one. Occasionally hotels order 20 beds, but the owner said he could not expand production beyond that. We could not obtain any explanation for the size of the inventory, which was exposed to rain and required security at night to be protected. Our best guess was the lack of human capital by the owner.

We also visited Courts, a large retailer of furniture and household appliances from the UK, active in former British colonies. Courts is very big in Mauritius and has two stores in Madagascar. Interestingly the cheapest beds at Courts were \$120, and of visibly higher quality than the more expensive (at least at asking prices) beds of the informal furniture makers described above.

The quality of furniture in Mauritius was visibly higher than in Madagascar, presumably because Mauritius is a much richer country. The first maker we saw had a mid-size workshop, with about 10 employees but no owner present, selling in a store down the street. The sales were on credit, and the business appeared to be formal.

The second business we saw in Mauritius was much more substantial. It was clearly registered, with a VAT number prominently displayed at the entrance. It had 15 employees working on a piece rate

basis, and sold 70% to Courts and 30% through its own store. Courts generally ordered 50-100 pieces once every three months, but returned some defective items that the owner then sold in his own store. The owner reported that in 2007 the sales of the business were \$500,000 and the profits \$40,000. The owner nonetheless complained that the business was slow in part because Courts was bringing furniture from China and Malaysia, and that he was considering shutting down unless business recovers.

The third furniture business in Mauritius was formal as well, and looked the most substantial of the three. The owner started 10 years ago, and now had 16 employees. There was a car and a truck parked outside, as well as other signs of prosperity. The owner reported that he had a loan from the State-owned development bank. He also reported that he registered 2 months ago because he was getting too big to avoid getting into trouble with the government. This owner complained as well that business was slow.

We visited Courts in Mauritius as well, and learned how it buys furniture. The manager said that the suppliers they found initially were all informal but Courts required them to register to do business. They offered the suppliers training (e.g., by sending them to Malaysia), joint design of products, as well as 3 month guaranteed orders. Furniture suppliers ranged from \$70,000 to \$800,000 per year in annual contracts with Courts. The manager reported growing imports from Malaysia and China, but also said that most domestic suppliers could not produce enough volume, as well as deliver with sufficient time consistency, to be of interest to Courts.

A small informal furniture manufacturer in Busia, in Western Kenya, had all the work done outside. Some wood, and a minimal inventory, were stored in a nearby shed. All the furniture was made to order, after the customer made a down payment for materials. There were no machines (or access to electricity), and the furniture looked extremely rough and unpolished, despite being made from beautiful hard wood. All of the 10 workers were informal, the business had no loans, and paid no taxes. Nonetheless, the business was registered with the municipal council.

In Nairobi, we visited an informal furniture stand on the side of the main road leading to a good neighborhood. There are some finished products exhibited by the roadside, clearly of very rough quality. Some assembly work was done in the back of the shop, but the owner said there were also workshops in the slum, but not machines. All workers were casual. The owner said that he has a license from the municipality to allow him to sell at that location, but he was not registered with tax authorities, nor compliant with various labor regulations.

We then saw quite a large furniture factory in Nairobi, specializing in making frames for sofas and armchairs from wood. Sometimes the factory upholstered the frames itself, sometimes it sold wooden frames to formal upholsterer and retailers, but most of the time, according to the owner, individuals just came to pick up the frames and upholstered them on their own. The sales of the firm were obviously substantial: during the half an hour that we were there, several people came and picked up frames, all paying cash. The owner said he had 80-100 employees, all informal. He said he had been there for 15 years, but has just registered last year, largely because his business with formal firms was growing, and they demanded invoices. The factory had several electric machines. Perhaps most interestingly, all production was done outside: there was no building. There were vast amounts of wood chips scattered all over the place, and the owner informed us that another factory a few yards down burned down a few months ago. But he had no fire insurance.

A final furniture visit was to a factory next door, which made slightly more complex furniture, including bedroom and dining room sets, also had machines, also had nearly all production outside, and was not registered.

These visits suggest several observations. First, formality is not an all or nothing state. Many of the firms we visited, in both Madagascar and Kenya, including even street-side sellers, had some kind of a municipal license to operate, but employed purely informal employees and were very far from any contact with tax authorities. Tax registration, including incorporation into the VAT collection system, seems like the last step of becoming completely formal, delayed for as long as possible.

Second, the main reason that firm owners gave for becoming formal in that last sense of being able to issue invoices and joining the tax system, was sales to formal firms. Because of the VAT, formal firms such as Courts nearly always demand invoices they use to report their costs, and to issue such invoices the seller must be formal itself. It is this pull from the formal sector that appears to offset, at least for some firms, the tax and other costs of becoming formal. Without this pull, informal firms typically maintain extremely low production of low quality goods, and, consistent with the old theories of dualism, appear idle most of the time. Perhaps this idleness stands for something more productive, such as guarding the goods, but presumably the owners could be making and guarding at the same time.

Third, and perhaps most interestingly, our visits to furniture factories and other businesses gave us a very strong impression that formal firms produce higher quality output than informal firms do. Informality seems to be associated with producing very low quality goods, in small batches, often to order, with few or no machines, with no credit, advertising, or other aspects of modern production. The buyers of these goods are typically individual or informal businesses themselves, who transact in cash.



Formality, in contrast, is associated with higher quality, larger production volumes, sales to formal firms, and greater use of credit and advertising. As we show in the statistical part of our paper, a crucial dividing line separating formal and informal firms might be the human capital of the entrepreneurs.

Before turning to the statistical part of the paper, we should elaborate what we mean by quality. In the case of furniture, quality reflects visible characteristics of the product, such as roughness of the wood. But quality can also refer to whether a product can be trusted in the first place: whether the bottled water sold by the peddlers outside the formal store for much lower prices is actually bottled or filled in from the tap, whether watches or bags sold with designer labels are genuine, whether food served in a restaurant is fresh, and so on.

### *III. Characteristics of informal firms.*

In this section we describe our data and present simple descriptive statistics. Our basic approach is to compare country-by-country the relative performance of formal and informal firms in Africa. To do so, we combine data from three World Bank surveys of individual firms. The first survey –the Enterprise survey—covers formal firms and is available for 123 countries throughout the world. The other two surveys –the Informal and Micro surveys— contain information on both informal and formal firms in a few poor countries. The Informal survey is available for 9 African countries, including Burkina Faso, Cameroon, Cape Verde (surveyed twice), Egypt, Kenya, Niger, Senegal, Tanzania and Uganda. All these countries are below the world median income in 2008 (USD 7,558 in PPP terms) and 6 out of 9 are below the 25<sup>th</sup> percentile (USD 2,194 in PPP terms). The Micro survey is available for 20 African countries, including Angola, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Congo, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Madagascar, Mauritania, Mauritius, Namibia, Rwanda, Swaziland, Tanzania, Togo, and Uganda. With the exception of Botswana and Mauritius, all are below the world median income, and 13 out of 20 are below the 25<sup>th</sup> percentile. The concept of informality used in the Informal and Micro surveys focuses on registration (as we discuss below, there are several possible kinds of registration). Although questions about tax avoidance are asked, they are indirect.

Before describing the data in detail, we need to preempt a possible misconception about the nature of the firms in our data. In the context of poor countries, the term informal firm evokes the image of street hawkers selling goods out of baskets or of eateries in front of homes. In fact, such image is a good description of how the very poor people make a living (Banerjee and Duflo, 2007). However, the informal firms in our sample do not fit that image. For example, roughly 75% of the observations in the

Informal and Micro surveys have –in addition to the entrepreneur-- two employees or more. The informal firms in our sample are likely to be substantially more productive than the own-account workers of Banerjee and Duflo. Indeed, the people who work in them look more like the developing countries' middle class as discussed in Banerjee and Duflo (2008).

### ***III.A Data***

All three World Bank surveys have a similar structure and differ mainly in the firms that they sample. It is easiest to start by describing the Enterprise Survey--the source for our control group of *registered* or formal firms. It covers mainly manufacturing and certain services firms with five or more employees. The earliest available data is from 2002 and the latest is from 2009. The initial step in carrying out an Enterprise survey involves contacting the government statistical office of the relevant country to request a list of registered establishments. In some instances, the World Bank supplements the government's list with firms registered with the Chamber of Commerce of the relevant country or listed by *Dun and Bradstreet* or by similar private vendors of business directories. Thus, although firms in the Enterprise Survey may hide some of their output, the central government typically knows of their existence. We refer to these firms as “registered” and define the term below. The next step involves contacting the firms that will be sampled. Enterprise Surveys use either simple random sampling or random stratified sampling. A local World Bank contractor phones the firms to set up an interview with the person who most often deals with banks or government agencies. At that stage, firms with fewer than 5 employees are dropped from the sample, as are government-owned establishments, cooperatives, and community-owned establishments. Typical final sample sizes range between 250 and 1,500 businesses per country. The core questionnaire is organized in two parts. The first part seeks managers' opinions on the business environment. The second part focuses on productivity measures and is often completed with the help of the chief accountant or human resource manager.

The World Bank has also conducted separate surveys of informal and small firms to complement the Enterprise Survey. Data on unregistered firms has been collected through the “Informal” questionnaire while data on firms with less than 5 employees has been collected through the “Micro” questionnaire. Both surveys share a similar methodology. In the case of the Informal survey, local World Bank contractors identified neighborhoods perceived to have a large number of informal firms. These neighborhoods were then divided into enumeration blocks. These enumeration blocks were subsequently surveyed on foot. In the case of the Micro survey, local World Bank contractors selected districts and zones of each district where, based on national information sources, there was a high concentration of

establishments with fewer than five employees. The contractor then created a comprehensive list of all establishments in these zones. Finally, the contractor selected randomly from that list and went door-to-door to set up interviews with the top managers of the selected establishments. Although the Micro survey targets establishments with fewer than five employees, larger establishments are not dropped from the sample. In fact, firms with fewer than five employees account for only 62% of the African firms in the Micro sample.

Participation in the surveys is voluntary, and respondents are not paid to participate. Respondents are asked sequentially about the business environment, infrastructure, government relations, employment, financing, and firm productivity. There is some variation in the response rate across questions. To illustrate, out of 8,203 Informal and Micro firms surveyed in our sample, we have: (1) the age of 8,167 firms, (2) the number of employees of 8,193 firms, (3) the sales of 7,699 firms, (4) the fraction of investment financed internally of 7,083 firms, (5) assessments of the fraction of taxes typically evaded by firms in their industry of 5,210 respondents, and (6) capacity utilization of 3,259 firms. Since Informal and Micro firms typically do not keep detailed records of their operations, some respondents may simply not know the information being asked. Unfortunately, we have no way of quantifying the biases, if any, from missing data.

Critically, the “Informal” and “Micro” surveys cover registered firms as well as firms that exist without the government’s knowledge (i.e., “unregistered” firms). In the remainder of this paper, we focus on informality understood in terms of hidden firms rather than hidden output. To compare the performance of registered and unregistered firms, we need to define what it means to be registered. The questions regarding the legal status of the firm are worded differently in the Informal and Micro questionnaires. In the Informal Survey, we rely on respondent’s answer to whether firms are “registered with any agency of the central government”. In practical terms, firms are registered with an agency of the central government if they have obtained a tax identification number. In the Micro Survey, we rely on respondent’s answer to whether firms have either “registered with the Office of the Registrar...or other government institutions responsible for commercial registration” or have “obtained a tax identification number from the tax administration or other agency responsible for tax registration”.<sup>1</sup> Both surveys also keep track of whether firms are registered with “any local government agency”. We focus on registration with the central government because this form of registration is more directly relevant to avoiding taxes, enforcing contracts, and raising finance. We will also present statistics on municipal registration and, for firms in the Informal survey, industry board registration. In sum, the Informal and Micro surveys allow us

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<sup>1</sup> We obtain very similar results if the definition of Micro “registered” firms only includes firms that have a tax identification number.

to examine the productivity of (small) registered and unregistered firms whereas the Enterprise Survey provides information on the productivity of registered firms that have at least five employees.

### ***III.B. Descriptive Statistics***

Table 1 lists the African countries surveyed and presents the number of observations and average sales for the Informal (Panel A) and Micro samples (Panel B). Each panel also shows similar statistics for a control group of African firms from the Enterprise Survey. The average 2008 income per capita in purchasing power terms is roughly \$3,000, and ranges from \$313 in Congo to \$13,574 in Botswana.

The Informal Surveys covered 9 countries. They were carried out between 2003 and 2009 and, on average, have 151 firms with non-missing sales in each country. The Micro surveys were carried out in 20 African countries between 2006 and 2009 and, on average, have 109 firms with non-missing sales per country. The World Bank also carried out Enterprise surveys in parallel with the relevant Informal and Micro surveys. We use firms from the Enterprise survey as a control group. The average number of firms in the control group with available sales data is 283 for the Informal sample (Panel A) and 299 for the Micro sample (Panel B), and ranges from 53 in Niger (Panel A) to 1,119 in Egypt (in Panel A).

Throughout the paper we emphasize productivity differences between registered and unregistered firms and between small and big firms. Critically, whereas firms in the Informal survey are typically unregistered, firms in the Micro survey are typically registered. The average Informal survey has 32 *registered* firms out of a total of 151 firms, while the average Micro survey has 78 *registered* firms out of a total of 109 firms. To examine differences in size, we group Enterprise-survey firms in three categories according to the number of employees: (1) fewer than 20 employees (“Small”); between 20 and 99 employees (“Medium”); and 100 employees or more (“Big”). When assessing some of our results on productivity, it is worth keeping in mind that the distribution of firms across these three categories is fairly uneven. For example, there is one Big firm with non-missing sales data (out of 93) in the 2006 control group for firms in Cape Verde but 411 (out of 1,119) in the control group for firms in Egypt (see Panel A). Related to the small number of observations, there are few extreme outliers in the data (most likely resulting from errors in currency units). To mitigate the role of outliers, we cap at the 95<sup>th</sup> percentile the value of sales, sales per employee, and value added per employee in each country and in each survey. Capping does not qualitatively change the results we present.

The most striking fact in Table 1 is that the average sales of firms in the Informal and Micro surveys is tiny even in comparison with the average annual sales of Small firms in the Enterprise survey.

Specifically, average sales are \$28,077 for Informal firms but \$1,142,822 for Small Enterprise firms in the control group. Similarly, average sales are \$65,884 for Micro firms but \$449,324 for Small Enterprise firms in the control group. Typically, unregistered firms are even smaller than the average firm in the Informal and Micro surveys (Cape Verde in 2006, Mauritania, and Niger are exceptions to this pattern). For example, in the Informal survey sample, average sales for unregistered Tanzanian firms are \$9,212 compared to \$19,260 for registered firms. Looking across countries, registered firms in the Informal survey sample have average sales \$4,877 higher than those of unregistered firms. Similarly, registered firms in the Micro survey sample have sales \$32,458 higher than those of unregistered firms. It is natural to worry that the reported sales of unregistered firms may be low because respondents lie about their output. We address this issue in Section V.

What do unregistered firms do? Tables 2 and 3 shed light on some of the basic characteristics of firms in the Informal and Micro surveys, respectively. Both Tables have a similar –but not identical-- structure since there are small differences between the two questionnaires. For each variable, we present the mean for each group (e.g., unregistered, registered, Small, Medium, and Big) as well as t-statistics for the difference between the means of different groups of interest (e.g. Small vs. unregistered). To avoid the possibility that the results are driven by the country with the most observations, we first average all observations within a country and then compute means and t-statistics across countries.

We discuss both tables in order, beginning with Table 2. The first block of variables shows some general characteristics of the firms. Unregistered firms, although younger (10.1 years) than the average firm in the control group (18.7), have been operating for quite a long time. By definition, unregistered firms are not registered with the central government. Yet, 35.1% of them are registered with a local government agency and 14.3% are registered with an industry board or agency.

The next four variables describe the assets owned by firms in the Informal survey. The ownership of land, although higher among Enterprise survey firms than Informal survey ones, is not significantly different among the two groups (45.6% vs. 66.6%). Similarly, firms in the Informal survey own a smaller fraction of the buildings that they occupy than firms in the Enterprise survey (46.2% vs. 52.9%) but this difference is not statistically significant. The ownership of electric generators –a key asset in poor countries – is significantly different across firms. Few unregistered and registered firms own a generator (2.7% and 5.6%, respectively). In contrast, 24.6% of the Small firms in the Enterprise survey and 80.5% of Big firms in that survey own a generator. Capacity utilization rates do not vary much between unregistered and Enterprise survey firms (56.4% vs. 65.2%, respectively). The evidence suggests that firms in the Informal and Enterprise survey may not share the same clients. Only 1.8% of the firms in the

Informal survey make the largest fraction of their sales to large firms. In contrast, large firms are the main client of 13.9% of the firms in the Enterprise survey.

The next block of variables describes the employees and their human capital in the Informal survey. Unsurprisingly, unregistered firms have the smallest average number of employees (3.0). The key fact regarding informal firms is that –consistent with the dual view but not with the other two views-- their top managers have low human capital. For example, the probability that the top manager of a firm has some college education is only 7.2% if the firm is unregistered compared to 8.5% for registered firms and 66.9% for all firms in the Enterprise survey. To summarize the differences in human capital, we create an index ranging from 1 to 4 according to whether the top manager attended primary school, secondary school, vocational school, or college. This index equals 1.8 for managers of unregistered firms and 2.9 for managers of Enterprise survey firms. We construct a similar index for the employees. Here the pattern is strikingly different than for top managers. Employees of informal firms have very similar levels of education as those of Enterprise survey firms (2.4 vs. 2.2).

Next, we turn to how firms are financed. Only 16.9% of the unregistered Informal survey firms have ever had a commercial loan. Instead, they finance 66.8% of investment with internal funds and 10.4% with help from the family. The most striking fact about financing is that all small firms –and not just unregistered ones--- lack access to finance. In fact, Small firms in the Enterprise survey finance 73.9% of their investment with internal funds and 2.8% with family funds. Big firms in the enterprise survey have more access to external finance than small ones. For example, internal funds pay for 60.7% of the investment of Big firms rather than for 66.8% as in the case of unregistered firms. Yet, the fact that all Small firms lack access to finance suggests that it may be misguided to put access to finance for unregistered firms at the center of the development agenda.

Finally, there is no evidence in the Informal survey that these young unregistered firms are dynamic engines of employment creation. Specifically, the two-year average growth rate of employment is 7.4% for unregistered firms, 8.9% for registered firms, and 7.8% for all Enterprise survey firms. Moreover, the median the two-year average growth rate of employment is 0% for both unregistered and registered firms, and 2.1% for all Enterprise survey firms.

Firms in the Micro sample show very similar patterns as those in the Informal sample (see Table 3). For this reason, we discuss them only briefly focusing on the questions that are only available on the Micro questionnaire and on the few results that are different between the two questionnaires. The Micro questionnaire gives us a bit more insight into the firms' assets. Only 17.2% of the unregistered firms and 13.4% of the registered ones are located in the owners' house. Most unregistered (71.4%) and registered

firms (80.4%) occupy a permanent structure. However, there is evidence of hardship resulting from the lack of secure title (De Soto, 2000). Specifically, 11.3% of registered firms and 8.8% of unregistered firms were forced to move in the previous year because of lack of secure title.

Much like their counterparts in the Informal survey, unregistered firms in the Micro sample are significantly less likely to own a generator than all other firms. The shortage of generators is suggestive of insufficient capital since only 60% of the unregistered firms have an electric connection to the grid. Furthermore, unregistered firms are much less likely to use their own transportation equipment than registered firms (6.6% vs. 22.9%, respectively). Consistent with the view that unregistered and Enterprise survey firms may serve different clients, Big firms export 22.2% of their sales while unregistered firms export only 0.8% of their sales. Finally, there is evidence that unregistered firms have less access to computers than do other firms. In particular, unregistered firms are less likely to use email to communicate with their clients than either registered or Enterprise survey firms (3.2%, 9.1%, and 47.7%, respectively). Similarly, unregistered firms are less likely to use a webpage to connect with clients than either registered or Enterprise survey firms (0.9%, 2.8%, and 17.6%, respectively).

Unregistered firms in the Micro sample – unlike their counterparts in the Informal sample – have a faster average growth rate of employment than firms in the Enterprise Survey. The average annual employment growth rate of unregistered firms (17.1%), while not quite matching the growth rate of registered firms (19.9%), exceeds that of Enterprise survey firms (13.4%). However, this finding needs to be interpreted cautiously for two reasons. First, the median growth rate of employment is 0% for unregistered firms and 11.8% for Enterprise survey firms. Second, the sales and employment levels of unregistered firms remain very small despite having been around for 8 years.

To complement the evidence on growth rates, we examine how often registered firms initially started operating as unregistered. The Enterprise survey files have available a question on whether firms were registered when they started operations. Table 4 shows the available data regarding the initial legal status of firms in twenty three African countries and, for comparison purposes, summary statistics for 14 Latin American countries. The fraction of firms that were registered initially ranges from 56.1 in Ivory Coast to 96.1 in Eritrea, and averages 81%. Since 1.3% of the respondents did not answer the question, we estimate that 18% of the firms registered after starting operations. For comparison, 90% of Enterprise survey firms in Latin America were registered when they started operations. In sum, firms rarely start as unregistered and later change their status. Bearing in mind that the number of unregistered firms in our

sample is likely to greatly exceed the number of registered firms, this is not the pattern that we would expect to see if the informal sector were a reservoir of entrepreneurial talent.<sup>2,3</sup>

We conclude this section by presenting some data on the institutional environment in which firms operate. All observers of informality agree on the basic tradeoff faced by firms (i.e. taxes and regulatory burden vs. public goods and finance). The previous literature has emphasized access to public goods as one of the main attractions of operating in the formal sector. Table 5 presents data on the institutional environment faced by firms and on how they operate in it. Panel A shows results for the Informal survey and Panel B for the Micro survey.

Three facts stand out. First, unregistered firms enjoy tangible advantages. Specifically, managers of unregistered firms in the Informal sample estimate that a typical firm in their sector evades 54.5% of its tax liability. Tax evasion sharply decreases with firm size. For example, managers of Small firms in the control group estimate that a typical firm in their sector evades 27.6% of its liability and tax evasion drops to 18.2% for Big firms in the control group. Tax evasion by unregistered Micro firms and Small firms in the control group follows a similar pattern (62.3% vs. 41.0%, respectively).

Likewise, the regulatory burden increases rapidly with firm size. Whereas managers of unregistered firms in the Informal (Micro) sample report spending 9.5% (4.5%) of their time dealing with government regulations, that task requires 14.3% (11.4%) of time for managers of Big firms in the control group. Finally, the evidence regarding the relationship between formality and bribes is mixed. Specifically, managers of unregistered firms in the Informal survey estimate that firms in their sectors pay 6.9% of their sales to “get things done” while managers of firms in the control group report that bribes equal 3.4% of sales. In contrast, managers of unregistered firms in the Micro survey estimate that firms in their sectors pay 3.4% of their sales to “get things done” while managers of firms in the control group report that bribes equal 5.9% of sales. In sum, although perhaps partially offset by higher bribe payments, lower taxes and less regulation confer a clear cost advantage to unregistered firms.

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<sup>2</sup> To get a benchmark that may be useful to calibrate the figures in Table 5, assume that there are 1,000,000 workers and that half of them work for informal firms. Moreover, assume that the average informal firm has 2 employees and that the average formal firm has 10 employees. Finally, assume that 10% of the firms go out of business in any given year. Then, 25,000 informal firms and 5,000 formal firms are formed each year. If unregistered firms had a yearly 2.2% ( $= (50,000/250,000) * 0.1 / (1 - 0.1)$ ) probability of registering (and of increasing employment to 10 workers), all 50,000 registered firms started operations in the unofficial sector.

<sup>3</sup> Interestingly, African firms that start operations without being registered take a long time to do so. For example, only 35.6% of the initially unregistered African firms had registered by the end of the sixth year of operations (results not reported). This slow transition into the formal sector is inconsistent with theoretical models where entry into the informal sector allows entrepreneurs to acquire information (e.g. about demand for the firm’s products) at a lower cost than entry into the formal sector (Bennett and Estrin, 2007).



Second, the quality of public goods in our sample is very bad. In the informal survey, unregistered firms report that they experienced power outages on 45 days of the previous year. Surprisingly, firms in the Enterprise survey fare even worse (65 days on average, difference not statistically significant). On many days, firms experience multiple power outages. For this reason, the number of power outages for the Micro survey is radically higher than the number of days without power in the Informal survey. Specifically, unregistered firms in the Micro survey experienced 138.1 power outages in the previous year. This time, Enterprise survey firms do marginally better (96.4 days, difference not statistically significant). In such an environment, only firms large enough to afford a generator can be productive. Outages of water, phones, and transportation are also very high by the standards of developed countries. As a result, the performance of firms that are too small to provide for substitutes for public goods (e.g. use their own transportation equipment) may be severely impaired.

Third, outright theft is very prevalent in our sample, but small firms do not make much use of police and of courts. Specifically, unregistered firms in the Informal survey report that, in a typical year, losses from theft amount to 3.6% of annual sales, ranging from 0.4% in Burkina Faso to 13.6% in Uganda. Small firms in the enterprise survey report smaller losses (1.8%, difference not statistically significant). Somewhat surprisingly, losses as a result of theft appear to be lower for Micro firms (0.8%) than for Small firms in the control group (1.8%). To put these figures in context, note that Enterprise Survey respondents estimate losses as a result of theft equal to 0.6% of sales in Germany, 0.2% in Ireland, and 0.1% in Spain.

In response to theft, firms spend heavily on security and make “protection” payments to gangsters. For example, security and protection payments equal respectively 2.4% and 2.6% of the sales of unregistered firms in the Informal sample. Firms in the control group spend a bit more on security (2.9%) and much less on protection payments (0.2%). The police do not appear to play a central role in addressing theft. In fact, most theft is not even reported to the police. Only 22.7% of the incidents suffered by unregistered firms in the Informal survey are reported to the police. In contrast, 32.9% of the incidents experienced by registered firms in the Informal survey are reported to the police—still a low figure. This pattern is consistent with the view that unregistered firms may have trouble protecting their property rights. Alternatively, the absolute value of the losses suffered by unregistered firms may be too low to justify filing a police complaint. Firm size does play a role in reporting theft to the police. However, even Big firms in the control group for the Informal sample only report to the police roughly 70% of the theft incidents.

Interestingly, small firms do not make much use of courts to adjudicate disputes, either. Only 29.2% of unregistered and 33.2% of registered firms in the Micro sample used courts to resolve commercial disputes during the previous year. In the control group, the use of courts to solve commercial disputes rises quickly with firm size from 51.3% for Small firms to 81.8% for Big firms. Surprisingly, courts appear to work in a reasonably efficient manner. It takes roughly 80 days to resolve a commercial dispute in the Informal sample countries and approximately 26 days in the Micro sample countries. The fact that unregistered firms and Small firms in the control group behave similarly regarding how they solve commercial disputes suggests that inadequate access to courts is unlikely to explain differences in productivity between the two groups of firms. The same argument applies to lack of police protection.

The tentative picture that emerges from this section supports the dual view of informality. Unregistered firms have been around for a long time (8 to 10 years), but their sales are still trivially small. Moreover, the overwhelming majority of formal firms registered when they started. The small size of unregistered firms is symptomatic of uneducated management and low-quality assets. As we argued in the previous section, this also leads to lower quality. When public goods are unreliable, unregistered firms are too small to afford owning generators, computers, or transportation equipment. They do not have large firms as clients. They do not export. Despite De Soto's (2000) emphasis on access to credit as the key to igniting the growth of unregistered firms, lack of external finance appears to be an attribute of all small firms in poor countries – not just of unregistered firms. In sum, the limitations of unregistered firms appear to be far more severe than acknowledged by their champions.

#### ***IV. Productivity of unregistered firms.***

In this section we examine the productivity of unregistered firms and present the key findings of the paper. In measuring the productivity of unregistered firms, we face severe data limitations. In particular, we do not have information on how much capital these firms have. The Informal and Micro questionnaires do not collect such information since unregistered entrepreneurs typically lack detailed records to estimate the value of their assets. We thus have to measure productivity without capital.

To this end, we use two crude measures of productivity: (1) sales per employee; and (2) (gross) value added per employee, where (gross) value added is defined as sales net of expenditure on raw materials and energy.<sup>4</sup> Thus, we define value added per employee for firm  $i$  in industry  $s$ :

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<sup>4</sup> Data on wages is unavailable for most countries in the Informal sample. For this reason, we are unable to remove labor costs from our measure of value added.

$$VA_{si} = \frac{P_{si} Y_{si} - P_m M_{si} - P_E E_{si}}{L_{si}}$$

where  $P_{si} Y_{si}$  is the level of sales,  $P_m M_{si}$  is expenditure on raw materials,  $P_E E_{si}$  is expenditure on energy, and  $L_{si}$  is the number of employees. The definition of employees includes both full- and part-time workers but not seasonal workers. To the extent that seasonal employment is more prevalent in unregistered firms than in the formal sector, we overstate the productivity of unregistered firms. We use expenditure on production inputs (e.g., energy) and machines as crude proxies for capital invested.<sup>5</sup>

### ***V.A Measurement error***

Even aside from the theoretical concerns, we need to deal with the fact that our sales numbers come from unofficial firms, raising concerns about measurement error. There is good reason to worry that our productivity measures may be biased since unregistered entrepreneurs may choose to hide output not only from the government but also from the World Bank contractors. For example, de Mel, McKenzie, and Woodruff (2007) find that micro-enterprises underreport profits by 30% to researchers, although they attribute this more to lack of recall than to intentional understatement.

We offer two pieces of evidence that support the view that biases are unlikely to drive the main results in the paper. First, Table 6 shows the available information regarding expenditure on various production inputs (scaled by sales). If unregistered entrepreneurs lied only about sales, inputs as a fraction of sales would be higher for unregistered firms than for other firms. Moreover, such differences should be very large given that, on average, the sales of small Enterprise survey firms are roughly 40 (10) times larger than the sales of firms in the Informal (Micro) survey. In fact, unregistered firms do spend more on inputs than firms in the control group but such differences are small in economic terms and generally not statistically significant. For example, expenditure on raw materials by Small firms in the control group is 2.1 percentage points lower than for unregistered firms in the Informal sample and 0.1 percentage points higher than for unregistered firms in the Micro sample (differences are not statistically significant). Differences in expenditure on energy are the only statistically significant difference

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<sup>5</sup> This approach to productivity measurement has recently received considerable criticism, since the sales measure obviously combines physical output and prices. We obtain qualitatively similar results by following the methodology proposed by Hsieh and Klenow (2009) to address this issue and model the equilibrium prices that should prevail in a competitive equilibrium (results not reported). Moreover, Foster et al. (2008) gather data on both sales and prices and find that the correlation between the sales-based and corrected measures of productivity is incredibly high, well over 0.9.

consistent with the hypothesis that unregistered firms lie. Specifically, expenditure on energy by Small firms in the control group is 4.9 percentage points lower than for unregistered firms in the Informal survey and 0.3 percentage points lower than for unregistered firms in the Micro sample. In contrast, expenditure on machines by Small firms in the control group is 4.1 percentage points *higher* than by unregistered firms in the Micro sample but essentially equal to that by unregistered firms in the Informal sample. Finally, there is weak evidence that unregistered firms in the Informal survey spend more on labor and land than Small firms in the control group. In sum, there is no evidence that the enormous differences in size between unregistered firms and Small firms in the control group that we see in Table 1 are the result of underreporting by unregistered firms.

Second, Table 7 shows the available data on wages per employee. Under the dual hypothesis, unregistered firms should pay low wages (Harris and Todaro 1970). These low wages may be consistent with some on-the-job home production by workers in unregistered firms. Alternatively, workers in unregistered firms may be less skilled than those in registered firms. Either way, the dual view predicts that the measured output of unregistered firms should be low relative to the output of workers in the control group. In contrast, wages in the formal and informal sectors should be comparable if observed differences in productivity are due only to measurement error. Panel A shows wages per employee in Burkina Faso, Cameroon, and Cape Verde – the only African countries in the Informal sample with wage data. Panel B shows wages per employee for the countries covered by the Micro sample. Wages are scaled by income per capita.

Three facts stand out. First, there is no clear correlation between size and wages within the control group. For example, Big firms pay higher wages than do Small firms in Cameroon and Togo. The reverse is true in Burkina Faso and Rwanda. On average, wages in Big and Small firms are indistinguishable from each other. Second, unregistered firms consistently pay lower wages than Small firms in the control group. Burundi illustrates this point. Wages in unregistered firms equal 1.76 times per capita income. In contrast, wages in the control group of Small firms equal 5.84 times per capita income. On average, in the Micro sample, wages are 1.96 times per capita income in unregistered firms and 3.32 times per capita income in Small firms. Third, although there is considerable heterogeneity across countries, the workers of unregistered firms are not the poorest among the poor. In Rwanda, for example, wages for the employees of unregistered firms exceed GDP per capita by 29%. Similarly, in the Micro sample, the average wage of unregistered workers is roughly equal to twice GDP per capita. Taken at face value, the large wedge in wages between unregistered firms and the control group is strongly consistent with the dual view of unregistered firms. Of course, we cannot rule out the alternative

interpretation that respondents shrewdly lie to the World Bank about sales, inputs, and wages. However, the findings on inputs and wages should allay some of the concerns regarding data quality.

As a final point, it seems to us that concerns about intentional understatement of revenues should not be exaggerated for our data. Firms participating in the surveys do so voluntarily. Virtually all of them answer questions about sales, even though they do not have to. They also give answers suggesting massive underpayment of taxes and bribe payments by “firms like theirs.” This is not behavior of those fearful that World Bank contractors will turn them in (or that authorities would do anything about it). Our view is that most informal firms operate in the open, that they have done so for years, that they pay the police and other authorities to leave them alone, and that fear of reprisals for truly reporting revenues to the World Bank is very far from their minds. This particular concern is a rich-country fear rather than a poor country reality.

#### ***IV.B Productivity of unregistered firms***

Table 8 presents the main findings in the paper. Panel A shows estimates of (log) value added per employee for the Informal sample and its Enterprise Survey control group. Panel B shows analogous data for the Micro sample. Two key facts stand out. First, consistent with the anecdotal evidence in Section II, unregistered firms are significantly less productive than the Enterprise Survey firms. The productivity gap between unregistered firms and even the Small firms in the control group is truly enormous. Firms in Egypt in the 2008 Informal survey illustrate this pattern. Value added per employee for Small firms is 180% higher than for unregistered firms. The example of Egypt is representative of the results for other countries although differences in value added per employee are not statistically significant in 7 out of 18 cases. On average, based on the Informal sample, the productivity of Small Enterprise Survey firms is around 120% higher than for unregistered firms. Similarly, based on the Micro sample, the productivity wedge between Enterprise Survey Small firms and unregistered firms is 80%.

Second, Big firms are significantly more productive than Small ones. Continuing with the example of Egypt in 2008, value added per employee is 60% higher for Big firms than for Small firms. This large heterogeneity in firm productivity is consistent with work by Hsieh and Klenow (2009) showing sizable gaps in the marginal products of labor and capital across plants within narrowly-defined industries in China and India. On average, depending on the sample, value added per employee is between 90% and 110% higher for Big firms than that of Small ones.

The cumulative effect of these productivity differences is large. Returning to the example of Egypt in 2009, Big firms are 240% more productive than unregistered firms. On average, value added per employee is 250% higher for Big firms in the Informal survey than for the unregistered ones. Similarly, value added per employee is 230% higher for the Big firms in the Micro sample than for the unregistered ones.

To illustrate what these differences in productivity mean in practice, consider the average unregistered firm in Egypt's informal survey. It has value added of \$1,138 per employee on sales of \$1,480 per employee. In contrast, an average Small firm in the control group has value added of \$7,169 per employee and sales of \$16,318 per employee. If the unregistered firm could achieve the value added level of a Small firm only by registering, would it choose to do that? By assumption, changing its legal status would generate \$6,031 ( $=\$7,169 - \$1,138$ ) per employee in additional cash flow. However, the firm would have to pay registration fees and taxes as well as comply with regulations. The registration fee – including the value of the entrepreneurs' time – would probably amount to roughly \$1,740 (Djankov et al., 2002). The firm would also need to pay labor taxes (25.6%), corporate taxes (13.8%), and VAT (10.0%). To keep things simple, assume that wages are 20% of sales and that there are no additional costs. Moreover, to bias the example against the firm choosing to register, assume that the firm would evade all taxes if unregistered but comply fully if registered. Under these assumptions, wages for the Small firm equal \$3,264 ( $=0.20 * \$16,318$ ) and the hypothetical firm would owe additional payments of \$835 ( $=0.256 * \$3,264$ ) in labor taxes, \$539 in corporate taxes ( $=0.138 * (\$7,169 - \$3,264)$ ), and VAT of \$391 ( $=0.10 * (\$7,169 - \$3,264)$ ). Thus, the firm would have to disburse \$3,505 per employee in taxes and fees. In this back-of-the-envelope calculation, the firm would pocket \$2,526 ( $=\$6,031 - \$3,505$ ) per employee by registering.

Of course, the gains would be even larger if the unregistered firm could –merely by registering -- duplicate the value added per employee of Big firms in the control group. On average, such firms have value added per employee of \$12,440 on sales of \$29,733. Calculations similar to the preceding ones suggest that the unregistered firm would gain \$6,494 per employee if -- only by registering-- it could duplicate the level of value added per employee of Big firms.

A similar set of calculations illustrates that unregistered entrepreneurs can simply not afford to pay taxes unless sales sharply increase from merely registering. Under the assumption that wages equal 20% of sales ( $=\$296$ ), the average unregistered firm has a pre-tax profit per employee of \$842 ( $=\$1,138 -$

\$296) and owes taxes of \$276 per employee.<sup>6</sup> Unless sales dramatically increase as a result of registering, the average unregistered firm would have considerable difficulty paying \$1,740 to register.

Given the very large difference in productivity between unregistered firms and the control group, the cost of complying with government regulations would have to be implausibly high to justify operating as an unregistered firm. A more realistic scenario is that –consistent with the dual view -- unregistered firms would not be able to achieve the performance of Small firms just by registering. Perhaps, for example, unregistered firms lack the human capital necessary to match the quality of the goods produced by formal firms. The image of unregistered firms consistent with their observed levels of productivity is not that of predators but rather that of relics of the past.

What accounts for the large difference in productivity between unregistered firms and the control group? We begin by running simple OLS regressions and discuss self-selection issues later. In principle, the productivity differences that we document in Table 8 could be driven by industry effects, by differences in inputs, including human capital, or by differences in size. The goal of the OLS regressions that follow is to examine whether unregistered firms remain unusually unproductive after we control for these factors. In simple terms, we interpret the estimated coefficient on the unregistered dummy as a measure of our ignorance regarding the production function of unregistered firms. Killing the unregistered dummy would not mean that unregistered firms are as productive as registered ones, but that differences in productivity are captured by differences in inputs and scale, as in Rauch's (1991) selection story.

All specifications include the following four dummy variables: (1) the firm is in the Informal survey; (2) the firm is registered and in the Informal survey; (3) the firm is in the Micro survey; and (4) the firm is registered and in the Micro survey. Firms in the Enterprise survey are the omitted category. We then add –one at a time – (log) income per capita, eight industry dummies, expenditure on raw materials, expenditure on energy, expenditure on machines, the index of manager education, and (log) sales.<sup>7</sup> All three expenditure variables are scaled by employees.

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<sup>6</sup> Such firm owes \$76 in labor taxes ( $=0.17*\$296$ ), \$116 in corporate taxes ( $=0.138*(\$1,138-\$296)$ ), and \$84 in VAT ( $=0.10*(1,138-\$296)$ ).

<sup>7</sup> Errors are clustered at the country level. We do not include country fixed effects since the frequency of unregistered firms in our sample may not reflect the incidence of unregistered firms in the population.

Table 9 shows OLS regressions using (log) value added per employee as the dependent variable.<sup>8</sup> The first regression only includes dummies for whether the firm is in the Informal sample or in the Micro sample, and the interactions between each of those two variables and whether the firm is registered.

The regression results confirm the findings in Table 8. The estimated coefficients equal -1.57 for the Informal sample and -1.29 for the Micro one. Moreover, the interactions of Informal and Micro with registered equal 0.16 and 0.49, respectively. All four dummies are highly statistically significant except for the interaction between Informal and registered. Adding GDP per capita does not change the basic pattern. Similarly, the estimated coefficients for the four dummies barely change as we add industry controls. Coefficients do change when we add expenditure on raw materials. Specifically, the estimated coefficients on the dummies for the Informal and Micro surveys drop to -0.81 and -1.00, respectively, while the estimated coefficient for the interaction between Micro and registered drops to 0.33. Adding expenditure on energy further lowers the estimated coefficients on the four dummies but not significantly so. The four coefficients barely change as we add expenditure on machinery. The coefficients for expenditure on raw materials, energy, and machines are not only statistically significant but also economically important. For example, increasing raw materials by one standard deviation is associated with a 47% increase in value added. Similar increases in expenditure on energy and machines have somewhat smaller effects (31% and 15% percentage points, respectively). Coefficients fall another notch when we add manager education. Interestingly, ignoring selection issues, the estimated coefficient on manager education suggests that a top manager with some college education increases value added per employee by 44 percentage points ( $=0.1452 \times 3$ ) relative to a top manager with some lower school education. Finally, there is no evidence that unregistered firms are unusually unproductive once we control for (log) sales. Specifically, the estimated coefficients on both Informal and Micro switch signs when we add (log) sales to the regression. In fact, the coefficients on both Informal and Micro are not only positive but also significant. The interaction between registered and Micro is the only interaction dummy that remains statistically significant. Finally, in the regressions that control for sales, the estimated coefficient on the education of the top manager is significant but has the “wrong” sign.

#### *IV.C Selection*

The OLS results in this section suggest that unregistered firms are not unusually unproductive once we take into account their expenditure on inputs, the human capital of their top managers, and their

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<sup>8</sup> We obtain qualitatively similar results using (log) sales per employee or a measure of (log) real output based on Hsieh and Klenow (2007).



small size. Of course, these are all endogenous variables. Indeed, the dual view of informality emphasizes the sorting process that matches able managers with good assets. High quality managers are willing to pay taxes and bear the cost of government regulation in exchange for being able to advertise their products, raise outside capital, and access public goods. In contrast, low quality managers avoid taxes and regulations since the benefits of operating in formal economy are less valuable for small firms.

Table 10 examines the sorting process. Specifically, we examine the relationship between the quality of the firm's assets and the human capital of its top manager—our only proxy for managers' ability. The dependent variables fall into two categories: dummy variables (Panel A) and continuous variables (Panel B). The dummy variables include indicators for whether: (1) the firm is registered; (2) the firm has ever had a loan; (3) the main buyers are large firms; (4) the firm occupies a permanent structure; (5) the firm is located in the owner's house; (6) the firm owns the building it occupies; (7) the firm owns the land it occupies; (8) the firm uses its own transportation equipment; (9) the firm owns a generator; (10) the firm uses email to communicate with clients; (11) the firm uses a website to communicate with clients; and (12) the firm has an electrical connection. Finally, we use five continuous variables as dependent variables: (1) the percentage of investment that is financed internally; (2) expenditure on raw materials as a fraction of sales; (3) expenditure on energy as a fraction of sales; (4) expenditure on machines as a fraction of sales; and (5) capacity utilization. All regressions control for income per capita and include eight industry dummies.

Many—but not all—the correlations in Table 10 are consistent with sorting on managers' ability. Specifically, the results in Panel A show that managers who attended college are more likely to work for firms that are registered, have borrowed from banks, sell to large firms, communicate with clients through email, have a webpage, and have an electric connection. Along the same lines, managers who attended college are more likely to work for firms that own land, transportation equipment, and generators. Moreover, the results in Panel B show that managers who attended college are more likely to work for firms with more external finance and higher capacity utilization. The economic significance of these coefficients is large. The probability of being registered increases by 69% if the top manager has some college education (rather than some lower school education). Having a top manager with some college also has large effects on the probability of ever having borrowed from a bank (+32.2%), the probability of selling to large firms (+83.5%), the probability of owning buildings (+26.5%), the probability of owning transportation equipment (+41.4%) and a the probability of having a generator (+84.9%), the probability of using email (+126%), the probability of having a webpage (+101%), and the probability of having an electrical connection (+121%). Similarly, having a top manager with some college education reduces the

fraction of investment financed with internal funds by 20 percentage points (the standard deviation is 32%), and increases capacity utilization by 20 percentage points (the standard deviation is 22.7%).

In contrast, the evidence regarding the probability of occupying a permanent structure is weak. The only significant coefficient is for vocational schooling. Nor is there evidence that either expenditure on raw materials or the probability of owning buildings increases with managers' education. Finally, two regressions have statistically significant coefficients with the "wrong" sign: the likelihood that the firm operates in the house of the owner is higher when managers have attended secondary or vocational schools rather than lower schools and expenditure on energy is lower if the top manager attended college rather than lower schools.

These results suggest an explanation for the puzzling low productivity of unregistered firms. The productivity gap between registered firms and the control group disappears once we take into account crude proxies for physical and human capital and control for size. Of course, size is an endogenous variable. These results on manager selection are broadly consistent with the view that part of the reason why unregistered firms are small is that they are run by managers of low ability (Rauch 1991). These managers do not find it worthwhile to pay the cost of running a formal firm. In sum, unregistered firms are small because they are run by less able managers and, as such, face a high cost of capital, few opportunities to advertise their products, and insufficient scale to own critical assets such as generators and computers. The evidence from our visits suggests that, for all these reasons, they also produce low quality products, which are not demanded by formal customers.

## ***V. Obstacles to Doing Business.***

As a final step, we present information on obstacles to doing business, as reported by respondents in the Micro and Enterprise surveys.<sup>9</sup> Table 11 reports the percentage of firms that identify each of 17 obstacles as the most important one for their firm.

Three findings stand out. First, the business obstacles facing firms in the Micro and Enterprise Survey are similar. Second, there is considerable agreement that access to electricity and finance are serious obstacles. Specifically, 32.9% of Big firms in the Enterprise Survey and 20% of the firms in the Micro Survey regard access to electricity ranks as the most serious obstacle to doing business. Similarly, access to finance ranks as the most serious obstacle to doing business for 14.4% of Big firms in the Enterprise Survey and 23.1% of firms in the Micro Survey. Third, beyond access to electricity and

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<sup>9</sup> Results for firms in the Informal survey and their control group are qualitatively similar.

finance, there is considerable disagreement regarding the importance of the other obstacles to doing business. For example, only 9.8% of Big firms in the Enterprise Survey and 5.4% of the firms in the Micro Survey identify tax rates as the most serious obstacle to business. Neither the Micro Survey firms nor the Enterprise survey firms consider access to land, labor regulations, business licensing and permits, the legal system, tax administration, corruption, crime, transportation, customs and trade regulations, political instability or the education of the workforce to be major obstacles to doing business.

We can also use the information on obstacles to shed light on the McKinsey Global Institute view that informal firms compete unfairly with formal ones. Respondents provide an assessment of whether the “practices of competitors in the informal economy” are an obstacle to their business. Contrary to the McKinsey view, “practices of competitors in the informal economy” are perceived as the top obstacle by roughly 9% of the managers of firms in either the Micro or the Enterprise survey. Moreover, the perception of informal practices as a top business obstacle by managers of firms in the Enterprise Survey is a significant concern only in four countries: Swaziland (28%), Mauritius (18%), Mauritania (16%), and Togo (16%). Second, the answer is slightly *lower* for the Enterprise Survey firms than for the informal Micro firms (8.9% vs. 9.7%), which is not consistent with the view that the informal firms undercut formal ones. Third, one might have guessed that it is the Small registered firms in the Enterprise survey that would be mostly severely affected by the informal firms. However, informal practices are an equally serious obstacle for both groups of firms (9.4% vs. 9.3%). None of this evidence is supportive of unfair competition.

A final piece of evidence comes from perceptions regarding the benefits and costs of registering. Specifically, five Informal survey questionnaires include questions regarding the benefits of registration while fourteen Micro survey questionnaires include questions regarding obstacles to registration. Panel A in Table 12 reports the percentage of respondents who rank each possible answer as either the most important or second most important benefit of registration. The main benefits of registering are improved access to financing (67%), raw materials (27%), and markets (12%)—broadly consistent with the previous findings about the obstacles to doing business faced by informal firms. Better access to workers (1%), infrastructure services (2%), property rights (5%), government services (8%), opportunities with formal firms (9%), and lower bribes (12%) are not nearly as important.

On the cost side, Panel B in Table 12 reports the percentage of respondents who rank each possible answer as either a “very serious obstacle” or a “major obstacle” to register a business. The main obstacles to registration are the financial (34%) and administrative (26%) burden of taxes as well as the cost of registering (29%) and the need to comply with minimum capital requirements (25%). There is

also suggestive evidence that, at least in some countries, firms perceive the bribes that registered firms pay as a reason to remain informal. Specifically, 85% of the respondents in Ivory Coast rate the bribes that registered firms pay as a top obstacle. Unfortunately, Madagascar is the only other country where the Micro questionnaire asked about bribes as an obstacle to registering. In that country, 20% of the respondents report that bribes in the formal sector are a top obstacle to registering. Labor regulation (16%) and the difficulty of obtaining information about how to register (18%) are seen as somewhat less important. Here as well, the picture that emerges is one in which the formal firms have better access to markets, services, and finance, and hence can be much more productive, but need to pay taxes (and, perhaps, bribes). Presumably, for the unregistered firms, the tax price is too high to justify registration.

In summary, between their extreme inefficiency and operation in very different markets, informal firms do not appear to pose much of a threat to the formal firms, at least as perceived by the latter. Informal firms clearly recognize the many benefits of being official, including access to markets and to finance (although it is far from clear that they would gain the latter even if they registered). They do not seem to think that regulation, or the cost of registration, and the biggest obstacles to registration. On the other hand, they do see taxes as a huge problem. Overall, they do not seem to be productive enough for the benefits of formality to justify the costs.

## **VI. Conclusion.**

Our most basic finding is that in Africa, as in other parts of the world, high productivity comes from formal firms, and in particular large formal firms. Productivity jumps sharply if we compare small formal firms to informal firms, and rises rapidly with the size of formal firms. To the extent that productivity growth is central to economic development, the formation and growth of formal firms is necessary for economic growth (see also Lewis 2004, Banerjee and Duflo 2005).

Formal firms appear to be very different animals than informal firms, which accounts for their sharply superior productivity. Perhaps most importantly, they are run by much better educated managers. As a consequence, besides being larger, they tend to use more capital, have different customers, market their products, and use external finance to a greater extent than do the informal firms. Our visits to Madagascar, Mauritius, and Kenya suggest that formal firms also produce higher quality products, which may account for substantial market segmentation between formal and informal firms. There is no evidence that informal firms become formal as they grow. Rather, virtually none of the formal firms had

ever been informal. It does not appear from the available evidence that informal firms would sharply increase their productivity if only they registered.

This interpretation raises the crucial question of what happens to informal firms as the economy develops. After all, the most basic fact about the informal economy is that its role diminishes sharply as incomes grow. How does this happen? Do informal firms register or do they die? We do not have a definitive answer to this question, but what we have points in the direction of death rather than registration. It is still possible of course that a minority of informal firms, and especially the most productive ones, end up joining the formal economy, perhaps by supplying formal firms. But there is no evidence, at least in our data, that this is the typical story. The vast majority of informal firms appear to begin and to end their lives as unproductive informal firms.

Informal firms nonetheless play a crucial role in developing economies. They represent over half of the economic activity in Africa. They provide livelihood to billions of poor people. Because these firms are so inefficient, taxing them or forcing them to comply with government regulations would likely put most of them out of business, with dire consequences for their employees and proprietors. If anything, strategies that keep these firms afloat and allow them to become more productive, such as microfinance, are probably desirable from the viewpoint of poverty alleviation. But these are not growth strategies: making unofficial firms official will not yield substantial improvements in productivity.

Growth strategies, then, need to focus on formal firms, especially the larger ones. Surely reducing the costs of formality, such as registration costs, is a good idea, but this is not the whole story. Likewise, some of the almost-standard proposals for development, such as improving land rights, the legal environment, and even the human capital of the employees appear to be relatively minor factors from the viewpoint of official entrepreneurs. The main obstacles to the operations of formal firms, according to our data, are: 1) human capital of entrepreneurs, 2) taxation, 3) electricity, and 4) finance. Improvements in each of these areas can promote the growth of large firms, and thus growth overall.

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**Table 1. Sales of the Informal and Micro Survey Sample Firms**

**Panel A: Informal Survey**

	Year	Informal Survey						Enterprise Survey							
		Unregistered		Registered		All		Small		Medium		Big		All	
		Sales	Obs.	Sales	Obs.	Sales	Obs.	Sales	Obs.	Sales	Obs.	Sales	Obs.	Sales	Obs.
Burkina Faso	2009	18,262	111	.	.	18,262	111	1,226,313	196	4,590,659	105	10,800,000	56	3,719,511	357
Cameroon	2009	19,839	121	.	.	19,839	121	309,663	144	2,996,489	124	44,300,000	70	10,400,000	338
Cape Verde	2006	29,917	85	18,922	18	27,996	103	374,308	69	1,738,857	23	4,149,963	1	752,375	93
Cape Verde	2009	83,190	82	.	.	83,190	82	498,339	66	2,548,385	50	3,860,018	21	1,761,825	137
Egypt, Rep.	2008	19,572	159	29,346	28	21,035	187	1,335,882	350	5,160,261	358	28,800,000	411	12,600,000	1,119
Kenya	2003	20,297	149	30,712	36	22,323	185	1,675,268	49	6,070,552	65	31,800,000	41	11,500,000	155
Niger	2005	15,169	48	14,927	58	15,037	106	4,999,650	34	4,416,983	16	14,700,000	3	5,371,892	53
Senegal	2003	24,944	153	29,827	41	25,976	194	433,291	86	4,542,087	90	18,400,000	35	5,169,733	211
Tanzania	2003	9,212	285	19,260	23	9,963	308	278,088	77	3,754,425	62	15,700,000	38	4,796,542	177
Uganda	2003	35,082	91	45,341	23	37,152	114	297,418	107	3,222,021	58	10,700,000	28	2,681,279	193
Average		27,549	128	26,905	32	28,077	151	1,142,822		3,904,072		18,320,998		5,875,316	283

**Panel B: Micro Survey**

Country	Year	Micro Survey						Enterprise Survey							
		Unregistered		Registered		All		Small		Medium		Big		All	
		Sales	Obs.	Sales	Obs.	Sales	Obs.	Sales	Obs.	Sales	Obs.	Sales	Obs.	Sales	Obs.
Angola	2006	22,524	8	46,153	107	44,509	115	219,543	353	440,131	64	826,909	6	261,533	423
Botswana	2006	27,192	27	105,688	73	84,494	100	1,054,364	212	4,027,974	86	9,497,498	39	2,790,306	337
Burkina Faso	2009	177,476	115	.	.	177,476	115	1,226,313	196	4,590,659	105	10,800,000	56	3,719,511	357
Burundi	2006	31,950	16	44,336	121	42,889	137	262,566	219	1,313,305	43	2,923,213	8	508,740	270
Cameroon	2009	19,671	3	92,758	110	90,817	113	309,663	144	2,996,489	124	44,300,000	70	10,400,000	338
Cape Verde	2009	68,171	31	50,890	73	56,041	104	498,339	66	2,548,385	50	3,860,018	21	1,761,825	137
Congo, Dem. Rep.	2006	20,150	40	32,891	64	27,991	104	156,191	258	779,580	71	1,675,336	11	335,518	340
Gambia, The	2006	12,955	47	20,307	76	17,498	123	191,976	118	975,985	47	3,564,678	7	543,472	172
Guinea	2006	93,345	27	129,568	77	120,164	104	180,759	194	979,018	19	2,246,573	7	315,430	220
Guinea-Bissau	2006	22,532	29	48,451	108	42,965	137	155,735	97	441,720	16	.		196,228	113
Ivory Coast	2009	6,128	47	36,858	45	21,159	92	291,630	247	2,648,291	100	11,400,000	43	2,121,482	390
Madagascar	2009	21,715	3	108,928	98	106,338	101	602,681	128	2,818,355	160	8,207,987	67	3,036,662	355
Mauritania	2006	56,070	69	38,977	53	48,644	122	258,159	181	2,287,588	44	8,216,648	5	819,408	230
Mauritius	2009	50,159	18	102,087	60	90,104	78	1,193,050	168	3,533,822	128	16,900,000	58	4,608,373	354
Namibia	2006	5,392	49	31,419	47	18,134	96	665,167	225	2,917,353	82	9,329,198	17	1,689,759	324
Rwanda	2006	8,295	22	46,821	106	40,199	128	344,204	143	2,071,016	53	7,671,968	16	1,328,946	212
Swaziland	2006	5,658	34	52,230	83	38,696	117	391,593	207	2,418,694	55	6,982,505	32	1,488,191	294
Tanzania	2006	30,093	25	48,327	40	41,314	65	326,825	259	3,430,273	111	16,400,000	44	2,866,305	414
Togo	2009	134,510	139	.	.	134,510	139	296,217	81	6,774,754	42	27,000,000	17	5,484,240	140
Uganda	2006	43,584	38	93,144	59	73,729	97	361,505	367	1,609,611	149	5,885,212	36	1,058,645	552
Average		42,879	39	62,768	78	65,884	109	449,324	193	2,480,150	77	10,404,618	29	2,266,729	299



**Table 2. Attributes of firms in the Informal Survey Sample**

	Informal Survey			Enterprise Survey				Differences			
	Unregistered	Registered	All	Small	Medium	Big	All	Enterprise vs Informal	Registered vs Unregistered	Small vs Unregistered	Big vs Small
<i>General Characteristics:</i>											
Age of the firm (in years)	10.1	10.7	9.9	16.0	20.2	24.8	18.7	8.8 <sup>a</sup>	0.6	5.9 <sup>a</sup>	8.8 <sup>a</sup>
% of firms that are registered with a central government agency	0.0%	100.0%	15.5%	.	.	.	.	.	100.0%	.	.
% of firms that are registered with a local government agency	35.1%	57.6%	37.2%	.	.	.	.	.	22.5%	.	.
% of firms that are registered with an industry board or agency	14.3%	23.7%	16.9%	.	.	.	.	.	9.4%	.	.
% of occupied land that is owned by the firm	41.8%	56.0%	45.6%	60.6%	69.2%	73.9%	66.6%	21.0%	14.2%	18.7%	13.4%
% of occupied buildings that is owned by the firm	44.8%	52.9%	46.2%	43.8%	58.7%	69.8%	52.9%	6.7%	8.1%	-1.0%	26.1%
% of firms that own a generator	2.7%	5.6%	2.9%	24.6%	54.2%	80.5%	44.9%	42.0% <sup>a</sup>	2.9% <sup>b</sup>	21.9% <sup>a</sup>	55.9% <sup>a</sup>
Average capacity utilization (%)	56.4%	63.7%	57.7%	62.2%	66.0%	67.4%	65.2%	7.6% <sup>c</sup>	7.3%	5.8%	5.1%
% of firms for which the main buyer are large firms	1.6%	2.9%	1.8%	10.0%	18.7%	12.7%	13.9%	12.1% <sup>a</sup>	1.3%	8.4% <sup>b</sup>	2.7%
<i>Employees</i>											
Average number of employees	3.0	4.6	3.1	9.9	41.8	389.0	94.6	91.4 <sup>a</sup>	1.7 <sup>b</sup>	7.0 <sup>a</sup>	379.1 <sup>a</sup>
Index of education of top manager	1.8	1.9	1.8	2.5	3.1	3.6	2.9	1.1 <sup>a</sup>	0.2	0.7 <sup>a</sup>	1.1 <sup>a</sup>
% of top managers with primary education	47.3%	42.1%	47.2%	48.6%	38.7%	34.3%	44.1%	-3.1%	-5.3%	1.3%	-14.3%
% of top managers with secondary education	23.7%	14.8%	22.9%	51.1%	42.8%	36.1%	45.6%	22.7%	-8.9%	27.3% <sup>b</sup>	-14.9%
% of top managers with vocational education	13.2%	23.9%	14.0%	45.7%	42.5%	36.6%	43.5%	29.5% <sup>c</sup>	10.8%	32.5% <sup>b</sup>	-9.1%
% of top managers with college education	7.2%	8.5%	7.4%	54.7%	76.0%	93.0%	66.9%	59.5% <sup>a</sup>	1.3%	47.5% <sup>a</sup>	38.3% <sup>a</sup>
Index of education of average employee	2.4	2.4	2.4	2.1	2.2	2.4	2.2	-0.2	0.0	-0.3	0.3
% of employees with primary education	52.4%	48.3%	51.4%	44.1%	39.6%	39.5%	41.6%	-9.8%	-4.1%	-8.3%	-4.6%
% of employees with secondary education	36.9%	40.0%	38.0%	34.7%	30.7%	25.3%	33.8%	-4.2%	3.0%	-2.2%	-9.5%
% of employees with college education	10.7%	11.7%	10.7%	20.6%	29.8%	31.0%	24.7%	14.1% <sup>b</sup>	1.1%	10.0% <sup>b</sup>	10.3%
<i>Finance</i>											
%firms that have ever had a loan	16.9%	26.6%	18.6%	.	.	.	.	.	9.7%	.	.
% of financing from internal funds	68.6%	74.8%	70.7%	73.9%	66.4%	60.7%	69.8%	-0.9% <sup>c</sup>	6.2%	5.3%	-13.2% <sup>b</sup>
% financing from family	10.4%	5.8%	8.6%	2.8%	1.6%	0.8%	1.9%	-6.7% <sup>a</sup>	-4.6%	-7.5% <sup>a</sup>	-2.0% <sup>b</sup>
% of financing from banks	4.2%	4.8%	4.2%	11.3%	16.5%	21.4%	14.4%	10.2% <sup>a</sup>	0.6%	7.1% <sup>c</sup>	10.1% <sup>a</sup>
<i>Growth</i>											
Avg two-year employment growth	7.4%	8.9%	7.7%	6.5%	8.8%	9.2%	7.8%	0.1%	1.5%	1.0%	2.4%
Median two-year employment growth	0.0%	0.0%	0.0%	1.0%	2.6%	4.0%	2.1%	2.1% <sup>a</sup>	0.0%	1.0%	3.0%

Notes: <sup>a</sup> significant at the 1% level. <sup>b</sup> significant at the 5% level. <sup>c</sup> significant at the 10% level.

**Table 3. Attributes of firms in the Micro Survey Sample**

	Micro Survey			Enterprise Survey				Differences			
	Unregistered	Registered	All	Small	Medium	Big	All	Enterprise vs Micro	Registered vs Unregistered	Small vs Unregistered	Big vs Small
<i>General Characteristics:</i>											
Age of the firm (in years)	8.0	8.4	8.2	10.4	15.4	20.6	12.6	4.4 <sup>a</sup>	0.4	2.4 <sup>b</sup>	10.3 <sup>a</sup>
% of firms that are registered with a central government agency	0.0%	100.0%	72.4%	.	.	.	.	.	100.0%	.	.
% of firms that are registered with a local government agency	45.9%	82.9%	71.5%	.	.	.	.	.	.	.	.
% of firms located in the owners home	17.2%	13.4%	13.8%	.	.	.	.	.	-3.9%	.	.
% of firms located in a permanent structure	71.4%	80.4%	77.0%	.	.	.	.	.	9.0%	.	.
% of occupied land that is owned by the firm	22.7%	22.6%	22.7%	30.7%	53.0%	67.4%	37.8%	0.2 <sup>a</sup>	-0.1%	.	0.4 <sup>a</sup>
% of firms forced to move last year because of lack of secure title	11.3%	8.8%	9.8%	.	.	.	.	.	-2.5%	.	.
% of firms that own a generator	9.3%	18.3%	14.4%	30.4%	47.9%	71.4%	42.2%	0.3 <sup>a</sup>	9.0% <sup>c</sup>	0.2 <sup>a</sup>	0.4 <sup>a</sup>
% of firms with an electrical connection	60.0%	79.2%	73.6%	.	.	.	.	.	19.2% <sup>c</sup>	.	.
% uses own transportation equipment	6.6%	22.9%	18.2%	.	.	.	.	.	16.3% <sup>a</sup>	.	.
Hours per week that the firm operates	62.3	61.9	61.5	57.4	58.6	74.9	60.2	-1.4	-39.9%	-5.0	17.5 <sup>a</sup>
% of firms for which the main buyer are large firms	0.1%	2.4%	1.6%	.	.	.	.	.	2.3% <sup>a</sup>	.	.
%exports	0.8%	1.0%	1.4%	2.5%	6.6%	22.2%	5.6%	4.1% <sup>a</sup>	0.2%	1.7% <sup>c</sup>	19.8% <sup>a</sup>
% of firms that use email to connect with clients	3.2%	9.1%	7.1%	37.0%	63.7%	82.3%	47.7%	40.6% <sup>a</sup>	5.9% <sup>a</sup>	33.7% <sup>a</sup>	45.4% <sup>a</sup>
% of firms that use a webpage to connect with clients	0.9%	2.8%	2.2%	10.7%	24.8%	43.7%	17.6%	15.3% <sup>a</sup>	2.0% <sup>b</sup>	9.8% <sup>a</sup>	33.0% <sup>a</sup>
<i>Employees</i>											
Average number of employees	3.2	4.1	3.9	9.3	38.7	306.0	46.9	42.9 <sup>a</sup>	0.9	6.1 <sup>a</sup>	296.7 <sup>a</sup>
Index of education of top manager	1.8	2.2	2.1	2.6	3.1	3.7	2.8	0.7 <sup>a</sup>	0.4 <sup>b</sup>	0.8 <sup>a</sup>	1.0 <sup>a</sup>
% of top managers with primary education	50.8%	37.2%	41.3%	24.7%	14.9%	3.0%	20.5%	-20.7% <sup>a</sup>	-13.5%	-26.1% <sup>a</sup>	-21.7% <sup>a</sup>
% of top managers with secondary education	26.7%	25.0%	25.0%	24.5%	14.9%	8.7%	20.8%	-4.1% <sup>c</sup>	-1.7%	-2.2%	-15.8% <sup>a</sup>
% of top managers with vocational education	10.7%	13.9%	13.0%	15.7%	13.8%	8.0%	14.6%	1.6%	3.1%	4.9% <sup>b</sup>	-7.6% <sup>a</sup>
% of top managers with college education	11.8%	23.9%	20.8%	35.1%	56.4%	80.3%	44.0%	23.2% <sup>a</sup>	12.1% <sup>a</sup>	23.3% <sup>a</sup>	45.1% <sup>a</sup>
Index of education of average employee	2.2	2.3	2.3	2.2	2.3	2.5	2.3	0.0	0.1	0.0	0.3
% of employees with primary education	48.0%	44.3%	46.0%	47.8%	41.8%	31.2%	44.8%	-1.2%	-3.7%	-0.2%	-16.5% <sup>b</sup>
% of employees with secondary education	47.7%	47.7%	46.9%	42.9%	49.8%	52.8%	45.8%	-1.1%	0.0%	-4.9%	9.9%
% of employees with college education	4.1%	8.0%	7.0%	9.3%	8.4%	16.0%	9.4%	2.4%	3.9%	5.2% <sup>c</sup>	6.6%
<i>Finance</i>											
%firms that have ever had a loan	7.3%	12.5%	10.9%	.	.	.	.	.	5.1% <sup>b</sup>	.	.
% of financing from internal funds	79.1%	77.9%	79.4%	75.5%	66.5%	62.9%	72.5%	-7.0% <sup>b</sup>	-1.2%	-3.6%	-12.6% <sup>a</sup>
% of financing from family	6.5%	5.9%	5.7%	4.3%	2.9%	0.7%	3.8%	-1.8%	-0.5%	-2.2%	-3.5% <sup>a</sup>
% of financing from banks	3.8%	3.7%	3.7%	6.3%	12.1%	16.6%	8.5%	4.8% <sup>b</sup>	-0.1%	.	10.3% <sup>a</sup>
<i>Growth</i>											
Avg two-year employment growth	17.1%	19.9%	17.8%	13.4%	14.3%	10.8%	13.4%	-4.4%	2.7%	-3.8%	-2.6%
Median two-year employment growth	0.0%	4.0%	0.0%	11.8%	9.8%	6.1%	11.8%	11.8% <sup>a</sup>	4.0% <sup>b</sup>	11.8% <sup>a</sup>	-5.7% <sup>a</sup>

Notes: <sup>a</sup> significant at the 1% level. <sup>b</sup> significant at the 5% level. <sup>c</sup> significant at the 10% level.

**Table 4. Legal Status of Enterprise Survey Firms in Africa**

Country	Number of Observations	% Registered at Start	% Does not know
Benin	149	83.3%	0.7%
Burkina Faso	381	79.1%	1.8%
Cameroon	360	82.4%	0.3%
Cape Verde	147	81.4%	1.9%
Chad	148	79.3%	1.3%
Congo Rep	142	78.8%	8.6%
Eritrea	152	96.1%	3.9%
Gabon	179	64.2%	1.7%
Ghana	615	63.6%	0.2%
Ivory Coast	524	56.1%	3.2%
Lesotho	150	86.8%	1.3%
Liberia	150	73.3%	1.3%
Madagascar	442	95.7%	0.2%
Malawi	148	88.0%	0.0%
Mali	619	80.9%	0.0%
Mauritius	393	81.9%	2.0%
Mozambique	597	86.3%	0.0%
Niger	127	90.7%	0.0%
Senegal	625	75.8%	0.0%
Sierra Leone	150	86.7%	0.0%
South Africa	1056	88.1%	0.0%
Togo	153	75.5%	0.6%
Zambia	602	88.1%	0.0%
<b><i>Average Africa</i></b>		81.0%	1.3%
<b><i>Average Latin America</i></b>		90.0%	1.3%

**Table 5. Indicators of the Institutional Environment Facing Informal and Micro Survey Firms**

	<b>Panel A: Informal Survey</b>										
	Informal Survey			Enterprise Survey				Differences			
	Unregistered	Registered	All	Small	Medium	Big	All	Enterprise vs Informal	Registered vs Unregistered	Small vs Unregistered	Big vs Small
<i>Compliance with government regulations</i>											
% of tax liability evaded by "typical" firm	54.5	37.6	51.4	27.6	24.0	18.2	24.8	-26.7 <sup>a</sup>	-16.9	-26.9 <sup>b</sup>	-9.4
% of management's time spent dealing with government regulations	9.5	7.3	8.4	10.9	16.1	14.3	13.5	5.1 <sup>c</sup>	-2.2	1.4	3.4
% of sales a "typical" firm pays in informal gifts or payments to get things done	6.9	6.3	7.1	3.7	3.1	2.2	3.4	-3.7 <sup>a</sup>	-0.6	-3.2 <sup>b</sup>	-1.5
<i>Public goods</i>											
Days last year with power outages	45.0	63.2	47.5	58.9	69.6	74.4	65.0	17.5	18.1	13.8	15.6
Days last year with water outages	60.2	70.1	62.6	47.8	50.5	44.1	50.5	-12.0	9.9	-12.5	-3.6
Days last year with telephone outages	7.2	42.6	32.5	27.7	20.5	21.9	23.1	-9.4	35.3	20.5 <sup>c</sup>	-5.8
Days last year with transportation outages	60.0	46.9	58.9	17.0	19.0	17.3	18.0	-40.9	-13.1	-43.1	0.3
<i>Property rights</i>											
% of sales lost last year owing to theft	3.6	5.3	3.9	1.8	1.3	0.4	1.4	-2.5	1.8	-1.8	-1.4
% of sales spent on security expenses	2.4	1.9	2.2	2.3	3.2	3.2	2.9	0.7 <sup>c</sup>	-0.5	-0.2	1.0
% of sales spent on "protection payments"	2.6	1.8	2.5	0.1	0.2	0.3	0.2	-2.3	-0.8	-2.4 <sup>c</sup>	0.1
% of incidents reported to the police	22.7	32.9	28.2	46.6	55.1	70.2	55.7	27.5	10.2	23.9	23.6
Days it took a typical court case to be resolved	70.6	105.8	79.7	90.3	73.4	95.7	83.8	4.1	35.2	19.8	5.4
<b>Panel B: Micro Survey</b>											
	Micro Survey			Enterprise Survey				Differences			
	Unregistered	Registered	All	Small	Medium	Big	All	Enterprise vs Micro	Registered vs Unregistered	Small vs Unregistered	Big vs Small
<i>Compliance with government regulations</i>											
% of tax liability evaded by "typical" firm	62.3	52.6	53.5	41.0	32.4	29.7	38.2	-15.2 <sup>b</sup>	-9.6	-21.3 <sup>a</sup>	-11.3 <sup>c</sup>
% of management's time spent dealing with government regulations	4.5	5.0	5.0	8.7	10.1	11.4	9.3	4.3 <sup>a</sup>	0.5	4.2 <sup>b</sup>	2.7 <sup>c</sup>
% of sales a "typical" firm pays in informal gifts or payments to get things done	3.4	3.2	2.9	6.1	6.4	4.8	5.9	3.0 <sup>a</sup>	-0.2	2.7 <sup>b</sup>	-1.3
<i>Public goods</i>											
Number of power outages in the last year	138.1	110.5	118.3	92.9	101.6	103.4	96.4	-21.9	-27.6	-45.2	10.5
Days last year with water outages	.	.	.	78.6	71.0	59.1	69.2	.	.	.	-19.5
<i>Property rights</i>											
% of sales lost last year owing to theft	0.8	0.6	0.6	1.8	1.3	1.1	1.7	1.1 <sup>b</sup>	-0.1	1.1 <sup>c</sup>	-0.8
% of sales spent on security expenses	3.2	3.9	3.6	2.3	1.9	1.2	2.0	-1.6	0.7	-0.9	-1.1 <sup>b</sup>
% of firms that had payment dispute in last 2 years	6.0%	8.4%	7.5%	9.5%	16.6%	19.4%	11.4%	4.0% <sup>c</sup>	2.3%	3.5%	9.9% <sup>a</sup>
If there was a payment dispute, % of firms that used court to resolve it	29.2%	33.2%	30.1%	51.3%	67.6%	81.8%	58.3%	28.3% <sup>a</sup>	4.1%	22.1% <sup>c</sup>	30.5% <sup>a</sup>
Days it took a typical court case to be resolved	.	25.7	25.7	.	.	.	.	.	.	.	.

Notes: <sup>a</sup> significant at the 1% level. <sup>b</sup> significant at the 5% level. <sup>c</sup> significant at the 10% level.

**Table 6. Expenditure on Production Inputs by Informal and Micro Survey Firms**

<b>Panel A: Informal Survey</b>											
	Informal Survey			Enterprise Survey				Differences			
	Unregistered	Registered	All	Small	Medium	Big	All	Enterprise vs Informal	Registered vs Unregistered	Small vs Unregistered	Big vs Small
Expenditure on raw materials / Sales (%)	39.5%	43.4%	39.5%	37.3%	37.6%	39.3%	36.9%	-2.6%	3.9%	-2.1%	1.9%
Expenditure on energy / Sales (%)	9.4%	8.0%	8.7%	4.6%	3.2%	4.0%	5.3%	-3.4%	-1.4%	-4.9% <sup>a</sup>	-0.5%
Expenditure on labor / Sales (%)	22.4%	21.8%	22.8%	18.3%	15.6%	13.0%	16.3%	-6.4% <sup>c</sup>	-0.6%	-4.1%	-5.2% <sup>c</sup>
Expenditure on machines / Sales (%)	7.3%	9.5%	7.3%	6.9%	8.1%	6.2%	7.4%	0.1%	2.2%	-0.4%	-0.6%
Expenditure on land / Sales (%)	5.3%	14.4%	6.8%	3.2%	1.4%	2.2%	3.0%	-3.8%	9.2%	-2.1%	-1.0%

  

<b>Panel B: Micro Survey</b>											
	Micro Survey			Enterprise Survey				Differences			
	Unregistered	Registered	All	Small	Medium	Big	All	Enterprise vs Micro	Registered vs Unregistered	Small vs Unregistered	Big vs Small
Expenditure on raw materials / Sales (%)	37.8%	37.6%	36.2%	37.9%	39.6%	38.9%	38.5%	2.3%	-0.2%	0.1%	1.0%
Expenditure on energy / Sales (%)	3.9%	3.8%	4.1%	3.6%	3.3%	3.2%	3.5%	-0.7%	-0.1%	-0.3% <sup>c</sup>	-0.4%
Expenditure on labor / Sales (%)	23.5%	21.3%	22.0%	21.8%	20.3%	15.9%	20.8%	-1.3%	-2.2%	-1.7%	-5.9% <sup>a</sup>
Expenditure on machines / Sales (%)	4.5%	4.0%	5.2%	8.6%	9.0%	6.1%	7.9%	2.7% <sup>c</sup>	-0.6%	4.1% <sup>b</sup>	-2.6%
Expenditure on land / Sales (%)	2.5%	0.9%	1.4%	1.2%	0.9%	1.1%	1.0%	-0.4%	-1.6%	-1.4%	-0.1%

Notes: <sup>a</sup> significant at the 1% level. <sup>b</sup> significant at the 5% level. <sup>c</sup> significant at the 10% level.

**Table 7. Ratio of wages per employee to GDP per capita**

<b>Panel A: Informal Survey</b>												
Informal Survey					Enterprise Survey				Differences			
Country	Year	Unregistered	Registered	All	Small	Medium	Big	All	Enterprise vs Informal	Registered vs Unregistered	Small vs Unregistered	Big vs Small
Burkina Faso	2009	0.95	.	0.95	3.46	4.46	3.06	3.70	2.75 <sup>a</sup>	.	2.50 <sup>a</sup>	-0.40
Cameroon	2009	0.96	.	0.96	1.90	2.39	3.84	2.50	1.54 <sup>a</sup>	.	0.95 <sup>a</sup>	1.94 <sup>a</sup>
Cape Verde	2006	0.90	1.25	0.96	2.92	4.03	.	3.19	2.23 <sup>a</sup>	0.35	2.03 <sup>a</sup>	.
Cape Verde	2009	0.76	.	0.76	0.66	0.81	0.60	0.71	-0.05	.	-0.10	-0.06
Average		0.89	1.25	0.91	2.24	2.92	2.50	2.52	1.62 <sup>b</sup>	0.35	1.34 <sup>c</sup>	0.49

  

<b>Panel B: Micro Survey</b>												
Micro Survey					Enterprise Survey				Differences			
Country	Year	Unregistered	Registered	All	Small	Medium	Big	All	Enterprise vs Micro	Registered vs Unregistered	Small vs Unregistered	Big vs Small
Angola	2006	.	2.23	2.17	3.26	3.02	.	3.20	1.03 <sup>a</sup>	.	.	.
Botswana	2006	0.35	0.58	0.52	0.89	1.05	1.03	0.95	0.43 <sup>a</sup>	0.23 <sup>a</sup>	0.54 <sup>a</sup>	0.14
Burkina Faso	2009	2.76	.	2.76	3.48	4.51	3.06	3.73	0.97 <sup>b</sup>	.	0.72	-0.42
Burundi	2006	1.76	3.13	2.97	5.84	7.29	.	6.04	3.07 <sup>a</sup>	1.37 <sup>c</sup>	4.08 <sup>a</sup>	.
Cameroon	2009	.	1.98	1.95	1.90	2.39	3.84	2.50	0.54 <sup>b</sup>	.	.	1.94 <sup>a</sup>
Cape Verde	2009	1.08	0.89	0.95	0.65	0.80	0.60	0.70	-0.25 <sup>b</sup>	-0.19	-0.43 <sup>b</sup>	-0.05
Congo, Dem. Rep.	2006	5.64	5.45	5.52	8.25	11.35	9.26	8.93	3.41 <sup>a</sup>	-0.18	2.62 <sup>a</sup>	1.01
Gambia, The	2006	0.54	1.04	0.85	1.52	2.41	.	1.78	0.94 <sup>a</sup>	0.49 <sup>a</sup>	0.98 <sup>a</sup>	.
Guinea	2006	0.83	1.23	1.13	1.30	1.13	.	1.27	0.15 <sup>c</sup>	0.40 <sup>b</sup>	0.47 <sup>a</sup>	.
Guinea-Bissau	2006	6.11	7.21	6.97	9.64	6.92	.	9.25	2.29 <sup>b</sup>	1.10	3.53 <sup>c</sup>	.
Ivory Coast	2009	0.53	0.87	0.69	1.67	2.90	2.64	2.09	1.40 <sup>a</sup>	0.34 <sup>b</sup>	1.14 <sup>a</sup>	0.98 <sup>a</sup>
Madagascar	2009	.	1.11	1.11	2.44	2.66	2.31	2.52	1.40 <sup>a</sup>	.	.	-0.12
Mauritania	2006	2.12	2.10	2.11	3.88	3.98	.	3.91	1.80 <sup>a</sup>	-0.02	1.76 <sup>a</sup>	.
Mauritius	2009	0.39	0.45	0.44	0.56	0.68	0.68	0.62	0.19 <sup>a</sup>	0.06	0.17	0.12
Namibia	2006	0.27	0.79	0.55	2.48	2.56	2.30	2.49	1.94 <sup>a</sup>	0.51 <sup>a</sup>	2.21 <sup>a</sup>	-0.19
Rwanda	2006	1.29	1.52	1.47	4.01	5.70	3.12	4.36	2.89 <sup>a</sup>	0.23	2.72 <sup>a</sup>	-0.89
Swaziland	2006	0.50	1.20	1.05	1.92	2.21	1.88	1.97	0.92 <sup>a</sup>	0.69 <sup>a</sup>	1.42 <sup>a</sup>	-0.04
Tanzania	2006	1.44	1.59	1.53	3.59	5.07	5.72	4.21	2.68 <sup>a</sup>	0.16	2.15 <sup>a</sup>	2.13 <sup>a</sup>
Togo	2009	4.61	.	4.61	4.89	12.35	7.74	7.59	2.98 <sup>a</sup>	.	0.28	2.85
Uganda	2006	3.08	3.93	3.60	4.32	4.90	3.91	4.45	0.85 <sup>b</sup>	0.85	1.24 <sup>b</sup>	-0.42
Average		1.96	2.07	2.15	3.32	4.19	3.43	3.63	1.48 <sup>b</sup>	0.40	1.51 <sup>c</sup>	0.50

Notes: <sup>a</sup> significant at the 1% level. <sup>b</sup> significant at the 5% level. <sup>c</sup> significant at the 10% level.

**Table 8. Productivity of Firms in the Informal and Micro Sector Survey**

<b>Panel A: Log value added per employee for firms in countries covered by the Informal Survey</b>													
Country	Year	Informal Survey			Enterprise Survey				Differences				
		Unregistered	Registered	All	Small	Medium	Big	All	Enterprise vs Informal	Registered vs Unregistered	Small vs Unregistered	Big vs Small	Big vs Unregistered
Burkina Faso	2003	8.3	.	8.3	9.5	10.0	10.5	10.0	1.6 <sup>a</sup>	.	1.2 <sup>a</sup>	1.0 <sup>b</sup>	2.2 <sup>a</sup>
Cameroon	2006	7.9	.	7.9	8.3	9.3	10.3	9.3	1.4 <sup>a</sup>	.	0.4	2.0 <sup>a</sup>	2.4 <sup>a</sup>
Cape Verde	2006	8.1	7.85	8.1	8.5	9.2	.	8.8	0.7 <sup>a</sup>	-0.3	0.4	.	.
Cape Verde	2009	8.4	.	8.4	9.0	9.7	.	9.1	0.7 <sup>c</sup>	.	0.6	.	.
Egypt	2009	7.0	7.40	7.1	8.9	9.4	9.4	9.2	2.1 <sup>a</sup>	0.4	1.8 <sup>a</sup>	0.6 <sup>a</sup>	2.4 <sup>a</sup>
Kenya	2009	7.8	8.04	7.8	9.6	10.0	10.3	9.9	2.1 <sup>a</sup>	0.3	1.8 <sup>a</sup>	0.7 <sup>a</sup>	2.5 <sup>a</sup>
Niger	2003	.	.	8.2	11.4	10.0	.	10.8	2.6 <sup>b</sup>	.	.	.	.
Senegal	2003	7.2	7.22	7.2	9.1	9.8	10.0	9.5	2.3 <sup>a</sup>	0.0	1.9 <sup>a</sup>	0.9 <sup>a</sup>	2.8 <sup>a</sup>
Tanzania	2003	6.2	.	6.2	.	.	.	8.9	2.6 <sup>a</sup>	.	.	.	.
Uganda	2003	7.2	7.92	7.3	8.7	9.3	10.0	9.1	1.8 <sup>a</sup>	0.8	1.6 <sup>a</sup>	1.3 <sup>a</sup>	2.9 <sup>a</sup>
Average		7.6	7.69	7.7	9.2	9.6	10.1	9.5	1.8 <sup>a</sup>	0.2	1.2 <sup>a</sup>	1.1 <sup>a</sup>	2.5 <sup>a</sup>

  

<b>Panel B: Log value added per employee for firms in countries covered by the Micro Survey</b>													
Country	Year	Micro Survey			Enterprise Survey				Differences				
		Unregistered	Registered	All	Small	Medium	Big	All	Enterprise vs Informal	Registered vs Unregistered	Small vs Unregistered	Big vs Small	Big vs Unregistered
Angola	2006	.	8.3	8.3	9.0	8.9	.	9.0	0.7 <sup>a</sup>	.	.	.	.
Botswana	2006	.	8.8	8.9	9.5	10.0	9.5	9.6	0.8 <sup>b</sup>	.	.	0.0	.
Burkina Faso	2009	8.7	.	8.7	9.5	10.0	10.5	10.0	1.3 <sup>a</sup>	.	0.8	1.0 <sup>b</sup>	1.8 <sup>a</sup>
Burundi	2006	.	7.8	7.9	8.2	9.2	.	8.5	0.6 <sup>a</sup>	.	.	.	.
Cameroon	2009	.	8.4	8.4	8.9	9.8	10.9	9.9	1.4 <sup>a</sup>	.	.	2.0 <sup>a</sup>	.
Cape Verde	2009	8.6	9.0	8.8	9.0	9.7	.	9.1	0.3	0.4	0.5	.	.
Congo, Dem. Rep.	2006	6.9	7.6	7.4	8.2	8.9	8.5	8.5	1.1 <sup>a</sup>	0.7 <sup>b</sup>	1.3 <sup>a</sup>	0.3	1.6 <sup>a</sup>
Gambia, The	2006	6.9	7.4	7.3	8.3	8.8	.	8.5	1.2 <sup>a</sup>	0.5 <sup>c</sup>	1.4 <sup>a</sup>	.	.
Guinea	2006	8.0	8.7	8.5	8.3	8.7	.	8.4	-0.1	0.6 <sup>c</sup>	0.3	.	.
Guinea-Bissau	2006	.	8.3	8.3	8.2	8.4	.	8.3	0.0	.	.	.	.
Ivory Coast	2009	6.7	7.8	7.2	8.3	9.1	10.7	8.9	1.7 <sup>a</sup>	1.0 <sup>a</sup>	1.5 <sup>a</sup>	2.4 <sup>a</sup>	4.0 <sup>a</sup>
Madagascar	2009	.	8.4	8.3	8.2	8.6	8.6	8.5	0.1	.	.	0.3	.
Mauritania	2006	8.4	.	8.2	8.7	9.2	.	8.9	0.8 <sup>a</sup>	.	0.3	.	.
Mauritius	2009	8.3	8.8	8.7	9.2	9.4	10.4	9.5	0.8 <sup>a</sup>	0.5	0.9 <sup>b</sup>	1.2 <sup>a</sup>	2.1 <sup>a</sup>
Namibia	2006	.	7.8	7.5	9.8	10.2	10.4	10.0	2.5 <sup>a</sup>	.	.	0.6 <sup>b</sup>	.
Rwanda	2006	.	8.4	8.3	9.1	9.4	9.1	9.2	0.9 <sup>a</sup>	.	.	0.0	.
Swaziland	2006	.	8.6	8.5	9.8	9.5	9.6	9.6	1.1 <sup>a</sup>	.	.	-0.2	.
Tanzania	2006	7.9	8.2	8.1	8.9	9.7	10.4	9.3	1.2 <sup>a</sup>	0.3	1.0 <sup>a</sup>	1.4 <sup>a</sup>	2.5 <sup>a</sup>
Togo	2009	.	.	8.4	8.8	.	.	9.6	1.1	.	.	.	.
Uganda	2006	8.2	8.4	8.3	8.7	9.0	9.8	8.8	0.5 <sup>a</sup>	0.3 <sup>a</sup>	0.5 <sup>a</sup>	1.0 <sup>a</sup>	1.6 <sup>a</sup>
Average		7.9	8.3	8.2	8.8	9.3	9.9	9.1	0.9 <sup>a</sup>	0.6	0.8 <sup>a</sup>	0.9 <sup>a</sup>	2.3 <sup>a</sup>

Notes: <sup>a</sup> significant at the 1% level. <sup>b</sup> significant at the 5% level. <sup>c</sup> significant at the 10% level.

**Table 9. Regressions explaining value added per employee**

Informal Survey	-1.5729 <sup>a</sup> (0.2536)	-1.5943 <sup>a</sup> (0.2290)	-1.4886 <sup>a</sup> (0.2000)	-0.8088 <sup>a</sup> (0.2770)	-0.7199 <sup>a</sup> (0.2295)	-0.7308 <sup>a</sup> (0.2356)	-0.6424 <sup>a</sup> (0.2255)	0.2841 <sup>c</sup> (0.1503)
Informal Survey & Registered	0.1565 (0.1408)	0.1554 (0.1382)	0.1253 (0.1153)	-0.0902 (0.1566)	-0.0347 (0.1641)	-0.0299 (0.1644)	-0.0678 (0.1566)	0.0081 (0.0754)
Micro Survey	-1.2945 <sup>a</sup> (0.2440)	-1.2717 <sup>a</sup> (0.2357)	-1.2814 <sup>a</sup> (0.2411)	-0.9916 <sup>a</sup> (0.2324)	-0.7465 <sup>a</sup> (0.1997)	-0.7311 <sup>a</sup> (0.1979)	-0.6541 <sup>a</sup> (0.1841)	0.3645 <sup>a</sup> (0.0854)
Micro Survey & Registered	0.4895 <sup>a</sup> (0.1694)	0.4768 <sup>a</sup> (0.1586)	0.4092 <sup>b</sup> (0.1487)	0.3347 <sup>a</sup> (0.1050)	0.3037 <sup>a</sup> (0.1053)	0.2920 <sup>b</sup> (0.1051)	0.2632 <sup>b</sup> (0.1047)	0.1057 <sup>b</sup> (0.0479)
LN (GDP Per Capita)		0.1957 (0.1300)	0.1796 (0.1236)	0.1818 <sup>c</sup> (0.1036)	0.1594 (0.0950)	0.1537 (0.0912)	0.1718 <sup>c</sup> (0.0877)	0.0672 (0.0686)
Ln(Raw Materials / Employee)				0.2810 <sup>a</sup> (0.0896)	0.2273 <sup>b</sup> (0.0863)	0.2212 <sup>b</sup> (0.0866)	0.2133 <sup>b</sup> (0.0858)	0.0278 (0.0406)
Ln(Energy/Employee)					0.1637 <sup>a</sup> (0.0322)	0.1535 <sup>a</sup> (0.0309)	0.1440 <sup>a</sup> (0.0299)	0.0333 <sup>b</sup> (0.0140)
Ln(Expenditure Machines / Employee)						0.0280 <sup>a</sup> (0.0064)	0.0248 <sup>a</sup> (0.0063)	-0.0012 (0.0038)
Manager's Education							0.1452 <sup>a</sup> (0.0337)	-0.0599 <sup>a</sup> (0.0175)
Ln(Sales)								0.5648 <sup>a</sup> (0.0381)
Constant	8.9910 <sup>a</sup> (0.1174)	7.5627 <sup>a</sup> (1.0042)	7.2358 <sup>a</sup> (0.9944)	3.7778 <sup>b</sup> (1.3749)	2.9736 <sup>b</sup> (1.1439)	3.0406 <sup>b</sup> (1.1158)	2.7195 <sup>b</sup> (1.0716)	0.6590 (0.6269)
Observations	4,075	4,075	3,955	3,955	3,955	3,955	3,955	3,955
Adjusted R-Squared	14%	15%	19%	34%	38%	39%	40%	66%
Industry Dummies	No	No	Yes	Yes	Yes	Yes	Yes	Yes

Notes: <sup>a</sup> significant at the 1% level. <sup>b</sup> significant at the 5% level. <sup>c</sup> significant at the 10% level.



**Table 10: Manager ability and self-selection**

Panel A: Probit regressions

	Registered with central government	Firm has ever had a loan	Main buyer are large firm	Occupies a permanent structure	Located in owner's house	Owens building it occupies	Owens the land it occupies	Owens transportation equipment	Owens a generator	Uses email to communicate with clients	Uses website to communicate with clients	Firm has electrical connection
Secondary	0.2869 <sup>c</sup> (0.1644)	0.2544 <sup>a</sup> (0.0806)	0.2416 (0.2254)	0.1396 (0.1673)	0.2473 <sup>a</sup> (0.0825)	-0.1292 (0.1439)	0.0570 (0.1141)	0.0118 (0.1979)	0.3022 <sup>c</sup> (0.1692)	0.4325 <sup>a</sup> (0.0975)	0.4411 <sup>a</sup> (0.1041)	0.6632 <sup>a</sup> (0.1407)
Vocational	0.3932 <sup>a</sup> (0.1453)	0.4450 <sup>a</sup> (0.1627)	0.5228 <sup>b</sup> (0.2379)	0.3674 <sup>b</sup> (0.1840)	0.3561 <sup>a</sup> (0.1301)	-0.1547 (0.1772)	0.1156 (0.1287)	0.4289 <sup>b</sup> (0.1937)	0.2733 <sup>c</sup> (0.1657)	0.5421 <sup>a</sup> (0.1389)	0.5302 <sup>a</sup> (0.1127)	0.7607 <sup>a</sup> (0.2246)
College	0.6917 <sup>a</sup> (0.1916)	0.3228 <sup>a</sup> (0.0994)	0.8350 <sup>a</sup> (0.2682)	0.2853 (0.2122)	0.0354 (0.1164)	0.2301 (0.2500)	0.2650 <sup>b</sup> (0.1036)	0.4140 <sup>a</sup> (0.1097)	0.8488 <sup>a</sup> (0.2269)	1.2567 <sup>a</sup> (0.1452)	1.0111 <sup>a</sup> (0.1113)	1.2099 <sup>a</sup> (0.2204)
Ln(GDP/POP)	0.0447 (0.1959)	-0.0294 (0.0588)	0.0508 (0.1215)	-0.2605 <sup>a</sup> (0.0992)	-0.1220 (0.1251)	-0.1010 (0.2550)	-0.1077 (0.0859)	0.0375 (0.0870)	-0.1220 (0.1199)	0.1119 (0.1160)	0.1004 (0.0891)	-0.0630 (0.1660)
Constant	-0.9911 (1.5093)	-0.8918 <sup>b</sup> (0.4245)	-2.8640 <sup>a</sup> (0.9284)	2.8888 <sup>a</sup> (0.8811)	-0.4320 (0.9311)	0.5201 (1.8687)	0.2025 (0.6188)	-1.6668 <sup>b</sup> (0.7875)	-0.2655 (0.8682)	-1.7767 <sup>c</sup> (0.9104)	-2.5397 <sup>a</sup> (0.6832)	1.0422 (1.3772)
Obs	2,390	2,224	1,288	1,429	1,439	1,494	7,375	1,438	5,308	8,069	8,112	1,439
Pseudo R <sup>2</sup>	8%	3%	11%	4%	2%	11%	5%	3%	11%	13%	9%	13%

Notes: <sup>a</sup> significant at the 1% level. <sup>b</sup> significant at the 5% level. <sup>c</sup> significant at the 10% level.

**Table 10 -- Manager ability and self-selection (continued)**

Panel B: OLS Regressions

	Dependent Variables				
	%Investment financed with internal funds	Expenditure on raw materials / Sales	Expenditure on energy / Sales	Expenditure on machines / Sales	%Capacity utilization
Secondary School	-0.9120 (2.1722)	-0.0237 firms	-0.4084 (0.5400)	-0.7236 (0.7365)	0.9662 (2.0966)
Vocational School	-0.6260 (1.6657)	-0.0100 (0.0187)	-0.5316 (0.4066)	0.6415 (0.7915)	4.6005 <sup>c</sup> (2.3397)
College	-6.6813 <sup>a</sup> (1.9788)	0.0044 (0.0236)	-1.1386 <sup>b</sup> (0.4958)	0.3194 (0.8975)	6.7849 <sup>a</sup> (2.2222)
Ln(GDP/POP)	-4.3642 <sup>a</sup> (1.2611)	-0.0157 (0.0182)	0.1985 (0.2470)	0.8420 (0.6951)	0.7082 (0.6239)
Constant	106.7237 <sup>a</sup> (9.1257)	0.4942 <sup>a</sup> (0.1581)	3.7011 <sup>c</sup> (1.8890)	-0.2367 (4.8612)	56.7218 <sup>a</sup> (5.0422)
Obs	8641	4729	7780	7472	3578
Adj R <sup>2</sup>	3%	2%	4%	2%	30%
F-test	12.15 <sup>a</sup>	7.16 <sup>a</sup>	31.34 <sup>a</sup>	8.19 <sup>a</sup>	69.77 <sup>a</sup>
Industry Dummies	Yes	Yes	Yes	Yes	Yes

Notes: <sup>a</sup> significant at the 1% level. <sup>b</sup> significant at the 5% level. <sup>c</sup> significant at the 10% level.

**Table 11. Obstacles to Doing Business in the Informal and Micro Survey Samples**

	Micro Survey			Enterprise Survey				Differences			
	Unregistered	Registered	All	Small	Medium	Big	All	Enterprise vs Micro	Registered vs Unregistered	Small vs Unregistered	Big vs Small
<b>Obstacles (% of firms identifying an obstacle as the most important)</b>											
Macro Instability	4.0%	8.0%	7.0%	.	.	.	.	.	.	.	.
Telecommunications	2.0%	1.9%	2.0%	.	.	.	.	.	-0.1%	.	.
Electricity	17.1%	23.4%	20.0%	30.0%	31.3%	32.9%	30.4%	10.4%	6.3%	12.9% <sup>c</sup>	2.9%
Access to Financing	29.2%	20.0%	23.1%	20.0%	17.7%	14.4%	18.6%	-4.5%	-9.1% <sup>c</sup>	-9.2% <sup>b</sup>	-5.6%
Tax Rates	4.5%	6.3%	5.4%	10.9%	7.6%	9.8%	10.1%	4.7% <sup>c</sup>	1.7%	6.3% <sup>b</sup>	-1.1%
Practices of competitors in the informal economy	9.7%	7.9%	8.5%	9.4%	7.7%	9.3%	8.9%	0.4%	-1.8%	-0.3%	-0.1%
Uneducated Workforce	0.8%	0.8%	0.8%	2.3%	3.4%	5.8%	2.8%	2.0% <sup>c</sup>	0.0%	1.5%	3.6%
Political instability	2.8%	2.2%	2.9%	4.5%	6.7%	5.3%	5.0%	2.1%	-0.5%	1.7%	0.8%
Customs and Trade Regulations	1.5%	1.7%	1.7%	2.0%	2.5%	4.8%	2.3%	0.7%	0.1%	0.5%	2.7% <sup>c</sup>
Transportation	6.3%	6.4%	6.5%	3.5%	4.2%	3.8%	3.8%	-2.7% <sup>c</sup>	0.1%	-2.8%	0.3%
Crime	3.4%	4.8%	4.9%	4.7%	4.3%	3.8%	4.6%	-0.3%	1.3%	1.3%	-0.9%
Corruption	1.8%	2.3%	2.0%	4.1%	4.9%	3.0%	4.4%	2.4% <sup>b</sup>	0.5%	2.3% <sup>b</sup>	-1.2%
Tax Administration	1.4%	1.6%	1.4%	1.7%	2.4%	2.8%	2.1%	0.7%	0.2%	0.2%	1.1%
Legal System	0.0%	0.2%	0.2%	0.4%	1.2%	1.4%	0.8%	0.6% <sup>a</sup>	0.2%	0.4% <sup>b</sup>	1.0%
Business licensing and permits	3.8%	2.6%	2.8%	2.5%	2.4%	1.2%	2.3%	-0.4%	-1.2%	-1.4%	-1.2%
Labor Regulations	0.0%	0.3%	0.2%	0.5%	1.2%	1.1%	0.7%	0.5%	0.3% <sup>c</sup>	0.5% <sup>b</sup>	0.6%
Access to Land	7.6%	4.7%	5.4%	3.5%	2.4%	0.5%	3.1%	-2.3% <sup>c</sup>	-2.8%	-4.0% <sup>b</sup>	-3.0% <sup>a</sup>

**Table 12: Costs and benefits of registering**

Panel A: Percentage of Informal Survey respondents rating the following as either the most important or second most important benefit that their firm could obtain from registering

	Burkina Faso	Cape Verde	Mauritius	Madagascar	Nepal	Average
Better access to financing	63%	70%	72%	67%	64%	67%
Better access to raw materials	27%	32%	46%	25%	6%	27%
Better access to markets	13%	14%	17%	14%	4%	12%
Less bribes to pay	26%	15%	2%	16%	0%	12%
Better opportunities with formal firms	5%	10%	15%	3%	10%	9%
More access to government programs or services	8%	1%	9%	9%	12%	8%
Better legal foundations on the property	3%	3%	6%	10%	4%	5%
Better access to infrastructure service	2%	0%	4%	6%	0%	2%

**Table 12: Costs and benefits of registering (continued)**

Panel B: Percentage of Micro Survey respondents that indicate that the following present either a "major obstacle" or a "very serious obstacle" with respect to registering a business

	Angola	Burundi	Botswana	Ivory Coast	Gambia	Guinea Bissau	Guinea	Madagascar	Mauritius	Namibia	Rowanda	Swaziland	Tanzania	Uganda	Average
Bribes that registered firms need to pay	.	.	.	85%	.	.	.	20%	.	.	.	.	.	.	52%
Financial burden of taxes	12%	28%	12%	79%	27%	34%	55%	46%	19%	15%	30%	20%	37%	60%	34%
Financial cost of completing registration	22%	28%	13%	70%	24%	40%	42%	30%	14%	26%	4%	22%	28%	48%	29%
Administrative burden complying with taxes	17%	20%	7%	63%	14%	43%	43%	37%	23%	8%	9%	12%	31%	35%	26%
Minimum capital requirements	26%	20%	8%	48%	13%	32%	19%	25%	18%	25%	29%	25%	26%	38%	25%
Other administrative burdens	16%	17%	11%	76%	10%	35%	34%	27%	16%	7%	2%	9%	20%	23%	22%
Time to complete registration	28%	12%	15%	63%	9%	13%	25%	20%	11%	18%	3%	18%	11%	31%	20%
Difficulty of getting information	14%	1%	14%	58%	12%	17%	30%	19%	10%	22%	5%	14%	9%	23%	18%
Labor market rules	4%	18%	9%	48%	6%	23%	41%	9%	23%	3%	1%	20%	9%	7%	16%