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ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/oaef20

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To cite this article: Salmon Mugoda , Stephen Esaku , Rose Kibuka Nakimu & Edward Bbaale | (2020) The portrait of Uganda's informal sector: What main obstacles do the sector face?, Cogent Economics & Finance, 8:1, 1843255

To link to this article: https://doi.org/10.1080/23322039.2020.1843255

Published online: 05 Nov 2020.

Mugoda et al., *Cogent Economics & Finance* (2020), 8: 1843255
https://doi.org/10.1080/23322039.2020.1843255

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GENERAL & APPLIED ECONOMICS | RESEARCH ARTICLE

The portrait of Uganda's informal sector: What main obstacles do the sector face?

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Received: 20 August 2020
Accepted: 25 October 2020

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Reviewing editor:
Robert Read, Economics, University of Lancaster, UK

Additional information is available at the end of the article

Abstract: In this paper, using primary data collected from business owners, we examine the nature and obstacles in the informal sector of Uganda. We find that education level matters in the selection of enterprises. The bulk of businesses, like eating kiosks, fish selling, shoe shining among others that require no specialized skill to operate were mainly run by primary school dropouts and those with no formal level of education. Furthermore, we find evidence of a strong entrepreneurial spirit among secondary school dropouts than at any other education level. Across all businesses surveyed, secondary school dropouts run a high number of informal enterprises. Evidence suggests that their motivation is driven by two key factors, namely, wanting to take advantage of an existing business opportunity and failure to find employment in the formal sector. The empirical results show that access to finance, crime, theft and disorder, electricity, water, taxes, burdensome inspections, and informal gifts are robust and significant obstacles to the operations of the informal sector in Uganda. Policies should focus on a regulatory framework that supports the sector to create secure livelihoods and generate employment opportunities for the unemployed rather than viewing the sector as a source of

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PUBLIC INTEREST STATEMENT

There is concern that the growth of the informal sector is bad for the formal sector, since the former is involved in illegal business transactions that harm the wellbeing of the entire population. In this paper, we study the nature of the informal sector with a special focus on the activities, entrepreneurs who are engaged in it, and their level of education. Further, we ask whether the activities of the informal sector are really "illegal." We find evidence that the sector is involved in the legal production of goods and services in the country. All the activities they engage in are legal and permitted by law with enterprises providing employment and a means of income generation for owners. Furthermore, we also find strong entrepreneurial development among the secondary school dropouts compared to other levels of education. There is evidence that access to finance, electricity and water supply, crime, theft, and disorder remain the main obstacles faced by the informal sector.

"illegality." Improving access to finance, providing regular power and water supply, and improving the tax regime would mitigate the obstacles faced by informal businesses leading to possible formalization. Informal sector businesses should not be perceived as "illegal entities" but rather complementary effort by an increasingly enterprising population in the country.

Subjects: Microeconomics; Development Economics; Public Finance; Entrepreneurship; Small Business Management; Social Entrepreneurship; Entrepreneurial Finance

Keywords: household production; production; informal economy; business taxes; underground economy; shadow economy

JEL: D10; D13; E23; E26; H25

1. Introduction

There is increasing consensus that the informal sector has become part of many economies, both in the developed and developing countries. As indicated by Lewis (1959), the informal economy[1] was seen as marginal and involved in peripheral activities that were not linked to the modern or formal economy. Throughout the 1950s, there was a general view that the informal economy in developing countries was temporal and would disappear when these countries realized significant levels of industrialization and economic growth. However, empirical evidence shows that the informal economy can no longer be regarded as a temporal phenomenon in both developed and developing countries (Schneider et al., 2010). This suggests persistence in the growth of the informal economy in both the developed and developing economies. The key reason for this observed growth of the informal sector in most developing countries seems to be that the modern or formal sector has not been able to create jobs that can sufficiently absorb the growing and sometimes unskilled labor force in most of these countries (Esaku, 2019, 2020). Further, the taxation burden associated with businesses that formalize their status appears to deter informal businesses from transitioning into formal businesses (Dell'Anno, 2016; Goel & Nelson, 2016).

Thus, the informal sector is seen to play a complementary role of job creation and generation of incomes that provides the poor segments of the population with a means of survival and welfare improvement (Fourie, 2018; International Labour Organization, 2002; Swedish International Development Cooperation Agency [Sida], 2004). In some developing countries where the size of the informal sector is substantially large, its growth has been attributed to the challenges arising from the overregulation and taxation burden that is associated with the formalization of businesses. This implies that those who are unable to join the formal sector or regularize their businesses may not be in a position to ensure a sustainable source of earnings, leading to the growth of the informal economy in the process. Consequently, the informality of enterprises continues to plague the business landscape of these countries as the population attempts to survive or ensure a minimum standard of living. Consequently, the informal sector seems to be more pronounced in countries with inequitable distribution of incomes and productive resources and where corruption thrives (Schneider et al., 2010). This would imply that economic growth that results into jobless growth and income inequality promotes the growth of the informal economy as economic agents continue to seek ways of survival.

Although the informal sector has persisted across the developed and developing countries for many decades, the formal examination of its causes and consequences is relatively a recent phenomenon and largely focused on recent years (Buehn & Schneider, 2013). This gap in the literature has largely been due to a lack of consensus on how to define, measure, and estimate the informal sector because informal economy production and marketing processes cover many forms, such as

undocumented cash transactions, transactions that involve barter trade or in-kind transactions, unlicensed service provision, and many others that are largely undetected or difficult to track down (Williams, 2006). However, there have been recent attempts to provide some estimates of the informal sector at the macro level using a variety of estimation techniques (Alm & Embaye, 2013).

One important consensus that has emerged from previous studies is the important contribution of the informal economy in job creation and the generation of income. It is now a recognized fact that the informal sector has the potential to generate jobs and incomes for the poor. Accordingly, the international Labor Organization of the United Nations (ILO) estimates that more than 60% of the employment globally occurs in the informal sector (International Labour Organization, 2002, 2018). The implication of the above finding is that the sector should no longer be considered an underground or shadow economy since there is observed substantial contribution it makes to the lives of the poor. For example, Fourie (2018) estimates that of the informal enterprises surveyed in 2013, nearly 20% of them provided employment to about 850,000 people, an indication of the substantial employment contribution of informal enterprises in South Africa. Given the importance of the sector to the creation of income and employment, it is important that appropriate and effective policy frameworks be designed to regulate and guide the sector, without hindering its potential to create jobs and generate incomes for the poor.

Despite the contribution of the informal sector, the sector faces a myriad of obstacles. Previous studies show that access to finance, taxes, burdensome regulatory framework, and regular supply of power is among the robust obstacles faced by businesses operating in the informal sector. For example, Ayyagari et al. (2008) find access to finance as a robust and significant obstacle to the growth of firms in developing countries. Similarly, Peprah et al. (2019) find that access to finance, working space, electricity, and high taxes is among the strong obstacles that women entrepreneurs in Ghana face in their daily operations. Similarly, Sasidharan and Rajesh Raj (2014) analyze the growth obstacles of informal sector enterprises in India and find evidence that inadequate power supply is a severe obstacle to the growth of businesses in the sector. Coad and Tamvada (2012) find evidence of access to finance and electricity as robust obstacles to the growth of firms.

In this paper, we present the portrait of the informal sector in Uganda, with a special focus on the nature of the informal sector activities, education level of persons engaged in the sector, and the major obstacles emanating from the business environment that are serious obstacles to the success of the informal sector. Several studies, in both developed and developing countries, have investigated the contribution of the informal sector in their economies. Much of the focus on both the theoretical and empirical fronts has been on the analysis of the size, causes, and consequences of the informal sector, with less attention paid to Africa as a region. Furthermore, the evidence has been largely from macroeconomic data with no attempt to provide empirical evidence at the micro level. This paper attempts to fill this gap by making use of micro-level data collected from 911 enterprises in January 2020. Furthermore, this paper may be the first attempt to give a comprehensive portrait of the informal sector landscape in Uganda, at least to the best of our knowledge. There is recognition among analysts that the informal sector in Uganda has been growing since the 2000s due to the rising labor force, especially among the youth, who cannot be absorbed by the formal sector in the country. On account, of the above, it is important to understand how the landscape of the informal sector in the country looks like. The importance of this rests on the fact that a growing informal sector needs to operate around a policy framework that guides its operations since it offers a substantial proportion of jobs and incomes for the majority who cannot be absorbed by the formal economy.

A thorny issue driving research on the informal sector has been on its definition. To guide this study, it is crucial to agree on a working definition of the concept of informal sector.[2] Some authors view the informal sector as being the production of goods and services with the intension to avoid taxation

(Schneider, 2007), while others tried to define it using a variety of definitions that are based on the following criteria: (i) activities of the sector (see Alm & Embaye, 2013; Buehn & Schneider, 2013; UNECE-United Nations Economic Commission for Europe, 2008), (ii) employment level (Fourie, 2018), (iii) legal businesses but sometimes with hidden activities (Schneider, 2005), (iv) income and employment—survival (Berner et al., 2012), and (v) registration status of the business (see Schneider, 2007).

However, we draw our definition from the consensus that has emerged in the literature, which views the sector as the legal production of goods and services by businesses that are not registered for the purposes of taxation. The transactions in the sector are conducted by enterprises that may not have been registered for purpose of tax, social security payment when actually they should have been declared for taxation (Evans et al., 2006). These transactions are legal and aimed at advancing the livelihoods of the poor. We view the informal sector entrepreneurs as those who start an enterprise for the legal production of goods and services. In most cases, they are not registered as formal businesses and operate under difficult working conditions without formal social security benefits.

In this study, we use the concept of informal sector or informal economy to mean all market-based legal production of goods and services by business units that have no tax identification number (TIN) but may or may not have business permits (trading licenses) issued by local authorities in areas where they operate from. This definition implies that we do not capture activities by domestic workers who are in the care economy, for example, care activities like housemaids or keepers because these workers are not engaged in the production of products for sale. The interest in this paper is to capture activities in the sector that undertake the production of goods and services outside the care economy and formal economy.

Apart from section one, the remainder of the paper is structured as: section two is a review of related literature while sections three and four are the data and the methodology, respectively. Section five is the presentation of the empirical evidence of the obstacles in the informal sector and section six concludes the paper.

2. Review of related literature

2.1. Theoretical foundations and empirical evidence

The existence of the informal sector or shadow economy is still a strongly debated issue in the extant literature. The renewed debate on the existence of the informal economy can be seen in an attempt to quantify its size, causes, and consequences (see Dell'Anno, 2016; Loayza, 1996; Schneider, 2005; Tanzi, 1982). From the theoretical perspective, there was a general view in the 1950s through to the 1970s that the formal economy would grow rapidly and offer a great incentive for workers to be employed in the formal sector. This was in recognition of the dualistic existence of both the formal and informal sectors in the economy during the period. Although the informal sector lived side-by-side with the formal sector, its existence and contribution to the growth of the economy was considered a temporal phenomenon. The informal sector was thus taken to be a product of "backwardness, traditionalism, and underdevelopment" of most societies (Geertz, 1963; Lewis, 1959). The above notion implies that the informal sector should be more pronounced in economies that are less developed and still struggling with the absorption of the superior technology of development. Conversely, in economies that are developed and with technologically superior methods of production, informality should be less pronounced.

However, from the 1980s through 2000s, there has been a general recognition that the informal sector (see, Schneider, 2005), and informal entrepreneurship in general (De Soto, 2001; Williams, 2006) has been expanding and enduring in several regions of the world. The assumption that the

informal sector was a temporary phenomenon seems faulty and unacceptable in the face of mounting evidence of the growth of this sector across regions of the world.

To try to explain the persistence of the informal sector across the world, researchers have advanced the political economy stance theory which emphasizes that the growth and persistence of this sector are the result of government inefficiencies (Castells & Portes, 1989; Gallin, 2001; Loayza, 1996; De Soto, 1989). Viewed from the political economy stance, the informal sector is the product of under-regulation and the lack of social security which perpetuates poverty (Castells & Portes, 1989; Gallin, 2001), and the presence of excessive regulation and taxation imposed by governments with no power to enforce compliance (Loayza, 1996; De Soto, 1989). As shown by De Soto (1989), a burdensome regulatory framework (paperwork required to finalize business registration, red tape, taxes paid by formal businesses, social security contributions, among others) makes formalization unattractive to businesses. Similarly, Allingham and Sandmo (1972) present a tractable model of evasion of income tax, where an individual chooses to either declare the true income for taxation purpose or hide (conceal) it all together. If the income tax evasion is detected, the culprit pays the true income tax in addition to the fine, but when she/he succeeds then there is no tax liability. In their model, the possibility of being discovered is positively correlated with the enforcement actions taken by the tax body to increase the probability of detecting the culprit. Taken together, the above theoretical evidence suggests that informality is driven by a number of factors that are both economic and political.

Correspondingly, Neck et al. (1989) theoretically analyze the relationship between the shadow economy and taxes and present evidence that higher marginal tax are some of the causes and key drivers of informality. Additionally, the overall tax and social security contribution burden lead to the growth and expansion of the informal sector in most regions of the world (Schneider, 2005). From the empirical viewpoint, Schneider (2005) and Johnson et al. (1998) provide evidence that shows the existence of a statistically significant relationship between the shadow economy and taxes. In their findings, higher taxes impose a burden on the entrepreneur which in turn creates an incentive to operate "underground" to avoid the tax burden. Schneider (1986), reaches the same conclusion for Scandinavian countries, where the tax variables were positively correlated with the currency demand. The above findings appear not to be isolated. Similar studies by Kirchgaessner (1983) for Germany, and Klovland (1984) for Norway and Sweden find a positive and statistically significant relationship between the shadow economy and taxation.

Although a number of studies on the informal sector focus on the size and causes, some studies have paid attention to the importance of the sector. For example, Gaspirini and Tornarolli (2007) study the informal sector in Latin America and show its importance to the growth of jobs and employment, where the sector is noted to be employing workers that are mostly unskilled and operating family-based businesses. The employment contribution of the sector has been noted. For example, Maloney (2004) shows that the sector employs between 30% and 70% of the workforce in Latin America, with well over 60% of the men in Mexico, who were originally employed by the formal sector voluntarily leaving to join self-employed (informal sector). Similarly, Blanchflower and Oswald (1998) find that 48% of the workers in Britain, 63% in the United States, and 49% in Germany preferred self-employment than working for the formal sector. The above evidence shows that self-employment, and the informal sector production plays a key role in the production and distribution of goods and services. Correspondingly, Gatti et al. (2011) provide evidence showing that workers who are engaged in the informal sector (those in informal sector employment) range between 20% and 40%, in the Middle East, operating mostly in small firms. For the case of Africa, M. A. Chen (2001) estimates that nearly 93% of the new employment in the 1990s occurred in the informal sector of the economy. Steel and Snodgrass (2008) find similar evidence where they show that the informal sector in Africa accounts for nearly 80% of the gross domestic product and well over 90% of the new employment opportunities. The increasing contribution of the informal sector toward new job

creation has been associated with stagnant employment growth in the formal economy thereby creating an opportunity for people to find alternative forms of employment (Xaba et al., 2002).

Given its importance, the informal economy should be viewed as complementing the formal sector in the production of goods and services (Webb et al., 2013) through its ability to generate new jobs. Employment is generally seen as one of the major contributions of the informal sector thus complementing the effort of the formal sector to create jobs for the expanding unemployed population (Blanchflower & Oswald, 1998; Fourie, 2018; International Labour Organization, 2002). If indeed the informal businesses generate employment opportunities, then it is important for policy makers to develop policies that strengthen the growth and formalization of these businesses rather than restricting them. Notwithstanding its contribution to employment and production of goods and services, the informal economy is sometimes criticized for not being able to grow past their informality to formality, and for engaging in illicit activities. Despite the above criticism, there is a general consensus among economists on the important role the sector plays in the provision of employment opportunities to the unemployed, and the production and distribution of goods and services.

Additionally, some studies have focused on the motivations for starting the business in the informal sector (see M. Chen, 2014; Williams & Lansky, 2013) and the policy framework needed to formalize the registration status of these businesses (Williams & Nadin, 2013). The above studies provide empirical evidence that the growth of the informal economy is being compounded by inefficiencies of the market economy to allocate resources fairly across the economic agents (see Schneider, 2005; Schneider et al., 2010). Consequently, the growth of the informal sector is the result of the unequal opportunities that face economic agents. There is consensus that workers in the informal sector lack opportunities to progress compared to those in the formal sector who are well educated and well positioned. The success of the informal sector would imply the formalization of businesses that are involved in this sector. This means that market imperfections that created the proliferation of the informal sector must be addressed. This would imply addressing the tax burden, unemployment, inequality, and regulatory framework that promotes the growth of small businesses (Schneider, 2007). Although the informal sector remains a crucial complement to the formal sector, a few studies have examined its nature and obstacles with a focus on the perspectives of business owners.

Empirically, a number of factors have been attributed to the causes of informality in both the developed and developing economy. Alm and Embaye (2013), show that some of the key drivers of the informal economy include the tax rate, enforcement, and inflation rate. If the burden of taxation in the economy is high, a number of informal enterprises will be induced to conceal their production of goods and services from the tax body for fear that paying tax may cause business failure. Similarly, enforcement of business regulations is a key driver of the informal sector in most countries (Goel et al., 2019; Schneider, 2005). Correspondingly, the higher the inflation rates in the country the higher the informal sector in the economy. This is because increases in the general price level in the economy lead to the hoarding of goods, thereby raising the general cost of living. However, those without regular incomes will be motivated to start some form of income-generating activity so as to survive. Similarly, some studies have shown that "opportunity" and "necessity" also drive the growth of the informal sector. There is the recognition that some informal businesses have been started because owners wanted to take advantage of existing business opportunity (Williams, 2007). This implies that entrepreneurs see a window of opportunity to exploit a business opportunity, especially when situational conditions like the availability of technology allow them to create a value option in the product or service. Other businesses have been started because owners had no other choice of employment or were unemployed for long periods (Sirmon et al., 2007). Regardless of the motives that drive the informal sector in most economies, the sector should be seen as a force to be reckoned with.

However, informal sector actors face a number of barriers that have hindered their operations over time. One significant barrier to their success is the limited access to finance due to informality (Ayyagari et al., 2008). Formal providers of the much-needed financing require collateral so as to access credit. However, informal sector businesses may not have the capacity to present the required collateral because of the nature of their operations. They are small, formed for survival, and face an uncertain future. Given this, they are unlikely to access financing for their businesses. Correspondingly, taxation, and inspections have been shown as robust obstacles to the growth and formalization of informal sector businesses (see Dell'Anno, 2016; Goel & Nelson, 2016). In the "eyes" of informal businesses, taxation exerts pressure on these businesses leading to business failure as a result. Moreover, regular inspections reduce the chances of success as these inspections are seen to cause interruptions to cash flows.

Peprah et al. (2019) find that working space and electricity are among the strong obstacles that women entrepreneurs face in their daily operations in Ghana. This implies that the robustness of the obstacles that informal businesses face might be heterogeneous so that women-owned enterprises seem to perceive the above obstacles in a different way compared to male owned. In the same vein, Sasidharan and Rajesh Raj (2014) investigate the growth obstacles that informal enterprises face in the Indian economy and find evidence that inadequate power supply is a severe obstacle to the growth of businesses in the sector. This evidence is also emphasized in Coad and Tamvada (2012). The above authors find electricity as robust obstacles to the growth of firms.

Although there is renewed interest in the study of the informal sector, studies that examine the nature and barriers faced by informal sector businesses, focusing on Africa are limited. This paper is an attempt to fill this gap by examining the nature and obstacles facing the informal sector in Uganda.

3. Methodology

In this section, we provide the estimation method used to analyze the obstacles that informal businesses face in Uganda. We follow two steps. In the first step, we follow the extant literature on the informal sector and identify the key obstacles that affect the growth and success of informal businesses. In the second step, we use a probit model to econometrically estimate the main obstacles to the success of informal businesses in Uganda. Third, we estimate the marginal effects of the above obstacles, so as to facilitate the interpretation of the probit estimates. Finally, in the fourth step, we use the alternative specification to check the robustness of our results.

The extant literature highlights a number of obstacles that affect the growth and success of informal businesses in developing countries (see the Swedish International Development Cooperation Agency (Sida), 2004). These obstacles can be grouped into three broad categories; (i) obstacles related to lack of infrastructure, that is, electricity, water, telecommunications, transport network among others; (ii) institutional issues; lack of access to formal training, high illiteracy rates, limited access to production resources like land, finance, banking services, excessive government regulation, limited market for goods, among others, and finally (iii) economic issues; limited access to technology, lack of working capital, lack of funds for expansion, transaction costs (cost of starting a business), among others. The availability or the lack of these variables can either enhance or affect the success of businesses in the informal sector.

Accordingly, we asked business owners this question "which of the following elements of the business environment, if any, represents the biggest obstacle faced by this business?" The options we provided include the following:

If these variables are obstacles to the success of the informal sector businesses, we should expect to observe a negative sign (-ve) and a significant effect on informality. Accordingly, we use

probit regression to estimate whether the above variables significantly hinder the progress of businesses in the informal sector. We need to model the above variables as the predicted probability of a business experiencing the occurrence of the above barriers. Our general probit model, defined in terms of the above variables, can be specified as:

$$P(B_{it}=1)=\Phi\{fin_{it},land_{it},gift_{it},crime_{it},elect_{it},pol_{it},trans_{it},wat_{it},tax_{it},fees_{it},inreg_{it},burd_{it}\} \quad (1)$$

Where $\Phi\{\bullet\}$ can be taken to be the normal cumulative distribution function that defines the predicted probability. As indicated before, negative estimates that are statistically significant should be an indication that indeed the above variables significantly hinder the success of businesses in the informal sector. We further examine two issues: (i) whether the operational location of the business (urban or rural) has any bearing on the significance of the above obstacles, and (ii) whether women-owned business differ from male-owned businesses in their perception of the obstacles faced by their businesses. We report the predicted probabilities in Table 7. However, to facilitate the interpretation of the predicted values of the estimates, we need to estimate the average marginal effects of the predicted estimates for the purpose of deriving meaningful economic conclusions. Accordingly, we estimate the average marginal effect of each of the above variables and report these effects in Table 8.

4. The results and discussion

In this section, we present the data, results, and discussion of the findings under specific subsections.

4.1. The data

The data we use in this paper were collected as part of the research project "An examination of the informal sector in Uganda" that was funded by the Ugandan government under the Research and Innovation Fund. The research design that we adopted was a mixed research design, where we focused on three key designs, that is, exploratory, descriptive, and cross-sectional research designs. The study population was drawn from 10 districts of the country, with our unit of analysis being business enterprises that are informal. The selected districts were categorized under the six regions of the country, that is; (i) Central region, where we selected two districts; Kampala city and Mukono district, (ii) Southern region, where we selected Masaka, (iii) Eastern region Iganga, Mbale, and Soroti districts were selected, (iv) Western region, Hoima and Mbarara districts were selected, (v) Northern region, where Gulu district was selected, (vi) West Nile region, where Arua district was selected. The determination of the population based on two criteria, (i) the level of entrepreneurship or business activity and (ii) the location of the district.

The sample size for each district was determined at 100 based on cluster sampling, bringing the whole sample to 1000 targeted respondents, who are business owners. However, the study was able to reach only 911 respondents who were business owners, which is 91.1% of what was expected. We targeted informal businesses based on our definition of the informal sector in section one, that is, businesses that have no tax identification number (TIN), but may or may not be registered by the local government or authority where they operate from for purposes of getting a trading permit or license. Broadening our definition to include businesses with trading licenses or permits allows us to collect a small sample of formal businesses for comparison purposes.

Our main objective of the study was to collect data for analyzing the nature of the portrait of the informal sector in Uganda, with a main focus on the characteristics of the entrepreneurs and businesses including the challenges they face. This survey provides important insights into the nature of the informal sector in the country which will enable policy makers to formulate policies that can guide the sector. Furthermore, this survey enables us to explore the nature of the sector, from the viewpoint of

business owners rather than that of households. Previous attempts to collect data on the informal sector in the country were focused on households rather than business owners. This survey fills this gap by targeting business owners. Research assistants followed business owners to sites of operation and administrated questionnaires face-to-face. To improve understanding of the research instrument, we simplified and pre-tested the questionnaires with a sample of respondents and adjusted areas that were not clearly understandable. The wording of the questions was in an acceptable form according to business owners, which helped generate honest responses. This approach has been previously described as effective in eliciting genuine responses (see Putninš & Sauka, 2011).

The questionnaires focused on the following areas: (i) district, location, legal status, and industry, (ii) general information focusing on ownership, acquisition of the business, motives of starting the business, year when business was started, education level of the owner and business experience, (iii) Infrastructure and services, (iv) output (sales and supplies), (v) Location of the operations, (vi) crime level, (vii) finance, (viii) business and government relations, (ix) labor, (x) registration (regulation), (xi) business environment, and finally (xii) assets of the business.

4.2. Descriptive statistics

4.2.1. Basic information of enterprises surveyed

To provide a clear understanding of the data, we provide a summary of the distribution of the enterprises or businesses, across the 10 districts that were surveyed, in Table 1 and in Figure 1. In Table 1, we can observe that the district of Gulu had the highest (97) of businesses surveyed, representing 10.6% of the sample followed by Kampala and Masaka, each with 95 businesses, representing 10.4% of the sample. We also report the location of the businesses surveyed (whether they are urban or rural based) in columns 8–11. We can observe that 715 enterprises were sampled from urban areas while 196 were from rural areas. We did this categorization for comparison purpose.

We provide an illustration of the data points for the main sample (excluding the categorization) in Figure 1. Figure 1, presents a similar portrait of the data as given in Table 1.

4.2.2. Employment characteristics and ownership structure of enterprises surveyed

We report the employment characteristics and ownership structure of enterprises surveyed in Table 2. The data show that 22.5% of the enterprises were owner-operated (one person enterprise), while a majority (60.81%) of them employed between two and three workers. Furthermore, 13.5% of enterprises employed between four and six workers, while a small fraction (3.18%) of the enterprises had more than six workers. The data seem to agree with the view that the informal sector employment is mainly in enterprises that are small (in terms of the number of workers) compared to large ones (Fourie, 2018). On the ownership structure, we find that 51% of enterprises were male owned compared with 49% of them that were female owned. On registration status, we asked business owners whether they were registered with any business registration body or local government or municipal council by the time they started the business. We purposively excluded businesses that had a tax identification number (TIN) because they were not considered informal. Consequently, we find that 96 (10.54%) of the businesses surveyed had "some form" of registration by either a city, municipal, or town council for purpose of operation (operational permit or trade license), while the bulk of them 815 (89.46%) were not registered. The bulk of businesses, 799 (87.71%) were started using personal resources while 57 (6.26%) were started as a result of a purchase. Similarly, 42 (4.6%) of the businesses surveyed were family businesses. Out of this number, 31 (3.4%) were joined through marriage while another 11 (1.2%) was as a result of heritage (inheritance). Finally some entrepreneurs 13 (1.43%) started their businesses by joining an existing non-family business.

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Table 1. The distribution of enterprises according to districts and business location

District	All enterprises			Urban			Rural		
	# Ent.	Mean	Std. Dev.	# Ent	Mean	Std. Dev	# Ent.	Mean	Std. Dev
All Ent.	911	1.215	0.411	715	0.785	0.411	196	0.215	0.411
Kampala	95	0.104	0.306	95	0.133	0.340	-	-	-
Mukono	89	0.098	0.297	89	0.124	0.330	-	-	-
Masaka	95	0.103	0.306	94	0.131	0.338	1	0.005	0.071
Iganga	91	0.100	0.300	57	0.080	0.271	34	0.174	0.379
Mbale	89	0.098	0.297	50	0.070	0.255	39	0.199	0.400
Soroti	89	0.098	0.297	88	0.123	0.329	1	0.005	0.071
Hoima	90	0.099	0.299	55	0.077	0.267	35	0.179	0.384
Gulu	97	0.106	0.309	81	0.113	0.317	16	0.082	0.275
Arua	91	0.100	0.300	45	0.063	0.243	46	0.235	0.425
Mbarara	85	0.094	0.291	61	0.085	0.280	24	0.122	0.329

Source: Authors' calculation from RIF data

Notes: Ent. denotes enterprises surveyed. Values in column 2, from Kampala to Mbarara, should add up to 911 enterprises, while values in column 3 should sum up to 1.

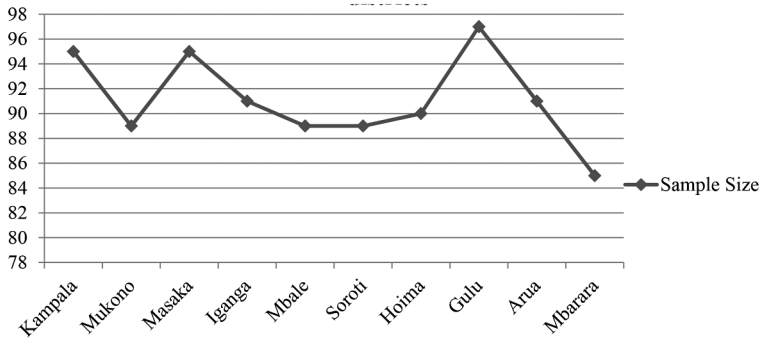

Figure 1. The distribution of enterprises according to districts.

Source: Authors' illustration from RIF data

Furthermore, we report the experiences of the businesses (owners) in panel (e). It can be seen that a majority (32.4%) of businesses had operated for a period of between one year and three years; while a small proportion (0.09%) of them were in operation for a period of between 19 and 22 years. The most experienced businesses, (1.2%) operated for a period of 25 years and above. Our analysis points to the fact that some businesses may see formalizing their businesses as a less attractive objective and would rather continue to operate without registration.

4.3. The nature of the informal sector in Uganda

4.3.1. The distribution of enterprises surveyed and their ownership status

To have a clear understanding of industries and ownership status of the enterprises, we present their distribution, according to industry affiliation, ownership and the gender of the owner of the business, in Table 3. We categorized the industries into three broad categories; (1) light manufacturing and

agro-processing; which includes food, textile, garments, perfumes and oils, fabrication, electronics, mills, chemicals, and machinery and equipment, (ii) services, includes restaurant, barber and salon, mechanics and repairs, radio repair, bicycle repair, transportation, and cobbler and shoe shiners, and finally (iii) trade, includes retail shops, produce, fish selling, eating kiosks, construction, information technology (I.T), art and crafts, flowers, and mobile money business. Of the 911 businesses surveyed, 463 (51%) were owned by men while 448 (49%) of them were owned by women entrepreneurs. We observe that the informal sector in Uganda is involved in the legal production of goods and services in a variety of industries. We note that the majority of businesses (16%) were selling essential products (retail shops) followed by those operating eating kiosks representing (8.8%). But who are the people engaged in these two leading businesses? We note that most of the informal businesses seem to offer income and survival means to people who are most vulnerable to poverty, that is, the women. We can observe that women-owned businesses are highly involved in selling essential products (retail shops) and operating eating kiosks. For example, in column 7, row 21, we can note that out of the 146 enterprises operating retail shops, 59% of them are operated by women compared to 41% that are operated by men. A similar pattern emerges from the analysis of eating kiosks. Of the 79 enterprises operating eating kiosks, 72% of them are operated by women while 28% are run by men. We observe a pattern in Uganda's informal sector that is quite similar to what is common in other countries (see Fourie, 2018). The informal sector has been shown to be heterogeneous, that is, the sector participants are engaged in a variety of activities, ranging from street vending and hawking, to retail trading, implying that the heterogeneity of the informal sector shapes its dynamics and evolution. Given the diverse nature of activities in the informal sector, we can suggest that this sector may be important in providing gainful employment and incomes to the most vulnerable segments of the population as can be seen by the number of women engaged in retail business and eating kiosks. Furthermore, Table 3 illustrates the importance of trade, compared with light manufacturing and agro-processing, and service-related activities, in providing gainful livelihood opportunities to women in the informal sector. In Table 2, comparing the surveyed enterprises in panels (a)–(c), we note the substantial contribution of trade to providing a means of survival to business owners. Of the 911 enterprises surveyed, 290 (31.83%) of them operate a business in light manufacturing and agro-processing, 190 (20.86%) operate service activities, while the bulk of the enterprises, 431 (47.31%) operate trade-related activities. This evidence underscores the importance of trade-related activities in the informal sector in absorbing the unemployed labor force.

4.3.2. The characteristics of the informal sector by the level of education

We provide the distribution of enterprises according to the education level of the owners, in Table 4. Our interest is to investigate whether enterprise selection is determined by the education level of the owner. A visual inspection of columns 5 and 6 (owners who end in primary and secondary) shows they are the most common levels of education for most business owners. Tracking our two leading enterprises, that is, retail selling and eating kiosks, we note that 43.2% of those involved in retail selling ended in secondary schools. For the case of eating kiosks, we note a comparable pattern similar to that of primary school dropouts. Relative to other levels of education, most business owners (40.5%) operating eating kiosks ended at the primary level. Two important aspects to note from Table 4 are: (i) the level of education may indicate the knowledge gap that potentially translates into the skills gap. If this assumption is plausible then we should be able to see that activities that require little knowledge or skills are dominated by entrepreneurs with low education level, possibly no education or primary school dropouts. For example, a visual inspection of the panel (b), row 6 (Cobbler/shoe shiners), shows that 51.3% of the business owners are primary school dropouts. We can note a similar pattern in the same panel, row 5 (transportation), where the majority of people operating it are primary school dropouts. One might argue that the above findings are by chance. Let us turn to the panel (c) row 3 (fish selling). We can observe similar trends, where 35.7% of those involved in it have not been to school. (ii) the more knowledge or skill required to operate a particular activity implies

Table 2. Employment characteristics and ownership structure of enterprises surveyed

Characteristics of business	# Enterprises	Percent (%) of Enter.
Panel (a) Number of employees		
One person business (owner)	205	22.50
2–3 employees	554	60.81
4–6 employees	123	13.50
More than 6 employees	29	3.18
Panel (b) Ownership structure		
Male	463	50.82
Female	448	49.18
Panel (c) Registration status at start of business		
Registered at start of the business	96	10.54
Unregistered at start and now as well	815	89.46
Panel (d) How did you acquire ownership of this business?		
Started business on their own	799	87.71
Purchased an existing business	57	6.26
Joined existing family business:	42	4.6
(i) Joined existing family business through Marriage	31	3.4
(ii) Joined existing family business through heritage	11	1.2
Joined existing non-family business	13	1.43
Panel (e): Experience (age of enterprise)		
Less than 1 year	0	0
From 1 year to 3 years	295	0.324
From 4 years to 6 years	226	0.248
From 7 years to 9 years	144	0.158
From 10 years to 12 years	128	0.141
From 13 years to 15 years	41	0.045
From 16 years to 18 years	25	0.027
From 19 years to 21 years	33	0.036
From 22 years to 25 years	8	0.009
25 years and above	11	0.012

Source: Authors' calculation from Rif data.

Note: Column 2 in each of the four panels, (a)-(d) should sum up to 911 enterprises. Panel (d) should include rows, 1,2,3 and 6. Rows 4 and 5 should be excluded from the total of 911 enterprises since they only form part of existing family businesses.

a high level of education. We take a visual inspection of the panel (a) row 5 (fabrication) which requires a specialized level of skill to engage in it. Of 28 enterprises surveyed that run fabrication workshops, 46.4% of the owners had vocational education which equipped them with the necessary skills. Similar trends can be seen from businesses operating electronics and mills where 54.5% and 50% are involved in selling electronics, respectively. Similar trends are shown by mechanics/repairs

Table 3. The distribution of enterprises according to the industry of operation and ownership status

Industry	Citizenship	# Ent	Mean	Std. Dev.	Gender	
Panel (a) Light manufacturing and agro-processing					**Male**	**Female**
Food	Ugandan	24	0.026	0.160	8	16
Textile	Ugandan	17	0.019	0.135	6	11
Garments	Ugandan	61	0.067	0.250	18	43
Perfumes/Oil	Ugandan	22	0.024	0.154	6	16
Fabrications	Ugandan	28	0.031	0.173	25	3
Electronics	Ugandan	33	0.036	0.187	25	8
Mills	Ugandan	10	0.011	0.104	9	1
Chemicals	Ugandan	37	0.041	0.197	16	21
Machinery & Equipment	Ugandan	58	0.064	0.244	27	31
Panel (b): Services						
Barber and Salon	Ugandan	65	0.071	0.257	38	27
Mechanics/Repairs	Ugandan	31	0.034	0.181	27	4
Radio repair	Ugandan	12	0.013	0.114	11	1
Bicycle repair	Ugandan	21	0.023	0.150	19	2
Transportation	Ugandan	22	0.024	0.154	21	1
Cobbler/shoe shiners	Ugandan	39	0.043	0.203	39	0
Panel (c): Trade						
Shop (Retail-essentials)	Ugandan	146	0.160	0.367	60	86
Produce	Ugandan	46	0.050	0.219	23	23
Fish	Ugandan	28	0.031	0.173	11	17
Eating Kiosk	Ugandan	79	0.088	0.283	22	57
Restaurant	Ugandan	24	0.026	0.160	7	17
Construction	Ugandan	13	0.014	0.119	9	4
Information Technology	Ugandan	26	0.029	0.166	18	8
Art nd Crafts	Ugandan	10	0.011	0.104	8	2
Flowers	Ugandan	7	0.008	0.087	2	5
Mobile money	Ugandan	52	0.057	0.232	8	44
Total		911			463	448
Percent		100%			51%	49%

Source: Authors' calculation from RIF data

(38.7%), radio repair (25%), construction (30.8%), information technology (46.2%), respectively. To conclude, the level of education is quite important in the selection of enterprises in the informal sector.

4.3.3. The characteristics of enterprises by how and why business started, and education level

We asked our respondents how the business was acquired and the motivations for starting it in the informal sector. There were four options to the first part of the question "how did the largest owner acquire this business?" The responses expected were (i) started the business on their own or with partners, (ii) purchased an existing business, (iii) Joined an existing family business, and (iv) Joined an existing non-family business. We further sub-divided response (iii) into two parts (iii.a) joined an existing family business by marriage, and (iii.b) joined an existing family business by heritage or inheritance.

Table 4. The distribution of the enterprises according to the education level of owners

Variable	No. of enter.	Proportion of enterprises	Education level				
			None	Prim.	Sec	Voc.	Univ.
Panel (a) Light manufacturing and agro-processing							
Food	24	0.026	0.250	0.125	0.292	0.083	0.250
Textile	17	0.019	0.059	0.176	0.471	0.176	0.118
Garments	61	0.067	0.033	0.098	0.361	0.311	0.197
Perfumes/Oil	22	0.024	0.045	-	0.409	0.273	0.273
Fabrications	28	0.031	0.071	0.179	0.250	0.464	0.036
Electronics	33	0.036	-	0.061	0.333	0.545	0.061
Mills	10	0.011	0.100	0.300	0.100	0.500	-
Chemicals	37	0.041	0.135	0.405	0.189	0.081	0.189
Machinery and Equipment	58	0.064	0.172	0.241	0.224	0.207	0.155
Panel (b): Services							
Berber and Salon	65	0.071	0.015	0.169	0.462	0.246	0.108
Mechanics/Repairs	31	0.034	0.097	0.161	0.226	0.387	0.129
Radio repair	12	0.013	0.250	0.250	0.250	0.250	-
Bicycle repair	21	0.023	0.286	0.429	0.143	0.143	-
Transportation	22	0.024	-	0.500	0.318	0.182	-
Cobbler/shoe shiners	39	0.043	0.385	0.513	0.077	0.026	-
Panel (c): Trade							
Shop (Retail-essentials)	146	0.160	0.034	0.199	0.432	0.151	0.185
Produce	46	0.050	0.065	0.457	0.326	0.087	0.065
Fish selling	28	0.031	0.357	0.286	0.321	0.036	-
Eating Kiosk	79	0.087	0.152	0.405	0.291	0.127	0.025

(*Continued*)

Table 4. (*Continued*)

Variable	No. of enter.	Proportion of enterprises	Education level				
			None	Prim.	Sec	Voc.	Univ.
Restaurant	24	0.026	0.083	0.167	0.333	0.208	0.208
Construction	13	0.014	0.154	0.077	0.231	0.308	0.231
Information Technology	26	0.029	0.038	0.154	0.154	0.462	0.192
Art and Crafts	10	0.011	-	0.200	0.200	0.400	0.200
Flowers	7	0.008	-	-	0.429	-	0.571
Mobile money	52	0.057	-	0.115	0.500	0.192	0.192

Source: Authors' calculation from RIF data

Note: columns 2 and 3 should add up to 911 and 1 respectively. The remaining columns 4–8 should be added row wise and should sum up to 1.

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The second part asked "which of the following options best describes why the largest owner started or took over the business-motivation for starting the business?" There were three responses required, (i) To take advantage of a business opportunity, (ii) Jobs or opportunities were absent or scarce, and finally (iii) the job I was in was not satisfactory. We report the results of the responses in Table 5. We can observe from column 2 that 799 enterprises, representing 87.7% of businesses surveyed started the business on their own while 6.3% purchased existing businesses. Additionally, 4.6% joined an existing family business while1.4% of them joined an existing non-family business. Of the 4.6% business owners who joined an existing family business, 3.4% of them were as a result of marriage union between the partners, while 1.2 were through heritage. Of the entrepreneurs that started businesses on their own, a majority of them (32.9%) were by secondary school dropouts followed by primary school dropouts (25.4%).

Next, we establish what the main reasons or motivations are for starting the business in the informal sector. Panel (b), column 3, row 1, shows that 46.7% of the business owners expressed wanting to take advantage of a business opportunity as a reason for starting their business in the informal sector. Correspondingly, 50.7% started their businesses for lack of employment opportunities in the formal sector while 2.6% suggested the employment they had was not satisfactory or at least not paying them what they expected. Interestingly, we observe that entrepreneurial spirit is more pronounced in secondary school dropouts than those with higher levels of education, like vocational and university degrees. This could possibly indicate that necessity entrepreneurship might be strong among secondary school dropouts compared to those with vocational and university education. In line with the above argument, the results might also suggest that the education system might be offering skills that are not relevant to the entrepreneurial development process but rather job seeking. However, this assumption may require empirical evidence to validate. A clear picture that emerges from Table 5 is that the informal economy activities in the country might be as a result of

Table 5. Acquisition and motivation for starting a business by the education level of owner

Variable	# Ent.	Prop. enter.	Education level				
			None	Prim.	Sec	Voc.	Univ.
Panel (a) How was business started?							
Started business on their own	799	0.877	0.108	0.254	0.329	0.190	0.119
Purchased existing business	57	0.063	0.018	0.088	0.421	0.263	0.210
Joined an existing family business:	42	0.046	0.048	0.191	0.381	0.190	0.190
Joined an existing family business by Marriage	31	0.034	0.032	0.226	0.419	0.161	0.162
Joined an existing family business by heritage	11	0.012	0.091	0.091	0.182	0.364	0.272
Joined existing non-family business	13	0.014	0.154	0.077	0.231	0.385	0.153
Panel (b) Reasons for starting business							
To take advantage of a business opportunity	425	0.467	0.100	0.238	0.336	0.198	0.129
Jobs or opportunities in formal sector were rare	462	0.507	0.100	0.238	0.336	0.198	0.128
The employment I was in was not satisfactory	24	0.026	0.099	0.235	0.332	0.195	0.128

Source: Authors' calculation from RIF data

Note: Panels (a) and (b) column 2, should each sum up to 911 enterprises. Similarly, column 3, should also sum to 1. However, the columns under education level should be summed up row wise, where each row should add up to 1.

both wanting to take advantage of existing business opportunities and the lack of employment opportunities. We find a slight difference between the two, where lack of employment opportunities thinly dominates wanting to take advantage of a business opportunity. This could indicate that most Ugandans seem to embrace entrepreneurship development rather than wait for employment opportunities to open up in the formal sector. Finally, our data seem to provide evidence that a few people are unlikely to start a business because their previous employment was not offering good compensation for their labor. Of the 911 businesses surveyed, only 24 (2.6%) were started because previous employment was not satisfactory. The data suggest secondary school dropouts (33.2%) are the most affected in this category.

4.3.4. The characteristics of enterprises by how and why business started, by education of owners

We disaggregate the education level by gender and report the results in Table 6. From columns 5 and 10 (secondary education level for both male and female business owners), we can note key differences. Of the enterprises started by secondary school dropouts who are men, 16.3% started the business on their own. However, this value is slightly higher for women-owned enterprises. Of the enterprises started by secondary school dropouts who are women, 16.7% started the business on their own. We also note that men are more likely to purchase an existing business than women. For example, of the enterprises acquired through purchase, 29.8% were purchased by secondary school dropouts who are men compared to 12.3% purchased by women. Another interesting pattern we can note from Table 6 is the acquisition of an existing family business. We observe that, of the existing family businesses joined by secondary school dropouts, 19.4% and 22.6% are by men and women, respectively. We find that the probability of joining an existing family business through marriage increases with gender being female. This is in contrast with the probability of joining a family business through heritage. Of the businesses acquired by secondary school dropouts through heritage, 12.9% are by men while 9.1% are by women. This might be an indication of resource allocation between genders with business owners tending to prefer their businesses to be inherited by boys compared to girls. If this assumption is credible, then our data might be pointing towards this direction.

On the motivation of starting the business, panel (b) rows 1–3 provide a summary of the motives by the education level of the business owner. In row 1, columns 5 and 10 show how secondary school dropouts contribute substantially to business formation, by motives. Of the businesses started because the owner wanted to take advantage of business opportunity, 15.3% were started by men while 18.4% were by women. A high percentage of women were able to recognize a business opportunity compared to men. However, men who were secondary school dropouts were four times (18.8%14.9%) more likely to start a business because of limited employment opportunities in the formal sector than women who had dropped out of secondary education. This can be seen from the difference of 4 percentage points in their responses.

4.4. Results and discussion

4.4.1. Obstacles faced by businesses in the informal sector

In this section, we report the determinants of obstacles faced by business owners, in Table 7, and the average marginal effects in Table 8. We denote a business that is unregistered by an indicator variable equal one, and zero otherwise. Similarly, we assign value one if the business operates in an urban area and zero otherwise. For businesses that are owned by women, we code them as one and zero otherwise. In all our econometric specifications, we include regional and industry dummies to control for regional and industry differences. In Table 7, columns (2)–(4) we report the estimates when outcome variables are: registration status of the business, urban, and female ownership, respectively. In these columns, we can observe that lack of access to finance is a significant obstacle to informal businesses in Uganda regardless of the location of the business

Table 6. Acquisition and motivation and education level disaggregated by gender

Education level by gender

Acquisition	# Ent.	Male					Female				
		None	Prim.	Sec.	Voc.	Univ.	None	Prim.	Sec.	Voc.	Univ.
Panel (a) How business was acquired			0.140	0.163	0.100	0.050	0.054	0.114	0.167	0.090	0.069
Started business on their own	799	0.054	0.140	0.163	0.100	0.050	0.054	0.114	0.167	0.090	0.069
Purchased existing business	57	-	0.035	0.298	0.070	0.088	0.018	0.053	0.123	0.193	0.123
Joined existing family business	42	0.024	0.095	0.190	0.119	0.071	0.024	0.095	0.190	0.071	0.119
Joined exist. family bus. by Marriage	31	-	0.097	0.194	0.065	0.129	0.032	0.129	0.226	0.097	0.032
Joined existing family bus. through heritage	11	0.091	0.091	0.129	0.0182	0.091	-	0.091	0.091	0.182	0.182
Joined non-family business	13	0.154	0.077	0.077	0.231	0.154	-	-	0.154	0.154	-
Panel (b) Reasons for starting business											
To take advantage of a business opportunity	425	0.059	0.122	0.153	0.089	0.047	0.071	0.101	0.184	0.099	0.075
Jobs or opportunities in formal sector were rare	462	0.041	0.141	0.188	0.108	0.065	0.032	0.115	0.149	0.087	0.074
The employment I was in was not satisfactory	24	0.083	0.083	0.167	0.167	0	0	0.083	0.125	0.250	0.042

Source: Authors' calculation from RIF data

Note: Panels (a) and (b) column 2, should each sum up to 911 enterprises. However, columns under education level should be summed up row wise, where each row should sum up to 1.

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Table 7. Obstacles faced by businesses in the informal sector

Variable	(a)	(b)	(c)
Access to finance	−0.581**(0.298)	−0.505**(0.215)	−0.135*(0.064)
Access to land	-	-	−1.038*(0.625)
Crime, theft and disorder	−0.838**(0.354)	−0.682**(0.268)	0.363 (0.230)
Electricity	−1.286***(0.330)	−0.794***(0.240)	−0.272* (0.200)
Political instability	0.667(0.502)	0.450(0.505)	0.004 (0.216)
Transport	−0.023(0.531)	−0.613**(0.303)	0.098(0.256)
Water	−0.130***(0.039)	−0.136***(0.036)	0.030 (0.021)
Taxes	−0.766***(0.286)	−0.200(0.268)	−0.252 (0.236)
Fees for registration	−0.202(0.139)	−0.131(0.108)	−0.195**(0.095)
Information on registration	−0.165(0.185)	−0.557***(0.140)	−0.001 (0.130)
Burdensome inspections by regulators	−0.567*** (0.170)	−0.429***(0.130)	−0.050 (0.124)
Informal gifts asked	−0.372** (0.158)	0.106(0.139)	-
Industry dummies included	Yes	Yes	Yes
Regional dummies included	Yes	Yes	Yes
Pseudo R^2	0.188	0.160	0.029
Constant	1.167***(0.329)	2.341***(0.283)	0.156(0.198)
Number of observations	910	910	910

Note: Model (a) uses registration status of business as dependent variable, model (b) uses urban as dependent variable, and model (c) uses female as dependent variable. The dependent variables are indictor variables; for model (a) the business is coded one if it's unregistered, zero otherwise. Similar coding follows for models (b) and (c). Business is coded one if its operations are in urban area, zero otherwise; Businesses owned by female is coded one, and zero otherwise. Standard errors are in brackets and significance levels are: * p <.1; ** p < .05; *** p < .01

operations and female ownership. Furthermore, female-owned businesses perceive a lack of access to land as a statistically significant impediment to the success of their businesses. We can also note that across all the three econometric specifications, crime, theft, and disorder is a significant impediment to business success in the informal sector.

Conversely, political instability, across all the three specifications, is not a significant hindrance to the success of the informal sector in Uganda. Correspondingly, transport is seen only by the urban informal economy as a significant barrier. Furthermore, we also find evidence that water, taxes, burdensome inspections by the authorities, and informal gifts asked from the informal sector actors are significant obstacles that businesses in the sector experience. Similarly, businesses operating in urban areas do perceive water, information required to complete registration, and burdensome inspections by authorities as hurdles they face in their operations. However, we see the difference between women-owned enterprises and the others. We can note that women-owned enterprises are significantly affected by lack of access to finance, lack of access to land, limited electricity access, and fees to be paid to complete the registration of the business.

As conjectured in our methodology section, we can observe that the bulk of the variables (obstacles to the informal sector) are significant determinants that limit the operations of businesses in the informal sector. Studies on the entrepreneurs in Ghana have indeed shown that the above obstacles pose serious limitations to the success of the sector. For example, Robson and Obeng (2008) study

500 entrepreneurs from the regions of Ghana and find evidence of a systematic relation between some of the above variables and the growth of businesses. Similarly, Peprah et al. (2019) analyze the characteristics and challenges faced by women entrepreneurs engaged in the informal sector of Ghana and find evidence that more than 30% of the businesses surveyed expressed the above variables as obstacles they faced in their operations. Furthermore, Sasidharan and Rajesh Raj (2014) investigate the barriers hindering the growth of the informal sector in India and find a shortage of electricity as a very severe limitation to the growth of the informal sector.

Next, we present and discuss the average marginal effects in Table 8. We note that access to finance is a serious and significant limitation to the operations of businesses in the informal sector. If access to finance improves, there is a probability that business operations might succeed and expand both horizontally (to include other branches) and vertically (broadening the product scope or range of products). Our results show that, all else equal, a one unit increase in access to finance decreases the probability of business failure in the informal sector by 0.088 significant at 5 percentage level. Lack of access to finance implies that businesses cannot acquire the much-needed financing to expand their operations. Furthermore, we note that access to financing is a more pronounced factor for urban-based businesses compared to rural ones. We find that a one unit increase in access to finance reduces the severity of financing obstacle by 0.123 in businesses whose operations are in urban areas. We also find that women-owned businesses are more likely to benefit from increased access to finance than male owned. For women-owned enterprises, a one unit increase in access to finance reduces financing obstacle, by 0.052, all else equal and significant at 10 percentage level. Similarly, we find that increasing access to land for women-owned enterprises reduces the probability of land being an obstacle, by 0.401, all else equal and significant at 10 percentage level. These findings are consistent with the evidence in Peprah et al. (2019) and Robson and Obeng (2008).

Table 8. Average marginal effects of obstacles faced by businesses in the informal sector

Variable	(a)	(b)	(c)
Access to finance	−0.088**(0.045)	−0.123**(0.052)	−0.052*(0.004)
Access to land	-	-	−0.401*(0.240)
Crime, theft and disorder	−0.127**(0.053)	−0.166**(0.065)	0.140 (0.088)
Electricity	−0.194***(0.050)	−0.193***(0.057)	−0.105* (0.040)
Political instability	0.101(0.076)	0.120(0.123)	0.001 (0.083)
Transport	−0.003(0.080)	−0.149**(0.073)	0.036(0.099)
Water	−0.020***(0.006)	−0.033***(0.009)	0.012 (0.008)
Taxes	−0.766***(0.286)	−0.049(0.065)	−0.097 (0.091)
Fees for registration	−0.202(0.139)	−0.032(0.026)	−0.096**(0.037)
Information on registration	−0.025(0.028)	−0.136***(0.033)	−0.001 (0.050)
Burdensome inspections by regulators	−0.086*** (0.026)	−0.104***(0.031)	−0.019(0.048)
Informal gifts asked	−0.056** (0.023)	0.026(0.0.034)	-
Industry dummies included	Yes	Yes	Yes
Regional dummies included	Yes	Yes	Yes
Number of observations	910	910	910

Note: Models (a)-(b) are labeled as before. Standard errors are in parenthesis and significance level: * p < .1; ** p < .05; *** p < .01

Correspondingly, we observe that crime, theft, and disorder are significant obstacles to the operation of informal sector businesses, especially those that operate in urban areas. We find that a one unit increase in the level of crime, theft, and disorder significantly decreases the success of informal sector businesses by 0.127 and 0.166 for urban-operated businesses. We note that crime, theft, and disorder are serious obstacles that can retard the growth of any business because of the associated challenges. This finding seems to provide the first evidence of the significance level of the above variable. Previous studies, to the best of our knowledge, have not quantified the effect of crime, theft, and disorder on the success of business operations in the informal sector. Similarly, a shortage in electricity supply is a significant obstacle to informal sector businesses. Our results show that, all else equal, a one unit rise in the electricity supply reduces obstacles to electricity in the informal sector by 0.194, and 0.193 for urban-operated businesses. We also find similar trends in women-owned enterprises, where an increase in the supply of electricity reduces the probability of failure of business operations by 0.105, significant at 10 percentage level. This finding is in line with previous studies that have indicated the importance of electricity in the growth of small businesses and those in the informal sector of the economy (see Coad & Tamvada, 2012). We note that electricity is a significant component of the production process in the informal sector. Increasing its supply to this sector leads to improvement and a reduction in the number of obstacles facing the informal sector in the country.

Analogously, we find evidence of a significant effect of a shortage in water supply and taxes on the operations of the informal sector. Our results show that increasing water supply reduces the probability of it being an obstacle by 0.020, all else equal and significant at 1 percentage level. Similarly, improving the tax environment for the informal sector reduces the taxes being seen as an obstacle by 0.766, all else equal and significant at 1 percentage level. A number of studies have shown how taxes are a serious obstacle to the growth of businesses in the informal sector. Our results seem to suggest that taxes are perceived negatively by actors in the sector. This finding is consistent with other previous studies showing that taxation is a significant determinant of the informal sector growth (see Dell'Anno, 2016; Neck et al., 1989; Schneider, 1986).

Correspondingly, we also find that burdensome inspections by the regulators and informal gifts being asked from informal businesses significantly affect the growth of these businesses. We show an increasingly burdensome inspection by regulators reduce the growth and success of informal sector businesses by 0.086, and 0.104 for urban businesses. The results seem to suggest that burdensome inspection might be a common practice in urban compared to rural areas. The implication of this finding is that burdensome inspections by regulars perpetuate the existence of informal business on account that most of the informal businesses cannot afford standard operating procedures. Any breaches of the required standard operating procedures attract some fines and penalties. Businesses with inadequate resources to cover the required standard operating procedures may try to circumvent these inspections by staying "underground" to avoid being detected by the regulators. This may mean that there will still be a large number of informal businesses that continue to operate unregistered for fear of the burdensome inspections. This retards their progress and transition to formality (Arsić et al., 2015). These results agree with previous studies that show that a more burdensome regulatory framework seems to propagate informality (see Buehn & Schneider, 2013; De Soto, 2001; Johnson et al., 1998a; Loayza, 1996; Schneider, 2005; Swedish International Development Cooperation Agency (Sida), 2004).

In summary, our results show that the informal sector in Uganda is quite substantial in terms of the production of goods and services and absorbing the unemployed. Consequently, effort should be directed at formulating a regulatory framework that supports the growth and formalization of informal sector businesses. Improving access to finance, providing regular power and water supply, and improving the tax regime would mitigate the obstacles faced by informal businesses in the country. Furthermore, improving the business environment, by reducing the levels of crime,

Table 9. Obstacles faced by businesses in the informal sector

Variable	(a)	(b)	(c)
Access to finance	0.208(0.293)	−0.111**(0.042)	−0.385**(0.174)
Access to land	1.648***(0.630)	1.383***(0.402)	−0.039**(0.009)
Crime, theft and disorder	−0.210(0.310)	−0.357(0.249)	−0.187 (0.182)
Electricity	−0.970***(0.275)	−0.126**(0.021)	−0.404**(0.179)
Political instability	1.648(0.630)	1.826***(0.003)	−0.289 (0.208)
Transport	-	-	-
Water	−0.297***(0.079)	−0.269***(0.066)	−0.063* (0.035)
Taxes	−0.766***(0.286)	−0.198(0.440)	−0.447 (0.381)
Fees for registration	−0.417*(0.261)	−0.254*(0.180)	−0.220*(0.125)
Information on registration	−0.335**(0.134)	−0.952***(0.243)	−0.013 (0.208)
Burdensome inspections by regulators	−1.203*** (0.473)	−0.714***(0.220)	−0.029 (0.201)
Informal gifts asked	−0.722** (0.298)	0.065(0.249)	−0.164(0.195)
Industry dummies included	Yes	Yes	Yes
Regional dummies included	Yes	Yes	Yes
Pseudo R^2	0.184	0.178	0.028
Constant	0.975**(0.417)	2.913***(0.408)	0.561**(0.255)
Number of observations	910	910	910

Note: Estimation is done using a Logit model. Models (a)-(b) are labeled as before. Standard errors are in parenthesis and significance level: * p < .1; ** p < .05; *** p < .01

the number of inspections required before a business is registered, and addressing corruption would also stimulate the growth and formalization of informal businesses in the country. For the women-owned businesses, providing access to working space (land), electricity, reducing fees required to complete registration would go a long way in strengthening entrepreneurial development among women. Informal sector business should not be seen as "illegal entities" but rather complementary effort by an increasingly enterprising population in the country.

4.4.2. Robustness checks

As a way of robustness check, we estimate our main equation using a logit model and report the results in Table 9. As can be seen in that table, our results remain qualitatively and quantitatively similar to what we reported in Table 7. We can scan through our previously robust results, that is, access to finance, electricity supply, and water supply. Although access to finance in the model (a) is not significant and has an unexpected sign, it becomes significant in models (b) and (c). Correspondingly, electricity is robust across all the three specifications implying that it is a significant obstacle faced by businesses operating in the informal sector. Table 9 also shows robust results for water and working space (access to land). Overall, the results shown in Table 9 mirror what Table 7 shows, and gives credence to our findings. We also report a correlation matrix in the Appendix 1, Table A1.

5. Conclusion

This paper presents the portrait of the informal sector in Uganda, focusing on the obstacles that hinder the formalization. The data we use were collected as part of the research project "The informal sector in Uganda" funded by the government of Uganda under the Research and

Innovation Fund (RIF) activities administered by Makerere University. Our findings reveal interesting facts about the informal sector and the obstacles the sector faces.

First, we find that Uganda's informal sector is heterogeneous in terms of the products and services being produced. The sector participants are engaged in a variety of activities, ranging from street vending and hawking, to retail selling. This suggests that the diverse components of heterogeneity do drive the dynamics and evolution of the informal sector in Uganda. We find evidence of a skills-gap in the selection of enterprises. For example, most of the businesses, like eating kiosks, fish selling, shoe shining among others, that require no specialized skill to operate were mainly run by primary school dropouts and those with no formal level of education. The implication of the above finding is that the more knowledge or skill required to operate particular activity the higher the level of education. We also find that this sector is important in providing gainful employment and incomes to the most vulnerable segments of the population.

Second, we find evidence of a strong entrepreneurial spirit among secondary school dropouts than any other level of education. Across all the industries and services surveyed, secondary school dropouts created a substantial number of enterprises in the informal sector. Evidence suggests that their motivation is driven by two key factors, namely; wanting to take advantage of an existing business opportunity and failure to find employment in the formal sector. Moreover, a small fraction of businesses that was started in the informal sector was as a result of the owner being unsatisfied with previous employment. This implies that most Ugandans seem to embrace entrepreneurship development rather than wait for employment opportunities to open up in the formal sector. Further, we find that the bulk of the secondary school dropouts started their businesses on their own and making the best use of the available resources they saved.

Third, our empirical analysis shows that access to finance, crime, theft and disorder, electricity, water, taxes, burdensome inspections, and informal gifts (corruption) are robust and significant obstacles to the operations of the informal sector in Uganda. However, we observe differential effects in their severity across the location of the business operations and gender of the business owner. Access to finance and electricity supply is found to be robust obstacles regardless of where the business operated from and the gender of the business owner. This might be due to the fact that both access to finance and electricity supply is significant components of the production process in the informal sector. Improving access to these components of the production process would indeed revitalize the informal sector operations.

Conclusively, policies aimed at job creation and poverty reduction should be directed at a regulatory framework that supports the sector to create secure livelihoods and generate employment opportunities for the unemployed rather than seeing the sector as a source of "illegality." Improving access to finance, providing regular power and water supply, and improving the tax regime would mitigate the obstacles faced by informal businesses and their possible formalization. Furthermore, improving the business environment, by reducing the levels of crime, the number of inspections required before a business is registered, and addressing corruption would also stimulate the growth and formalization of informal businesses in the country. For the women-owned businesses, providing access to working space (land), electricity, reducing fees required to complete registration would go a long way in strengthening entrepreneurial development among women. Informal sector business should not be seen as "illegal entities" but rather a complementary effort by an increasingly enterprising population in the country. One limitation of this paper is that it does not examine the employment dynamics in the informal sector. This could be one avenue for future research that might provide promising results.

Acknowledgements
We acknowledge the support of the government of Uganda to Makerere University Research and Innovation Fund a special research fund to the University for Novel Research and Innovative ideas. We also appreciate comments provided on earlier drafts of this paper that enabled us to write the final copy. The rest of the errors and omissions are ours.

Funding
This research was supported by the Research and Innovation Fund, Makerere University under Grant number RIF1/CoBAMS/010.

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Disclosure statement
The authors declare no potential conflict of interest in this research, authorship, or publication of this paper.

Citation information
Cite this article as: The portrait of Uganda's informal sector: What main obstacles do the sector face?, Salmon Mugoda, Stephen Esaku, Rose Kibuka Nakimu & Edward Bbaale, *Cogent Economics & Finance* (2020), 8: 1843255.

Notes
1. We use the concept informal economy to refer to informal sector. The two concepts are used interchangeably, and they refer to the same thing in this paper.
2. The sector is sometimes referred to as the shadow or underground economy (see Dell'Anno, 2016; Goel et al., 2019; Schneider, 2005).

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Appendix 1. Correlation matrix of the main variables used in the regression model

Table A1. Correlation matrix for main variables

	Finance	Land	crime	Electric	Pol.	Trans.	Wat.	Tax	Fees	Info.	Inspect.	Gifts
Finance	1											
Land	−0.097	1										
Crime	−0.317	−0.022	1									
Electric	−0.422	−0.029	−0.094	1								
Pol.	−0.412	−0.029	−0.093	−0.124	1							
Trans.	−0.256	−0.018	−0.057	−0.076	−0.075	1						
Wat.	−0.128	0.023	0.093	0.096	−0.402	−0.031	1					
Tax	−0.089	0.060	−0.001	0.088	−0.027	−0.040	0.064	1				
Fees	0.118	−0.027	0.025	−0.041	−0.182	0.093	0.139	−0.091	1			
Info.	0.016	−0.031	0.006	0.024	−0.023	−0.017	−0.022	−0.035	0.163	1		
Inspect	−0.012	0.042	0.100	0.048	−0.128	0.030	0.086	0.108	0.034	−0.057	1	
Gifts	0.116	0.003	−0.003	−0.054	−0.111	0.013	0.124	−0.013	0.189	0.049	−0.034	1

Source: Authors' calculation from RIF data.

***Cogent Economics & Finance* (ISSN: 2332-2039) is published by Cogent OA, part of Taylor & Francis Group.**