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Why Do Firms Choose to be Informal? Evidence from Enterprise Surveys in Africa

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Abstract

This analysis looks at the determinants of firms' decisions to locate in the informal vs. formal sector. We test the hypothesis that firm decision-making regarding formality is based on a model of profit-maximization where the benefits and costs of location in the formal versus informal sectors are compared. Using the World Bank's enterprise surveys in both the formal and informal sector of six African countries—Kenya, Uganda, Tanzania, Zambia, South Africa, and Senegal--we see that firms' decision to be formal is correlated with the benefits and costs imposed by their investment climate. After controlling for firm-level, sector, and country-specific effects, we find that the incidence of ***formality is positively correlated with*** perceptions regarding ***the availability of electricity supply***, ***access to finance and access to land, and negatively correlated with the rate of taxation and corruption***. These results suggest that improvements to the investment climate—increasing its beneficial aspects and reducing its costs—may result in more firms entering the formal economy, thereby providing a larger base of taxation and other benefits to society as a whole.

Introduction

The informal economy in Africa is large, both in terms of the number of enterprises as well as its contribution to GDP. Indeed, it is estimated that as much as 90 percent of the economy is informal in some African countries. Moreover, in the last thirty years the informal economy has grown significantly, fueled by various factors. DeSoto concluded that informal actors remained out of the formal economy due to the cost imposed by the regulatory structure within the country. Increasing unemployment, either through loss of public sector jobs or a growing labor force, has also been cited as a factor for the growth of the informal economy, which serves as a social safety net for the unemployed.

The past decade has witnessed the emergence of a large volume of literature on the informal sector. The literature is quite diverse, covering informal labor (Almeida, 2005; Chen, 2004), tax policy (Ihrig and Moe, 2004; Emram and Stiglitz, 2004), as well as corruption (Johnson et al, 1998; Marcouiller and Young, 1995). Most of the authors working on the informal sector argue that firms locate in this sector because the manager/entrepreneur believes that the benefits of informality outweigh the costs (Djankov et al, 2002; Loayza 1996; Ishengoma and Kappel 2006). Djankov et al creates a taxonomy of informality considering type of activity, level of technology, profile of the owner, profile of the market and financial need. They then enumerate benefits and costs of informality and finish by providing policy recommendations to encourage formalization. Loayza discusses the informal economy as a result of excessive taxes and regulation. He studies the determinants and effects in an endogenous growth model. He finds the size of the informal sector to depend positively on the proxies for tax burden and labor restrictions and negatively on a proxy of quality of government institutions. This model was tested using country level data in Latin America. Ishengoma and Kappel, like the others, set up the formalization model around the costs and benefits in each investment climate (formal and informal). They then assess approaches to encourage formalization in this paradigm and make recommendations for specific measures. In our analysis, we test this hypothesis with the help of new, firm-level data from sub-Saharan Africa.

In this paper, we draw on a number of the analyses mentioned above to look at the decision-making at the level of the individual firm. We test the hypothesis that firms decide to locate in the formal or informal sector based on a cost-benefit analysis, which is in turn dependent on several aspects of the investment climate. And for the first time, a unique cross-country dataset from sub-Saharan Africa enables us to test this claim.

Why are we interested in this question? We have reason to believe that the movement of firms from the informal to the formal sector is of benefit to the firm and to society as a whole. For the firm, formality is intended to increase access to services such as financial services, infrastructure, and other public services, which facilitates enterprise growth. For the society at large, there are three types of benefits when firms transition towards the formal economy. First, informal firms for the most part do not pay taxes, and if they do, not often at the same level of formal firms. By increasing the number of firms in the formal economy, the tax base could be expanded and the tax rate might even be lowered. With a growing informal sector and less source for public revenue, the government will be increasingly less able to provide public services over the medium to long term. Second, if a large proportion of the economy is informal, the government has less reliable data on the private sector, without which policies and reforms are unlikely to reflect the priorities of the economy as a whole. Third, since most regulations are designed to benefit all actors in the economy; having more firms in the formal sector will ensure that a greater proportion of economic actors fall under a uniform regulatory regime.

The paper will be divided as follows. First, we will elaborate on the decision about whether to operate in the formal or informal economy, by building a simple model. Second, we will describe the data from sub-Saharan Africa that we use to test our theory as well as the sampling methodology. Third, we will analyze the differences in the investment climate facing informal and formal firms. Fourth, we consider the "success factors" of informal firms by looking at sales growth over time. Fifth, we will recommend policy options for governments that want to expand the formal economy. Finally, we will provide some concluding thoughts and recommendations for future research.

I. What Drives a Firm's Decision to Locate in the Informal vs. Formal Sector?

What drives the decision to locate in the informal vs. the formal sector? Based on the literature described above, we hypothesize that this decision is made on the basis of a cost-benefit analysis. We structure the decision to formalize around the simple principle of costs and benefits within the informal and formal economy. In the formal economy, firms face certain costs. First, the registration process is usually the first set of costs an informal firm faces when considering formalization. Second, they must pay taxes and interact with tax officials. Also, formal firms are subject to regulations established by the government, including labor regulations, custom/trade regulations, environmental regulations, and health / safety regulations. Lastly, another cost faced largely by formal firms is bribes and other informal payments, typically at the discretion of the government official enforcing a regulatory requirement.

Along with these costs, there are also several clear benefits of participating in the formal economy. First, formal firms have easier access to finance. Second, as they are legally recognized entities, they likely have easier access to land. Formal firms also usually enjoy easier access to standard utility connections such as electricity, water and telephone service.

The informal economy also has costs and benefits that must be compared to the formal economy. On the cost side, entrepreneurs must consider the cost of avoiding government officials. Firms also may have to avoid detection, or pay bribes for services. On the benefit side, they may have access to some services and facilities at lower or no cost. Depending on the financial infrastructure in the region, they may also have access to micro-credit. Therefore, a firm will formalize if the estimated profit in the informal sector is less than that in the formal sector. The one time fee of registration is added directly to the cost of formalization in this model. Thus, firm i will locate in the formal sector if

$$\sum_{t=0}^{T}(Sales_{Ft} - Costs_{Ft}) - \frac{\text{Re}\,gistration_{F}}{T} > \sum_{t=0}^{T}(Sales_{It} - Costs_{It})$$

Where

$Sales_{Ft}$=Estimated Sales in the Formal sector in time t

$Costs_{Ft}$=Estimated Costs in the Formal sector in time t

$Registration_{F}$=Cost of Registration

$Sales_{It}$=Sales in the Informal sector in time t

$Costs_{It}$=Costs in the Informal sector in time t

T=Total number of years over which an informal entrepreneur is willing to wait to achieve a profit

The relationship between the costs and benefits as described previously and this formalization model should be fairly straight-forward. What we have not yet discussed are the drivers of T. The inclusion of a time horizon for profit achievement in the model is an attempt to capture the difference in risk profile of various entrepreneurs and the stability of different business environments. A risk averse entrepreneur will expect to achieve a profit in a shorter timeframe than someone less risk averse. Though policy makers should not hope to alter the nature of the entrepreneur, they can attempt to establish a more stable and predictable investment climate. As the sales and cost estimates that entrepreneurs are making are based on the investment climate, with greater stability, entrepreneurs will feel more confident in the estimates holding for longer periods of time. As such, one should expect a policy change that reduced costs in the formal sector or increased sales in the formal sector in a stable investment climate to encourage a greater percentage of entrepreneurs to formalize than in an unstable investment climate.

II. Firm Survey Data and the Classification of Informality

In 2002, it was estimated that the size of the informal economy in Africa was 78 percent of non-agricultural employment, 61 percent of urban **employment**, and 93 percent of all new jobs.[1] In 2004, a second series of estimates was made, as a percentage of 1999/2000 **GNP**. The average of African nations was 41 percent with South Africa being the lowest at 28.4 percent and Zimbabwe being the highest at 59.4 percent.[2] In this analysis, using enterprise-surveys for several informal economies in Africa, we aim to extend the research on the informal sector in Sub-Saharan Africa, by looking at the importance of the investment climate faced by informal firms compared to their formal counterparts. By gaining a more complete understanding of the differences in the investment climate, policymakers can develop policies that provide incentives for informal entrepreneurs to join the formal economy, which we believe will have benefits for the economy as a whole.

In this analysis, we use firm level data from six countries in sub-Saharan Africa-- Kenya, Senegal, Tanzania, Uganda, South Africa, and Zambia--collected within the last three years. Formal firm data were gathered using the standard World Bank Investment Climate Survey instrument, while informal sector data were gathered using a different instrument that varies slightly across countries. The informal firm data was gathered using a survey instrument modeled on the Enterprise Survey for registered firms, but focusing on those areas that would be most applicable to informal firms (eg. informal firms were not asked about importing and exporting).[3] Finally, the Zambia survey was conducted slightly differently, using a household survey approach. Appendix 1 describes the approach to sampling in the informal sector data set used in this paper. Appendix 2 presents several summary statistics regarding the sample of firms. Tables 1 and 2 below summarize the characteristics of the sample of firms surveyed in the informal sector (including partially formal firms) and formal sector:

[1] Xaba, Jantjie, Pat Horn and Shirin Motala, "The Informal Sector in Sub-Saharan Africa," Employment Sector 2002/10 Working Paper on the Informal Economy (Geneva: International Labour Office, 2002) 3.
[2] Schneider, Friedrich and Robert Klinglmair, "Shadow Economies around the World: What do we know?," WP 2004-03 (Linz: Center for Research in Economics, Management and the Arts, 2004) 8.
[3] The South Africa survey was not the exact same survey as Kenya, Senegal, Tanzania, and Uganda, but the data is still comparable.

Table 1: Informal Sector Firm Surveys in Sub-Saharan Africa

Country	No of firms surveyed	% Firms Male-Owned	Years of Operation of the Firm	Percentage ownership of household
Kenya	212	53%	11.45	87%
Tanzania	373	67%	7.67	89%
Uganda	242	58%	7.91	71%
South Africa	240	75%	7.85	78%
Senegal	214	89%	11.60	85%

Table 2: Formal Sector Firm Surveys in Sub-Saharan Africa

Country	No of firms surveyed	% Male-owned	Years of Operation	Percentage owned by largest shareholder or owner
Kenya	272	94%	29.11	66%
Tanzania	232	92%	20.31	76%
Uganda	246	95%	17.21	76%
South Africa	758	92%	27.14	73%
Senegal	209	93%	20.54	77%

A very important issue is the definition of informality. How do we classify a firm as informal or formal? The answer is more complicated than one might think. In this analysis, we generate our informality variable using information on the size of the firm and whether or not the firm was registered with the central government. If the firm has not registered with the central government AND has 10 or fewer employees, we consider it to be informal. If it has registered with the government and has 10 or fewer employees, it is considered to be partially formal. We consider all firms with more than 10 employees to be formal firms (all captured in the survey of formal firms). In creating the middle grouping of partially formal

firms, we attempt to demonstrate that the formality distinction is more of a continuum than a binary variable. [4]

Other characteristics of informal firms, such as owner's gender, age of firm etc are also worth noting. The gender breakdown of respondents (typically the manager or owner) is as follows. In Kenya, the figure was 52 percent male, while in Senegal, the firms were 89 percent male-owned. In the Zambia survey, only 42 percent of respondents were male; this survey uses a slightly different sampling approach (discussed in Appendix 1) which sheds light on the correlation between gender and location of informal activity. The respondents for firms operating out of the home were overwhelmingly female in Zambia, while the respondents in commercial districts, industrial sites, and traditional marketplaces were mostly male. This suggests that the male-dominated samples for the other countries may be ignoring a substantial portion of the informal sector that is operating out of residential homes. Recognizing that the location of informal activity is correlated with the gender of the entrepreneur is an important issue for policymakers to be aware of.

Finally, it is worth noting that most firms are wholly owned by the household of the respondent. And more than 50 percent of firms in each sample are less than 10 years old. The number of young firms may indicate that informal firms tend to fail within the first ten years; a more optimistic theory is that older firms have already formalized their operations. Appendix 2 provides summary statistics on the sample structure of the data used in this analysis.

[4] The use of registration with the central government clearly has some drawbacks in a cross country study. As the central government agency is not specified, different firms could interpret this question differently. (In the survey for South Africa, the question is more specific in that they ask if the firm is registered with the Department of Trade and Industry. We use this variable for the South African firms.) However, we feel that any registration with the central government indicates that the informal firms are moving towards formalization, and thus is useful in helping us distinguish the most informal from the partially formal. Finally, one variable that is often used in the characterization of formality is whether or not a firm has paid taxes. Missing data and problems with accurate reporting of this information are reasons why we do not use this approach.

III. The Role of the Investment Climate

Previous research shows that firms operate in a high-cost environment in Africa (Eifert, Gelb and Ramachandran, 2005) . In this section, we look at whether the investment climate varies between formal and informal firms. We first look at variables that we hypothesize would be of benefit to formal firms, then at aspects of the investment climate that would act as a tax on formal firms.

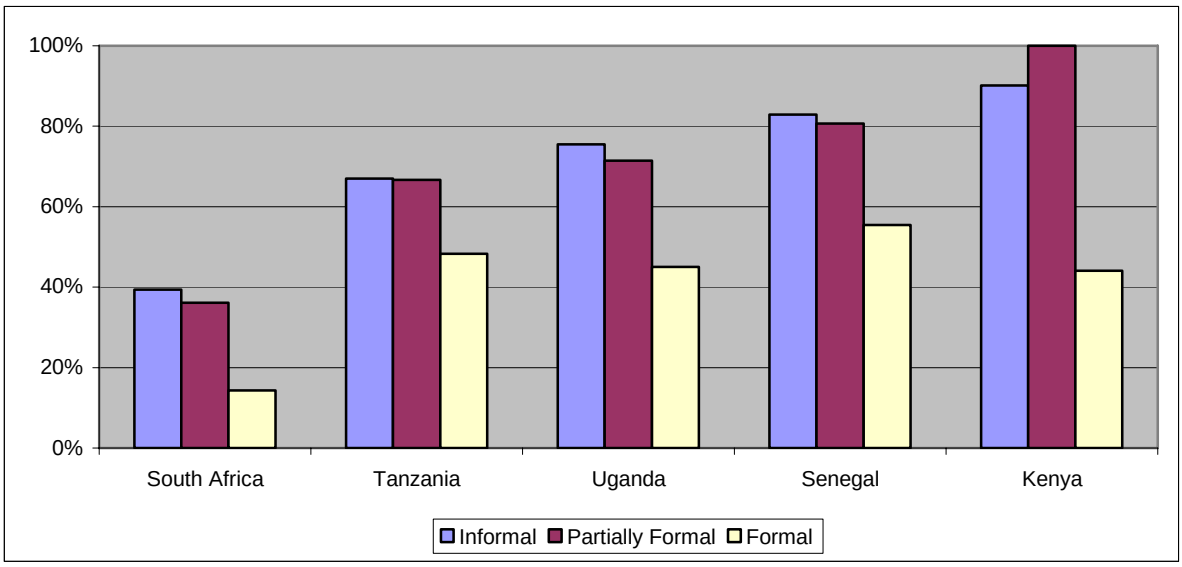
Benefits to Formalization

The first group of investment climate variables that we will examine will be those we consider to be the benefits of formalization i.e. there is better access to this set of sub-components if a firm is located in the formal sector. These include access to finance, cost of finance, access to land, and the availability of electricity, telecommunications, and transport.

Finance (Access and Cost)

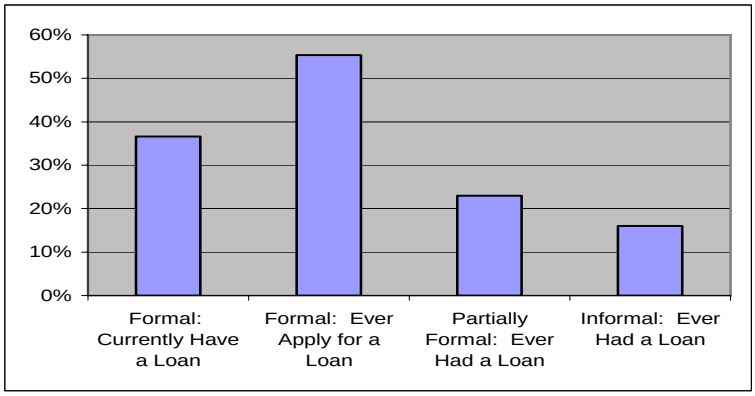
Firms in every country surveyed had a significant association between formality and access

Figure 1: % of firms perceiving access to finance to be a "major" or "very severe" obstacle to operations and growth



to finance.[5] Figure 1 depicts the difference in perception of access to finance across categories of formality. Only in Kenya do partially formal firms view finance as a more severe constraint than informal firms, though formal firms still perceive access to finance less severely than both.

Figure 2: % of firms with access to loans



Disaggregating further, we consider how many firms ever had a loan. On aggregate, approximately 25 percent of partially formal firms ever had a loan; while closer to 15 percent of informal firms have ever had a loan. (These numbers drop to 19 and 13 percent respectively when including those that did not respond to the question as also never having had a loan.) Though the question does not have a comparator in the formal dataset, we can compare it to those formal firms that currently have a loan, or have ever applied. Greater than 35 percent of formal firms currently have a loan; while over 50 percent have ever applied. When using the formal variable for currently have a loan, with the variable for ever had a loan, a chi-squared test for significant is highly significant between ever having a loan and perception of access to finance. The perception of lack of access to finance is backed up

[5] A chi-squared test of independence between the binary variable for perception of access to finance and the categorical variable for formality yielded a p-value of .000 at the aggregate and country levels. The null hypothesis of independence can be rejected at the .1 percent level.

by objective data that demonstrates that fewer informal and partially formal firms have ever had a loan compared to formal firms.[6]

In Figure 3, it is clear that the sources of finance differ quite significantly by formality.[7] In each of the five countries, formal firms use bank loans for a greater percentage of their finance needs than partially formal or informal firms. Family and friends make up a greater percentage of the financing needs of partially formal and informal firms. As family and friends clearly do not have the same capacity as banks, it is not surprising that informal and partially formal firms are credit constrained when compared to their formal counterparts. Formal firms also use more trade credit than partially formal and informal firms. A final word should be said about the amount of financing arising from retained earnings or internal funds within the informal economy--the mere fact that these firms have retained earnings suggests that they are profitable businesses that are worth supporting.[8]

[6] A chi-squared test for independence on the binary variable for perception of access to finance and the binary variable for ever had a loan (currently have a loan for formal) yields a p-value of .003. Thus the null hypothesis for independence can be rejected at the 1 percent level.
[7] All formal surveys broke this question down between new investment and working capital; the informal survey for Senegal also split these categories.
[8] Sethuraman (year?), p. 35.

Figure 3: Decomposition of Finance

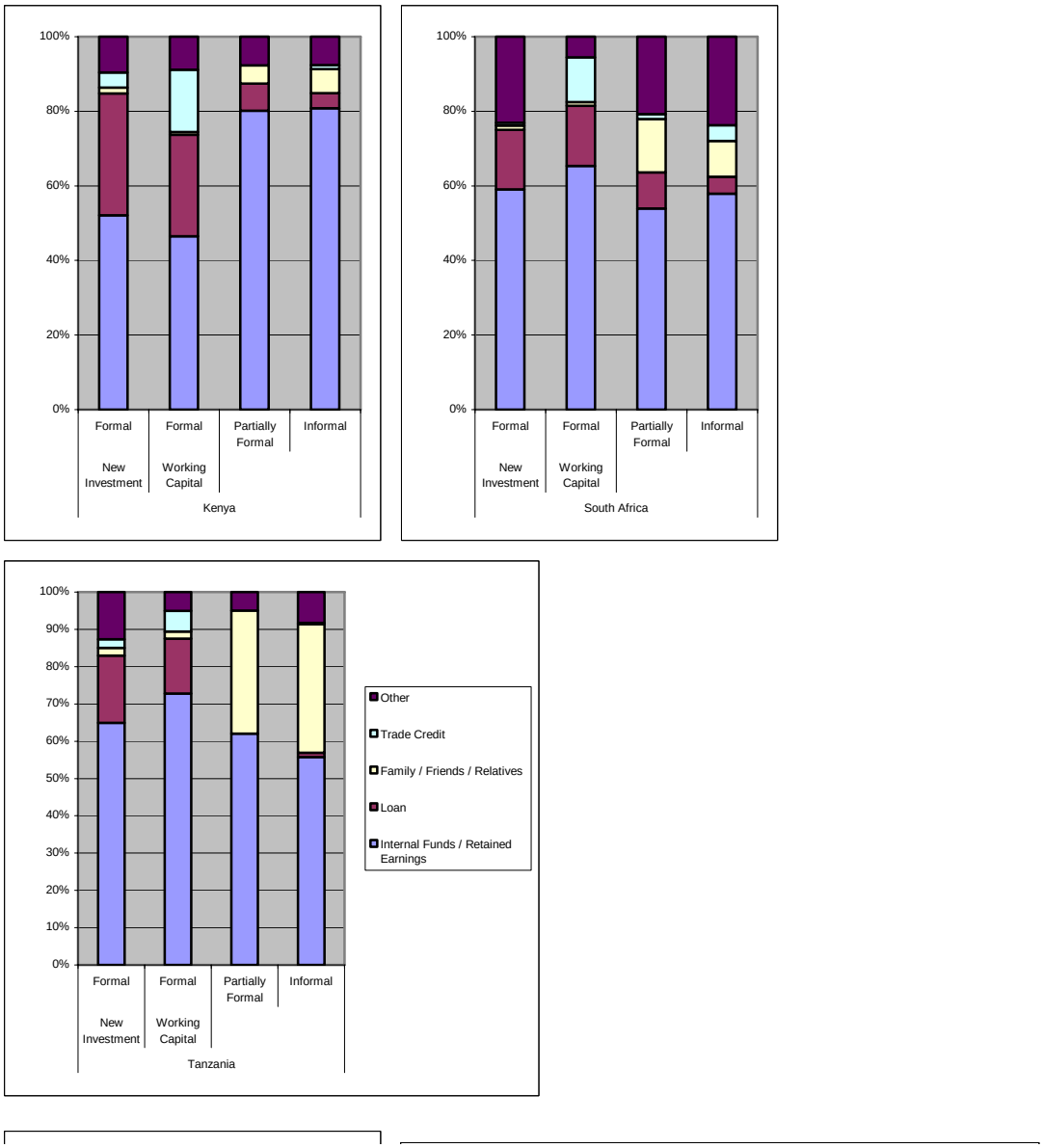
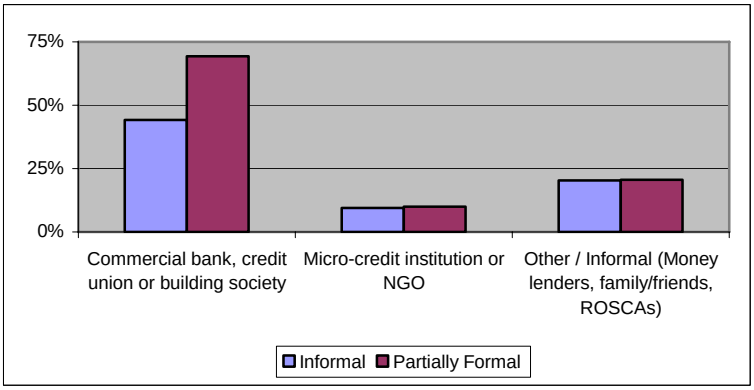


Figure 4 shows that the key difference between firms when considering deposit relationships

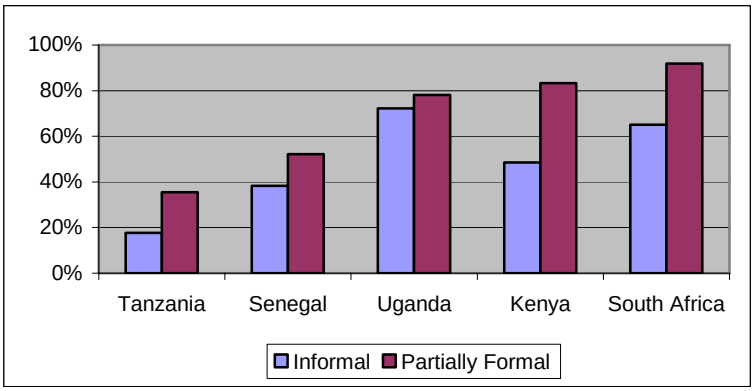
Figure 4: % of firms with deposits at various financial institutions



is within the category of commercial bank, credit union or building society deposits. Seventy percent of partially formal firms have deposits at one of these institutions, compared to only 45 percent of informal firms. To gain a clearer picture of this relationship, it will help to look at this relationship by country.

In Figure 5, it is clear that this relationship is consistent by country. More partially formal

Figure 5: % of firms with deposits at commercial bank, credit union or building society



firms are holding deposits at this category of financial institution, which is certainly more formal than the other two. A lower percentage of firms that have such deposits view access to finance as a "major" or "very severe" constraint, though the relationship is only marginally significant.[9] It is interesting to note the difference between informal and partially formal across countries. We see that partially formal and informal firms in Uganda vary only slightly, whereas the difference in Kenya and Tanzania is more severe. This may suggest that being registered with the central government in some countries might be required for starting a relationship with a bank. Thus deposit relationships are also more common among registered businesses.

[9] A chi-squared test of independence between the binary variable for perception of access to finance and the binary variable for deposits at a commercial bank, credit union or building society yields a p-value of .118. Thus we fail to reject the null hypothesis at the 10 percent level, though could reject it at the 12 percent level.

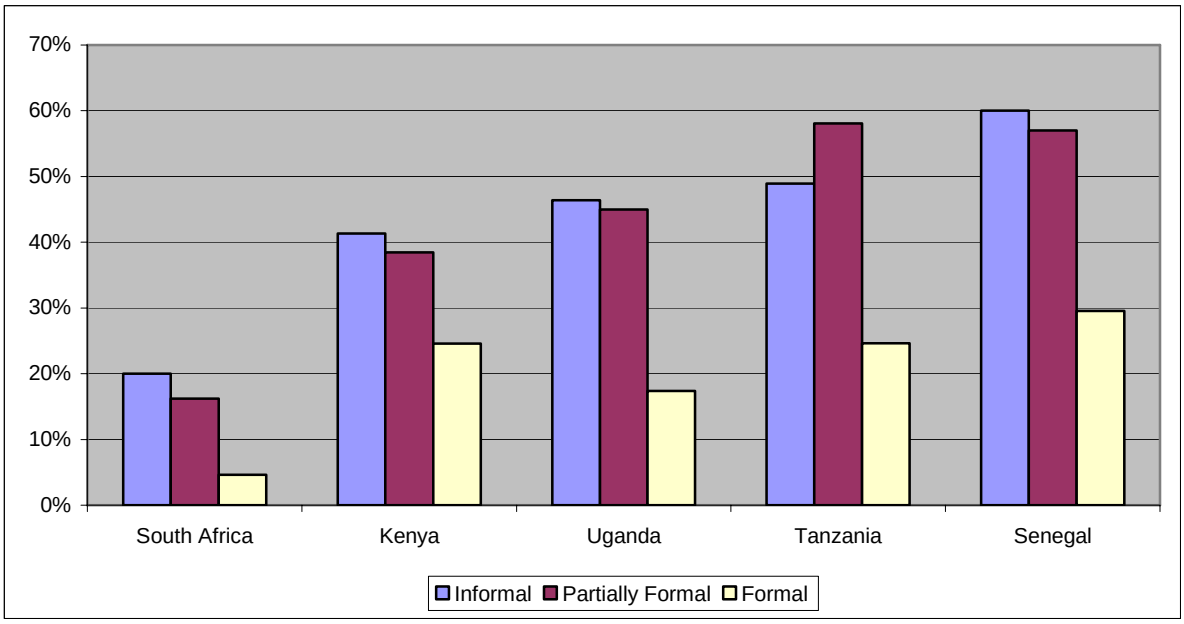
i) Access to Land

Access to land has a highly significant association with formality in all countries within our sample. Figure 6 shows that in each of our countries informal and partially formal firms perceive access to land to be a binding constraint on growth.[10] Informal and partially formal firms in Tanzania and Senegal perceive access to land most severely, while those in South Africa are less concerned with land access. Land is especially problematic for informal firms for two reasons. First, to acquire land the title must be transferred to the new owner which requires interaction with government officials, something an informal firm tends to avoid. Second, often to avoid interactions with government officials, informal firms must be more mobile and not tied to a fixed location. As a result, they do not settle in a single place. Remaining mobile can create disincentives for investment, as discussed by DeSoto in his study of the informal economy in Peru; most firms will be less likely to invest in fixed capital, if they do not have secure title to the land.[11] If a firm is not making the necessary investments in fixed capital, it will be more difficult to increase productivity and growth.

[10] A chi-squared test of independence between the binary variable for perception of land and the categorical variable for formality yields a p-value of .000 for every country but Kenya, which yields a p-value of .011. Thus, null hypothesis of independence can be rejected at the .1 percent level for all countries by Kenya. For Kenya, the null hypothesis of independence can be rejected at the 5 percent level.

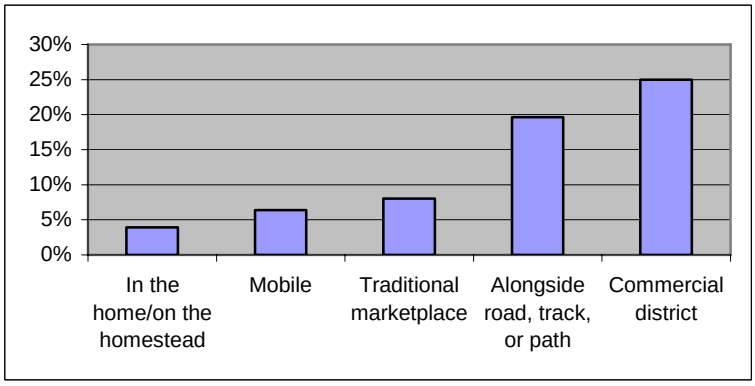
[11] DeSoto, 20.

Figure 6: % of firms perceiving access to land to be a "major" or "very severe" obstacle to operations and growth



As our sample is taken from various marketplaces (rather than households), most firms are

Figure 7: Percentage of informal Zambian firms forced to move within the last year by location



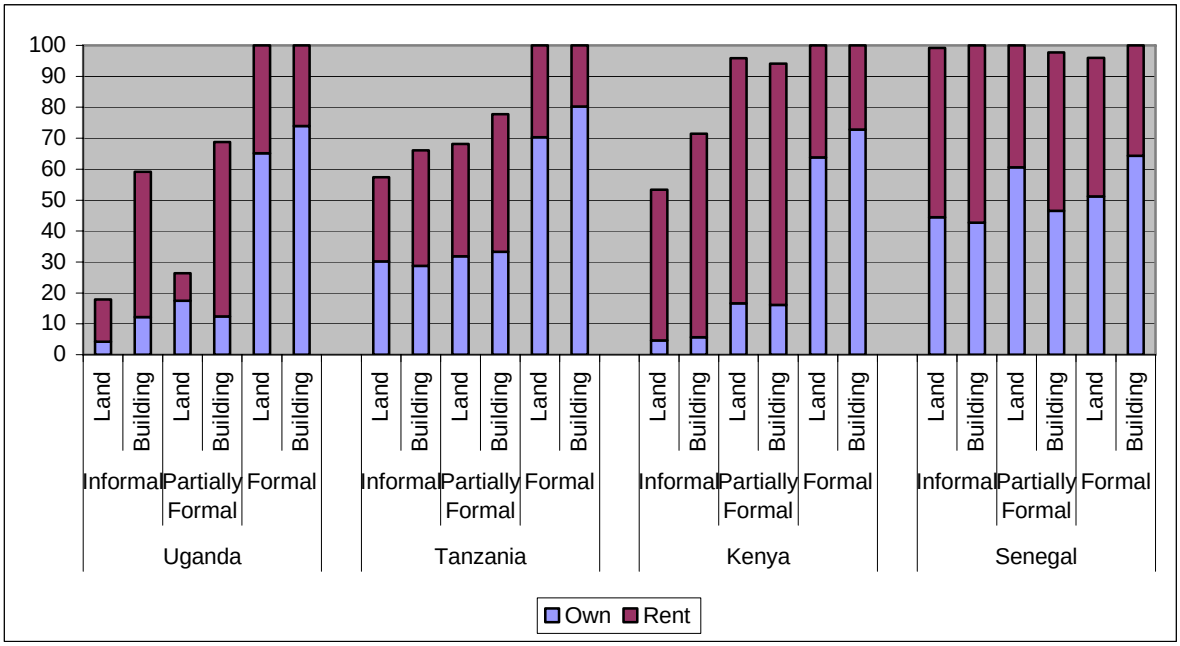
identifiable by government officials, and are consequently risking harassment and forced movement. Figure 7 looks at firms which are forced to move in the Zambia sample. Fewer than 5 percent of firms operating in the home were forced to move versus a much higher

percentage of those operating in other locations. This result is not surprising as it is easier to keep one's economic activities hidden if they are not in plain view. However, approximately 8 percent of firms operating in a traditional marketplace had to move. For those operating along the road 20 percent of firms had to move. In commercial districts, 25 percent of firms had to move. There is a clear cost of being forced to move, which at a minimum is lost production while moving and locating a new place to do business and potentially damage to the means of production. For this reason, it would seem that firms that are operating in the marketplace are clearly accepting the risk for a potential gain.

Of these firms, not all of them own the land, many rent. In Figure 8, we see that informal and partially formal firms are more likely to rent than own, which is not surprising as they have less access to finance to be able to purchase land or buildings. The percentage of land that is owned, versus rented, is significantly associated with perception of land. If the firm owns more land, they are less likely to perceive land as a binding constraint.[12] Again, this result is not surprising as they can not be forced to move if they are legal owners. Examining this same relationship by country demonstrates that the relationship holds across our sample with the exception of the survey in Senegal, which as previously mentioned poses the question differently.[13] Uganda, Tanzania, and Kenya, we see that formal firms own a significantly greater percentage of both their land and buildings. Interestingly, the difference between informal and partially formal firms land ownership in Tanzania is negligible. This might suggest that it is easier for unregistered firms in Tanzania to own property. If this is the case, examining such a policy might provide direction for policy makers in other countries.

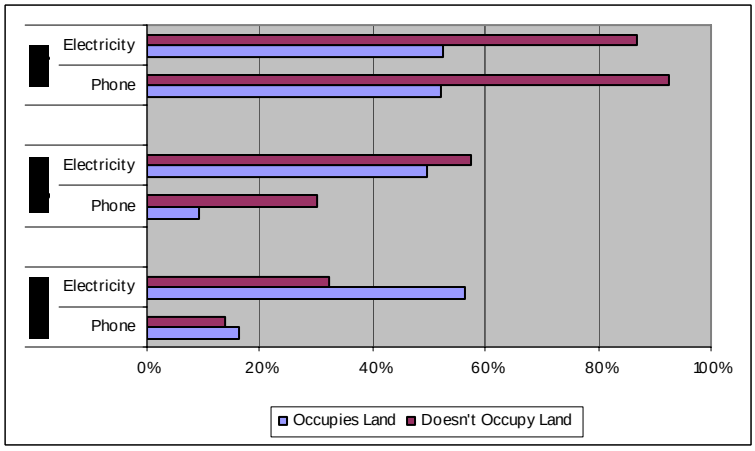
[12] A pair-wise correlation of percent land owned and the binary variable for perception of land access as a binding constraint yields a p-value of .0000. Thus the null hypothesis of no linear association can be rejected at the .01 percent level.
[13] The question is not asked in South Africa.

Figure 8: % of firms owning/renting land or building by formality and country



Clearly, if one is not in a fixed location, it is much more difficult to have electricity, water, or

Figure 9: % of firms perceiving electricity or phone as a "major" or "very severe" obstacle to operations and growth by land occupation



land line phone connections. Thus occupying land is a first step before access to these other benefits to formalization is possible. Figure 9 shows that in both Kenya and Uganda, those that occupy land perceive electricity and phone service to be less of an issue than those not

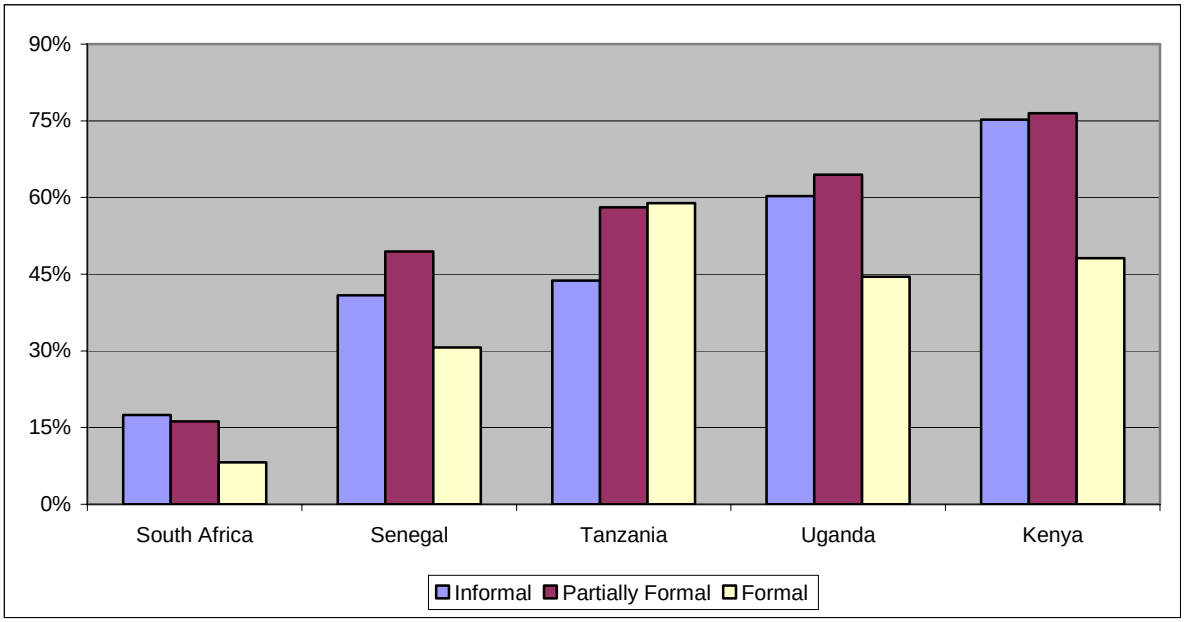
occupying land, as predicted.[14] At first glance, Tanzania appears to be an anomaly, as those that occupy land view these services more severely; however, this can be easily explained by the interpretation of the question by individuals that do not have access to electricity in Tanzania. As discussed in the next section, individuals that responded as not having access to electricity or phone service in Tanzania tended to answer that these were not a problem. Presumably they meant the service was not a problem, rather than their lack of access. The consistency may be attributed to the explanation of this question by enumerators. Clearly, not having access to electricity or phone service would be a constraint to most firms operations and growth.

ii) Electricity

The perception of electricity as a "major" or "very severe" obstacle to operations and growth is closely related to formality. Figure 10 shows that only in Tanzania do informal and partially formal firms view electricity as less of a problem than formal firms.[15] In all other countries in our sample, firms in the informal sector are more likely to rank electricity as a major or severe constraint.

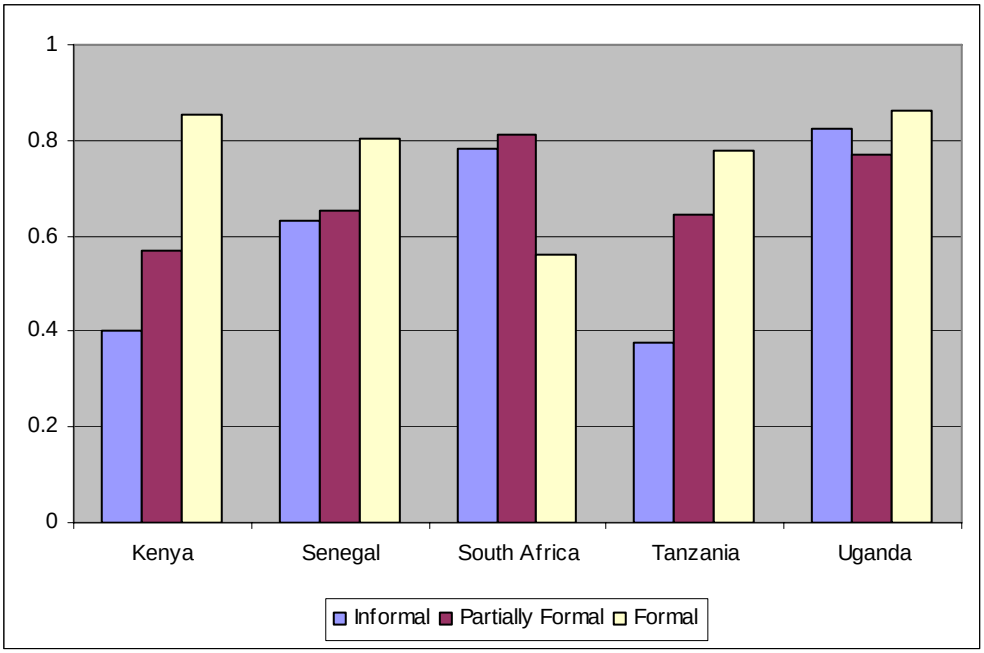
[14] A chi-squared test of independence of both the perception of electricity and phone service with the binary variable for land occupation yields p-values of .000. The null hypothesis of independence can rejected at the .1 percent level.
[15] Of the sample of informal and partially formal firms in Tanzania, nearly two thirds responded that they did not use electricity. Of those that did not use electricity, 76 percent said that it was not a problem.

Figure 10: Percentage of Firms that Rate Electricity as a Major or Severe Constraint



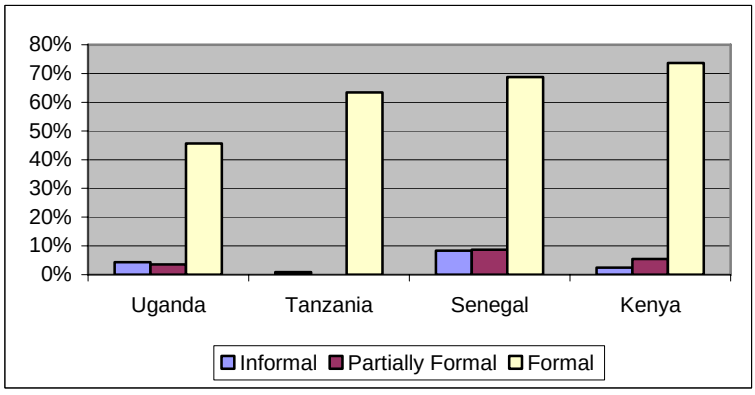
It is also worthwhile to look at the response rate on questions regarding electricity usage; this is further indication of firms' access to the grid or any other source of power. Figure 11 shows that response rates are much lower in the informal sector; it is likely that firms do not answer this question because they do not have access to electricity at all.

Figure 10: % Response Rate on Days Lost Due to Power Outages



These figures suggest that informal firms' perception of electricity is likely influenced by their lack of access, while formal firms have more issues with the quality of service. Figure 12 shows that formal firms are much better able to compensate for unreliable power; this figure shows the percentage of firms in each sector that own or share a generator.

Figure 11: Do you own or share a generator?



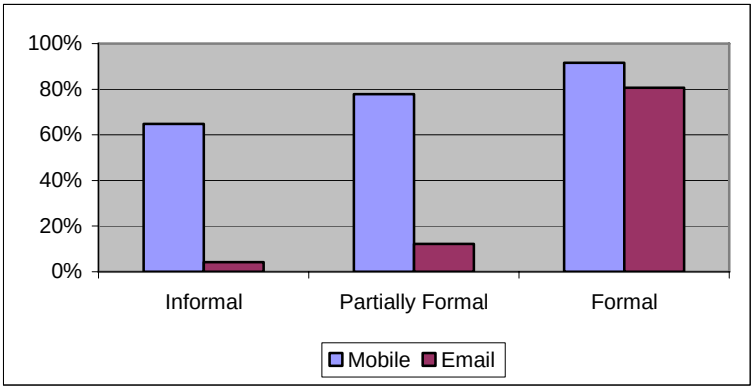
It is unsurprising that electricity supply is an issue for formal or informal firms in Sub-Saharan Africa. The Investment Climate Assessments consistently rate infrastructure as an

issue. What is more important in differentiating firms in the formal versus informal economies is their ability to manage the risk created by an unstable supply of power. With the exception of South Africa, all firms in our sample were asked if they owned or shared a generator (Figure 12). Though the large gap may not be surprising as generators are quite expensive, it speaks to the difficulty of hedging against the risk of power fluctuations and outages for small firms in the informal economy. As we saw in the discussion of finance, informal firms have more difficulty acquiring finance, so even if they decided to make the investment in a generator, they might not be able to get a loan to do so.

iii) Telephone

The emergence of cell phone, satellite phone, and wi-fi technology will help firms that do not operate out of a fixed location access telecommunications services to communicate with their suppliers and customers (Figure 13). However, at the time of data collection, informal firms still rated telephone services much more severely than their formal counterparts. Informal firms perceive telephone services to be a more constraint than formal firms in each of our five countries.[16]

Figure 12



In an attempt to understand the difference in perception for formal and informal firms, we will examine the usage of both email and cell phones. Figure 13 provides an aggregation of

[16] A chi-squared test of independence on the binary variable for perception of telephone service and the categorical variable for formality yields a p-value of .000 for Kenya, South Africa, and Uganda. The p-values in Senegal and Tanzania are .001 and .017, respectively. Thus, the null hypothesis of independence can be rejected at the 5 percent level for all countries.

mobile phone and email use for firms across our sample, which is quite consistent for each country.[17] While mobile phone use has become common for all firms, the use of email has remained the domain of larger formal firms. The use of email services has a strong, significant association with the perception of phone service.[18] Some of this may be driven by the customers and suppliers. If informal firms primarily operate with individuals and small firms email may not be necessary; however, if they do not make the investment to upgrade their technology, they may never grow to the point that they could serve larger businesses, or buy from more technologically advanced suppliers. When examining the relationship between email use and a consistent three years of sales growth, we find that email users have been more successful.[19] This relationship suggests that those firms willing to adopt technology have been more successful.

iv) Transportation

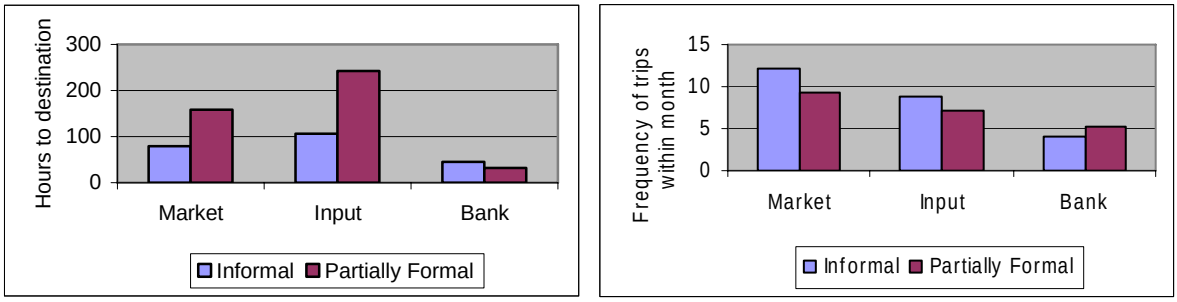
The final component of the investment climate that we consider a benefit of formalization is transportation. The intuition here is less straightforward than with finance, land, or the utilities, though it is no less important. We know that a greater percentage of informal and partially formal firms perceive transportation to be a binding constraint than do formal firms; the relationship is statistically significant in every country except Tanzania.[20] Unlike electricity or telephone services, transportation is not linked to the occupation of land; however, it can be associated with location, or rather location relative to suppliers and customers. In an effort to understand how distance and frequency of travel is related to

[17] A chi-squared test of independence on the binary variable for both cell phone use and email use with the categorical variable for formality yield p-values of .000. Thus the null hypothesis for no association can be rejected at the .1 percent level.
[18] A chi-squared test of independence on the binary variable for email use with the binary variable for perception of phone service yields a p-value of .000. Thus the null hypothesis for no association can be rejected at the .1 percent level.
[19] A chi-squared test of independence on the binary variable for email use with the binary variable for three years of sales growth yields a p-value of .092. Thus the null hypothesis for no association can be rejected at the 10 percent level.
[20] A chi-squared test of independence between binary variable for perception of transportation and the categorical variable for formality yields a p-value of .000 for Kenya and South Africa. The p-value for Senegal, Tanzania, and Uganda is .086, .925, and .007, respectively. The null hypothesis of independence can be rejected at the .1 percent level for Kenya and South Africa, the 1 percent level for Uganda and the 10 percent level for Senegal. In Tanzania, the null hypothesis can not be rejected.

perception of transportation as an issue, we will examine these variables for informal and formal firms.[21]

In Figure 14, we see that partially formal firms are traveling further to reach markets and inputs, though they travel less often to these destinations.[22] If partially formal firms are working with other firms more than individuals, as has been indicated, it may not be necessary to interact with them as frequently (i.e. a contract for a larger order may necessitate fewer trips than selling to individuals on a daily basis). Another possibility is that partially formal firms have better information about markets and suppliers, thus they are

Figure 13: Distance and Frequency of Travel to Destinations



willing to travel further for a good deal. A final possibility may be that informal firms, due to poor transportation or inability to finance larger inventories, deal mostly with customers and suppliers that are close out of necessity. Thus the correlation may have less to do with the proactive nature of partially formal firms, than the constraints on informal firms. Regardless of the reason, we know that both hours to input and frequency of trips to market have a significant association with perception of transportation as a constraint on operations and growth.[23]

[21] These same questions were not asked in the Investment Climate Survey for the formal firms or for informal firms in South Africa.

[22] Pair-wise correlations between the binary variable for formality and the interval-ratio variable for distance to input and market yield p-values of .0027 and .0223. The null hypothesis for no linear association can be rejected in both cases at the 5 percent level. The correlation coefficients are .0981 and .1113, respectively. A pair-wise correlation between the binary variable for formality and the interval-ratio variable for frequency to input yields a p-value of .0698. The null hypothesis for no linear association can be rejected at the 10 percent level. The correlation coefficient is -.0605.

[23] A pair-wise correlation between perception of transportation and the distance to input yields a p-value of .0001. Thus the null hypothesis of no linear association can be rejected at the .01 percent level. The correlation coefficient is .1432. A pair-wise correlation between perception of transportation and the frequency to market yields a p-value

B. The Costs of Formalization

There are two main costs of formalization imposed by the investment climate--taxes, and regulations. We argue that there is also a third cost--government corruption—which impacts both formal and informal firms but also acts as a "double tax" on formal, registered firms which are likely to be already paying taxes.

Taxes are probably the most visible cost of formalizing a business. However, like informality itself, the payment of taxes is more of a continuum along a spectrum. Many of the large formal firms do not report all of their sales for tax purposes, while some small informal firms pay some taxes. The second cost imposed by formalization is that of the regulatory environment, particularly around labor. Formal firms must confirm to rules around hiring, firing, wages, termination payments etc. Also, we consider corruption as a cost of formalization. As mentioned previously, corruption, though impacting both formal and informal firms, is viewed more severely by formal firms, as these are registered with the government and are more likely to pay taxes as well. The final cost of formalization is registration. Registration is the first administrative and financial barrier that a firm must overcome to formalize their firm. As such, it may be one of the first areas to consider when considering reforms, as reduction of cost would provide informal firms a cheaper transition to the formal economy.[24]

iv) Taxes

With the exception of Uganda, Figure 15 shows that formal and partially formal firms view the rate of taxation as a greater constraint than informal firms.

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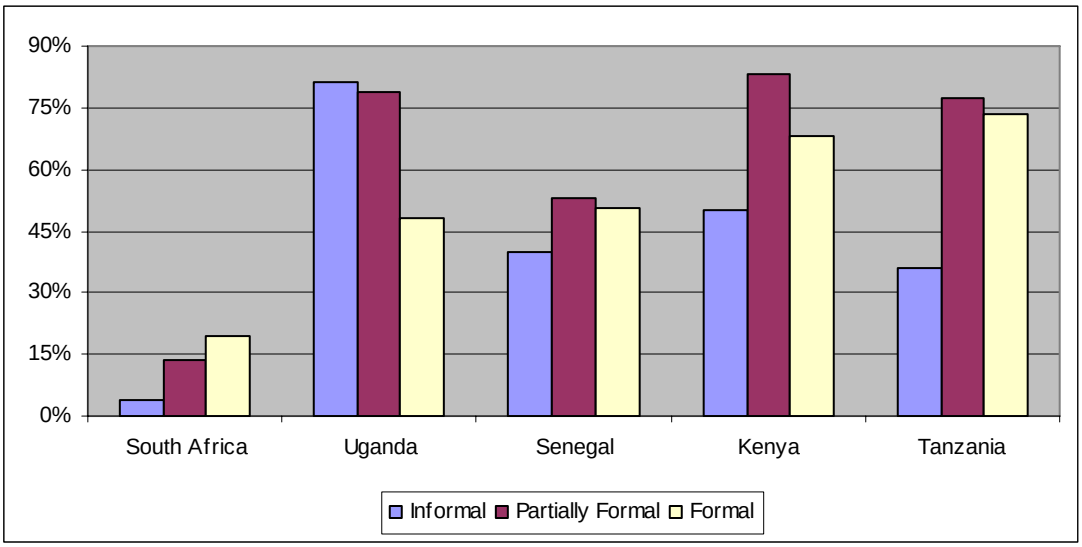
of .0025. Thus the null hypothesis of no linear association can be rejected at the 1 percent level. The correlation coefficient is -.1595.

[24] It is worth noting that we DO NOT code non-responses by informal sector firms to mean that the particular constraint is not major or severe. If we were to do so, the differences between informal and formal firms would rise dramatically. In many cases, it is quite likely that a non-response means that a particular issue is not a major or severe constraint but we refrain from making this judgment in our analysis.

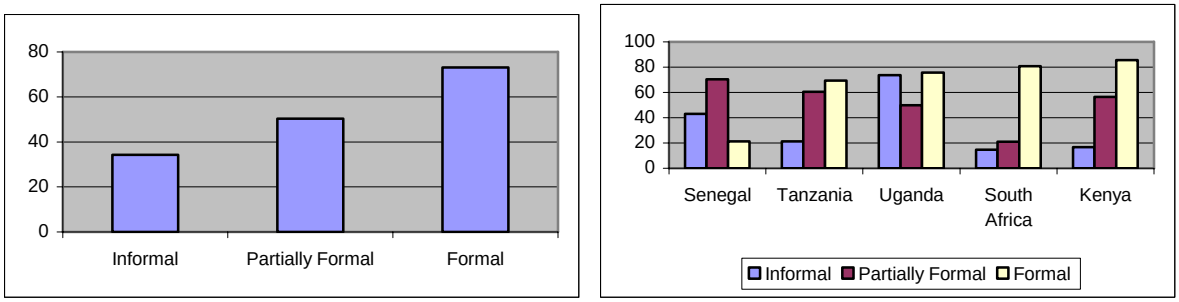
Figure 15: Percentage of Firms that Rate Taxation as a Major or Severe Constraint



This logic stands to reason, as informal firms are not registered with the central government, and thus would not pay as much, if any, taxes. It is also not surprising to see partially formal firms view the tax rate more severely than formal firms. As they have not been operating as long, this burden may be new. Depending on the structure of the tax regime, taxes could be more burdensome for smaller firms. Policy reforms must consider the impact of taxes on firms of different size, as these could act as larger barriers for smaller firms.

In an effort to better understand the relationship between taxes and formality, we will examine the question, "Recognizing the difficulties many enterprises face in fully complying with taxes and regulations, what share of total sales does an establishment like yours typically report for tax purposes over a 12-month period?" The question is asked in this way so that a firm that does not pay taxes does not feel that they are implicating themselves by being truthful. However, it is possible that the responses reflect a bias in the perception of the competition's behavior. (i.e. if a firm that reports 100 percent of sales for tax purposes perceives that their competition are not being as truthful with authorities, the results could be negatively biased.) On the other hand, firm's that do not report all their sales may respond with a higher percentage if they thought the information might be used by the government.

Figure 16: % of Sales Reported for Tax Purposes



With a possibility of both positive and negative bias, we hope that our average figures reflect the reality.

We show these results at the aggregate level and the country level in Figure 16. Formal firms report more of their sales for tax purposes, approximately 75 percent of sales, compared to 50 percent and 35 percent for partially formal and informal firms.[25] We also know that the percentage of sales reported for tax purposes has a significant and positive correlation with the perception of tax rate as an issue, thus the objective data supports the perception of taxes as a greater issue for formal firms.[26]

v) Labor Regulations

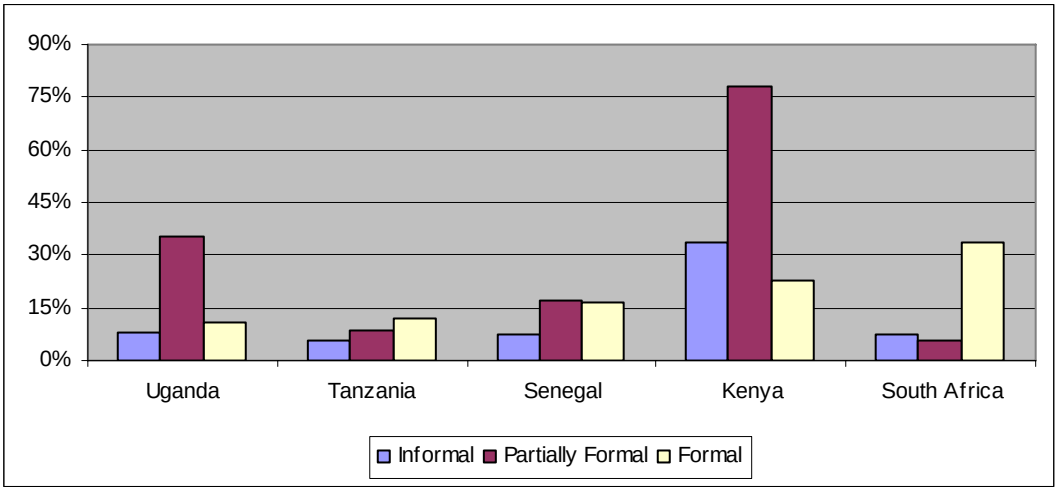
Labor regulations pose a significant obstacle to informal firms. In the informal economy, firms can react quickly to seasonal fluctuations and changes in market activity by increasing or decreasing their workforce. In the formal economy, firms are subject to the regulatory structure laid out by the government which often includes burdensome regulations around

[25] A pair-wise correlation of percent of sales reported for taxes and a binary variable for both formal and informal yields a p-value of .0000. Thus the null hypothesis of no linear association in both cases can be rejected at the .01 percent level. As expected the correlation coefficient for formal is positive (.2606) and for informal is negative (-.2522).

[26] A pair-wise correlation of percent of sales reported for taxes and the binary variable for perception of tax rate yields a p-value of .011. The null hypothesis of no linear association can be rejected at the .01 percent level. The correlation coefficient is .0551.

hiring and firing. Data on the perception of labor regulations by type of firm, shown in Figure 17 below, reveals the burden that informal firms avoid. [27]

Figure 17: Percentage of Firms that Rate Labor Regulations as Major or Severe



Only in Kenya do informal firms perceive labor regulations more severely than formal firms; however, the impact of missing data for both Kenya and Uganda is significant. Only 39 out of 212 informal/partially formal firms responded to this question; the degree of non-response bias the result, particularly if the remaining firms do not view labor regulations as a problem. Similarly for Uganda, only 78 of a possible 242 informal/partially formal firms responded.

Finally, the *Doing Business* database shows us the regulatory environment in the six countries in our sub-sample, these measures (at the country-level) reveal the burden that formal firms face when trying hire or lay off their labor force. Both the cost of hiring workers (measured as a percentage of worker salary) and the severance payment (measured as weeks of wages) place a high burden on formal firms in Africa.

[27] A chi-squared test of independence between the categorical formality variable and the binary variable for perception of labor regulations reveals a p-value of .000, .001, .002, .017 and .035 for South Africa, Kenya, Uganda, Tanzania, and Senegal, respectively. Thus the null hypothesis of independence can be rejected for all countries at the 5 percent level.

Table 3: Cost of Hiring and Firing

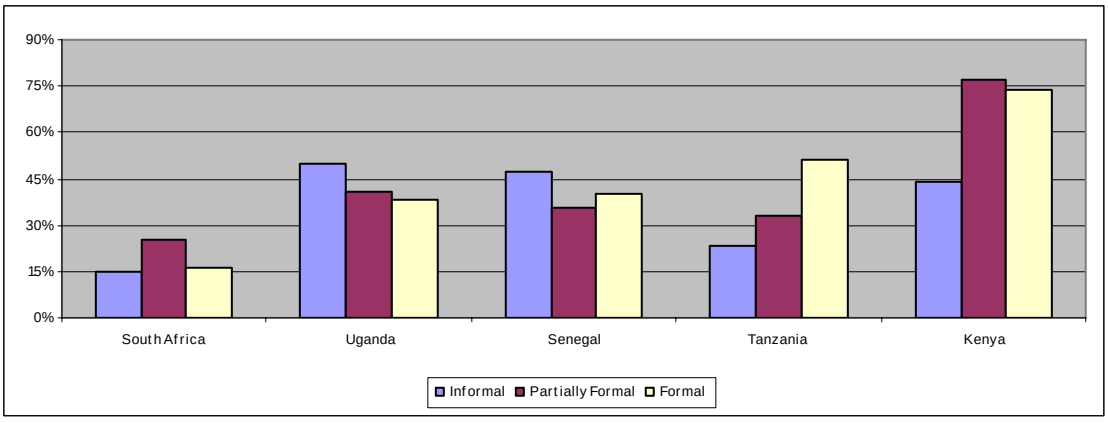
Country	Hiring Cost (% of salary)	Firing Cost (weeks of wages)
Kenya	4.3	47.3
Uganda	10	13
Tanzania	16	32
South Africa	2.4	24
Senegal	21.4	37.9

Source: *Doing Business*, World Bank, 2007

(vi) Corruption

As mentioned previously, corruption impacts both informal and formal firms within a society. As the firms surveyed here were operating in a marketplace, there is no reason to suspect that government officials would ignore them because they are not registered. We include it as a cost of formalization, as formal firms will likely resent corruption more than an informal firm, as they already are paying taxes, whereas informal firms may view bribe payments as a sort of tax to get things done.

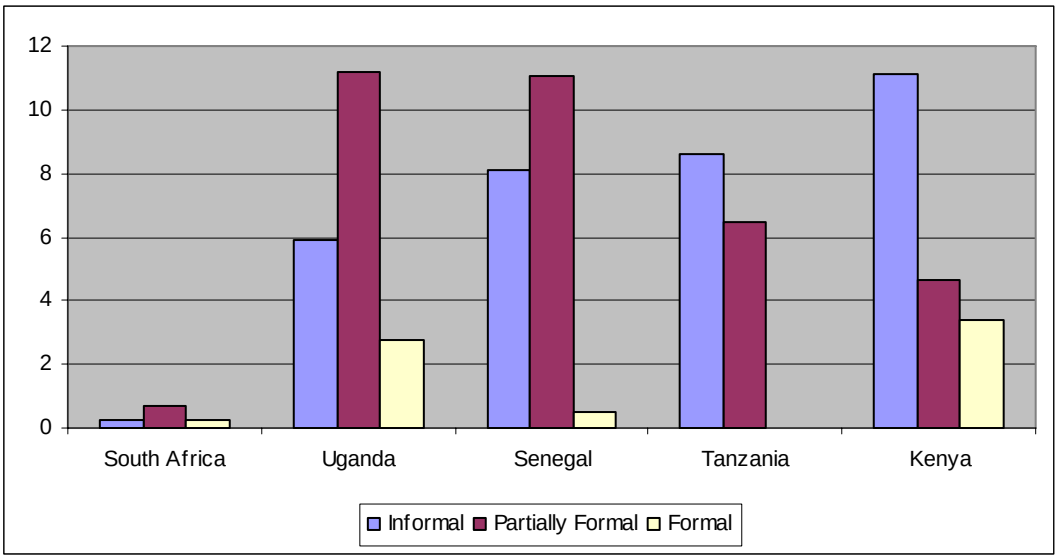
Figure 18: % Firms that View Corruption as a Major or Severe Constraint



To gain a better appreciation of this issue, we consider the average estimate of unofficial payments as a percentage of annual revenue for a typical firm. The level of unofficial

payments is significantly higher for informal and partially formal firms than for formal firms with the exception of South Africa.[28]

Figure 19: % of Annual Revenues Lost in Unofficial Payments



(vii) Registration

The final cost of formalization that we discuss in this paper is the cost of registration. Unfortunately, we do not have perception or quantitative data on the cost of registration. As most informal firms are not registered, asking them about their perception of registration would be unlikely to yield useful results. However, registration cost and process represent the first barriers to formalization for informal firms. If the registration cost or procedure is too expensive or onerous, an entrepreneur would likely never consider any of the other steps. The World Bank's *Doing Business* database yields the following country-level information for the number of procedures, time and cost of setting up a business in each of the countries in our sample:

[28] A pair-wise correlation between formality and the percentage of unofficial payments yield p-values of 0.0001, 0.0000, 0.8299, 0.0000, and 0.0204 for Kenya, Senegal, South Africa, Tanzania, and Uganda, respectively. The correlation coefficients are all negative, thus the more formal, the lower percentage of unofficial payments.

Table 4: Time and Cost to Set up a Business

Country	# of Procedures	Time (Duration Days)	Cost (% GNI per Capita)
Kenya	13	54	46.3
Uganda	17	30	114
Tanzania	13	30	90.6
South Africa	9	35	6.9
Senegal	10	58	112.6

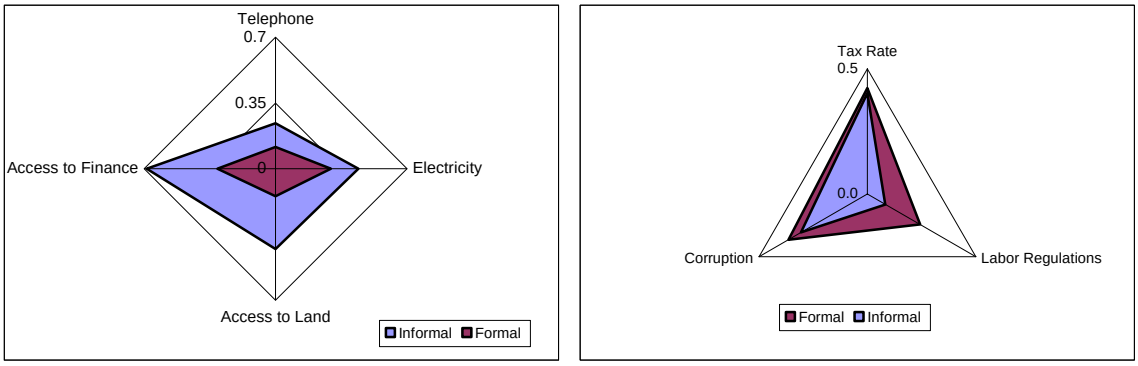
Source: *Doing Business*, World Bank, 2007

As we can see from these data, the overall cost of registration is substantial in each of the five countries in our sample. This fact makes registration a good target for policies intended to encourage formalization. By significantly reducing the number of steps and cost, policy makers might remove the key barrier for informal firms in their decision to formalize.

II. The Incidence of Formality—Econometric Tests

It is clear from our dataset that firms located in the formal sector perceive the investment climate to be quite different than firms located in the informal sector. The following charts summarize the difference in perceptions of the investment climate across formal and informal firms across four "beneficial" sub-components—telephones, electricity, access to finance and access to land—as well as components that increase the costs of formalization—labor regulations, taxes and corruption. Looking at tax rates, corruption and labor regulations, we see that formal firms tend to rank these as more problematic than informal firms.

Figure 20: A Summary of Perceptions of Informal and Formal Firms



As discussed earlier, we hypothesize that the decision to formalize is influenced by the investment climate, after controlling for firm, sector, and country-level characteristics. Figure 21 provides initial evidence that our hypothesis is justified. In this figure, we report the results of chi-squared tests regarding the severity of investment climate constraints and whether they are significantly different between formal vs. partially formal and informal firms.

Figure 21: Chi-squared tests for the Perception of the Severity of Investment Climate Constraints Across Informal vs. Formal Firms in Africa

	P-Value of Chi-sq with Formal					
	Aggregate	Kenya	Senegal	South Africa	Tanzania	Uganda
Access to Finance	0.000	0.000	0.000	0.000	0.000	0.000
Land Access	0.000	0.011	0.000	0.000	0.000	0.000
Telephone	0.000	0.000	0.001	0.000	0.017	0.000
Electricity	0.000	0.000	0.028	0.001	0.000	0.000
Labor Regulations	0.000	0.001	0.035	0.000	0.017	0.002
Custom/Trade Regulations	0.000	0.027	0.018	0.004	0.000	0.004
Tax Rate	0.000	0.010	0.110	0.000	0.000	0.000
Transport	0.000	0.000	0.086	0.000	0.925	0.007
Macroeconomic Instability	0.049	0.019	0.000	0.000	0.000	0.612
Economic Policy Uncertainty	0.000	0.000	0.025	0.469	0.023	0.024
Cost of Finance	0.000	0.000	0.172	0.000	0.632	0.000
Skills and education of available workers	0.000	0.000	0.003	0.000	0.410	0.364
Tax Administration	0.000	0.402	0.267	0.008	0.000	0.000
Crime	0.000	0.000	0.032	0.016	0.208	0.468
Corruption	0.002	0.000	0.749	0.327	0.000	0.440
Anticompetitive or unfair business practices	0.092	0.250	0.631	0.146	0.030	0.056

	Significant at 1%
	Significant at 5%
	Significant at 10%
	Insignificant

Figure 21 demonstrates that at the aggregate level, ***every investment climate constraint is significantly associated, either positively or negatively, with the incidence of formality.*** Looking at each constraint individually, we see that access to finance, access to land, telephones and electricity are significant for all countries in terms of how they are perceived; formal firms view these as less of a constraint than informal firms. Transport, also considered a benefit of formalization, is significant in every country but Tanzania. Labor regulations, custom/trade regulations and tax rate are clearly perceived as a cost of formalization. With the exception of the tax rate in Senegal, the severity of each of these constraints has a significant positive association with formality.

Next, we look at the correlates of formality in a multivariate context, controlling for firm-specific, sector and country-level effects. Given that our data are cross-sectional and not available yet in panel form, we cannot infer casuality but we can look at correlations of the

incidence of formality with sub-components of the investment climate. We construct a Probit model where the dependent variable is set to 1 if the firm is formal, 0 otherwise. Based on the model described above, we test whether the decision to formalize is correlated with perceptions of the investment climate. Thus, a maximum likelihood function is described, for firm i:[29]

Yi* = F(n, a, X1……Xn, S1…S4, C1…C5,)+e

And the following estimation is carried out based on the function described above:

Yi = probability that firm will locate in the formal sector*
Yi = observed location (1 if formal sector, 0 otherwise)
and
n = number of employees (log)
a = age of the firm
X1…Xn= perception of constraint imposed by the investment climate subcomponent (telephone, electricity, transport, access to land, rate of taxation, labor regulations, access to finance, corruption)
S1…S4= sector dummies
C1…C5= country dummies
e= error term

Table 5 shows the correlations between formality (ie whether or not a firm is located in the formal sector) and perceptions of the investment climate for four countries—Tanzania, Uganda, South Africa, and Kenya. We construct three Y variables--Y1 is formal firms only, Y2 groups partially formal firms with formal firms and Y3 groups partially formal firms with informal firms.

[29] We do not have the cost of registration but assume it to be a fixed amount for firms entering the formal sector. Thus, it gets picked up in the constant term.

Table 5: The Correlates of Formality

	(1)	(2)	(3)
	formal1	formal2	formal3
Perception Variables:[1]			
Telephone / Fax / Email	-0.0015	0.0020	-0.0061
	(1.13)	(0.26)	(1.92)*
Electricity	-0.0014	-0.0070	-0.0022
	(1.66)*	(1.17)	(1.39)
Transport	-0.0002	-0.0045	-0.0010
	(0.27)	(0.72)	(0.67)
Access to Land	-0.0033	-0.0129	-0.0071
	(3.07)***	(2.05)**	(3.23)***
Tax rates	0.0015	0.0164	0.0028
	(2.65)***	(3.07)***	(2.39)**
Labor Regulations	0.0003	0.0086	0.0000
	(0.55)	(1.36)	(0.01)
Access to Finance	-0.0026	-0.0193	-0.0047
	(3.29)***	(3.49)***	(3.10)***
Corruption	0.0005	0.0111	0.0007
	(0.84)	(2.12)**	(0.59)
Firm Variables:			
Years in Operation	0.0001	0.0006	0.0002
	(3.12)***	(2.57)**	(3.36)***
Log (# of employees)	0.0067	0.0500	0.0153
	(13.89)***	(17.50)***	(13.91)***
Industry Variables:			
Food Processing	0.0011	0.0091	0.0022
	(2.46)**	(1.78)*	(2.06)**
Garments/Textiles/Leather	-0.0047	-0.0290	-0.0077
	(2.99)***	(2.67)***	(2.70)***
Wood / Furniture	-0.0001	-0.0142	-0.0000
	(0.20)	(1.83)*	(0.03)
Country Variables:			
Senegal	-0.0491	-0.0472	-0.0915
	(4.77)***	(2.54)**	(4.90)***
Tanzania	-0.0555	-0.0970	-0.0891
	(5.55)***	(4.63)***	(5.27)***
Uganda	-0.0015	0.0032	-0.0048
	(0.66)	(0.25)	(0.91)
South Africa	-0.0288	-0.0542	-0.0567
	(5.70)***	(4.00)***	(5.76)***
Observations	1967	2061	2061
Pseudo R-squared	.8150	.6480	.8151

Robust z statistics in parentheses

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

[1]*Perception variables are included as dummies with 1=if firm perceives investment climate constraint as major/severe or 0=Perceive as monderate/minor constraint*

We see that across the three dependent variables, the results are very robust. Perceptions regarding the severity of infrastructure-related constraints are less likely to be correlated with formality; the coefficient on electricity is almost zero while that on telecommunications and transport are negative. Access to land is also negatively correlated with formality; formal firms have better access to land and this result is statistically significant, after controlling for various other firm, sector and country-specific effects. However, as previously discussed, formal firms face certain costs as well. The severity of taxes is positively and significantly correlated with formality. The perception of constraints imposed by labor regulations and government corruption are also positively associated with formality. Finally, formal firms perceive access to finance to be significantly lesser constraining than informal firms.

It is also worth noting that several firm, sector and country-specific variables included in the regression are statistically significant. Older firms are positively correlated with formality; this is consistent with the argument that informal firms are unlikely to survive past a few years. Size is positively correlated with formality in a statistically significant manner, again consistent with the argument that informal firms are unable to expand their operations due to a variety of reasons, and consequently stay small. More firms in the food processing sector are formal, while fewer firms in the garment/textile sector are formal; this may reflect the differing cost of formality across these sectors and is worthy of further exploration. Finally, Uganda has significantly more formal firms in our sample than Kenya, while South Africa has fewer; this again may reflect different costs imposed by the investment climate of these countries. In the case of South Africa, this may also reflect the legacy of apartheid.

Further estimations of formality, as correlated with quantitative measures of the investment climate, are described in Appendix 2. These reinforce the finding that formality is correlated with better access to infrastructure and also with a greater burden regarding unofficial payments to government officials.

Suggestions for Further Research

Our results show that more firms are located in the formal sector when electricity, access to finance, and access to land are perceived to be less constraining. Our results also show that tax rates and corruption are perceived to be more constraining by formal firms. These results have policy implications--policymakers may be able, via investment climate reforms to reduce the burden of formality, to provide an incentive for informal firms to transition to the formal economy. Recent efforts to reduce the burden of red tape in the formal private sector in Kenya, led by the Africa Private Sector Group of the World Bank, may be useful in terms of moving firms to the formal sector and should be carefully evaluated in this regard.
For example, in Mali a law was passed to streamline the number of procedures and reduce the cost of enterprise creation. The law replaced previous procedures applied by statistics, tax and treasury, social security and employment departments with a unique firm identification number. In addition, notaries' fees were reduced. The Government of Mali also reformed the tax system by allowing firms to bundle monthly payments to the tax administration, which later channels the resources to relevant administrations afterwards. Moreover, the Government is undertaking an effective marginal tax rate study for future reforms.

In Kenya, licensing obligations serve as a key constraint and burden on the private sector in terms of time, human resources, and money. In addition, during the duration of the license, random and routine inspections are carried out, sometimes frequently and are major drivers of corruption. The number of business licenses in Kenya is now estimated at some 1,300. In 2005, the Government of Kenya embarked on an ambitious reform program using a guillotine method for licensing reforms. The Working Committee on Regulatory Reforms for Business Activity in Kenya was established and reviewed 86 licenses in phase I, out of which 17 licenses were eliminated through the 2005/06 fiscal budgetary process. During Phase II, and additional 118 licenses were eliminated by Parliament. By December 30, 2006, all licenses, including local government licenses would have been reviewed and an additional 400 licenses are expected to be eliminated or simplified. The Government of Kenya is building upon its efforts in licensing reforms, and is now broadening the scope for additional regulatory reforms.

Though much theoretical work exists on the topic of informality, future research should attempt to focus on specific policies and on the measurement of firm reactions. Recently, a series of groundbreaking reforms have been undertaken in several African countries to improve the business climate (*Doing Business*, 2007 and various *Investment Climate Assessments*). It would be very useful to evaluate the impact of these reforms on the formal and informal sector, and to measure the movement of firms from the informal to the formal sector.

Finally, it would be very useful to survey the same sample of informal sector firms over time, perhaps every three years, to determine if there are changes in perceptions of the investment due to policy reforms and if these changes in perceptions have resulted in the decision to formalize. These data would yield valuable insights into which policies are most useful in moving firms to the formal sector in Africa.

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Appendix 1: Data, Sampling Methodology and Statistical Summary

There are several ways of collecting informal sector data, none of them ideal. Surveyors can conduct an initial walking survey of the key marketplaces in the selected area to identify all possible informal firms. From these identified firms, one could then select a random sample. Again the methodology here is flawed, as the firms identified operate outside of their homes, and are the most visible to the enumerators. These firms were selected because they were less hidden to surveyors; presumably they are also less hidden to the government as well. Thus they are risking subjection to regulations and harassment by officials by their visibility. Again, such a sample would be different than the entire population of informal firms. It would ignore most home-based operations, and likely identify larger informal enterprises. This methodology was used for Kenya, Senegal, Tanzania, Uganda and South Africa.

Another methodology is the one used in the Zambia survey, the household survey. This survey identifies economic activities by household. By focusing at the household level, the survey not only picks up those enterprises that may be on the informal lists or operating in the marketplace, identified in the first two methodologies, but it also identifies the most hidden, or least formal, enterprises that are home-based, or out of the purview of the average observer. In selecting this methodology, it is clear that the sample of firms will differ from the first two. For this reason, the sample is most likely to represent the informal sector in its most comprehensive perspective.

However, even this methodology may not be ideal depending on what one is trying to understand about the informal firms. By being the most comprehensive, it also contains more of the least formal firms. If the goal is to develop policies intended to provide incentives for those most likely to move towards formalization, the target population should likely be those firms that are in the best position to move towards formality. Also, by defining informal firms as 5 or fewer workers, rather than 10 or fewer, as is more common in the literature, the Zambia sample has much smaller firms which may not be as prepared to formalize. Understanding how the survey methodology influences the results obtained is

essential, especially if the analysis will influence policy. Though we will not compare the Zambia data directly with the other surveys, we will use this dataset, which also includes many different questions, to emphasize the importance of survey design when considering informal sector analysis.

Unlike the other surveys, the Zambia survey was quite different and offers some insight into areas not discussed in the other surveys. The Zambia survey differs most substantially in the selected sampling methodology. As one could imagine, it is more difficult to sample informal firms than formal firms, as they are less likely to be registered at a central location. When surveying informal firms, there are three possible methods that are available.[30] First, one could work with informal business associations (if they exist) or NGOs that may have lists of informal firms. From these lists, the surveyors could select a random sample to survey. The major flaw here is that by being on a list, firms have identified themselves to these organizations, and are thus different in a way than the total population of informal firms. The sample is therefore not truly random. Given these issues, we have drawn on the Zambia data for the descriptive statistics used in the paper but have not included them in the regression analysis.

Summary Statistics of Sample

To provide a brief overview of the data, we provide a set of sample statistics for each of the informal samples by country. For each of the samples, we only include those informal firms with fewer than 10 employees.[31] However, we can see from our samples that the majority of firms in each case have five or fewer workers. As mentioned, the sampling methodology in Zambia favors selecting smaller firms; eighty-five percent of firms in the Zambia dataset have only 1-2 workers, with approximately 70 percent being composed of a single worker. Size of firm is used as an indicator of informality in most studies of the informal economy. As a result, the study of micro-enterprises and informal enterprises is very much intertwined. Most informal enterprises are quite small, as it would be most difficult to conceal a firm with

[30] World Bank, Zambia Informal Investment Climate Assessment Draft, February 21, 2006.
[31] The methodology for Zambia stipulated only those with 5 or fewer workers.

50 employees. These firms are also more mobile as a result of their size, and thus are more capable of avoiding government officials.[32] As a result, it is sometime difficult to untangle the effect of informality from size.

Table A1.1: Structure of Sample for Kenya Informal Investment Climate Survey (percent)

	Share of Sample		Share of Sample
Firm Size (# of Employees)*		**Firm Ownership**	
1-2	36.63	Not Wholly Owned by Household	12.35
3-5	44.03	Wholly Owned by Household	79.01
6-10	6.58		
Formality**		**Gender of Respondent**	
Partially Formal	16.46	Male	52.26
Informal	83.54	Female	47.74
Firm Activity		**Years in Operation**	
Furniture Making	3.29	Greater than 30 years	3.7
Wood Carving	4.12	20-30 years	9.05
Other	22.22	10-20 years	28.4
Food Processing	26.34	Less than 10 years	58.02
Garments/Textiles	44.03		

*Question: Including paid and unpaid workers, how many people work at this establishment this week?

**If the firm is registered with central government, they are considered partially formal.

Some groups may not add up to 100 percent due to non-response.

[32] Castells, Manuel and Alejandro Portes, "World Underneath: The Origins, Dynamics, and Effects of the Informal Economy" in *The Informal Economy: Studies in Advanced and Less Developed Countries* (Baltimore: The Johns Hopkins University Press, 1989) 20.

Table A1.2: Structure of Sample for Tanzania Informal Investment Climate Survey (percent)

	Share of Sample		Share of Sample
Firm Size (# of Employees)*		**Firm Ownership**	
1-2	53.21	Not Wholly Owned by Household	11.23
3-5	37.97	Wholly Owned by Household	88.77
6-10	8.56		
Formality**		**Gender of Respondent**	
Partially Formal	8.29	Male	66.84
Informal	91.71	Female	33.16
Firm Activity		**Years in Operation**	
Wood Carving	12.30	Greater than 30 years	1.07
Food Processing	13.90	20-30 years	4.28
Garments/Textiles	13.90	10-20 years	17.38
Furniture Making	0.27	Less than 10 years	76.47
Other	59.63		

*Question: Including paid and unpaid workers, how many people work at this establishment this week?

**If the firm is registered with central government, they are considered partially formal.

Table A1.3: Structure of Sample for Uganda Informal Investment Climate Survey (percent)

	Share of Sample		Share of Sample
Firm Size (# of Employees)*		**Firm Ownership**	
1-2	6.85	Not Wholly Owned by Household	24.19
3-5	69.35	Wholly Owned by Household	73.79
6-10	21.37		
Formality**		**Gender of Respondent**	
Partially Formal	22.98	Male	58.06
Informal	77.02	Female	41.94
Firm Activity		**Years in Operation**	
Wood Carving	0.40	Greater than 30 years	2.02
Food Processing	25.81	20-30 years	2.42
Garments/Textiles	45.97	10-20 years	14.92
Furniture Making	3.23	Less than 10 years	75
Other	24.60		

*Question: Including paid and unpaid workers, how many people work at this establishment this week?

**If the firm is registered with central government, they are considered partially formal.

Some groups may not add up to 100 percent due to non-response.

Table A1.4: Structure of Sample for South Africa Informal Investment Climate Survey (percent)

	Share of Sample		Share of Sample
Firm Size (# of Employees)*		**Firm Ownership**	
1-2	32.08	Not Wholly Owned by Household	22.5
3-5	48.75	Wholly Owned by Household	77.5
6-10	19.17		
Formality**		**Gender of Respondent**	
Partially Formal	15.42	Male	75.42
Informal	84.58	Female	24.58
Firm Activity		**Years in Operation**	
Services	26.25	Greater than 30 years	0.42
Light manufacturing	23.33	20-30 years	6.33
Retail trade	33.75	10-20 years	18.14
Construction	16.67	Less than 10 years	75.11

*Question: Including paid and unpaid workers, how many people work at this establishment this week?
**If the firm is registered with central government, they are considered partially formal.
Some groups may not add up to 100 percent due to non-response.

Table A1.5: Structure of Sample for Zambia Informal Investment Climate Survey (percent)

	Share of Sample		Share of Sample
Firm Size (# of Employees)*		**Household Size**	
1-2	85.19	1-2	10.08
3-5	13.68	3-5	40.34
6-10	1.14	6-10	40.06
		Greater than 10	9.52
Gender of Respondent			
Male	42.02	**Firm Ownership**	
Female	57.98	Female, one proprietor	49.3
		Male, one proprietor	29.69
		Multiple proprietors-husband and wife	9.24
Firm Activity		Multiple proprietors-blood relatives	6.72
Manufacture/Production	12.61	Multiple proprietors-non-family	5.04
Service/Repair	19.61		
Trade/Commerce	67.79		
		Years in Operation	
		Greater than 30 years	0.28
Formality**		20-30 years	2.52
Partially Formal	0.56	10-20 years	7.84
Informal	99.44	Less than 10 years	89.36

*Question: Including paid and unpaid workers, how many people work at this establishment this week?
**If the firm is registered with central government, they are considered partially formal.
Some groups may not add up to 100 percent due to non-response.
All data restricted to firms with 10 or fewer employees, or those firms not answering that question.

Appendix 2: Further Estimations the Correlates of Formality Using Firm Experience Variables

	(4)
	formal1
Firm Variables:	
Own/share a generator?	0.0282
	(3.89)***
Communicate with customers using cell?	0.0104
	(1.61)
Communicate with customers using email?	0.0283
	(3.66)***
Unofficial gifts as a % of sales	-0.0007
	(2.18)**
% of land owned	0.0004
	(5.05)***
% of land rented	0.0003
	(4.25)***
Years in Operation	0.0003
	(2.86)***
Log (# of employees)	0.0125
	(7.35)***
Industry Variables:	
Food Processing	0.0100
	(3.51)***
Garments/Textiles/Leather	-0.0089
	(1.31)
Wood / Furniture	0.0030
	(1.30)
Country Variables:	
Kenya	0.0138
	(3.50)***
Tanzania	
Uganda	0.0112
	(4.29)***
Senegal	0.0023
	(0.75)
Observations	668
Pseudo R-squared	.8000
Robust z statistics in parentheses	
*** significant at 10%; ** significant at 5%; *** significant at 1%**	