

ICT Access, Social Infrastructural Facilities and the Performance of Informal Micro- and Small-Business Enterprises (MSBEs) in Nigeria

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Abstract-This paper examines the roles that access to ICT and improved social infrastructure play on the performance levels of informal micro and small business enterprises in Nigerian. For formal sector organisations, studies have been conducted to verify this, but not much is known with respect to micro and small informal sector businesses. This study therefore intends to bridge this yawning gap by carrying out an analysis of the impact of the access to telephone (a major component of ICTs that is fast finding common usage among informal sector enterprise-owners) among informal micro and small businesses in Nigeria. The study relies on primary data on the informal sector enterprises collected by the Nigerian Institute for Social and Economic Research (NISER) in 2014. Basic descriptive statistics in addition to the Ordinary Least Squares Regression model is used in the analyses of the data. Policy measures that will enhance further diffusion of ICT infrastructure among micro and small business to enhance their growth and contributions to income and employment generation are recommended at the end of the paper.

Keywords: *Social Infrastructural Facilities, ICT, Micro and Small Business Enterprises, Nigeria.*

I. INTRODUCTION

It has generally been agreed in the literature that increased access to information and communications technologies (ICT) as well as availability of improved social infrastructure promote economic development in any type of economy (Deen-Swarray, Moyo & Stork, 2013; Proshare, 2014). This situation is assumed to be true for enterprises as well. For instance, the use of ICT infrastructure has the capacity to increase accessibility of enterprises to vital information thereby enhancing the productivity and profitability of such business enterprises. These have the capacity of enhancing increased investment that creates more and better employment of resources and generate more income. However, major leapfrogging arising from increased access to ICT and improved social amenities has been traced mainly to formal sector businesses while their informal sector counterparts are less researched. Although the studies of Deen-Swarray et al are focused on the impact of ICT on informal business activities in selected developing

countries, yet, the conclusion of the study appear too general to be applicable to any country in particular. This study is therefore focused on Nigeria and the focus is on the informal micro and small enterprises.

Undoubtedly, SMEs and informal sector play important roles in poverty alleviation through income creation and employment generation in an economy. Informal sector enterprises, more often than not are always bedeviled with a lot of challenges such as lack of familiarity with new technology, limited access to finance and markets and lack of awareness of skills and understanding of ICT (Mutala et al.2006). In order for the sector to play important role in an economy it must embrace changes in global technological environment and all necessary infrastructure must be put in place (Migiro, 2006). Globally, there is an increase in the applications of information and technology with the use of internet, mobile phones and personal computers. In view of the renewed attention on agricultural developing as an engine of social and economic growth, coupled with the recent emphasis on the role of SMEs in poverty alleviation , income creation and employment generation , most governments, especially in developing countries have put up policies to encourage the adoption of Information and Communication Technology in agribusiness sector. This has spurred the interest of many scholars, practitioners, and policy-makers.

II. LITERATURE REVIEW

A lot of studies have been carried out on the importance of information and communication technology in growth and development of the economy. However, the economic impact of ICT varies across organizations and countries (Scupola, 2006)). The European Commission (2007) highlights that e-adoption, in form of the use of electronic networks, has helped firms to collaborate and innovate. This has impacted overall economic performance (European Commission, 2007). Beckinsale & Ram (2006), Blackburn & Smallbone (2008) in their studies have shown that the use and diffusion of ICT has brought tremendous improvement

in value chain and competition levels of businesses. These and other studies emphasized the role of ICT in the development of mobile commerce in agriculture by identifying the important areas of ICT use in agriculture such as input procurement, production, marketing, food traceability, and financial service delivery thereby empowering individuals.

Many studies on e-adoption have not clearly shown how companies could derive full benefits from e-adoption, but the works of Koellinger (2004) and O'Mahony et al. (2005) did demonstrate how e-adoption has brought about innovations and increase in productivity growth in businesses. E-adoption has created platform for access to government services, increased the quality and quantity of training opportunity, a balancing of gender inequalities and reduction of fraudulent electoral practices (The United Nation 2010.). This does not say that e-adoption does not have its demerits. E-adoption can bring about digital and knowledge divide, displacement of workers, increase of surveillance and decline in labour bargaining power. But the advantages outweigh the disadvantages. In his work on ICT access and the extent of its use and development of informal sector in Kenya, Gikenye (2014) opines that there is a need for proper understanding of the content and information needs of SMEs to be able to formulate the appropriate policy for the businesses. He observed that most SMEs have limited themselves to the use of simple technology, such as mobile phone and have not embraced other forms of technologies. This, according to him was due to lack of finance and lack of necessary skills. Ocholla (2006) in his study also found out that mobile phone is commonly used among the SMEs owners due to the fact that mobile technology interfaces easily with informal oral traditional ways of circulating knowledge and information. Majority of SMEs owners in informal economy are ignorant of the law and rights guiding their businesses Orwa (2007).

Deen-Swarray et al. (2013), in their study of nine African countries, using nationally representative data for informal businesses in residential and semi-residential areas, found out the extent to which informal businesses employ ICTs and challenges they face. The findings also revealed that the lack of use of other kinds of ICTs such as personal computer and internet were attributable to affordability and availability. Kaynak et al.(2005) are of the opinion that government should provide adequate incentives to enable the SMEs acquire ICTs with minimum investment. They emphasized the need to provide enabling environment in which small businesses could thrive. Duncombe et al. (2009), in their study in Botswana discovered that there was a huge presence of informal information system, and advised that attention be focused on formalization of information systems, especially in sub-saharan Africa, to bring about entrepreneurial development.

Most of the previous studies have concentrated on assessing and ascertaining the level of readiness and adoption of ICT in developing and developed world. Many of these studies ignored the factors that could affect the e-readiness of ICT especially on the part of the small and

medium scale enterprises (SMEs) agri-business owners in the informal economy. The previous studies failed to pay attention on individual characteristics and traits of the firms and countries. Understanding the characteristics of the SMEs would enable one to understand the appropriate aspects of ICT to deploy and the pragmatic way of using them to bring about the desired results in a business. There is the need for more research work on the extent to which the various forms of ICTs (such as Mass Media-TV and Radio, and Telephone) have assisted SMEs owners in informal sector in exchanging ideas and experiences for improved awareness and feedback mechanism on policy issues and regulations. However, this study will consider the critical issues on the e-readiness assessment of the use of ICT in agriculture and shed light on the underlying factors that could influence e- adoption of ICT in Nigeria.

III. METHODOLOGY OF STUDY

A. *Research Design*

The research design for this study was cross-sectional. It made use of a set of secondary data-set collected on a quantitative survey on informal sector enterprises in Nigeria. As reported earlier, our main objective is to investigate the proposed relationship between access to ict facilities in the informal sector enterprises and the performance of those organisations. By focusing on a set of enterprises having similar characteristics, a greater homogeneity of context is achieved, which enhances the quality of policy advocacy for such context. Also, using micro-data rather than aggregate alternatives, permits a greater details to be captured both for descriptive and econometric analyses. According to Alessie et al. (1992), a research approach employing the use of micro-data provides more units of observations and therefore permits the separate identification of the effects of a greater number of determinants. Second, the approach utilizes heterogeneity in the population rather than aggregating across groups, so that empirical results are richer (See also Davidsson, 2004 as quoted in Urban and Kongo, 2015).

The dataset for this study therefore was the nation-wide enterprise-level data on informal sector enterprises collected by the Nigerian Institute of Social and Economic Research (NISER) in collaboration with the National Planning Commission (NPC) Abuja. Funding for the research was provided by the NPC and UNDP, and the research team was made up of high level manpower from NPC, NISER, National Bureau of Statistics (NBS), and Central Bank of Nigeria (CBN), SMEDAN and the Nigerian Association of Small Scale Industrialists (NASSI). The first phase of the study took place in six states drawn from each of the six geopolitical zones of Nigeria plus the Federal Capital Territory, Abuja. The survey was conducted in the year 2013.

The instrument for data collection by the NISER/NPC was a structured questionnaire that was used for obtaining the necessary information regarding the operations of informal sector enterprises in the selected states and the FCT. A 2-stage sampling technique was used in the data

collection process. The first stage was the selection of one state from each of the six geopolitical zones in Nigeria while the FCT was purposively chosen. The second stage was the random selection of one urban and one rural local government area from each of the selected states. In each state, four hundred questionnaire were administered to selected informal sector enterprises in the ratio of 70:30 for the urban and rural locations respectively, in each state selected for the exercise. This gives a total of two thousand eight hundred targeted micro-enterprises for the study.

Y is the vector of enterprise performance variables (gross weekly Profit, Employment level, Total Asset); H is the vector of enterprise-related variables; S is a vector of the owner-related variables, X is the vector of ICT and Infrastructure-related variables while N is the vector of other unclassified variables affecting business performance as specified by economic theory. Some elements of the S variables are age of the entrepreneurs, and the highest formal educational attainment measured as number of years spent in school. Other S variables include marital status of respondents, religion, Region of origin of enterprise owner (whether North or South of Nigeria). The elements of S variables include, type of enterprise - manufacturing, technical services or trade, location of enterprise - rural or urban, age of business enterprise, initial capital of business, present level of capital, relative ease of accessibility to loan and overdrafts, among others. In a stepwise fashion, the X variables are added to the H and S variables to determine the relative effects of each of the X variables on business performance. X variables used are ICT access and the extent of available infrastructure to the enterprise.

The estimation of the basic model is in stages as follows. At first, the H and S variables are estimated in the sub-model:

$$Y = \beta_0 + \beta_1 S + \beta_2 H + \mu \quad (4)$$

In the next stage, we added the ICT and social infrastructure vectors X as well as other related variables (N) as stated in equation (3) above, thereby resulting in equation (5) below:

$$Y = \beta_0 + \beta_1 S + \beta_2 H + \beta_3 X + \beta_4 N + \mu \quad (5)$$

The apriori expectation is that the coefficient estimate of the X variables be positive and statistically significant in line with our conjecture of the relative importance of the ICT and economic infrastructure on the development of informal sector enterprises in Nigeria.

IV. DATA ANALYSIS AND DISCUSSION OF FINDINGS

A. Types, Ownership and Size of Informal Sector Enterprises in Nigeria

Informal economic activities are made up of a wide range of micro, small, and medium-scale enterprises which are mainly in the self-employment categories. Although the economic activities of the informal sector are both legal

(e.g. tailoring, block-making, food vending, among others) and illegal (commercial sex activities and all other forms of prostitutions, smuggling, Traditional (untrained) birth attendants, magicians and money doublers, among others) in nature but the activities considered in this study are the legal types. They are (i) Manufacturing Enterprises (ii) Technical Services; and (iii) Distributive Trade.

The Manufacturing sub-sector encompasses all economic activities involving textile/weaving; leather product; plastic product; wood product; metal fabrication; rubber and plastic products; food products; grass/reed crafts; stone crafts; mining/quarrying; boat building and net-making; block making; agro-allied processing (Garri, Soya milk, Zobo processing); animal husbandry (poultry, piggery, fish farming, etc); bakery; sachet/table water manufacturing; and drug making. Out of the 2800 enterprises surveyed, 668 representing 24 percent are of the manufacturing type.

The Technical Service Sub-sector includes those business activities such as repairs and maintenance, informal education services, health services, counselling services as well as labour for menial work. Repairs and maintenance services, vehicle repairs and maintenance, tinkering, carpentry and servicing of various household and commercial tools. Informal health services, especially in the rural areas, include traditional birth attendants, herbalists and other traditional medical practitioners. There are also traditional spiritualists who offer counselling services. These services are rendered for fees paid to those who render them. Main activities covered in this sub-sector include automobile repairs (mechanics, rewire, vulcanizer, panel beater, painter); Bicycles/motorcycle repairs; footwear repairs (cobbler); Hairdressing/barbing; electronics, including radio/TV/computer repairs; carpentry/furniture; boat repairs; plumbing/pipe fittings; bricklaying; blacksmith; welder and frame cutters; potters and related clay and abrasive formers; fashion designing; and transport operators (taxi, buses, motorcycles (okada), tricycle (keke). The technical services subsector represents 37.7 percent of the total number of sampled enterprises.

The activities of the distributive trade sub-sector are mostly the distribution of goods through wholesale and retail outlets. Items traded include basic food stuff materials; textile; furniture and fittings; coal and charcoal; plastics and rubber products; building materials; fabricated metal products; computer software and hardware; agro-allied, spare parts; electronics/electrical; laundry; cooked food in restaurants (foods and drinks centres); patent medicine; among others. Thirty-eight percent of total number of enterprises sampled belong to the distributive trade subsector.

In terms of ownership structure, most of the enterprises are run as sole trader businesses as 93.3% of them are solely owned by individuals. Those operated as either Partnership or Family businesses are 3.2% and 2.6% respectively while the rest are run as private limited companies. The modal level of initial and current capital is over N50, 000. Over 50 percent of the enterprises belong to this category for the

initial capital while over 70 percent of the businesses have a current capital level of over N50, 000 which is the modal current capital level. Contrary to the conjecture that many informal sector enterprises have short life-span, some of these businesses have run for over 30 years. According to the statistics gathered from the survey exercise, 65 of the enterprises representing 2.4 percent of the total have been in existence for at least 30 years. Nine hundred and fifty seven of them (representing 35.5%) are between 11 and 29 years old, those in the 6-10 years of age Y is the vector of enterprise performance variables (gross weekly Profit, Employment level, Total Asset); **H** is the vector of enterprise-related variables; **S** is a vector of the owner-related variables, **X** is the vector or ICT and Infrastructure-related variables while **N** is the vector of other unclassified variables affecting business performance as specified by economic theory. Some elements of the **S** variables are age of the entrepreneurs, and the highest formal educational attainment measured as number of years spent in school. Other S variables include marital status of respondents, religion, Region of origin of enterprise owner (whether North or South of Nigeria). The elements of **S** variables include, type of enterprise - manufacturing, technical services or trade, location of enterprise - rural or urban, age of business enterprise, initial capital of business, present level of capital, relative ease of accessibility to loan and

overdrafts, among others. In a stepwise fashion, the **X** variables are added to the **H** and **S** variables to determine the relative effects of each of the **X** variables on business performance. **X** variables used are ICT access and the extent of available infrastructure to the enterprise.

The estimation of the basic model is in stages as follows. At first, the **H** and **S** variables are estimated in the sub-model:

$$Y = \beta_0 + \beta_i^0 S + \beta_i^1 H + \mu \dots \dots \dots (4)$$

In the next stage, we added the ICT and social infrastructure vectors **X** as well as other related variables (**N**) as stated in equation (3) above, thereby resulting in equation (5) below:

$$Y = \beta_0 + \beta_i^0 S + \beta_i^1 H + \beta_i^2 X + \beta_i^3 N + \mu \dots \dots \dots (5)$$

The *apriori* expectation is that the coefficient estimate of the **X** variables be positive and statistically significant in line with our conjecture of the relative importance of the ICT and economic infrastructure on the development of informal sector enterprises in Nigeria.

Table 1: Selected Characteristics of Enterprises and Owners

Main Characteristics		Percent (N=2800)	Main Characteristics		Percent (N=2800)
Type of Enterprise	Manufacturing	23.9	Formal Education	None	10.8
	Technical Service	37.7		Primary	12.2
	Distributive Trade	38.4		Secondary	42.4
Age of Enterprise	1-5 Years	37.9		V/Technical	10.0
	6-10 Years	24.2		Post-Secondary	24.6
	11-19 Years	28.0		Type of Work Place	Open Space
	20-29 Years	7.5	Open Shed		12.0
30 Years and over	2.4	Uncomplete d Building	2.5		
Forms of Business Ownership	Sole Trader	93.2	Lock-up Store		41.6
	Partnership	3.2	Workshop	14.9	
	Family	2.6	Others	6.2	
	Private Limited	2.0	Owned the Workplace?	Yes	23.1
Business Location	Urban	65.1	No	76.9	
	Rural	34.9	Do You Have Telephone?	Yes	68.7
Gender Of Owner/Respondent	Male	76.6	No	31.3	
	Female	23.4	Is there Access Road?	Yes	83.4
Marital Status	Single	28.1	No	16.6	
	Married	65.9	Is there Electricity?	Yes	73.3
	Divorced/Widowed	6.0	No	26.7	
			Piped Water?	Yes	23.1
			No	76.9	

Source: Computed from Survey Data

Access to ICT facility proxied by the ownership and use of telephone in business dealings was found to be common among sampled businesses (68.7%), while other infrastructural facilities available vary from 23% for access to piped water, to 73.3 percent and 83 percent for access to electricity supply and motorable road-networks respectively. An infrastructural availability index constructed for each of the enterprises showed that 40.3% of all enterprises have

access to at least 3 of the four facilities (telephone, water, electricity supply and access roads) captured in the survey. Three hundred and ninety seven enterprises, representing 17.3 percent of the total have access to all the four facilities. Of those enterprises that have all the four facilities. Manufacturing sector represents 26.4 percent while Technical Services and Distributive Trade constitute and 32.2% and 41.4 percent respectively. Some of these

characteristics are presented in Table 1, while those that are considered important as adjudged by economic theory are incorporated in the empirical analysis in the later section of this paper.

B. *The Log of Odds of an Enterprise Having ICT Access*

As reported in Table 1, not all the enterprises have an access to the four listed infrastructural facilities, and more importantly, telephone which is used as proxy for ICT infrastructure. Factors determining access to telephone on one hand and the combination of telephone and electricity on the other hand, in each of the enterprises was examined by the use of binomial logit model which predicts the log of odds ratio of an enterprise with an identified characteristic possessing an ICT infrastructure (in this case, telephone or electricity and telephone) among the sampled enterprises. Two main models were estimated: the first one made use of Access to telephone (using binary variable (0, 1): 1, for owning a telephone and zero, otherwise) as the independent variable; while the second model used the interaction of Electricity and Telephone access as the independent variable. The latter independent variable is important due to the fact that the availability of electricity in the enterprise constitute an incentive for owning ICT gadgets which, more often than not rely, on the availability of electricity for operation and/or battery recharge.

In Table 2, the result obtained for both types of regression estimates are shown as Regression 1 and Regression 2 respectively. In regression 1, the coefficient estimates of the explanatory variables affecting the enterprises' access or otherwise to telephone are reported while the ones affecting the access to telephone and electricity are reported in regression 2 of the same table. The model reported in Regression 1 shows that three of the explanatory variables are statistically significant at the levels of confidence indicated. These variables are: Region of operation of the enterprises, current level of capital employed, and the level of education of the owner/manager of the enterprise. The model as a whole explained 21.3 percent (Nagelkerke R-Squared) of the variance in the log of odds of having access to telephone, and correctly classified 74.8 percent of the cases. The omnibus test of model coefficients reported a Chi-Square statistic of 72.554 ($p < 0.001$) indicating that the model is able to distinguish between respondents who have access to telephones in their enterprises and those that did not at the time of the survey. In columns 4 and 8 of Regressions 1 and 2, the Exp(B) or the odds ratio are reported and each of these represents the

predicted change in odds for a unit change in the predictor if such a predictor is a numeric variable, and for a differential change if a categorical variable. The Wald estimates are reported in columns 2 and 6 and the figures show the importance of the corresponding variable in the model.

In regression 1, the independent variable is access to telephone and three of the explanatory variables (Region, Weekly Profit and Education) are both statistically significant and important predictors. In addition to being statistically significant at the indicated levels, they report very high Wald statistic showing the relative importance of each in the model. For instance, Region South has the highest Wald statistic of 46, followed by Region North of 22. Weekly profit has the next high Wald statistic of 7 while the Biztype-Technical Service has 3 with a statistical significance of 10%. The implications of these is that enterprises operating in the Southern part of Nigeria relative to the North and Abuja are 17 times more likely to possess a phone (a proxy for ICT-access) or, in other words, have access to ICT for business transactions while an increase in profit by one unit predicts a 7 times more likelihood of having a telephone in business operation. The educated owners are three times more likely to have a telephone than their uneducated counterpart.

One important infrastructure that is a complementary factor to ICT access is electricity. Though many ICT appliances are equipped with facilities to make them run on batteries even if there is no electricity supply, but these DC voltage batteries need to be recharged from time to time. Thus it is hypothesised that availability of electricity in the business premises is an enhancing factor for ICT adoption in business. Thus an interactive variable of Telephone and Electricity was used as the independent variable in Regression 2 and the results are reported in columns 5 to 8 of Table 3. This interactive dependent variable led to some interesting results: First, the owners' education variable became statistically significant at 1 percent level with odds ratio of 1.092 and a Wald statistic of 10, making it the second most important variable explaining ICT access after the Region variable. Second, the education variable is not only statistically significant, it became more important than the coefficient estimate of profit variable in Regression 1. Third, the Cox & Snell R^2 increased from 15% in Regression 1 to 16% in Regression 2 while Nagelkerke's R^2 remain unchanged. All of these show the importance of electricity for businesses to facilitate ICT adoption in micro and small businesses in Nigeria.

Table 2: Binary logit regression result for access to ICT infrastructure

In sampled enterprises

VARIABLES	REGRESSION 1				REGRESSION 2			
	B- Est. (1)	Wald (2)	Sig. (3)	Exp(B) (4)	B- Est. (5)	Wald (6)	Sig. (7)	Exp(B) (8)
Owners' Education (Years)	.041	2.284	.131	.969	.088*	10.69 6	.001	1.092
Gender of Owner: Male	.321	.285	1.269	1.378	-.078	.085	.771	.925
Gender of Owner: Female	Excl.				Excl.			
Enterprise Age	.004	.043	.835	1.004	-.004	.053	.817	.996
Region: North	1.452 *	22.47 4	.000	4.271	1.025 *	11.92 3	.001	2.786
Region: South	2.851 *	46.36 2	.000	17.305	2.131 *	31.27 3	.000	8.423
Region: Abuja	Excl.				Excl.			
BizType: Manufacturing	.077	.038	.846	1.080	-.248	.503	.478	.780
BizType: Technical Service	.722 ⁺	3.612	.057	2.069	.275	.626	.429	1.317
BizType: Distrib. Trade	Excl.				Excl.			
Sector: Urban	-.205	.626	.429	.815	.209	.752	.386	1.233
Sector: Rural	Excl.				Excl.			
Total Employed	-.042	2.239	.135	.969	-.034	1.714	.190	.967
Capital Employed	.096	.542	.461	1.101	.101	.633	.426	1.106
Weekly Profit (in Naira)	.447*	7.244	.007	1.564	.421*	7.601	.006	1.523
Constant	-	15.26	.000	.051	-	21.81	.000	.032
N	2.971	6			3.440	9		
Hosmer & Lemeshow	Chi-Square: 13.885 (Sig.=.085)				Chi-Square: 17.790 (Sig.=.023)			
Pseudo-R ² :								
- Cox & Snell	.151				.160			
-Nagelkerke	.213				.213			
Omnibus Test of Coeff.: Chi-Square	72.554				77.190			
Sig:	.000				.000			
Overall Percentage	74.8				66.4			
Dependent Variable:	Have Telephone? Yes=1, 0 Otherwise				Have Telephone and Electricity? Yes=1,			

Note: * = Significant at 1% level or less; ** = Sig. at 5% Level + = Significant at 10% level

Source: Computed by the authors from Survey Data

C. ICT, Social Infrastructure and Informal Business Performance in Nigeria

Descriptive Analysis

The empirical analysis carried out in this section measures the effect of ICT adoption and the availability of reported social infrastructure on the performance of micro and small businesses in Nigeria. The measure of performance adopted for this study is the self-reported weekly earnings by the owners of the businesses in the survey conducted to generate these data. As already reported

in Section 1 of this paper, three types of infrastructure in addition to Telephone were reported by the respondents. These are: Electricity, Pipe-borne water, and access roads. A cross-tabulation of each of these facilities with other characteristics of the enterprise and/or owners and mean profit is shown in Table 3. The table shows the distribution of weekly earnings by some selected characteristics. Businesses having ICT access enjoys twice as much profit as those that do not have as weekly profit levels are N44, 053 and N20, 202 respectively for those who have telephones and those that do not have it. Electricity supply within business premises guarantees above 150 percent level of profit relative to those who do not have such facility.

Table 3: Distribution of Mean Profit by Some Selected Variables

MAIN VARIABLE	DERIVED VARIABLES	MEAN WEEKLY PROFIT	N	STANDARD DEVIATION
Has Telephone?	No	20,202.93	745	43,589.36
	Yes	44,053.40	1633	337,799.53
	Total	36,581.32	2378	281,179.19
Has Electricity?	No	26,230.84	657	145,637.86
	Yes	40,093.27	1788	312,018.59
	Total	36,368.28	2445	277,335.94
Has Pipe-borne Water?	No	27,665.77	1825	165,117.44
	Yes	67,681.57	537	506,528.31
	Total	36,763.35	2362	282,119.65
Has Access Road	No	23,946.86	393	46,528.21
	Yes	33,933.57	2029	208,003.62
	Total	32,313.10	2422	191,327.79
Infrastructural Density	Infradex=1	19,748.59	335	46,908.44
	Infradex=2	28,796.38	595	153,742.33
	Infradex=3	30,816.09	897	197,403.54
	Infradex=4	58,571.03	374	320,680.13
	Total	33,301.78	2201	200,415.83
Current Age of Business	1-5 years	24,869.62	955	169,097.66
	6-10 years	31,418.75	612	130,445.37
	11-19 years	42,760.29	695	388,064.38
	20-29 years	86,164.36	188	490,340.72
	30 years and above	31,491.86	59	69,264.77
	Total	36,171.42	2509	273,835.25
Current Capital Level	Less than N1,000	4,476.47	17	6,570.29
	Btw N1,000 - N9,000	8,197.04	193	21,403.72
	Btw N10,000 - N49,000	14,219.92	553	87,221.46
	N50,000 & above	40,196.70	1791	216,711.94
	Total	31,834.90	2568	185,970.18

Source: Computed by the authors from Survey Data

TABLE 4A - Determinants of Weekly Income

Variable Names	REGRESSION 1		REGRESSION 2		REGRESSION 3		REGRESSION 4	
	B-Estimate	t-value	B-Estimate	t-value	B-Estimate	t-value	B-Estimate	t-value
L Capital	1.679*	14.113	1.692*	13.457	1.709*	13.538	1.736*	13.773
L Empt	0.154*	4.147	0.155*	4.047	0.146*	3.814	0.158*	4.096
L Educ	0.109*	2.147	0.094+	1.8	0.079	1.505	0.099+	1.898
L Bisage	0.2*	6.17	0.189*	5.67	0.186*	5.531	0.192*	5.689
Mfg	0.64*	9.732	0.635*	9.302	0.589*	8.534	0.641*	9.253
Trade	0.091	1.492	0.086	1.354	0.089	1.4	0.122+	1.913
Urban	0.021	0.392	0.027	0.478	-0.035	-0.604	0.017	0.3
North	0.05	0.639	0.046	0.58	0.041	-0.502	0.052	0.634
South	-0.019	-0.245	-0.069	-0.838	-0.038		-0.089	-1.044
Male	0.357*	5.446	0.362*	5.32	0.384*	-0.45	0.35*	5.103
Electricit			0.097	1.566		5.618		
Water					0.414			
Telephon						6.546	0.103+	1.769
Road				28.937				
L tradex								
Constant	5.959*	30.087	5.926*		5.939*		5.852*	28.116
N	2102		1985		1928	28.737	1939	
R ²	0.199		0.199		0.215		0.199	
R ² -Adjust	0.195		0.195		0.211		0.194	
F	51.861		44.562		47.847		43.488	
Prob(F)	.000		.000		.000		.000	

* Significant at 1% level; + Significant at 10% Level; Source: Computed from Survey Data

TABLE 4B: Determinants of Weekly Income business weekly earning, the natural log of *infradex* was introduced into the equation and this was found to be statistically significant on its effect on weekly business earnings.

Variables	REGRESSION 5		REGRESSION 6		REGRESSION 7	
	B-Est.	t-value	B-Est.	t-value	B-Est.	t-value
LCapital	1.777*	14.143	1.632*	11.957	1.724*	13.515
L Empt	0.161*	4.249	0.144*	3.619	0.159*	4.112
L Educ	0.101+	1.935	0.096	1.76	0.085	1.610
L Bisage	0.191*	5.705	0.197*	5.637	0.186*	5.484
Mfg	0.635*	9.338	0.669*	9.266	0.631*	9.086
Trade	0.101	1.594	0.15*	2.283	0.107+	1.673
Urban	0.022	0.394	0.006	0.103	0.014	0.248
North	0.062	0.774	0.031	0.369	0.050	0.608
South	-0.044	-0.016	-0.087	-0.993	-0.100	-1.172
Male	0.346*	5.091	0.333*	4.66	0.369*	5.345
Tel/Elec					.148*	2.145
Water						
Telephon						
Road	-0.032	-0.437				
L tradex			0.147*	2.316		28.372
Constan	5.887	27.679		5.864	5.903	
N	1968		1808		1898	
R ²	0.202		0.189		0.201	
R ² -Adj	0.198		0.184		0.196	
F	45.143		37.939		43.896	
Prob(F)	.000		.000		.000	

* Significant at 1% level; + Significant at 10% Level
Source: Computed from Survey Data

Businesses with pipe-borne water enjoy a profit level of almost N70, 000 per week relative to those without it and probably have to expend a large sum of money to provide own water supply. The *infradex* variable was created to measure the density of available infrastructure to each of the sampled enterprises. Those enterprises having access to all the four facilities is ranked as 4 while those having one is ranked 1. The table above shows that earnings of enterprises increase with increasing *infradex* while an increasing trend with weekly earning and age of business up to 29 years was observed. The same increasing trend was observed with current capital level.

ICT Access and the Performance of Micro and Small Businesses

An Ordinary Least Squares Approach Tables 5A and 5B present the ordinary least square (OLS) result of the regression of log of weekly earnings of enterprises on the selected explanatory variables. The importance of this exercise is to determine the effects of ICT and other infrastructure on earnings of micro and small enterprises in

Nigeria. In achieving this aim, a non-linear form of equation 5 was estimated and this has given rise to regressions 1 through 7 of Tables 5A and 5B. Since the equation is double-logged to achieve linearisation, the coefficient estimates of the numerical variables should be interpreted as elasticities, while the categorical variables should be interpreted as differential intercept relative to the reference category. The regression analysis shows that in addition to labour market and human capital variables, ICT and infrastructural variables are also statistically significant determinants of earnings distribution among the sampled enterprises. In regression 4 for example, Telephone variable is statistically significant at 10 percent level and its addition to the traditional variables (regression 1) led to the statistical significance of the Trade dummy and an increase in its differential coefficient from .091 in regression 1 to .122 in regression 4. Telephone therefore contributes to earnings and improves the contribution of trading enterprises to weekly earnings. This result appears plausible if it is realised that information from and to customers, raw material and finished goods prices, among others can be

easily transmitted and obtained by the use of telephones for communication and information processing in business.

On its own, the addition of Electricity variable did not improve weekly earnings (Regression 2, Panel A), and this is surprising at it is contrary to the *a priori* expectations. However, when Electricity variable is combined with Telephone variable in an interaction variable Tel/Elec, there is an improvement in the coefficient of determination while the variable itself is statistically significant at 1 percent level. The supply of electricity to any business premise enhances the access of owners to own and use telephone and other ICT devices, thereby improving the level of earnings in the business enterprise. Apart from road infrastructure which is surprisingly not statistically significant in its effects on business weekly earnings, others have contributed to it in a statistically significant sense.

V. SUMMARY OF FINDINGS AND CONCLUDING REMARKS

This study examined the effects of ICT and other social infrastructure like Electricity, pipe-borne water and access roads on the performance of micro, small and medium enterprises in the informal sector of Nigeria. Results from the analysis of data reveals evidence of positive effects of ICT and other social infrastructure on self-reported earnings of sampled enterprises. An interesting result from the analysis is the impact of the interactive variable 'Tel/Elect' which is the combination of electricity and telephone variables.

The implications of these findings for study is that the efforts of government towards making ICT and other social infrastructural facilities available for micro and small business is one important way of promoting the profitability and hence sustainability of these enterprises. When such businesses are profitable, stable and growing, they will become sources of income and employment generation to the Nigerian economy at it is in many developed nations.

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