Research Article

ICT Usage and Its Impact on Profitability of SMEs in 13 African Countries

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Abstract

This article reports on a small and medium enterprise (SME) survey carried out by the ResearchICTAfrica (RIA) in 14 African countries. It argues that the negative return on investment reported in the literature can be attributed to the failure to distinguish between the formal and informal sectors. This article demonstrates that informal SMEs have a higher profitability than formal ones. It further shows that ICTs are productive input factors and that their use increases labor productivity for informal as well as formal SMEs. The article further argues that there is still demand for fixed-line phones among SMEs but that mobile phones have become the default communications tool because fixed lines are either too expensive or not available. The primary policy recommendation arising out of this is that applications for SMEs need to be developed using mobile phones.

Introduction

This article reports on a small and medium enterprise (SME) survey carried out by the Research ICT Africa network (RIA[1]) in 14 African countries. The SME E-access and E-usage Index (2005) aims at understanding the impact of ICTs on private sector development, and how ICTs can contribute to a vibrant SME sector and economic growth in the context of developing economies.

The analysis presented here is based on the results of only 13 of the 14 countries. The data for Zambia had not been processed at the time of the submission of this article. The data currently cover Botswana, Cameroon, Ethiopia, Ghana, Kenya, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Tanzania, Uganda, and Zimbabwe.

The SME sector has an important role to play in economic development, poverty reduction and employment creation in developing economies (Hallberg, 2000). The SME sector is the sector in which most of the world's poor people are working (Stern, 2002). The sector largely exceeds the average economic growth of national economies in many countries and contributes significantly to employment creation. Accordingly, governments and donors alike have recognized the important role of the SME sector for overall development. As a result, many government policies are geared toward supporting SME sector growth through a variety of programs that range from tax incentives to technical assistance, from regulatory provisions to policy interventions, training and other types of business development services (O'Shea & Stevens, 1998).

The SME E-access & E-usage Index aims to look at ICT usage from the

1. RIA is a network of researchers at 14 African universities and research institutions working on ICT policy and regulation.

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demand side. The main objective is to identify obstacles that SMEs face in their daily business activities by providing guidance in the formulation of policy that will induce economic growth and employment. This article presents key results from this survey and provides valuable insights for development economists and policy makers working in the field of private sector development.

Methodology

The target sample for each country was 280 SMEs. The SMEs were sampled based on target lists in the capital of each country and two other, economically significant, urban locations. No random sampling procedure was used, but the businesses were selected based on their profile.

Intensive training was undertaken to ensure enumerators understood the value proposition of a business (i.e., to understand how the business makes its money). Gathering financial information from SMEs is not an easy task. It required enumerators to build up trust with the entrepreneurs and an understanding of how businesses operate. Several control questions were built into the questionnaire to check for consistency of responses while the interviews were conducted. This allowed enumerators to uncover wrong or inaccurate information.

Reasons that led entrepreneurs to provide inaccurate information other than fear of higher taxation or competition was the absence of record keeping. Enumerators were trained to assist SMEs without financial records to estimate the values of fixed assets and other financial figures.

Implied purchasing power parity (PPP) conversion rates were used to convert monetary values to US$ for all countries. This conversion meant that all data could be combined into one dataset.

SME-Definition

SME definitions vary from country to country and are ideally defined specifically according to sector. The cut off point in terms of size for this survey was based on a recommendation from the African Development Bank, which defines SMEs as having less than 50 employees. Sector specific definitions will be derived from the analysis collected in the survey and presented at a future date. The ILO distinguishes three types of enterprise models:

- Pre-entrepreneurial activities
- Microenterprises
- Small enterprises

This article distinguishes between survivalists or informal operators and businesses. Survivalists or informal operators engage 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. Survivalists or informal operators usually do not distinguish between business and personal finances, do not keep records, do not pay taxes, and are not registered with any authority. Money from sales or services rendered is generally immediately consumed for private purposes (same day, week, or month). A micro- and small business, by contrast, has some degree of formality. This might include a business bank account, formal work contracts for employees, a physical address with contact details, registration with the receiver of revenue and other authorities, and so forth. The line between informal operators and survivalist on the one hand and informal businesses on the other is fluent and varies from country to country: The distinction between formal and informal businesses equally varies from country to country (Table 1).

Only businesses that complied with the following characteristics were sampled:

- Physical presence (shop, workshop, house where the business is operating from) with contact details (a minimum of two out of these three: street number, post box, telephone/cellphone number);
- Business must operate with the aim of generating sustainable income streams;
- Business should be independent (i.e. not be a branch of a larger business);
- Business must have less than 50 employees.

Sample

A qualitative question regarding the business activity was asked and the response to it used to classify SMEs in terms of International Standard Industrial Classification (ISIC). The number of sampled businesses for different ISIC clusters is shown in Table 2. The analysis in this article is based on the responses of 3,691 SMEs across the continent.

Formality Index

The data collected from SMEs were used to classify responding SMEs into informal, semiformal, and for-

Table 1. Characteristics of SMEs

Informal Operator/survivalist	No employees Does not distinguish between business and personal finances Does not keep records Does not pay taxes Is not registered with any authority Engages in business activities to pay for daily and weekly expenses
Informal micro or small business	Less than 10 employees May not distinguish between business and personal finances May not keep records May not pay taxes May not be registered with any authority Has physical address and contact details
Formal micro or small business	Between 10 and 49 employees Keeps records Has separate bank account Pays taxes Is registered with all required authorities Has physical address and contact details

Table 2. Sample Distribution: ISIC Classification

Tabulation	**Total**
D: Manufacturing	682
F: Construction	219
G: Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	1,219
H: Hotels and restaurants	302
I: Transport, storage and communications	363
J & K: Financial intermediation & real estate, renting and business activities	437
M & N & O: Education, health, social work, other community, social and personal service activities	469
Total	3,691

mal businesses. Table 3 shows the various variables that contributed to the formality index.

Proprietary limited companies (PTYs) and closed corporations (CCs) usually require registration with various ministries such as finance and/or trade and industry, whereas sole proprietors and partnership do not necessarily need to be registered with either in most countries surveyed. An SME registered for VAT is also more likely to be formal than one that is only registered for income tax since VAT handling requires sophisticated record keeping.

Having written employment contracts for employees also contributed toward the formality index. Having a written contract allows employees to enforce the rights and minimum wages as stipulated in labor laws while those without contracts can often be hired and fired at will. Whether a business strictly separates personal from business finances and the sophistication of record keeping and accounting were also included in the formality index.

The maximum value a business could achieve in terms of the formality index is 4.5. Businesses were then categorized into informal, semi-formal and formal. The breakdown of this classification is shown in Table 4. Table 5 displays the breakdown of the sample in terms of formality categories and countries.

Usage Indices

Three indices are computed to compare ICT usage across formality categories with each other, the ICT possession index, the ICT usage index, and the ICT usage intensity index.

Table 3. Computing the Formality Index

Question	Value	Points
Form of ownership?	Sole proprietor, Partnership	0
	CC, Pty	0.5
Is your business registered with the receiver of revenues? (pay taxes?)	No	0
	Yes	0.5
Is your business registered for VAT?	No	0
	Yes	1
How many of your employees have a written employment contract?	None	0
	One or more	1
Does your business strictly separate business from personal finances?	No	0
	Yes	0.5
Does your business keep financial records?	None	0
	Simple bookkeeping	0.5
	Double entry bookkeeping	1
	Audit annual financial statements	1
Maximum total		4.5

Table 4. Classification of Formality Index

Formality Index	Index Points
Informal	1.5 points or below
Semi-formal	2 points or more and less than 3.5 points
Formal	3.5 or more points

ICT usage intensity among businesses is calculated using the ICT usage index and dividing it by the ICT possession index. ICT usage intensity shows the extent to which businesses employ ICT for business purposes in terms of what they have in ICT devices.

The ICT possession index looks at what businesses have in terms of ICT equipment and facilities. A point of 1 is given for each the ICT devices owned by a business and a maximum of 6 points is obtained should a business have all 6 items. Table 6 shows how this index is calculated.

The ICT usage index was developed by awarding one point for any employment of ICT facilities and equipment to carry out business transactions. This gave a maximum total of 15 points should a business be making use of all the ICT facilities and equipment mentioned in this study for business purposes. This is shown in Table 7.

ICT Usage

This section investigates the uses that ICTs are put to by SMEs. The section is divided into each of the main categories, starting with mobile phones.

Mobile Phones

The role of mobile phones in maintaining customer relationships is clear from the survey. Mobile phones are used more often for keeping in contact with customers and clients compared to any other form of communication. Seventy-six percent of SMEs in the sample used the mobile phone for this purpose compared to 48% using fixed-line telephones (of those who owned it). The difference is not so dramatic when ordering supplies, something that can be done using a fixed-line phone more easily since this can be an occasional occurrence. Nevertheless, there is a difference with 48% of SMEs using mobile phones compared to 36% using fixed lines, which again speaks to the increasing importance of mobility and low start-up costs associated with mobile phones.

The crossover between business and personal is also more pronounced among mobile phone users compared to fixed-line phone users. A quarter of SMEs use the fixed-line phone for personal use, compared to 53% of SMEs that use a work mobile phone for personal use. Comparing fixed-line

Table 5. Sample Breakdown by Formality and Country

	Informal	Semiformal	Formal	Total
Botswana	50	64	142	256
Cameroon	184	69	27	280
Ethiopia	152	83	47	282
Ghana	92	106	82	280
Kenya	137	90	50	277
Mozambique	70	109	101	280
Namibia	107	108	92	307
Nigeria	146	75	44	265
Rwanda	182	59	38	279
South Africa	102	76	112	290
Tanzania	65	104	94	263
Uganda	151	139	61	351
Zimbabwe	66	57	158	281
Total	1,504	1,139	1,048	3,691

Table 6. ICT Possession Index

The business has	Index Value
One or more working telephones	1
One or more working mobile	1
One or more working fax machines	1
One or more post boxes	1
One or more working computers	1
Internet connection	1
Maximum value	6

Table 7. ICT Usage Index

The business	Index Value
Uses the telephone to communicate with clients and customers	1
Uses the telephone to order supplies	1
Uses the mobile to communicate with clients and customers	1
Uses the mobile to order supplies	1
Uses the fax to communicate with clients and customers	1
Uses the fax to order supplies	1
Uses the post box to communicate with clients and customers	1
Uses the post box to order supplies	1
Uses the computer to communicate with clients and customers	1
Uses the computer to order supplies	1
Uses the Internet to communicate with clients and customers	1
Uses the Internet to order supplies	1
Sends SMS or Text Messages for business purposes	1
Receives SMS or Text Messages for business purposes	1
Uses the internet for business purposes	1
Maximum value	15

phones and mobile phones in terms of desirability, mobile phones are rated as significantly more important than any other category, including fixed-line phones. As much as 95% of SMEs that own a mobile phone rate it as important or very important compared to the next highest category, which was fixed-line phones, at 82%.

Fixed Line

Table 8 shows that nearly 60% of those SMEs that do not have a fixed-line phone consider it important or very important. When SMEs were asked why they did not have a fixed-line phone, 46% state that they have no need for a fixed-line phone, 31% say that fixed-line phones are too expensive, and 17% say

Table 8. SMEs that Stated that a Particular ICT Item is Either Important or Very Important for Their Business Operation, Distinguished by Whether the Business Possesses the Item or Not

	Don't Have It(%)	Have It(%)	All(%)
Fixed line Phones	58.9	98.9	82.4
Mobiles	68.5	99.0	95.4
Fax	30.1	95.0	50.4
Post Box	24.3	82.8	59.8
Computer	49.6	97.6	71.8
Internet Connection	39.1	95.4	52.2

that fixed-line phones are not available. Clearly, the mobile phone is easily fulfilling the role that fixed-line phones used to play with the added convenience of mobility and lower incremental payments. Of course, adding to the impression that there is no need for fixed-line phones is the fact that the vast majority have no access to fixed-line telephony in any case. Yet 83% of SMEs rate it as important and the conclusion that can be drawn from this is that there is an unmet demand for fixed line, even with its associated high cost and lack of availability.

Internet

Of those SMEs that do not own a computer, there is a nearly even split between those that believe there is no need and those that believe that computers are too expensive. The remaining reasons for not owning a computer are insignificant, including a lack of knowledge of computers. The split remains nearly the same when computers with Internet connections are included. Forty-five percent of SMEs state that the reason they do not have a computer with an Internet connection is because it is too expensive; 45% state that there is no need to own a computer. Pointedly, of the 45% of SMEs that state that they do not have a computer because it is too expensive, 89% are in the informal and semiformal sector. This would seem to emphasize the importance of educating SMEs on the benefits of computers, for example, inventory control (an application that is not available on mobile phones at present) as well as the importance of bringing down costs, through initiatives such as the Simputer.

It seems likely that there is some confusion between those that say that computers are too expensive and those that say there is no need for the technology, but this would have to be further investigated. Also, the role that cyber cafés play in replacing computers and Internet connections is underscored by the fact that 20% of SMEs that do not have an internet connection do use cyber cafés.

Seventy-two percent of SMEs in general rate a computer as important to very important, but this drops when rating the importance of an Internet connection; 52% believe that an Internet connection is important to very important. This speaks to the possibility that computer and Internet usage compared to mobile phone usage is a question of cost and accessibility rather than usefulness.

Postal Box

Even in an environment where mobile phones are the preferred communication tool, the postal box still has a role to play. In the sample, 35% of SMEs continue to use a postal box to communicate with customers and clients, most likely for more formal communication compared to a mobile phone, and 20% of SMEs use the postal service to order supplies.

Mobile as the Preferred Tool

It is a truism to say that SMEs have scarce resources. In practical terms, this means that there is a strong focus on those tools that have an immediate benefit, compared to those with longer-term benefits. The advantage of the mobile phone, for example, is twofold: first, it can be used with little training. Second, increasing numbers of people have mobile phones (the network externality effect). Other forms of ICTs, such as the fax machine and post box, have a rapidly declining network effect as fewer people continue to use them.

Table 9. SMEs that Stated That a Particular ICT Item is Either Important or Very Important for Their Business Operation, Distinguished by Their Degree of Formality

	Informal(%)	Semiformal(%)	Formal(%)	ALL(%)
Fixed line phones	67.4	87.4	95.8	82.4
Mobiles	95.8	95.7	94.4	95.4
Fax	26.2	53.6	77.6	50.4
Post box	44.3	62.3	76.6	59.8
Computer	52.5	77.5	89.5	71.8
Internet connection	35.5	55.3	71.7	52.2

Table 10. Mean Rank Comparison for ICT Usage, ICT Possession, and ICT Usage Intensity

	Formality	*N*	Mean Rank	Chi-Square	df	Asymp. Sig.
ICT Possession Index:	Informal	1,504	1,195	1,214.8	2	0.000
	Semi-formal	1,139	1,968			
	Formal	1,048	2,648			
	Total	3,691				
ICT Usage Index:	Informal	1,504	1,275	947.1	2	0.000
	Semi-formal	1,139	1,924			
	Formal	1,048	2,580			
	Total	3,691				
ICT Usage Intensity Index:	Informal	1,358	1,844	19.5	2	0.000
	Semi-formal	1,104	1,690			
	Formal	1,037	1,691			
	Total	3,499				

Of all the ICTs used by SMEs, mobile phones are seen as vital across the range of formal and informal businesses. Mobile phones score nearly exactly the same in the informal sector compared to the formal sector. In contrast, there is a positive relationship between the degree of formality and all the other forms of ICTs. The largest gap between informal and formal businesses in terms of the importance of ICTs includes fax machines, post boxes, and Internet connections.

The results of the Kruskal-Wallis test for the mean comparisons for the ICT possession, ICT usage and ICT usage intensity indexes indicate that there is a significant difference in the mean ranks for all three indices across formality. Formal SMEs possess more ICT equipment and make more use of it than semiformal ones; and semiformal SMEs more than informal ones. However, informal SMEs have the highest ICT usage intensity, followed by the semiformal ones, with the formal SMEs having the least. The high ICT usage in the formal sector can be attributed to more opportunities for using ICTs to support business processes.

Owners of informal businesses are also on average less educated than owners of semiformal and formal SMEs, as can be seen from Figure 1. A lack of knowledge of how to use a computer and accounting packages prevents many informal business operators from using them, apart from financial constraints. This could, for example be overcome by developing SMS based business applications since most people are familiar with and have access to

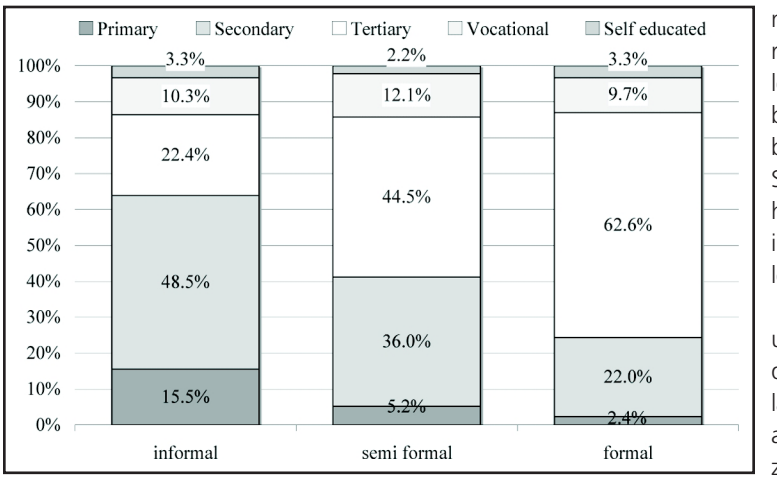

Figure 1. Owner's highest education.

mobile phones (Moyi, 2003). The higher ICT usage intensity of informal SMEs also points to that direction.

ICT Impact on Profitability

Informal businesses have a higher profitability in terms of fixed assets employed than semiformal ones, and semiformal ones a higher profitability than formal businesses as can be seen from Table 11. Profitability here is defined as aftertax profits (which is the same as pretax profits for most informal businesses) divided by the total value of fixed assets. The Kruskal Wallis test shows that the result obtained is significant. This supports the intuition that informal businesses usually operate at a higher gross profit than formal ones. Informal businesses are not bound to minimum wages, can hire casual labor whenever needed, pay mostly no taxes, and operate on less infrastructure than formal businesses. Health regulations often require, for example, separate toilets for males and females for any bar or restaurant. Many informal bars *(shebeens)* in Botswana, South Africa, and Namibia do not have any toilets at all. Operating informally means they are paying less or no rent at all.

Table 11. Mean Rank Comparison of Profitability (After-Tax Profit Divided by Total Fixed Assets) by Formality Categories

	N	Mean Rank
Informal	1,504	2,020.61
Semiformal	1,139	1,761.75
Formal	1,048	1,686.98
Total	3,691	
Kruskal Wallis Test	Chi-square	70.846
Grouping Variable:	df	2
formality index categories	Asymp. Sig.	0.000

Chowdhury and Wolf (2003) used modified Cobb-Douglas production functions to investigate labor productivity and returns for an SME survey conducted in Tanzania and Kenya. Their main finding is that ICT investments have no significant impact on the return on investment of SMEs.

This result ignores the fact that informal businesses are likely to have less ICT equipment than formal ones, yet their profitability is higher as shown in Table 10 and Table 11. Failure to distinguish informal from formal businesses will hence lead to incorrect conclusions.

Also, using production functions might not be an appropriate approach for dealing with SMEs. Production functions assume a certain relationship between inputs and outputs (Fandel, 2005). Most SMEs are not producing one product or service but more or less anything that makes money. An Internet café might offer tailoring and hair salon services at the same time. A locksmith might also fix cars on the side or do spray painting. It is often difficult to judge whether an SME is a manufacturing, a service or a retail/wholesale business because borders lines are fuzzy.

Wolf (2001) mentions that the focus on production processes might be too narrow and that ICTs might exert their influence through product-quality improvements and improved services. ICTs might additionally help SMEs in the administration of their businesses and enhance procurement and marketing processes.

This article therefore focuses on SMEs as a business rather than on single production processes. Turnover functions are used to measure the impact of ICTs on the profitability of SMEs. All analysis is carried out separately for SMEs of different formality classifications. A turnover function can be specified as follows:

Table 12. Robust Regression Results for Turnover Equations

	Formal	Semiformal	Informal
N	1,048	1,139	1,504
R^2	0.7775	0.9199	0.9481
F	74.39	208.58	193.52
Sig.	0.0000	0.0000	0.0000
Mean VIF	1.5	1.82	1.19

Table 13. Robust Regression Results Formal SMEs

	Unstandardized Coefficients	*t*	Sig.	VIF
Constant	1123.688	1.13	0.168	
Direct costs	1.889933	5.49	0.000	1.25
Wage bill	1.792044	5.26	0.000	1.57
ICT Usage Expenditure	3.926217	5.23	0.000	1.19
Rent, Land, Taxes, Mortgage Payments	7.839089	1.81	0.070	1.56
Water & electricity costs	−1.538975	−1.38	0.168	1.91

$$\frac{F_1}{F_A} = \beta_1 + \beta_2 \frac{F_2}{F_A} + \beta_3 \frac{F_3}{F_A} + \beta_4 \frac{F_4}{F_A} + \beta_5 \frac{F_5}{F_A} + \beta_6 \frac{F_6}{F_A} + \varepsilon,$$

where F_1 = turnover; F_2 = average water, electricity cost; F_3 = average cost for one's premises in terms of rent, land, taxes, and mortgage payments; F_4 = average business expenditure on telephone calls, fax, postage, and Internet; F_5 = average wage bill; F_6 = average direct cost (raw materials and other intermediary inputs or goods bought for resale); and F_A = total value of fixed assets.

The results from a regression analysis are summarized in Table 12. The R^2 for informal and semiformal SMEs is greater than 0.9 and the R^2 of formal SMEs is 0.77. This indicates that the turnover function in terms of the value of total fixed assets explains the turnover generation quite well across formality categories.

The *F* tests show significance for all three equations. Going into more detail indicated problems with multicollinearity for informal and semi-formal SMEs.[2] The variance inflation factor (VIF), which indicates whether a predictor has a strong linear relationship with other predictors, was considerably greater than 10 for some of the predictors. This is an indication of concern (Bowerman & O'Connel, 1990; Meyers, 1990). However, this is not surprising, because multicollinearity is to be expected for turnover functions since, in production relationships, output over time is a function of the amounts of various quantities of inputs employed (Hill, Griffiths, & Judge, 1997). The predictors with the highest VIF were dropped stepwise until the problem of multicollinearity was resolved.

All of the formal SMEs but water and electricity costs and the constant term were significant. Direct costs, wage bill, and ICT expenditure were significant at 99%. For semiformal SMEs, direct costs and ICT expenditure were significant and for informal SMEs only ICT expenditure was significant. ICTs hence contribute significantly to the turnover generation of SMEs across formality categories.

ICT Impact on Labor Productivity

Results released for all 14 participating countries further show that ICT usage also affects labor productivity positively (Stork, 2006). Labor productivity is

2. Problems of heterskedasticity were found in the data set, and a robust regression procedure in STATA was used that forced the variance of the error term to be 1.

Table 14. Robust Regression Results Semiformal SMEs

	Unstandardized Coefficients	*t*	Sig.	VIF
Constant	201.9	1.84	0.067	
Direct costs	1.62	15.35	0.000	1.12
ICT Usage Expenditure	2.77	4.79	0.000	2.24
Rent, Land, Taxes, Mortgage Payments	4.16	1.62	0.105	2.09

Table 15. Robust Regression Results Informal SMEs

	Unstandardized Coefficients	*t*	Sig.	VIF
Constant	112.54	0.66	0.507	
Direct costs	−0.169	−0.3	0.761	1.28
Wage bill	0.695	0.29	0.772	1.28
ICT Usage Expenditure	51.28	23.77	0.000	1.01

usually measured by dividing value added of a business by its number of employees (World Bank, 2006). For SMEs a more meaningful definition would be to use value added per individual working full time in the business (i.e., full-time employees, owners, and family members who also manage the business full-time).

Value added is defined as turnover minus direct costs, water, electricity, and any expenditure for premises. The equation below expresses labor productivity as a function of average salary (wage bill/full-time employees plus owners plus family members who run the business) and the ICT usage index. A positive significant coefficient for the ICT usage index would mean that higher ICT usage can be associated with higher labor productivity:

$$\frac{V}{E_A} = \beta_0 + \beta_1 \frac{W}{E_A} + \beta_2 ICTU + \varepsilon,$$

where V = value added; W = average wage bill; ICTU = ICT usage index; and E_A = full-time employees and owners who manage the business.

W/E_A is hence the average wage and V/E_A is labor productivity. Tables 16 and 17 display the robust regression results for the equation. The difference between informal and formal SMEs has been accounted for by using average wage as part of the independent variables.

Both the ICT usage index and average salary contribute significantly to explaining the variation in labor productivity among sampled SMEs. When adding 14 dichotomous variables for countries they are all significant except for South Africa. The additional variation, however, is only 0.5% though (adjusted R^2 = 0.575).

Specifying a similar equation for the ICT possession index shows that the ICT possession index equally explains variations in labor productivity (Tables 16 and 18):

$$\frac{V}{E_A} = \beta_0 + \beta_1 \frac{W}{E_A} + \beta_2 ICTP + \varepsilon,$$

where V = value added (turnover minus direct costs, water, electricity, premises, rent); W = average wage bill; ICTP = ICT possession index; and E_A = full-time employees and owners who manage the business. The R^2 for both equations is above 0.55, which indicates that the specified equations account for more than half the variation between SMEs.

Obstacles to ICT Adoption

The greatest obstacle to wider ICT usage was given as the high costs of ICTs (Table 19). This result was relatively uniform across the formality index, with nearly identical results from the informal to the formal sector.

Table 16. Robust Regression Results for Labor Productivity

	ICTU	ICTP
N	3,908	3,908
R^2	0.5701	0.5695
F	30.69 E	32.21
Sig.	0.0000E	0.0000
Mean VIF	1.02	1.01

Table 17. Robust Regression Results

	Unstandardized Coefficients	*t*	Sig.	VIF
Constant	−25,785.10	−1.73	0.083	
Average Wage	5.63	7.81	0.000	1.02
ICT Usage index	7,659.58	2.24	0.025	1.02

Table 18. Robust Regression Results

	Unstandardized Coefficients	*t*	Sig.	VIF
Constant	−21,836.49	−2.32	0.021	
Average Wage	5.64	7.75	0.000	1.01
ICT Possession index	12,284.54	2.60	0.009	1.01

This is the case even though the relative burden of ICT costs is higher for informal businesses than it is for formal ones. Table 20 shows the results of the Kruskal-Wallis test for the mean comparisons for the ICT usage costs divided by either total costs or turnover for informal, semiformal, and formal businesses.

The fact that there is such a strong relationship between ICT costs and either total costs or turnover points to the need for reduced prices. This is particularly relevant when one considers that informal businesses bear the brunt of higher costs and that these businesses have little support infrastructure. For example, many government programs are aimed at the formal sector, leaving the informal sector to fend for itself. This points to the desperate need to implement regulatory and policy changes with the aim of reducing the cost of ICTs in order to foster economic growth and employment.

The second-most-severe obstacle to ICT adoption was given as network problems and unreliable infrastructure. Given the parlous state of most fixed-line networks in Africa, this is easily understood.

The next-highest obstacle was the lack of awareness and knowledge of ICTs. Just below this category, SMEs listed a lack of financial resources as an obstacle to ICT usage. In this instance, informal businesses believed that this was more of a problem compared to semiformal and formal businesses which makes sense in that informal businesses are much less likely to have access to the banking system for credit.

Conclusion

The role of SMEs in promoting economic growth is gaining increasing awareness. In South Africa, it has been estimated that nearly 25% of its fixed capital formation is to be found in the SME sector (Berry,

Table 19. Main Obstacles to ICT Usage Stated by SMEs from 8 of the Sampled Countries

	Informal(%)	Semiformal(%)	Formal(%)	Total(%)
Network problems/unreliable infrastructure	11.3	11.7	10.5	11.2
Lack of financial resources	10.6	4.5	7.3	8.0
Lack of awareness & knowledge of ICTs	10.3	8.4	10.5	9.7
High cost, too expensive	55.6	60.8	58.8	57.9
Lack of skills & ICT illiteracy	2.8	7.4	6.9	5.1
No need	9.5	7.2	6.1	8.0

Table 20. Mean Rank Comparison

	Formality	*N*	Mean Rank	*Chi*-Square	df	Asymp. Sig.
ICT costs/total costs:	Informal	1,484	1,874.17	7.25	2	0.027
	Semi-formal	1,134	1,836.61			
	Formal	1,041	1,759.84			
	Total	3,659				
ICT costs/turnover	Informal	1,488	1,900.82	16.2	2	0.000
	Semi-formal	1,135	1,839.46			
	Formal	1,042	1,729.11			
	Total	3,665				

et al., 2002). A similar picture emerges for Namibia (Stork, Bruns, & Harris, 2004; Stork, Louw, & Matomola, 2004). However, the precise role of SMEs in providing employment and contributing to poverty alleviation remains unclear. Part of the problem is that there is a paucity of data around SMEs. In all of the countries in this survey, except Ethiopia, there is no centralized database on SMEs, making representative surveys very difficult. Also, there is a general lack of basic statistics such as how much employment SMEs provide, their average turnover, profitability, lifespan, and product range. Finally, of those SME surveys that have been done, the most conclusive have focused on issues such as access to capital and financial intermediation—correctly assuming that a key concern for any business is how to find additional capital to expand.

This focus has, up until now, largely ignored the fundamental role that ICTs can play within the SME sector. During the hype of the dot.com bubble in 2000, there was a general perception that the provision of ICTs to SMEs (and to individuals for that matter) would have a transformative effect. Clearly, the current view is more pragmatic. ICTs are now supported for the catalytic role that they can play within sectors of the economy. Within the SME sector, ICTs play a role in reducing transaction costs (thereby increasing efficiency) and increasing market access. For example, new financial products are increasingly based on mobile or Internet platforms. Finding new products, increasing customer awareness of the products available, and sourcing new markets are considerably easier using ICTs.

This article reports on an SME survey carried out by the RIA network in 14 African countries. The article demonstrates that the negative impact of ICT investments on business performance reported in the literature can be attributed to the failure to distinguish between the formal and informal sector. This article uses a formality index to classify respondent

SMEs into informal, semiformal and formal businesses.

The main findings of this paper are

- Informal businesses have a higher profitability in terms of fixed assets employed than semiformal ones, which in turn have a higher profitability than formal businesses. This is understandable, given that increasing formality encumbers a business, ensuring that it must follow certain laws in its operation, with the associated costs.
- ICTs are significant input factors for both formal and informal SMEs and contribute positively to revenue generation.
- ICT use increases labor productivity.
- Mobile phones have overtaken computers as tools in supporting the running of SMEs, given their prevalence and accessibility.
- The traditional focus on formal businesses particularly in terms of financial support undermines the role that the informal sector plays in the economy. The fact that it is more difficult to measure does not diminish its impact. The fact that informal businesses are more profitable than formal ones raises the issue that some businesses might prefer to be out of the formal environment.

Mobile phones are used right across the formality index. This situation has arisen by default rather than through regulatory intervention. At an infrastructural level, the opportunity now arises, through liberalization, to provide users with a wide range of competitive services that can drive increased access and lowered ICT costs

The focus upon mobile technology is both an advantage and a disadvantage. It is an advantage because it provides an SME with a low cost base and at the same time the flexibility to communicate with suppliers and customers easily. It is a disadvantage because of its limited functionality in terms of its ability to develop as an SME develops and its high usage charges. At present, mobile phones cannot be used to track inventory, provide cash flow and income statements, or even more basically, produce formal letters, marketing campaigns, or brochures.

The impact of these findings from a policy point of view requires further study that is outside of the scope of this report. Suffice to say that there are several key recommendations. A policy focus should be to either encourage the development of SME-specific tools on the mobile phone or to encourage lower ICT (specifically computer) costs:

1. Well-designed phone- or SMS-based business applications may have an impact on the profitability of SMEs. One of the key factors in providing the informal sector access to credit is the lack of co-operation between mobile operators and banks, often as a result of poor regulation. For example, in many countries, mobile operators are not allowed to be banks, but since mobile operators have access to the informal sector they could effectively service this sector. Encouraging innovation and cooperation between mobile phone operators and banks on the mobile platform could deliver SMS based business applications.
2. ICT costs can be reduced by establishing a regulatory environment that facilitates competition in the ICT sector. Lower ICT costs could be achieved through regulatory interventions such as
   - Introducing number portability between mobile phone operators;
   - International gateways for mobile operators and Internet Service Providers;
   - Introducing innovative approaches to fixed-line telephony such as prepaid mechanisms and fixed wireless access.

This article has attempted to contribute to the growing debate on the role of SMEs within a developing country economy. It finds that the informal sector is conflated with the formal sector or ignored, with substantially negative policy effects given the role of the SME sector in terms of contributing to economic growth and poverty alleviation. ■

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