

ICT access and usage among informal businesses in Africa

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Abstract

Purpose – *The purpose of this paper is to analyse the extent to which informal businesses employ information and communication technologies (ICTs) in their daily activities and the challenges they face in making use of ICTs.*

Design/methodology/approach – *The study uses nationally representative data for informal businesses in residential and semi-residential areas, as defined by national census sample frames for nine African countries.*

Findings – *The results show that mobile phones remain the most commonly used ICT among informal businesses, while the use of other ICTs, such as fixed-line telephones, computers and the internet remains negligible. Businesses were found to communicate more with their suppliers than with their customers via mobile phone. The lack of use of the different kinds of ICTs was attributed to issues around need, affordability, availability and access.*

Research limitations/implications – *The data are not representative of formal businesses.*

Practical implications – *There is little money to be wasted on gadgetry in the informal sector and only technologies that add value (i.e. bring in money in the short term) will be used. There is the need to be concerned about creating a business environment that allows informal businesses that have the skills and ambition to grow and become formal and sustainable. ICTs, in particular the mobile phone and mobile internet, have the potential to facilitate this. ICTs may allow for a deepening of the distribution and procurement channels of businesses. Doing business over distance could become more affordable through the mobile phone and mobile money.*

Social implications – *Policy makers have many choices in addressing affordability and access to ICTs in the informal sector, ranging from introducing competition and removing import duties on prepaid airtime, to supporting mobile application development for informal businesses in general.*

Originality/value – *This paper uses primary data that allow a better understanding of informal businesses and their use of and access to ICTs. It adds to the literature on the informal sector in which Africa's poor find their livelihood and from which base the formal economy operates.*

Keywords *Africa, Telecommunication services, Communication technologies, Information technology, Informal businesses, Mobile phones, Internet, Computers, Fixed-line*

Paper type *Research paper*

Introduction

The informal economy, originally thought of by many as a temporary stage in developing economies, has continued to expand over the years. It was believed that as developing countries went through industrial development, the informal sector would gradually fade away (Flodman-Becker, 2004). In the theoretical model developed by W. Arthur Lewis in the mid-1950s, it was assumed that the unlimited supply of labour in developing countries would eventually be absorbed into the formal economy as the industrial sector expanded. Failure of the market to absorb this excess supply of labour has resulted in an informal sector that has continued to grow in both the urban and rural areas, with the excess labour force creating its own forms of livelihood.

Most informal businesses show a preference for expanding horizontally by diversifying their interests rather than attempting to become formal (Flodman-Becker, 2004). The lack of transition from the informal to the formal sector has often been attributed to the challenges encountered by businesses in the informal sector. Most governments have rigorous tax laws, labour laws and standard procedures for business registration, and these frequently prevent informal businesses from venturing into the more formal setting. Lack of access to finance and other resources also hinders the transition of businesses from informal to formal (Esselaar *et al.*, 2006). Some businesses, however, prefer to remain informal for various reasons.

There has been a general consensus for some time on the role that information and communication technologies (ICTs) play in promoting economic development and enhancing business activities. In many developing economies, ICTs have become the focus as a means of reducing poverty, promoting businesses and encouraging competitiveness in the global economy. It is envisaged that ICTs enable informal businesses to save money and travel time, compare prices, transact with existing customers and increase their customer network (Donner, 2007). While ICTs have become more affordable in recent years, and the informal sector has employed ICTs as a means to conduct business, the gap in the use of these devices is still great.

This paper carries out an analysis of the usage of ICTs among informal businesses, with a particular focus on the extent to which ICTs are employed in conducting business activities, the willingness of businesses to employ ICTs and the challenges they face in the process.

Business classification

Use of the International Standard Industrial Classification (ISIC) is not suitable for informal businesses in Africa, as informal businesses may be engaged in various activities and are less specialised than businesses from developed economies. A farmer growing pineapples in Ghana, for example, may also produce pineapple juice and sell it at the local market. His activities, thus, spread across the primary, secondary and tertiary sectors (farming, manufacturing and services).

Classifying businesses as small and medium enterprises (SMEs) is also not ideal for developmental purposes. For example, a dental practice and a law office are small businesses but they are formal, have bank accounts, provide their employees with written contracts and know how to get relevant information for their business, as opposed to a small hair dressing salon in a township.

Classification into informal and formal is more suitable for policy purposes, since the terms identify marginalised businesses most precisely and help to develop target policies for creating jobs for the poor.

At present, there is little agreement on standards used to determine whether a business is formal or informal (Donner and Escobari, 2010). Generally, informal operators and informal businesses can be characterised by engaging in business activities with the aim of generating enough income for day-to-day consumption, rather than growing a business that generates a sustainable stream of income. They usually do not distinguish between business and personal finances.

Informal businesses typically are unregistered and usually operate from temporary structures. The difference between an informal business and an informal operator is that the later does not have a fixed business location, whereas the former often does, even if it is regularly disassembled and reassembled.

Key characteristics of the informal sector include ease of entry, a low resource base, family ownership, labour intensiveness, adapted technology and the use of informal methods for acquiring skills. All these activities contribute to the growth of economies, despite their unofficial nature (Garcia-Bolivia, 2006).

The size and scope of informal economic activity is dependent upon the levels of poverty and unemployment in a given country (Morris *et al.*, 1996). Other factors contributing to the size of the informal sector are rigid labour laws and a banking sector that is not equipped to serve informal businesses and the poor.

Definitions of various kinds have been used to define the informal business sector. An International Labour Organisation (ILO) definition of 1972 describes the informal economy as a separate, marginal economy that is not directly linked to the formal economy and that provides income or a safety net for the poor (ILO, 1993). Informality is generally associated with factors such as non-compliance with government regulations (including registration, adherence to labour regulations and payment of taxes), the size of a firm, resource endowment, whether the business is capital and labour intensive, the location of the business, the ownership of the business and characteristics of the workforce (Ishengoma and Kappel, 2006).

A more recent definition describes the informal sector as one in which economic activity is not, or is insufficiently, covered by formal arrangements (Flodman-Becker, 2004). In general, the characteristics by which informal businesses have often been classified include non-compliance with registration requirements, tax regulations and conditions of employment.

The fundamental difference between a formal and an informal business lies mainly in legal issues. It is often mandatory that a formal business pays its taxes and is officially registered for Value Added Tax (VAT) and, as such, tends to maintain financial records. An informal business, on the other hand, is seldom, if at all, registered for VAT and tends to avoid any form of tax payment.

This study adapted the Esselaar *et al.* (2006) approach in classifying businesses by means of an index (see Table I). Businesses are classified into informal, semi-formal and formal, based on form of ownership, tax registration, employment contracts and the separation of

Table I Calculation of the formality index

Index components	Index value	Share of businesses in a country with an index component match								
		Uganda (%)	Tanzania (%)	Rwanda (%)	Ethiopia (%)	Ghana (%)	Cameroon (%)	Nigeria (%)	Namibia (%)	Botswana (%)
<i>Form of ownership</i>										
Sole proprietor/Partnership	0	99.9	99.8	99.4	99.5	98.4	99.5	98.4	99.6	97.1
Close corporation/Pty Limited	0.5	0.1	0.2	0.6	0.5	1.6	0.5	1.6	0.4	2.9
<i>Pays tax on its profits (IRS)</i>										
No	0	75.2	73.1	77.9	95.9	71.5	74.3	80.2	86.2	87.1
Yes	0.5	24.8	26.9	22.1	4.1	28.5	25.7	19.8	13.8	12.9
<i>Registered for VAT/sales tax</i>										
No	0	76.0	78.4	85.7	98.4	78.0	78.2	92.3	87.5	86.9
Yes	1	24.0	21.6	14.3	1.6	22.0	21.8	7.7	12.5	13.1
<i>Employees with written employment contract</i>										
None	0	93.9	92.0	95.1	99.4	93.2	95.9	95.0	81.8	83.7
One or more	1	6.1	8.0	4.9	0.6	6.8	4.1	5.0	18.2	16.3
<i>Separate business from personal finances</i>										
No	0	58.9	19.7	68.0	97.8	74.8	76.0	71.7	73.7	53.2
Yes	0.5	41.1	80.3	32.0	2.2	25.2	24.0	28.3	26.3	46.8
<i>Type of financial records kept by business</i>										
None	0	48.0	53.7	55.9	96.8	75.3	81.7	78.1	42.1	53.5
Simple bookkeeping	0.5	48.7	40.1	42.8	3.1	22.7	15.6	20.2	49.4	37.8
Double entry bookkeeping	1	2.3	5.1	1.1	0.1	1.8	1.6	1.6	8.1	3.5
Audited financial statements	2	1.0	1.0	0.2	0.0	0.2	1.2	0.1	0.5	5.3
<i>Maximum possible value</i>	5.5									

personal from business finance. Using three categories instead of just formal and informal aims to capture all those businesses that strive to grow and become formal but have not yet achieved it entirely.

The form of ownership allows for classification into Proprietary (Pty) Limited companies and close corporations (CCs), which need to be registered with a government ministry like the Ministry of Finance or the Ministry of Trade and Industry. Other businesses are classified into sole-proprietors and partnerships, which do not necessarily need to be registered with a government entity.

The VAT regime is a more adequate measure for formality than just an income tax registration, since the handling of VAT requires more sophisticated financial record-keeping and accounting, which is further indication of the level of formality of a business. Informal businesses are usually not registered for VAT. Some may be registered for income tax and, as such, are capable of simple bookkeeping. In Cameroon, street vendors are required to buy a tax stamp, making them official taxpayers. The vendors are then legal in terms of tax, yet still are not registered for VAT and are not required to keep records. Based on the index developed in this study, these vendors are classified as informal businesses.

Bookkeeping, itself, is a further index factor for classification and has been divided into simple bookkeeping, double-entry bookkeeping and audited annual financial statements. Businesses with a more formal set-up have all of their financial transactions strictly separated from personal financial matters. Another variable used to establish the extent of formality of a business is a written employment contract for employees. This allows employees to enforce their rights and minimum wages, as stipulated in labour laws.

The variables used to distinguish the level of business formality have been given values, as indicated in Table I, with the maximum possible value set at 5.5 points. The study categorises businesses on the basis of these values into informal, semi-formal and formal businesses. Tables I and II show the range of the index points through which the formality index was obtained, the share of each country for each index component and the final classification.

The classification shows that, for all the countries, more than 90 per cent of the sampled businesses fall into either the informal or semi-formal categories. The analysis in this paper, therefore, focuses only on informal and semi-formal businesses. Formal businesses are excluded from the analysis, since our results would not be representative for this category, due to using a population census sample frame that excludes commercially zoned areas.

Entrepreneurship

Linked to business classification is the understanding of the drivers behind starting and running a business. Businesses have been classified as being driven by necessity or by opportunity, that is by being either pushed or pulled into entrepreneurship (Harding *et al.*, 2006; Minniti *et al.*, 2006; Smallbone and Welter, 2004). The notion of necessity refers to

Table II Distribution across formality classification

<i>Index points</i>	<i>Informal</i> ≤ 1.5 (%)	<i>Semi-formal</i> 2-3 (%)	<i>Formal</i> ≥ 3.5 (%)	<i>Total sample</i>
Uganda	86.40	12.90	0.70	500
Tanzania	77.80	17.70	4.50	491
Rwanda	91.10	8.20	0.70	640
Ethiopia	99.10	0.80	0.10	841
Ghana	85.70	11.50	2.80	500
Cameroon	87.90	10.00	2.10	520
Nigeria	91.50	7.80	0.70	554
Namibia	81.90	12.40	5.70	374
Botswana	80.60	10.50	8.90	379

when “entrepreneurs are pushed into entrepreneurship because all other options for work are absent or unsatisfactory”, while opportunity refers to “entrepreneurs who seek to exploit some business opportunity” (Williams and Nadin, 2010).

It is contended, however, that the assumption that necessity is the motivation for entering into an informal business tends to oversimplify the complex motives for entrepreneurship in the informal sector. Williams and Nadin (2010) show that not all businesses conducted off the books are necessity businesses, and that the necessity/opportunity dichotomy is too simplistic to capture the motives behind entrepreneurship.

The “push-and-pull” classification, based on the motivating factors for starting a business, has been employed in this study to better understand how these factors influence the use of ICTs for business purposes. These terms have been re-conceptualised into necessity and opportunity.

For the purposes of this paper, the group classified as “pull entrepreneurs” are those that started the business with the motivation either of making additional income or of choosing to be self-employed. This group is expected to exploit the use of ICTs as a means of expanding their businesses. The “push entrepreneurs”, who otherwise would have been unemployed, on the other hand, started businesses as a means to survive and to earn a living. These businesses are expected to be less inclined to use different kinds of ICTs.

Table III shows the push-and-pull classification of informal businesses. In the majority of the countries, more informal businesses were started by push than by pull factors. The link between ICTs and entrepreneurship is analysed by distinguishing between businesses that operate as a means of survival, in the absence of jobs (push factors), and those that operate to earn money in addition to a salary, as a drive for self-determination or because an own business pays more than a job (pull factors).

Businesses run by women

A growing body of literature shows that countries that are failing to address gender-based barriers are losing out on economic growth. Blackden *et al.* (2006) argue that gender inequality acts as a significant constraint to growth in sub-Saharan Africa. The study shows that gender gaps have had an impact on women entrepreneurs and, in some instances, have hampered the growth of their businesses.

The International Finance Corporation (IFC, 2010) conducted focus-group interviews in Kenya among women entrepreneurs and found that constraints such as unequal access to land and property, unequal access to finance and bank loans, taxes and customs, education and bureaucratic barriers to licensing a business disproportionately affected women entrepreneurs.

Table III Push-and-pull classification

	<i>My own business pays more than being employed/be my own boss (%)</i>	<i>Pull factor</i>		<i>Push factor</i>
		<i>To make money additional to my salary (%)</i>	<i>Total pull factor (%)</i>	<i>Otherwise I would have been unemployed/to make a living (%)</i>
Uganda	44.5	10.1	54.6	45.4
Tanzania	33.3	10.0	43.3	56.7
Rwanda	33.1	11.8	44.9	55.1
Ethiopia	12.7	1.8	14.5	85.4
Ghana	32.3	13.2	45.5	54.5
Cameroon	36.5	4.9	41.4	58.6
Nigeria	33.5	7.5	41.0	59.0
Namibia	6.5	18.2	24.7	75.4
Botswana	15.8	25.3	41.1	58.8

Bardasi and Getahun (2008) argue that women own the majority of the businesses in the informal sector. Their findings show that there was little difference between men and women entrepreneurs, although there were differences in the type of businesses they chose to engage in and in their perceived constraints (see Figure 1)

The analysis in this paper, thus, includes the gender dimension through classifying businesses as men-owned, women-owned or owned by both men and women.

ICT access and usage

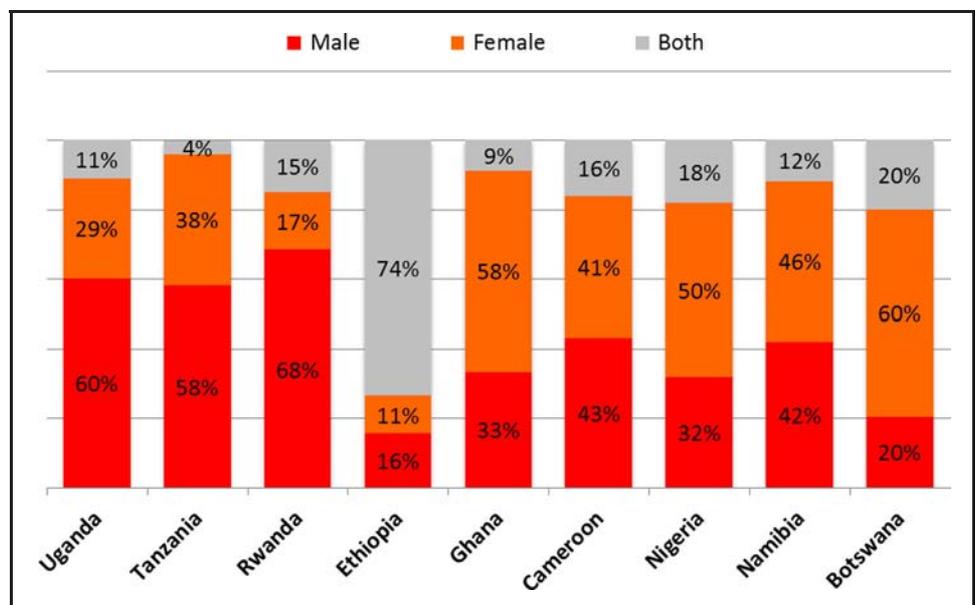
ICTs have been identified as being critical to development and socio-economic growth, and a growing body of literature views ICTs as having the potential to improve the productivity of small and informal businesses. It is contended that ICTs enable informal businesses to save money, compare prices, respond to customers at a faster rate, cut travel time and cost and find and acquire new customers (Donner, 2007).

Several studies have identified ICTs as one of the key tools to support the success of businesses (APF, 2008; Kramer *et al.*, 2007; Kodakanchi *et al.*, 2006). The use of advanced ICT devices allows businesses to communicate more efficiently with suppliers, customers and business partners, thus improving their competitive advantage in the industry, facilitating market research and improving information access (Inmyxai and Takahashi, 2010).

Donner (2006) explored the use of mobile phones by micro-entrepreneurs in Kigali and found that mobile phone ownership has brought about changes in social networks and communication patterns, thereby increasing business contacts. Esselaar *et al.*(2007), in a study that focused on ICT usage among SMEs, showed that the mobile phone was the most important ICT to informal businesses across African countries.

Molony's (2007) study investigated how the mobile phone was being integrated into Tanzania's business culture. It explored the changes brought about in entrepreneurs' business practices and the importance of trust in relation to new forms of communication enabled by the use of ICTs. The study concluded that trust is associated with social capital ("the social aspects of economic activities that boils down to who you know") and plays a critical role in the use of ICT among micro and small businesses.

Figure 1 Share of ownership of informal and semi-formal businesses by gender



A study conducted by Jagun *et al.* (2008) on the impact of mobile telephony on the development of micro-enterprises in Nigeria found that mobile phones assist in reducing information failures that impact on investment decisions and business activities in developing countries. The study demonstrated that mobile telephony contributed towards the efficient running of markets like the cloth-weaving sector in Nigeria, and showed that increases in mobile penetration have a positive impact on investment in the clothes and weaving sector.

Donner and Escobari (2010) reviewed 14 studies on the use of mobile phones and how the technology changed micro and small enterprises' internal processes and external relationships, and provided a distinction between use of landline and use of mobile phones. The review finds a pattern of evidence that suggests that these ICTs provide micro and small enterprises with more information. The Aker (2008) and Jensen (2007) studies provide quantitative data that shows linkages between increased availability of information and lower prices, resulting in less price variability and increased profits for market participants. Other studies show that mobile phones improve the productivity of micro and small enterprises, which is partly due to improvements in the sales, marketing and procurement processes. Evidence suggests that the benefits of mobile use by existing businesses are more informational than transformational (Donner and Escobari, 2010). The review, however, suggests that the benefits of increased access to telecommunications are uneven and the use of mobiles varies across industries.

With ICTs becoming more affordable, and the increasing adoption rate for both personal and business use, it is worth investigating to what extent ICTs are being used by businesses in Africa, with particular emphasis on informal businesses. Donner (2007) raised the question of whether the "benefits" of ICTs apply equally to all informal businesses. In trying to address this question, it is important to understand the characteristics of the various informal businesses and how they employ ICT in their daily activities.

Table IV shows the share of businesses having a working fixed line and using mobile phones for businesses purposes. Mobile phones remain the predominant form of ICT used by informal businesses. A surprising result is that a larger percentage of push entrepreneurs in Rwanda, and to a lesser extent in Uganda, use mobile phones for business purposes than do pull entrepreneurs. The share of male-owned businesses that use mobile phones is higher than that of female-owned businesses in all countries. The same holds for fixed lines, except in Rwanda and Botswana, where female-owned businesses have more fixed lines (but only marginally).

Computer use was higher for female-owned informal businesses in Rwanda, Uganda and Cameroon (Table V). In Uganda and Tanzania, the share of businesses with a working internet connection was also higher for female-owned businesses. Regarding push and pull factors, there were no surprises other than for computer use in Nigeria, where push entrepreneurs had a slightly larger share.

Table IV Informal businesses using fixed lines and mobile phones

	<i>With a working fixed line</i>					<i>Using mobile phones for business purposes</i>				
	<i>National (%)</i>	<i>Male owner (%)</i>	<i>Female owner (%)</i>	<i>Pull factor (%)</i>	<i>Push factor (%)</i>	<i>National (%)</i>	<i>Male owner (%)</i>	<i>Female owner (%)</i>	<i>Pull factor (%)</i>	<i>Push factor (%)</i>
Uganda	6.9	8.0	6.1	11.5	1.5	67.9	68.9	63.9	67.4	68.5
Tanzania	1.0	1.7	0.0	0.8	1.1	44.4	46.6	39.8	46.0	43.2
Rwanda	1.3	1.2	2.0	2.2	0.5	53.4	54.5	44.9	43.0	61.9
Ethiopia	0.3	1.8	0.4	0.5	0.3	12.3	46.4	3.2	19.6	11.1
Ghana	0.7	1.4	0.2	1.4	0.1	44.9	57.3	35.7	57.3	34.5
Cameroon	1.3	0.6	0.3	1.7	1.0	56.2	68.0	40.9	61.7	52.4
Nigeria	0.2	0.2	0.1	0.1	0.3	44.2	57.3	37.2	57.2	35.2
Namibia	4.1	5.9	2.7	5.1	3.7	51.9	60.5	45.3	74.6	44.8
Botswana	3.0	1.0	1.6	4.5	1.9	44.9	51.1	37.6	47.2	43.3

Table V Informal businesses with computers and internet access

	<i>Working computer or laptop</i>					<i>Working internet connection</i>				
	<i>National (%)</i>	<i>Male owner (%)</i>	<i>Female owner (%)</i>	<i>Pull factor (%)</i>	<i>Push factor (%)</i>	<i>National (%)</i>	<i>Male owner (%)</i>	<i>Female owner (%)</i>	<i>Pull factor (%)</i>	<i>Push factor (%)</i>
Uganda	3.2	2.7	4.6	4.8	1.3	2.0	1.4	3.2	3.4	0.2
Tanzania	2.8	3.3	2.3	6.4	0.0	0.1	0.0	0.2	0.0	0.2
Rwanda	2.0	2.0	2.8	4.4	0.1	0.7	0.5	0.3	1.5	0.1
Ethiopia	0.1	0.5	0.0	0.3	0.0	0.0	0.3	0.0	0.3	0.0
Ghana	1.3	3.2	0.0	2.8	0.0	0.7	1.2	0.2	1.3	0.2
Cameroon	4.4	2.2	2.6	6.3	3.0	2.2	2.0	0.0	2.5	1.9
Nigeria	2.7	4.9	1.9	2.5	2.8	0.1	0.3	0.0	0.3	0.0
Namibia	2.5	3.9	1.6	3.6	2.1	2.2	3.9	0.9	4.4	1.5
Botswana	3.5	4.5	1.3	6.4	1.5	2.9	4.0	2.0	5.3	1.1

Obviously, there may factors that influence the use of ICTs other than the motivational factors for starting a business and the gender of owners. These factors will be explored using an adoption model in the next section.

Mobile adoption

In comparison to other ICTs in the study, only the mobile penetration levels allow for the testing of factors influencing the use of mobile phones for business purposes. Fixed lines, computers and the internet are not used widely enough by informal businesses to allow for a quantitative analysis. Table VI displays the specification of a simple logistic regression model for mobile use for business purposes, and Table VII presents the results.

Results from the logistic regression are mostly as expected. Being male, living in urban areas, higher degrees of formality and distance of key customers are all significant and positive, as predicted. Higher education of the owner is not significant in this model, but it becomes significant when the formality index variable is dropped. All country dummies except for Tanzania are significant with a positive coefficient. Tanzania not being significant indicates that informal businesses in Tanzania are not very different from informal businesses in Ethiopia, which serves as the reference point for the country dummies. All other countries are significantly different from Ethiopia in the use of mobile phones for business purposes.

Surprisingly, customers' location was significant while supplier location was not. The location of suppliers remains insignificant even after the location of customers is dropped, ruling out interactions between the two variables. Table VIII displays the key characteristics of suppliers for the informal sector.

Tables VIII and IX show that face-to-face communication with suppliers and customers is still widely preferred to mobile phones in the informal sector, which is not surprising. However, they also show the importance of mobile phones for communication with suppliers for all countries except Ethiopia. One would, thus, have expected the distance of suppliers to be significant. Table VIII confirms that informal businesses from all countries predominantly procure locally, as the majority of their suppliers are within 50 km of their businesses.

Surprising in this context is that the distance of customers was significant, though the results show that fewer businesses communicate with their customers than with their suppliers via mobile phone, with the exception of Namibia and Botswana (see Table IX). This might be due to the fact that their customers are mostly local.

Running a model with only the variable for the distance of key suppliers shows that it is significant with a Pseudo R-square of 0.045, an indication that this variable's significance for the adoption of mobile phones could be having its effect masked by other variables. More research is required to understand this aspect better.

Table VI Mobile phone adoption model

<i>Variable</i>	<i>Description</i>	<i>Type</i>	<i>Exp. sign</i>	<i>Reasoning</i>
Male	Male ownership of a business	Dichotomous, 1 if male owner, 0 otherwise	Positive	Due to men often having better access to education and financial resources than women
Pull	Owner runs the business out of entrepreneurial spirit	Dichotomous, 1 if pull factor, 0 otherwise	Positive	Due to pull entrepreneurs being expected to be more driven to grow the business compared to people that are being pushed into running a business in the absence of formal jobs
S.2	Distance of key suppliers	Ordinal 1 = local, 2 = 50-150 km, 3 150 km or more, 4 = abroad	Positive	The further away key suppliers are located, the more important is the mobile phone for co-ordination
C.2	Distance of key customers	Ordinal 1 = local, 2 = 50-150 km, 3 150–km or more, 4 = abroad	Positive	The further away customers are located, the more important is the mobile phone for co-ordination
D.9.A	Number of full-time employees	Discrete	Positive	The number of employees is a measure of size; larger business have to co-ordinate more people and thus mobile phones become more important
HigherEduO	Highest education of owner = tertiary or secondary education	Dichotomous, 1.0	Positive	Mobile use for business purposes requires some skills, or at least literacy; higher education of the business owner should thus be associated with mobile use
Urban	Location of business	Dichotomous, 1 = urban, else 0	Positive	Mobile adoption is higher in urban areas than in rural areas
Formality index		Discrete from 0 to 5.5 in 12 steps	Positive	Formal businesses, while more likely to be larger and more sustainable, are also more likely to use mobile phones for business purposes
Country dummies	For each country a dichotomous variable was included to capture country specific differences	Dichotomous, 1.0	Positive	The omitted country is Ethiopia, which has the lowest mobile penetration in the sample of countries; the dummies for all other countries are thus expected to have significant and positive coefficients.
Constant			Negative	The constant captures the factors expected to have a negative impact on mobile use such as (female-owned, Ethiopian, pushed entrepreneurs, uneducated and operating in rural areas)

Barriers to ICT access and usage

The overwhelming reason for not using fixed lines was “no need”, which suggests that informal businesses rather use mobile phones (see Figure 2). In many of the countries, the penetration rate of fixed lines is less than 2 per cent. In addition, where available, the services tend to be of poor quality. The second most cited reason for the limited use of fixed lines in most countries was the high cost of fixed-line access, particularly in Uganda, Rwanda, Tanzania and Cameroon. Factors that have contributed to the high cost of fixed-line access include VAT and other taxes. For example, in Uganda, VAT of 23 per cent is charged for usage of fixed lines, while in Tanzania VAT is set at 18 per cent, which drives up the costs of access and impacts on usage. Non-availability of fixed-line services was an issue in Ethiopia, which is the only country in the sample that still has a fixed and mobile monopoly.

Although mobile phones are the most commonly used ICTs, interestingly the most cited reason for not using them was “no need”, followed by the high cost involved (Figure 3). Thus, it is important to analyse in more detail the businesses that do not need a mobile phone compared to those that would like to use one but cannot afford it. In Rwanda, Cameroon, Tanzania, Ethiopia and Uganda, in particular, informal business owners say that they are not using mobile phones for businesses purposes because it is too expensive.

Table VII Logistic regression for mobile use for business purposes (informal businesses only)

	<i>Coef.</i>	<i>Robust std err.</i>	<i>z</i>	<i>P > z</i>	<i>[95% Conf. Interval]</i>	
Male	1.465476	0.2841738	5.16	0.000	0.9085056	2.022446
pull	0.0437885	0.2739236	0.16	0.873	-0.493092	0.5806689
C_2	0.6239492	0.1774086	3.52	0.000	0.2762347	0.9716637
S_2	0.0112322	0.1991889	0.06	0.955	-0.3791708	0.4016352
Formality index	1.082838	0.183247	5.91	0.000	0.7236803	1.441995
D_9_A	-0.059007	0.0826063	-0.71	0.475	-0.2209123	0.1028983
HigherEduO	0.4706483	0.2887309	1.63	0.103	-0.0952538	1.03655
Urban	0.8513839	0.1428477	5.96	0.000	0.5714075	1.13136
Namibia	0.7687561	0.2731022	2.81	0.005	0.2334856	1.304027
Tanzania	-0.3298912	0.2977255	-1.11	0.268	-0.9134225	0.2536402
Rwanda	0.6942077	0.2689158	2.58	0.01	0.1671423	1.221273
Ghana	0.9224447	0.2750464	3.35	0.001	0.3833637	1.461526
Cameroon	0.8764221	0.220597	3.97	0.000	0.4440599	1.308784
Nigeria	0.9063866	0.2764337	3.28	0.001	0.3645865	1.448187
Uganda	0.9669981	0.315618	3.06	0.002	0.3483982	1.585598
Botswana	0.6442115	0.3109629	2.07	0.038	0.0347353	1.253688
Constant	-3.177637	0.3130937	-10.15	0.000	-3.791289	-2.563985

Notes: Diagnostics – Number of obs. = 4,265; Wald chi2(16) = 232.90; Prob > chi2 = 0.000; Log pseudo likelihood = -6,011,613.6; Pseudo R2 = 0.3039

Table VIII Key supplier characteristics

	<i>Number of key suppliers</i>			<i>Size of key suppliers</i>			<i>Where key suppliers are located</i>			<i>Communication (multiple response)</i>	
	<i>None</i>	<i>1 to 5</i>	<i>6 or more</i>	<i>Informal business</i>	<i>Small formal business</i>	<i>Large formal business</i>	<i>Within 50 km</i>	<i>Between 50 and 150 km</i>	<i>150 km or more</i>	<i>Mobile</i>	<i>Face to face</i>
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Uganda	0.3	94.2	5.6	30.3	56.6	13.1	58.2	33.1	8.3	58.8	89.4
Tanzania	20.3	75.4	4.2	24.3	46.0	29.7	76.2	19.6	3.6	36.5	97.7
Rwanda	0.8	97.4	1.9	43.2	53.4	3.3	81.9	16.9	0.8	45.1	89.7
Ethiopia	0.0	99.3	0.7	22.9	69.5	7.6	95.1	4.6	0.3	6.4	99.5
Ghana	25.3	72.6	2.1	44.5	37.8	17.7	62.3	25.6	11.6	45.5	90.6
Cameroon	0.9	96.3	2.8	74.9	17.0	8.1	75.0	15.0	9.5	41.8	91.8
Nigeria	20.8	70.7	8.4	49.7	37.3	13.0	80.8	15.3	3.9	39.8	89.4
Namibia	0.2	96.3	3.5	30.7	43.0	26.3	58.0	32.4	8.1	22.2	93.5
Botswana	6.3	92.8	0.9	8.5	21.1	70.4	79.0	13.2	5.9	24.0	91.8

Table IX Customer characteristics

	<i>Type of customers</i>			<i>Where most important customers are located</i>			<i>Communication (multiple response)</i>	
	<i>Individuals mostly</i>	<i>Small enterprises mostly</i>	<i>Big enterprises mostly</i>	<i>Within 50 km</i>	<i>Between 50 and 150 km</i>	<i>150 km or more</i>	<i>Mobile</i>	<i>Face to face</i>
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Uganda	98.1	1.6	0.3	86.4	10.7	2.9	48.0	94.6
Tanzania	97.9	1.6	0.5	92.9	6.7	0.4	31.6	95.0
Rwanda	98.0	1.8	0.1	93.9	4.4	1.7	42.0	89.3
Ethiopia	95.4	3.9	0.7	98.7	0.5	0.8	4.7	98.8
Ghana	97.1	2.4	0.5	75.3	18.8	5.8	33.2	92.3
Cameroon	96.1	3.2	0.7	85.6	7.5	6.9	39.4	94.3
Nigeria	96.3	3.2	0.5	92.0	5.8	2.2	26.9	90.5
Namibia	95.5	3.6	0.9	88.0	8.7	2.4	36.4	97.8
Botswana	97.5	2.2	0.3	91.8	5.5	2.7	30.3	95.0

Figure 2 Main reason why businesses did not have a fixed line

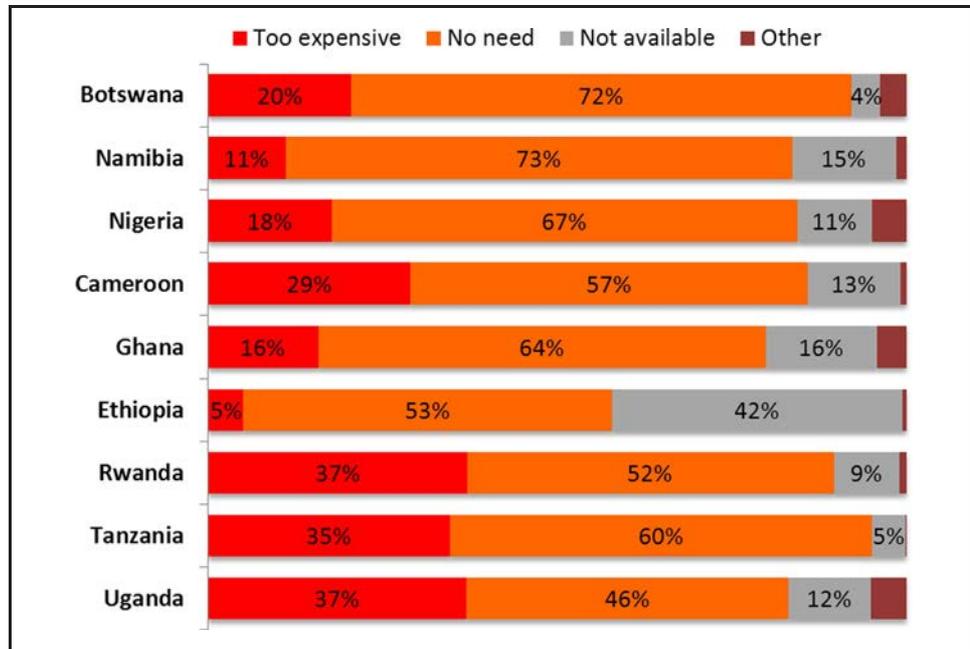
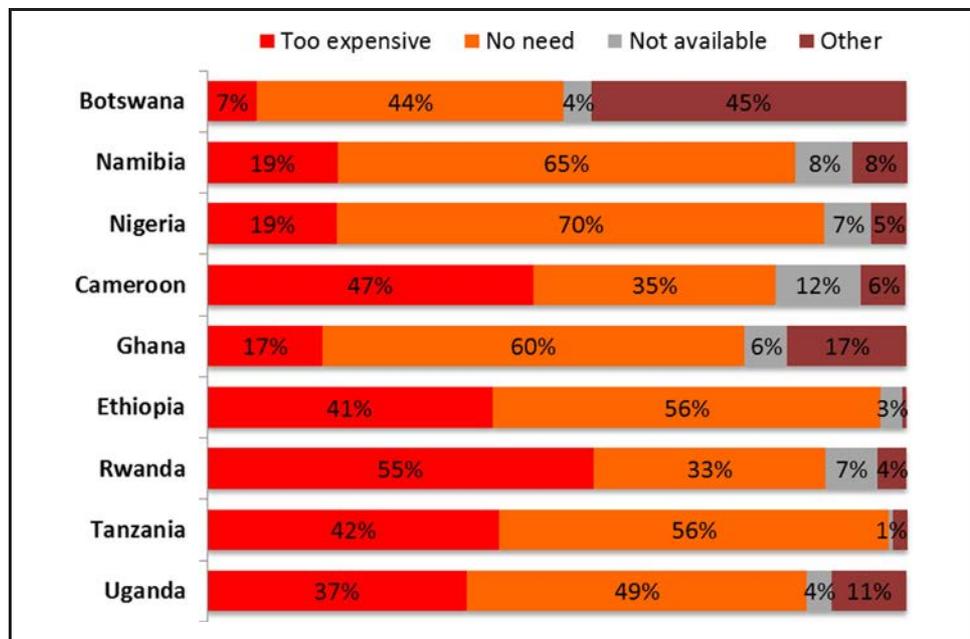


Figure 3 Main reason why businesses did not use mobile phones for business purposes



In most countries, the most cited reasons for businesses not having internet access were no need, cost and non-availability (see Table X). Most informal businesses may not see a need for the internet, due to the nature of their businesses or because they have not been exposed to its potential. In addition, high-cost access (computer or mobile phone) and other expenses in the form of MBs can limit usage.

In a situation where there is inadequate network coverage, poor quality and relatively high prices, businesses will find it unnecessary and not beneficial to have or attempt to make use

Table X Reasons why businesses did not have internet access (multiple response)

	<i>Too expensive</i> (%)	<i>No need</i> (%)	<i>Not available</i> (%)	<i>internet is too slow to use</i> (%)	<i>Use public internet access</i> (e.g. internet café) (%)	<i>No knowledge about it</i> (%)
Uganda	82.6	72.1	66.0	13.0	7.7	7.4
Tanzania	64.7	75.6	44.2	34.0	1.3	0.0
Rwanda	73.7	67.3	46.4	13.2	4.3	0.0
Ethiopia	2.3	89.3	21.1	1.6	0.5	0.0
Ghana	53.0	72.0	37.2	3.4	5.2	4.2
Cameroon	59.1	65.0	28.3	9.1	9.5	0.0
Nigeria	49.8	78.1	29.0	3.5	5.3	0.0
Namibia	68.7	86.5	68.6	6.6	2.6	21.2
Botswana	63.7	76.9	30.2	5.1	7.4	0.0

of an ICT device, and will rather settle for alternative means of communication and doing business. The Research ICT Africa (RIA) surveys have shown that ICT diffusion is still highly uneven, not only across but also within countries. There is limited access to the full range of ICTs on the continent, in general, and where there is access, optimal usage is often constrained by high cost and poor quality of service. In some instances, there is a lack of awareness and knowledge of what could be achieved through ICTs. All these factors tend to hinder the realisation of the full benefits and potential of ICTs in enhancing businesses and improving the well-being of individuals.

Banking and money transfer

One of the major challenges faced by informal business owners is lack of access to the formal banking system, in particular capital. The introduction of mobile money is viewed as a stepping-stone for those who lack access to formal financial services like savings accounts, credit and insurance (Comninos *et al.*, 2008; *The Economist*, 2009). In both Namibia and Botswana, about two thirds of informal businesses do not have access to a bank account. In Ethiopia and Tanzania, more than 90 per cent, and in Nigeria close to 90 per cent, of informal businesses do not have access to banking facilities (Figure 4).

In East Africa, the use of mobile money services has been on the rise over the past five years. There may be some form of interaction between using mobile money and subsequently having access to a bank account. Some operators, such as Orange Kenya, offer mobile money services inclusive of a bank account.

Mobile money is not as widespread in other countries and is non-existent in Ethiopia. The mobile money service in Nigeria was only introduced at the time of the survey, which accounts for the low level of mobile money usage reported (Table XI).

Interestingly, most businesses tend to send cash with someone when they need to transfer funds. This could be due to lack of alternatives, or there may be some social factors that underlie the face-to-face interaction by businesses. These factors need to be explored in further research. Despite the low penetration of mobile money, the service has the potential to address the financial gap and lead to informal businesses accessing formal financial services. This, in turn, may provide impetus for growth and expansion.

Conclusion and recommendations

The informal sector is mainly a cash and face-to-face sector, and will remain like that for the foreseeable future. Few will move out of the sector to take up formal employment, and few businesses will grow to become formal. The informal sector is probably the least understood and the most neglected by policy-makers, yet it is where Africa's poor find their livelihoods and from which base the formal economy operates. The informal sector provides the formal sector with a source of cheap labour and buys from and sells to it. The linkages between the

Figure 4 Does the business have access to a bank account, dedicated business account or private account that can be used for businesses purposes?

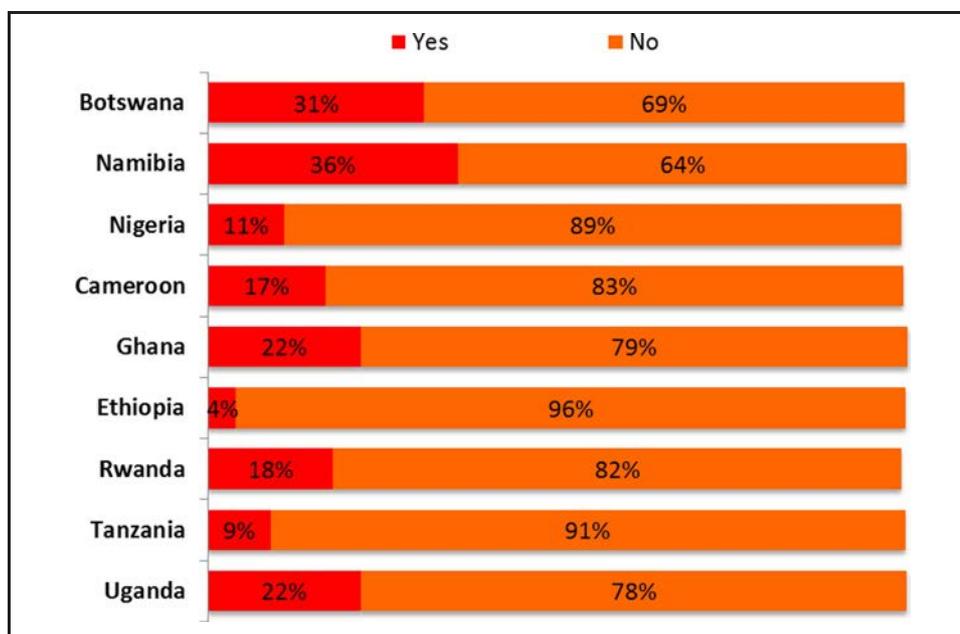


Table XI Means of sending and receiving money that the business uses

	Mobile money (%)	Post office (%)	Western Union/Moneygram (%)	Banks (%)	Send cash with someone (%)
Uganda	16.2	0.7	1.8	16.6	80.8
Tanzania	13.8	0.3	0.1	4.7	92.9
Rwanda	7.6	0.4	0.6	9.9	70.2
Ethiopia	0.0	0.0	0.0	5.2	55.1
Ghana	0.2	0.8	0.9	12.0	54.2
Cameroon	0.3	0.8	25.8	3.9	74.8
Nigeria	0.2	0.1	0.0	10.7	76.7
Namibia	0.7	25.0	0.6	40.8	85.7
Botswana	1.9	15.9	2.8	27.4	72.7

formal and informal sectors and the challenges they encounter in the business environment need to be investigated in more detail in further research.

Although there is growing consensus that ICTs play a key role in economic development and the enhancement of business activities, it is evident from the results above that only mobile phones are widely used among informal businesses. The use of other ICTs, such as fixed lines, computers and the internet, remains negligible. Furthermore, it is evident from the above analysis that despite the availability of a number of ICTs, the most common method of communicating with both customers and suppliers is face-to-face interaction.

The reasons cited regarding the lack of use of the different kinds of ICTs included issues around need, affordability, availability and access. These reasons are all somehow dependent on each other. Broader policy interventions would be required in order to facilitate access and address affordability. There is little money to be wasted on gadgetry in the informal sector and only technologies that add value (i.e. bring money in the short term) will be used.

Policy-makers have a wide choice in addressing affordability and access to ICTs in the informal sector, ranging from introducing competition for fixed-line and mobile phones in

Ethiopia and removing import duties on prepaid airtime in Uganda to supporting mobile application development for informal businesses, in general. Policy-makers need to be concerned about creating a business environment that allows informal businesses that have the skills and ambition to grow and become formal and sustainable. ICTs, in particular the mobile phone and mobile internet, have the potential to facilitate this. ICTs may allow for a deepening of the distribution and procurement channels of businesses. Through mobile money, doing business over distance could become more affordable.

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Appendix. Survey methodology

Research ICT Africa (RIA) conducted nationally representative household and business surveys in 2011/12 in 12 African countries. The survey used a census sampling methodology and is, thus, mostly limited to residential or mixed areas and not commercially zoned areas. The random sampling was performed in three steps:

1. The national census sample frame was split into urban and rural enumerator areas (EAs).
2. EAs were sampled for each stratum using probability proportional to size (PPS).
3. For each EA, a listing was compiled that included all businesses in the EA, and ten businesses were sampled using simple random samples for each selected EA.

Table AI Survey characteristics

<i>Target population</i>	<i>All businesses</i>
Domains	1 = national level
Tabulation groups	National level
Oversampling	Urban 60 per cent Rural 40 per cent
Clustering	Enumerator areas (EA) National Census
None response	Random substitution
Sample frame	Census sample from NSO
Confidence level	95 per cent
Design factor	1
Absolute precision	5 per cent
Population proportion	0.5, for maximum sample size
Minimum sample size	384
<i>Actual sample size</i>	
Uganda	500
Kenya	513
Tanzania	491
Rwanda	640
Ethiopia	841
Ghana	500
Cameroon	520
Nigeria	554
Namibia	374
South Africa	627
Botswana	385
Mozambique	495

Only businesses with a physical presence (i.e. shop, workshop, house or street corner from where the business usually operated) were sampled. Branches of businesses were excluded, unless they operated as franchises.

The minimum sample size was determined by the following equation (Rea and Parker, 1997):

$$n = \left(\frac{Z\sqrt{p(1-p)}}{C} \right) = \left(\frac{1.96\sqrt{0.5(1-0.5)}}{0.05} \right) = 384.$$

Weights are based on the inverse selection probabilities (UNSD, 2005) and gross up the data to national level when applied (see Table AI).

About the authors

Mariama Deen-Swarray is a Researcher at Research ICT Africa and is currently working on the analysis of business and household surveys recently conducted in 12 African countries. Prior to joining RIA, she worked as a researcher at ITASCAP, a private financial services and research institution in Sierra Leone and as a researcher at the Namibian Economic Policy Research Unit in Namibia. She has been involved in the information and communication technology sector and has worked on several ICT-related studies. She has participated in ICT conferences and has contributed to several publications in the field of ICT. She holds an MPhil in Economics from the University of Ghana and a BSc (First Class) in Computer Science and Economics from the University of Namibia. Mariama Deen-Swarray is the corresponding author and can be contacted at: mdeen-swarray@researchictafrica.net

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