

Employment Potentials, Innovation, and R & D Expenditure in Nigeria: Evidence from Indigenous Microenterprises

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Abstract: This study examined employment potentials of indigenous micro-enterprises in Nigeria as an alternative approach to tackling the menace of unemployment in Nigeria. Nigeria is a country with a relatively young population, with a median age of 18 years, which is lower than the African and global averages of 20 and 31 years respectively. A youthful population suggests a strong labor force; with the labor force population of around 70 million in 2020. Providing enough productive jobs for this young demographic (aged 15-29 years) and rising labor force is a challenge; more than 30 million young Nigerians were reported to be unemployed in 2021. As a result of this rapidly growing labor force, job creation is frequently on the top burners of policymakers and governments' development agendas. The dataset employed in the study is a secondary survey data exclusively from the TETFUND Report (2020). In order to achieve our objectives, we employed ordered logit and ordered probit as well as descriptive statistics. We thus found that improved innovation capabilities of these firms were found to result in increase in their employment potentials. Also, increased investment in R&D leads to rise in employment generating potentials of these entities, and adoption of superior foreign technologies in their operations equally improves the chances of the firm to generate employment. As a result, we recommended that there is need for government to offer technical assistance to these enterprises through trainings and workshops to horn their skillsets and build innovation capabilities that result in improved employment potentials. They need to be motivated to commit a sizeable part of their lean resources into activities such as training and re-training of employees that enhance innovation capabilities and employment potentials of these entities.

Keywords: Microenterprises, Unemployment, Logit, Probit, Innovation Capabilities

1. Introduction

Nigeria is a country with a relatively young population, with a median age of 18 years, which is lower than the African and global averages of 20 and 31 years respectively. A youthful population suggests a strong labor force; with the labor force population of around 70 million in 2020.ⁱ Providing enough productive jobs for this young demographic (aged 15-29 years) and rising labor force is a challenge; more than 30 million young Nigerians were reported to be unemployed in 2021 [27]. As a result of this rapidly growing labor force, job creation is frequently on the top burners of policymakers and governments' development agendas.

Increasing the number of available jobs in an economy

known as job creation remains a pivotal part of government initiatives aimed at lowering unemployment. This necessitates a stable microeconomic foundation as well as structural policies that promote innovation, skills, and novelty tools to tackle this unemployment. Consequently, job creation through enterprises is often described in the literature as the key to address this challenge. For instance, in the developing economies, approximately, 66 percent of all formal employment created by micro-sized enterprises (MEs), who dominate the global employment landscape with around 80 percent in low-income nations.ⁱⁱ Unfortunately, these micro entities are often the most vulnerable as the economic conditions become unfavorable. Small businesses are frequently found in the unorganized sector, where labor laws are almost nonexistent.

Thus, in the study, as a panacea to the to the rising

unemployment problem in Nigeria, we defined indigenous microenterprises as unorganized, privately owned manufacturing/services enterprises with a workforce of less than 10 employees that engage in traditional economic activities such as blacksmithing, wood carving, tying and dying of clothes, weaving, and so on. The size element is such an essential limiting component in the definition of our microenterprises, although, what makes a microenterprise differs by country and economy. Most microenterprises in Nigeria, on the other hand, suit our categorization of less than 10 workers [30]. For adequate job creation, the kind of employment that contributes directly to improvement in livelihood, it must be in sectors that have relatively high elasticities to employ.

In spite of the efforts of the governments through variety of policies and programs, Nigeria's unemployment rate has been continuously rising. Successive governments have attempted to reverse this ugly trend via SMEs with focus on formal sector while indigenous microenterprises are often neglected. As a result, perhaps, little or no substantial success have been recorded in reversing this ugly trend. The continued increase in the unemployment rate demonstrates that these policies and programs have not been effective in achieving the employment policy's objectives. Therefore, the study looked at the chances of employment generation through indigenous micro-entities in an effort to tap into the potentials of these indigenous firms as a substitute for the conventional approach to job development. Thus, it is against this background, we investigated the potentials of the indigenous microenterprises in job creation in Nigeria since employment generation is the main channel through which economic growth is made more inclusive, as labour remains one of the main resources the country has in abundance.

What is the effect of innovation capabilities on the employment potentials of indigenous micro-enterprises in Nigeria? How does investment in R & D influence employment potentials of these micro-enterprises in Nigeria? What are the major challenges militating against the realization of the economic potentials of these enterprises in Nigeria? The following are the five sections that made up this paper; the introduction is the first section; Section two follows with examination of related literature on the subject matter in order to identify knowledge gaps. Section three covers the theoretical foundation, research methods, and empirical modeling. The results and discussion of findings are the subjects of section four. Finally, the conclusion, and policy recommendations are covered in section five.

2. Literature Review

2.1. The Enterprise Landscape: Micro, Small and Medium Enterprises (MSMEs)

A universal definition of small and medium-sized businesses does not exist. Depending on the country's and organization's level of economic development, SME is defined differently by various entities. The total number of employees, the total amount invested (in assets), and the sales turnover are the indicators that are most frequently used to describe SMEs. SMEs in Nigeria are companies with between 11 and 100 employees and/or a total cost of less than 50 million naira, including land expenses. In Nigeria, both governmental and private organizations have promoted various meanings of the three dimensions. Selected institutional definitions of SMES within the parameters of assets and employment size are shown in table 1.

Table 1. Institutional Definitions of MSMEs.

Institution	Assets (N Million)			No of Employees		
	Micro	Small	Medium	Micro	Small	Medium
Bank of Industry	<=5	>5<=100	>100<=500	<=10	>11<=50	>=51<200
SMEDAN	<=5	>5<=50	>50<=500	<10	10-49	50-199
FMTII		<=50	<=200	10	100	300
World Bank	NA	NA	NA	<5	5-19	20-99
UNIDO	NA	NA	NA	<5	5 -19	20-99

Author's compilation (2022)

Considered as the engines of economic growth, SMEs account for roughly 90% of enterprises, more than 50% of formal employment, and a sizeable portion of global gross domestic product (GDP). When informal SMEs and microenterprises are taken into account, the contribution of formal SMEs to GDP in developing nations would be much higher.ⁱⁱⁱ In Nigeria, Micro, Small and Medium Enterprises (MSMEs)^{iv} contribute nearly three quarters of aggregate employment, nearly half of GDP but very low share (below 8%) of exports. An important distinction between developed and developing country settings is that while SMEs are known to dominate the sector in more developed economies, microenterprises dominate the landscape in most developing

countries, including Nigeria.

The composition of the enterprise sector, particularly its domination by self-employment, has important consequences for employment generation. In general, it has been observed that most microenterprises start micro, remain micro and die micro, given that only very few have capacity to grow and generate employment. Also, the link between economic growth and job creation is tenuous owing to the limitation to economies of scale. Thus, output and employment expansion derive largely from factor accumulation, in this case the creation of new enterprises and addition of resources to existing ones, rather than technological improvement and returns to scale.

Table 2. *Micro, Small and Medium Enterprises (MSMEs) & The Nigerian Economy.*

	2010	2013	2017	Average
Aggregate Employment (Thousands)	63,901	66,070	77,937	-
	<i>Share of Aggregate Employment (%)</i>			
Micro-Enterprises	51.5	87.5	72.8	70.6
Small and Medium Enterprises	1.7	2.9	3.7	2.8
Large Corporations, Public sectors and others	46.8	9.6	23.5	26.6
	100	100	100	100
Aggregate employment (N Billion)	54,612	80,093	113,712	-
	<i>Share of Aggregate of GDP (%)</i>			
Micro-Enterprises	26.1	32.3	-	29.2
Small Enterprises	15.8	8.5	-	12.2
Medium Enterprises	4.6	7.7	-	6.1
Large Corporations, Public sectors and others	53.5	51.5	50.2	51.7
	100	100	100	100

Source: Author's calculation based on (1) National Survey of Micro Small and Medium Enterprises (MSMEs) 2010, 2013 & 2017 by Small & Medium Enterprises Development Agency of Nigeria (SMEDAN, 2017) and National Bureau of Statistics (NBS), (2) Gross Domestic Product by Central Bank of Nigeria (CBN), (3) Labour Force Statistics by National Bureau of Statistics (NBS).

2.2. Microenterprises (MEs)

Nigerian microenterprises are dominantly own-account activities, or simply income-generating activities lacking the status of an enterprise. About 89% of microenterprises operate informally as self-employment and do not generate wage employment, implying that only 11% are actually pro-establishment enterprises.^v Overall, about 68 percent of microenterprises start up with initial capital less of than N50, 000 (in 2017 prices) and they dominantly operate as informal sole proprietorships with very little assets. In spite of these weaknesses, they account for over 70% of total employment, about 30% of gross domestic production (GDP) and 7.3% of exports. Estimated number of microenterprises (MEs) increased from 17 million in 2010 to 37 million in 2013. Despite the slowdown of 2015 and recession of 2016, the number of microenterprises increased to 41 million in 2017. Correspondingly, average enterprise size reduced from 1.9 in 2010 to 1.6 in 2013 and further to 1.4 in 2017. Although men dominate ownership of MEs, there has been consistent increase in the share of women-owned MEs from 42% in 2010 to 43% in 2017 and further to 49% in 2017.^{vi} Male employment in MEs increased by average of 5.4 million per year compared to female employment increase of 2.9 million per year during the period of expansion 2010-2013. In reverse, male employment decreased by average of 515 thousand per year compared to increase in female employment averaging 246 thousand per year during the contraction 2013-2017.^{vii}

The statistics imply that both employment level in MEs and average size of MEs contracted on aggregate during the period 2013-2017, expectedly. However, the statistics also imply that women-owned MEs and women employment in MEs increased during the same period, with the former increasing faster than the latter, indicative of decreasing size of new women-owned MEs. These are indications that the enterprises are increasingly own-account or income-generating activities, rather than pro-establishment enterprises.^{viii} The expansion of own-account activities can arise from working women losing their wage employment

and entering self-employment in order to remain economically active or women entering the labor force newly simply entering self-employment directly given limited opportunities in the labour market.^{ix}

Given the fact that MEs are home to more than 70% of aggregate employment, the pattern of changes in employment in MEs described above is consistent with movements in aggregate unemployment rates. Greater opportunities for men in the labour market implies that male unemployment rates are generally lower than female rates (male – 19.7% versus female – 23.7% in 2010). Nevertheless, the changes in unemployment levels by gender are instructive. Male unemployment rate increased by only 1% while female unemployment increased by 5.4% during the expansion period between 2010 and 2013, consistent with larger employment gains for men during the period. In reverse, between 2013 and 2017 when the economy contracted, male unemployment rate increased by 17.7% while female unemployment rate increased by a lower magnitude of 14.3% [26].

Agriculture and Commerce (wholesale and retail trade) are the leading microenterprise employment sectors, accounting for 70% of employment in 2010. The combined share reduced to 64% in 2013 and further to 57% in 2017. Meanwhile, manufacturing and social services gained traction between 2013 and 2017, with their combined share rising from 20% to 32%. The doubling of social services shares from 6% to 13% is likely a reflection of women's preference for social services. It is also noticeably fair that the leading employment sectors – agriculture and commerce – are also the leading output sectors, with a combined share of 83% in 2010 and 71% in 2013, and similarly, the combined share of manufacturing and social services increased from 4% in 2010 to 17% in 2013. In effect, although there is discordance between employment and output contributions at the level of individual sectors, there is a fair amount of concordance when the sectors are grouped. The disproportionate entry of women to self-employment between 2013 and 2017 drove up the employment shares of agriculture (the primary sector) and social services, where

employment share increased most substantially [26].

2.3. Empirical Review of Literature

Empirical research on the correlations between growth and employment in Nigeria Ajakaiye et al., indicates that between 2005 and 2014, Nigeria experienced a period of jobless growth. This, according to the authors, is due to a positive but low employment rate, particularly in the manufacturing sector [4]. In Nigeria, output and unemployment have a long-term inverse relationship. According to the 1.75 percent Okun coefficient, a 1% decrease in unemployment is followed by a 1.75 percent increase in GDP. Because Okun's model's slope coefficient is intrinsically unstable, it varies among economies and historical periods [36].

An empirical study on the effect of entrepreneurial development on employment creation was undertaken in Nigeria by Uzochukwu et al., They acknowledged that the growth of entrepreneurship always leads to the creation of jobs, compelling people to take actions that will improve both their own lives and the nation as a whole. They investigated on the link between entrepreneurial growth and job creation in Nigeria. He noted that job growth or employment chances in an economy might be linked to entrepreneurial training and development [54].

According to Ajuwon, O. S., Ikhide, S. and Akotey, small enterprises can create more jobs than any other type of business. They contend that, given the necessary assistance, small enterprises will be able to successfully lower the unemployment rate in the economy despite their high rate of closure. While all types of business sizes did poorly, the MSMEs outperformed large corporations in terms of creating jobs for the Nigerian economy, with small size enterprises leading the way [5].

In a 2012 study, Anyadike, Emeh, and Ukah examined how Nigeria's growing unemployment problem is reducing the nation's potential. The article mostly relied on recent works from passionate experts on organization development and government statistics documentations after using secondary source data. The authors came to the conclusion that the government should use a revised NYSC program to teach young people about the significance, advantages, and necessity of entrepreneurship development as well as to incorporate it into educational curricula at all levels of schooling [33].

Government Agenda was the subject of research by Innocent on Nigeria's unemployment rate. He learned that Nigeria's economy has been among the fastest-growing in recent years, despite the fact that its citizens are among the world's poorest. A recent stampede that resulted in the deaths of about 18 individuals revealed the peculiarities of the nation's nominal expansion without commensurate advancement as millions of people scrambled for about 4500 job openings listed by the Nigeria Immigration Service [18]. Analysts predict that by 2018, there will be over 215 million unemployed people worldwide, and Nigeria will account for a disproportionately large portion of that number. If the government doesn't act quickly to reverse the trend of rising

youth unemployment, analysts predict that this will have negative repercussions.

Salami performed research on Nigerian young unemployment and found that now is the time for innovative and creative solutions. He stated that Nigeria is on the edge of exploding if suitable actions are not implemented to lessen the detrimental effects of rising youth unemployment. His research finds a correlation between entrepreneurship and youth unemployment if enough attention is put to creating an enabling socioeconomic and political climate that might generate a culture in which young people think about job creation rather than job hunting [45].

An empirical study on exploiting the entrepreneurship-job generation relationship was undertaken by Uzochukwu, Lilian, & Chidiebere. Individual talent, attitude, skills, and knowledge, as well as social capital, credit, and government technology and infrastructure, are all factors to consider [54].

The effect of entrepreneurship on economic growth was examined by Nwachukwu, and Ogbo. From a population of all SMES in Nigeria's several states, 1000 were chosen at random. The research hypotheses sought to pinpoint the biggest challenge that SMEs in Nigeria confront, and they were assessed using chi-square statistics at a significance level of 0.05. The paper claims that SMEs have played and are still playing important roles in the expansion, modernization, and industrialization of several economies around the globe. They came to the conclusion that, before pursuing financial resources for the development of a SME, promoters should make sure that such resources were available or that they were endowed with management expertise and acumen [34].

The challenges and future of entrepreneurship in Nigeria were studied by Baba. He thinks that in this time of declining economic activity, the government should make every effort to provide the infrastructure required for people to learn the necessary skills, as the entrepreneurial spirit that propels economic growth through job creation will be lacking in the absence of technological skills. He came to the conclusion that while self-employment is crucial for rapid and sustained economic growth in Nigeria, it is critical to transform the mindset of the average Nigerian, particularly the youth, away from the futile pursuit of nonexistent white-collar jobs and toward self-employment [9].

In their study, Chidiebere, Iloanya, & Udunze, looked at how much entrepreneurship had contributed to the decline in youth unemployment in Nigeria. The research claims that government activities and policies have an impact on the "transformation question." This is a result of rising corruption, inefficiency, and poor management. They come to the conclusion that while Nigerian entrepreneurs still have a long way to go before, they can successfully drive economic transformation, entrepreneurship is a driver of job creation, creativity, and diversity in the country. They urge the government to foster an atmosphere that enables young people to work for a living and contribute to the economy in order to acknowledge the value of entrepreneurship for economic growth. They recommend that both the

government and the organized private sector support programs for tertiary students interested in starting their own businesses [11].

In 2014, Asad, Ali, & Islam, examined the need to boost entrepreneurship in Pakistan in order to lower unemployment. According to the regression results, explanatory differences in variables are responsible for 91% of the diversity in entrepreneurial development. It has been demonstrated that the number of new businesses opening is negatively connected to the unemployment rate. Lack of entrepreneurial development has been linked to Pakistan's high unemployment rate [8].

In order to achieve long-term economic success, Imafidon, examined how entrepreneurship grows in third-world nations. After using a survey method, the data was evaluated using chi-square. In Nigeria, questionnaires were given to 80 entrepreneurs who were randomly selected from the senatorial districts of Edo north, Edo center, and Edo south. According to the research, Nigeria's economic development and job creation depend greatly on entrepreneurship [17].

In their 2014 study, Felix, and Ezenwakwelu examined the empirical examination of entrepreneurial development and its impacts on Nigeria's economic expansion. The study was carried out at six small and medium-sized businesses in Asaba, Delta State. Taro Yamane's formula was used to calculate a sample size of 73 with a 5% error margin from the study's 90 total participants. Data was gathered using a questionnaire, and Chi-square was utilized to evaluate it. According to the research, entrepreneurial development contributes to economic growth by creating jobs and increasing national income [14].

Using a narrative textual case study, Afolabi assessed the effect of entrepreneurship on Nigeria's economic growth and development. The paper claims that Nigeria's economy has expanded over the past ten years at a real GDP growth rate of around 7%. Additionally, it was shown that entrepreneurship can foster economic development by generating jobs [1].

2.4. Theoretical Discuss: Dynamic Capabilities Theory

Dynamic capabilities have gained prominence in strategic management studies [21, 41]. The dynamic capacities theory was created by [51], and it was strengthened by the work of [39]. According to [50], while dynamic capabilities were primarily about businesses acting ethically, they were also about new product (and system) growth, a special management orchestration process, a change-oriented organizational culture, and accurate assessment of the business climate and technological trends at the right time. Because of this, very few people, if any, genuinely possess strong, dynamic abilities [50]. Strategic management and dynamic capabilities focus on how an organization may overcome sustainable competitive advantages, particularly in times of turmoil and ambiguity.

The reconfiguration capability, according to [43], describes an organization's capacity to reshape or transform new resources in order to achieve the sustainability objectives of the quickly changing business environment. This concept is

based on the deeper understanding of [6] dynamic capabilities. According to a survey of 380 firms, the fundamentals of strategic direction are unquestionably a crucial part of dynamic skills and adaptable ability. These writers have found evidence to support their claims that strategic orientation is a dynamic competence within an organization, similar to [20].

Technology orientation is addressed by the dynamic capabilities approach, which emphasizes that technological competence is not readily available but rather results through value-creating activities including research and development, lifelong learning, and the coordination of managerial resources [50, 18]. Furthermore, Rezazadeh, Karami, & Karami argued that businesses need to invest in technology innovation, test the creation and integration of new technologies, and manage technological uncertainties and strategy in order to thrive in the face of intensifying technological turbulence [48, 43].

Similar findings were made by Ritter, and Lettl, who found that business model studies have been put up as a network connecting a part to the expansion of strategic management literature [44]. In instance, Teece, Pisano, & Shuen, noted that a firm with adaptive skills would be dynamic and able to quickly update, test, and restructure new and revised business models. Dynamic capabilities are therefore recognized to support business models. This is a simple way to view any company [51]. A business model (enterprise system) can be developed as (1) overhead activities above (2) altering open-system, in which the open-system share acquires resources from the economy, such as capital and labor, and changes them into goods and services before selling them in the economy's market. Therefore, it is crucial to link the dynamic capabilities theory to the innovative organizational culture, strategic orientation, technological orientation, and strategic business model, as well as to innovation competitive advantage and sustainable employment creation by indigenous micro-enterprises, in this study.

3. Research Methodology

This section of the study is divided into four sub-sections: the first discusses the data source and variable descriptions; the second discusses the analytical framework; and the third discusses the analytical techniques to be employed in the study.

3.1. Data Sources and Description

The dataset employed in the study is exclusively from the TETFUND Sponsored Report (2020) on Framework for Modernizing and Upgrading Nigeria's Traditional Process Technologies (TPTs) to Improve MEs Competitiveness. The data collection process involved the use of standardized survey instruments, questionnaire, specifically designed to extract relevant information from target respondents: practitioners of TPTs and consumers of outputs of TPTs. The process involved randomized cluster sampling, which is applied to 5 TPTs clusters with a minimum of 80 businesses

sampled per cluster that are practitioners of TPTs. This sampling was conducted in 12 selected states with 2 states from each of the 6 geo-political zones based on the first two

highest states with concentrations of SMEs in Nigeria. Thus, the dataset is made up of 5,214 indigenous micro enterprises.

Table 3. Description and Definitions of Variables.

Dependent Variables	Variable description	Variable Type
Employment Capability	Proxied as firm's performance by responses on the probability of employment generation (Excellence = "4" Good = "3" Fair = "2" and Poor = "1").	Categorical (4 outcomes)
<i>Independent/Control Variables</i>		
Innovation Outcomes	Proxied as a dummy variable taking a value (Yes=1; No=0) that shows whether the firm has engaged in and form of innovation activities in the last 3 years.	Binary (2 outcomes)
Research and Development Expenditure (Investment)	Proxied by measuring the firm's allocation of funds to research and development during the previous three years as a dummy variable with the values (Yes=1; No=0)	Binary (2 outcomes)
Top manager's experience	The number of years of top managers in the industry/business operation (TME)	Categorical (3 outcomes)
Foreign technology	Adoption of foreign technologies in business operations (FT)	Binary (2 outcomes)
Managerial Education Level.	Measured by the educational level of top managers in the firm (ME)	Categorical (3 outcomes)
Access to credit.	Measured with information on whether a firm had a line of credit or a loan from a bank during the survey period (AC).	Binary (2 outcomes)

Source: TETFUND (2020)

3.2. Analytical Framework

The essential assumption behind the ordinal outcomes is that there is a latent continuous metric (specified as y^*) underneath the observable replies of the respondents, just like the binary choice models. This y^* is an unobserved variable, we only know when it crosses thresholds.

For instance, in this study, as we are modeling the predictors of employment potentials of indigenous micro-enterprises in Nigeria; once y^* crosses a certain threshold, the respondent ticks poor, then fair, then good, and then excellence.

Let us consider a latent variable model given as:

$$y_i^* = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_k x_{ki} + e_i$$

$$y_i^* = x_i' \beta + e_i$$

$$y_i = j \text{ if } \mu_{j-1} < y^* \leq \mu_j$$

Where $I = 1, \dots, N$

The probability that observation i will select alternative j is:

$$p_{ij} = p(y_{i=j}) = p(\mu_{j-1} < y^* \leq \mu_j)$$

$$= F(\mu_j - x_i' \beta) - F(\mu_{j-1} - x_i' \beta)$$

For the Ordered logit, F is the logistic cdf

$$F(z) = e^z / (1 + e^z)$$

For the Ordered probit, F is the standard normal cdf.

In this study, we assume $y_i = (1,2,3,4)$ for (poor, fair, good and excellence).

$$Emp_Cap_{ij} = f(\prod_i, For_Tech_i, Exp_Man_i, Edu_Man_i)$$

$i = 1,2,3, \dots, 5,124; j = 1,2,3,4$

i is for observations and

j is for alternative outcomes

$$Emp_Cap_i = \alpha_0 + \alpha_1 \prod_i + \alpha_2 For_Tech_i + \alpha_3 Exp_Man_i + \alpha_4 Edu_Man + \varepsilon_i \quad (1)$$

Choice rule:

$$y_i = 1 \text{ if } y_i^* \leq \mu_1$$

$$y_i = 2 \text{ if } \mu_1 < y_i^* \leq \mu_2$$

$$y_i = 3 \text{ if } \mu_2 < y_i^* \leq \mu_3$$

$$y_i = 4 \text{ if } y_i^* > \mu_3$$

Using the generic representation, the respective probabilities for the 4 categorical responses (ordered responses) are calculated as follows:

$$\Pr(y_i = 1) = F(u_1 - x_i' \beta)$$

$$\Pr(y_i = 2) = F(u_2 - x_i' \beta) - F(u_1 - x_i' \beta)$$

$$\Pr(y_i = 3) = F(u_3 - x_i' \beta) - F(u_2 - x_i' \beta)$$

$$\Pr(y_i = 4) = 1 - F(u_3 - x_i' \beta)$$

In line with probit and logit models, the $F(\cdot)$ is determined by the assumed distribution of e_i .

Estimator: Maximum Likelihood Estimator (MLE).

Statistical software: Stata Software.

3.3. Analytical Technique

In order to achieve our first objective, we employed ordered logit. This technique is adopted as our dependent variable is a categorical variable with a fixed, but arbitrary, 4 categories [17, 26]. Thus, the empirical model that investigates the relations between innovation capabilities and the employment capability of these micro-enterprises in Nigeria is structured as follows;

Where; Emp_Cap_i to proxy employment potentials measured by responses on the probability of employment generation (Excellence = “4” Good = “3” Fair = “2” and Poor = “1”), Π denotes firms’ innovation outcome (No = “0” and Yes = “1”); For_Tech_i is used of foreign technology (No = “0” and Yes = “1”), Exp_Man_i captures top managers’ experience in the industry, Edu_Man represents

owner/manager’s level of education and ε_{it} is error term; which follows logistic cumulative distribution probability function (cdf).

While second objective was examined using ordered probit [17, 26]. Thus, the empirical model that examines the impact of investment on the employment capability of these micro-enterprises in Nigeria is structured as follows;

$$Emp_Cap_{ij} = f(Inv_Exp_i, For_Tech_i, Credit_Access_i, Edu_Man_i)$$

$i = 1, 2, 3, \dots, 5, 124; j = 1, 2, 3, 4$

i is for observations and

j is for alternative outcomes

$$Emp_{Cap_i} = \beta_0 + \beta_1 R\&DInv_{Exp_i} + \beta_2 For_Tech_i + \beta_3 ACredit_Access_i + \beta_4 Exp_Man + \varepsilon_i \quad (2)$$

Where; Emp_Cap_i to proxy employment potentials measured by responses on the probability of employment generation (Excellence = “4” Good = “3” Fair = “2” and Poor = “1”), $RDINV_Exp_i$ denotes firms’ investment expenditure in R & D (No = “0” and Yes = “1”); For_Tech_i is used of foreign technology (No = “0” and Yes = “1”), Exp_Man_i captures top managers’ experience in the industry, AC_i represents firm’s access to credit and ε_{it} is error term; which follows normal cumulative distribution probability function (cdf).

Finally, a crosstabulation was conducted to profile the challenges/obstacles militating against realizing the full economic potentials of these indigenous entities as the third objective of the study.

4. Results and Discussions

4.1. Firms’ Characteristics

4.1.1. Geographical Distribution of the Survey

The state distribution of the indigenous micro enterprises’ participation in the survey is as depicted in Table 4 below.

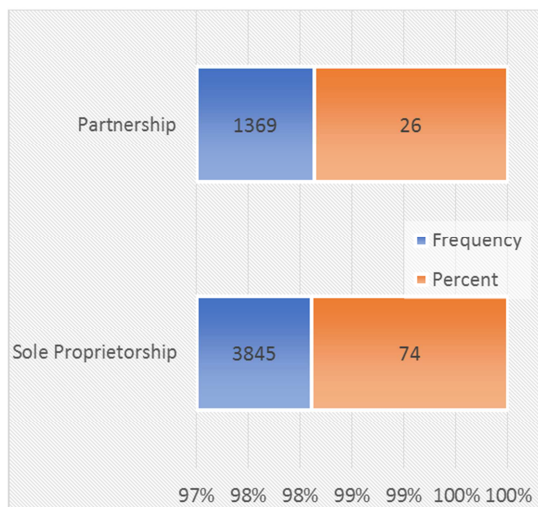
Each of the 12 selected states contributed on the average, 8 percent of the total survey. In conclusion, the random sampling distribution seems to be representative across the six geo-political zones of the country.

4.1.2. Ownership and Registration Characteristics

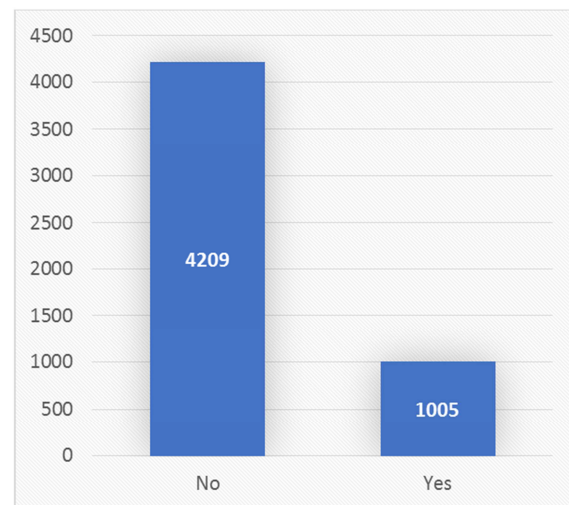
Ownership deals with the internal organization of a business entity as well as the rights and duties the legal stakeholders in such organization. As a result, we examined the types of ownership structure in place among selected indigenous microenterprises in Nigeria. As shown in Figure 1; roughly 74 percent (3,845) of the firms surveyed are sole proprietorship while the remaining 26 percent (1,369) are into partnership business.

Corporate Affairs Commission (CAC) registration profile of firms engaged in the survey is as depicted in Vb. Unsurprisingly but alarming, about 81 percent (4,209) of our respondents has no registration with the government agency in charge of business registration in the country; they mere operate informally while just 19 percent (1,005) showed evidence of registration with the CAC.

A: Ownership Structure



B: Business Registration



Source: (TETFUND, 2020)

Figure 1. Ownership and Registration Distribution.

Table 4. State Distribution of Indigenous MEs.

State	MEs	Percent
Anambra	416	8
Bauchi	414	8
Benue	397	8
Delta	403	8
Gombe	446	9
Imo	441	8
Kaduna	477	9
Kano	483	9
Lagos	399	8
Niger	450	9
Oyo	453	9
Rivers	435	8
Grand Total	5214	

Source: (TETFUND, 2020)

4.2. Analysis of Descriptive Statistics

Table 5 below shows the descriptive characteristics of the series that the study is examining. It is clear from the descriptive characteristics of the variables that they are all categorical in nature. The remaining three variables are polychotomous, and the final three are binary.

As shown in Table 5, about 23.95 percent (equivalent to

1,249), 7.35 percent (equivalent to 383), 30.11 percent (equivalent to 1,570) and 38.59 percent (equivalent to 2,012) of the firms shows poor. Fair, good and excellent potentials respectively to generate employment. Management educational qualification shows that about 35.21 percent (equivalent to 1,836) of our respondents has no formal education, 43.8 percent (equivalent to 2,284) of them has O' level, and 20.98 percent (equivalent to 1,094) of the firms' top managers are graduates. Similarly, management experience shows that about 35.44 percent (equivalent to 1,848) of our respondents has no experience, 23.28 percent (equivalent to 1,214) of them are experienced and, 41.27 percent (equivalent to 2,152) of the firms' top managers are highly experienced.

Meanwhile, just 27.64 percent (equivalent to 1,441) claimed to have no access to credit while the remaining 72.36 percent (equivalent to 3,773) have access to credit. Also, just 34.79 percent (equivalent to 1,814) claimed to have not engaged in any forms of innovations while the remaining 65.21 percent (equivalent to 3,400) have engaged in one form of innovations or the other. Lastly, 90.58 percent (equivalent to 4,723) of the firms reported to source their technologies locally while just 9.42 percent (equivalent to 491) relied on foreign licensed technologies.

Table 5. Descriptive Statistics.

Employment Potentials			Management Education		
	Frequency	Percent		Frequency	Percent
Poor	1,249	23.95	No Formal Education	1,836	35.21
Fair	383	7.35	O'Level	2,284	43.81
Good	1,570	30.11	Graduate	1,094	20.98
Excellence	2,012	38.59	Management Experience		
Access to Credit			No Experience	1,848	35.44
No	1,441	27.64	Experienced	1,214	23.28
Yes	3,773	72.36	High Experience	2,152	41.27
Innovation			Foreign Technology		
No	1,814	34.79	Domestic	4,723	90.58
Yes	3,400	65.21	Foreign	491	9.42

Source: Author's Computation

4.3. Examining Relations Between Innovation and Employment Potentials of Indigenous MEs in Nigeria

4.3.1. The Analysis of Relationship Between Innovation and Employment

As depicted in Table 6, the probability of increase in the firms' employment potentials (from poor to excellence) increases by 28% [(1.2 -1) *100] with an improvement in innovation status (from No to Yes) and it is statistically significant at 1% while controlling for the other variables. Similarly, the probability of achieving increased employment potentials of firm (from poor to excellence) increases by 21% [(1.21 -1) *100] and statistically significant at 5% as the firm switch to superior foreign technologies with other variables held constant. This corroborates the findings of (Ajuwon et al. 2017; SMEDAN 2013; Birch, 1979). As the top manager's experience in the industry rises as depicted by Man_Exp (from

Inexperience to Experience to High Experience), the chance of the firm's employment generation increases by 20% [(0.80 -1) *100] and statistically significant at 1%, ceteris paribus. Lastly, in the same vein, progress in education level of the top manager from (No formal education to O'Level to Graduate) is discovered to increase the probability of employment generation of the firm by 18% [(1.18 -1) *100] from 9% [(1.09 -1) *100], all things being equal.

Summarily, the chances of employment generating potentials of indigenous microenterprises increases with innovation, use of foreign technology, better experience and advanced education level of the manager.

Meanwhile, as revealed by the cut-off points below the regression coefficients, the four possibilities of (poor, fair, good and, excellence) are statistically different from each other so the categories should not be combined.

4.3.2. The Analysis of Relationship Between Innovation and Employment

Table 6. The Analysis of Relationship between (Innovation and Employment (Odds Ratio).

Emp_Pot	Odds Ratio	Std Error	z-static	
Innovation: Yes	1.28***	0.07	4.55	
Foreign_Tech	1.21**	0.10	2.30	
Man_Exp: Experienced	0.80***	0.05	-3.23	
Man_Exp: Highly Experienced	-0.98	0.06	-0.40	
Man_Edu: O'Level	1.09	0.07	1.46	
Man_Edu: Graduate	1.18**	0.09	2.24	
Nos of Obs			5,214	
Chi-Square			53.93	
Prob			0.0001	
Cut1	-0.97	0.07	-1.11	-0.82
Cut2	-0.59	0.07	-0.73	-0.45
Cut3	0.67	0.07	0.53	0.81

NB: *** p<0.01, ** p<0.05, * p<0.1

Source: Data Analysis 2022

Table 7. The Results of Relationship between (Innovation and Employment (Marginal Effects).

Emp_Pot	DY/DX			
	POOR	FAIR	GOOD	EXCELLENCE
Innovation: Yes	-0.05***	-0.008***	-0.004***	0.06***
Foreign_Tech	-0.03**	-0.007**	-0.01*	0.05**
Man_Exp: Experienced	0.04**	0.007***	0.003**	-0.05***
Man_Exp: Highly Experienced	0.004	0.001	0.001	-0.01
Man_Edu: O'Level	-0.02	-0.003	-0.002	0.02
Man_Edu: Graduate	-0.03**	-0.006**	-0.004*	0.04**

NB: *** p<0.01, ** p<0.05, * p<0.1

Source: Data Analysis 2022

As shown in Table 7, as the firms become innovative in their operations, the probability of reporting improved employment potentials increases by 6%. This is in line with Salami (2013). Also, as the firms adopt the use of foreign technologies in their operations, the probability of reporting improved employment potentials increases by 5%. In the same vein, as the management become better in education, the probability of reporting improved employment potentials increases by 4%. However, and surprisingly, improved experience is found to reduce the probability of reporting better employment potentials by 1% but not statistically significant.

Table 8. Comparing the Predicted and Actual Probabilities.

Predicted Probability			
Variable	Obs	Mean	St Dev
p1ologit	5124	0.240521	0.03378
p2ologit	5124	0.07404	0.006015
p3ologit	5124	0.301059	0.004539
p4ologit	5124	0.384381	0.043363
Actual Probability			
Emp_Cap	Freq	Percent	Cum
Poor	1,249	23.95	23.95
Fair	383	7.35	31.3
Good	1,570	30.11	61.41
Excellence	2,012	38.59	100
Total	5,124	100	

Source: Data Analysis 2022

As seen in Table 8, the average probabilities of reporting bad, fair, good, and excellence are 24%, 7%, 30%, and 38%, respectively, given the mean values of the regressors.

It is possible to observe from the table that the model reasonably corresponds to the data, since the predicted probabilities are similar to reality.

4.4. Examining Relations Between R_D Investment and Employment Capabilities of Indigenous MEs in Nigeria

4.4.1. The Analysis of R_D Investment and Employment Capabilities

The results in Table 9 here are z-scores. The result shows that improved level of R & D investment leads to an increase in the z-score in favour of better employment potentials by 0.20 points. This corroborates the findings by [14]. Also, Access to Credit is found to increase in the z-score in favour of better employment generating capability by 0.05 points, and the foreign technologies is found to increase in the z-score in favour of better employment generating capability by 0.14 points, all things being equal. However, improved experience results in decrease in the z-score in favour of better employment generating capability by 0.003 points.

Meanwhile, as revealed by the cut-off points below the regression coefficients, the four possibilities of (Poor, Fair, Good and Excellence) are statistically different from each other so the categories should not be combined into one.

Table 9. The Result of R_D Investment and Employment Capabilities (Z-scores).

Emp_Pot	Coefficient	Std Error	z-static	
R & D Investment: Yes	0.20***	0.03	6.08	
Foreign_Tech	0.14***	0.05	2.7	
Man_Exp: Experienced	-0.10**	0.04	-2.51	
Man_Exp: Highly Experienced	-0.003	0.04	-0.09	
Credit_Access: Yes	0.05	0.03	1.32	
Nos of Obs			5,214	
Chi-Square			67.99	
Prob			0	
Cut1	-0.60	0.04	-0.68	-0.52
Cut2	-0.37	0.04	-0.45	-0.30
Cut3	0.41	0.04	0.33	0.49

NB: *** p<0.01, ** p<0.05, * p<0.1

Source: Data Analysis 2022

Table 9. The Result of R_D Investment and Employment Capabilities (Z-scores).

Emp_Pot	Coefficient	Std Error	z-static	
R & D Investment: Yes	0.20***	0.03	6.08	
Foreign_Tech	0.14***	0.05	2.7	
Man_Exp: Experienced	-0.10**	0.04	-2.51	
Man_Exp: Highly Experienced	-0.003	0.04	-0.09	
Credit_Access: Yes	0.05	0.03	1.32	
Nos of Obs			5,214	
Chi-Square			67.99	
Prob			0	
Cut1	-0.60	0.04	-0.68	-0.52
Cut2	-0.37	0.04	-0.45	-0.30
Cut3	0.41	0.04	0.33	0.49

NB: *** p<0.01, ** p<0.05, * p<0.1

Source: Data Analysis 2022

4.4.2. The Analysis of R_D Investment and Employment Capabilities (Marginal Effects)

As shown in Table 10, as the level of R & D investment increases in the firms, the probability of reporting improved employment potentials increases by 8%. Also, as the firms adopt the use of foreign technologies in their operations, the probability of reporting improved employment generating

capability increases by 6%. In the same vein, as the management access to credit increases, the probability of reporting improved employment generating capability increases by 2%; ceteris paribus.

In summary, the chances of employment generating capability of indigenous microenterprises increases with investment and access to credit.

Table 10. The Results of R_D Investment and Employment Potentials (Marginal Effects).

Emp_Cap	DY/DX			
	POOR	FAIR	GOOD	EXCELLENCE
R & D Investment: Yes	-0.06***	-0.009***	-0.006***	0.08***
Foreign_Tech	-0.04***	-0.007**	-0.01***	0.06***
Man_Exp: Experienced	0.03**	0.005**	0.002*	-0.04**
Man_Exp: Highly Experienced	0.001	0.0001	0.0001	-0.001
Credit_Access: Yes	-0.01	-0.002	-0.001	0.02

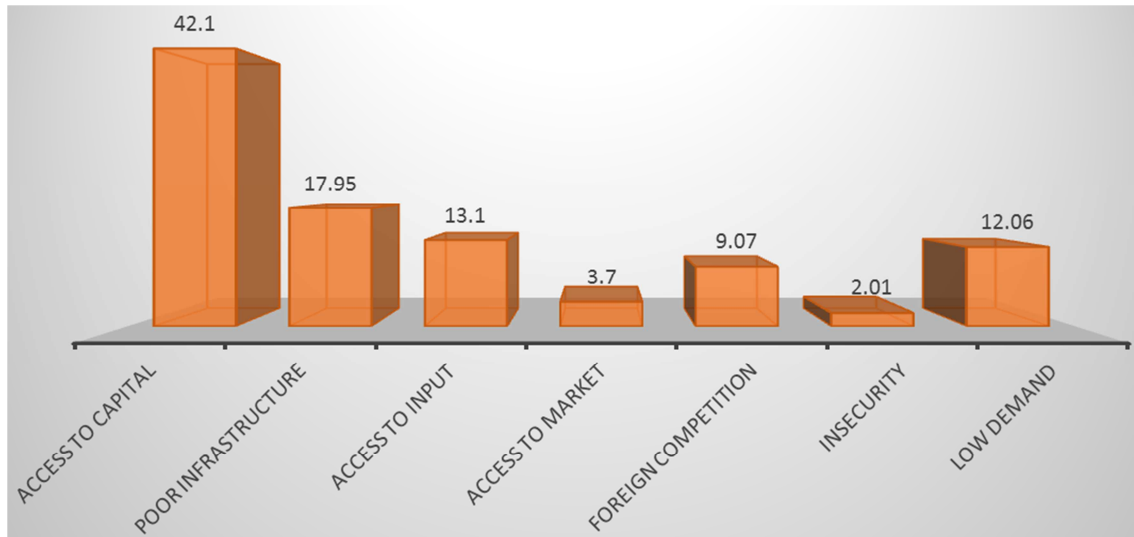
NB: *** p<0.01, ** p<0.05, * p<0.1

Source: Data Analysis 2022

4.5. Profile of the Major Obstacles Inhibiting Employment Generating Potentials of Indigenous Micro Enterprises (MEs) in Nigeria

The identified major constraints confronting MEs' operations in Nigeria as enunciated in the TETFUND are summarized in Figure 2. In a bid to ascertain the degree of

severity of these constraints on MEs operations, the frequency and mean of the responses are considered. We found that the major constraints confronting MEs in their operations in Nigeria were access to capital (1st), poor infrastructure (2nd), access to inputs (3rd) and low demand (4th). This is followed by foreign competition (5th), access to foreign market (6th), and the least is insecurity.



Source: (TETFUND, 2019)

Figure 2. Major Obstacles.

5. Conclusion and Policy Recommendations

5.1. Conclusion

In this study, we examined the employment potentials of indigenous microenterprises in Nigeria. Innovation and investment as such suggested in the Big-Push Theory are treated as the fundamental factors that can enhance employment generation potentials of these firms. We equally analysed the role of firms' characteristics such as management education, management experience in the industry, foreign technology and access to credit, in determining employment potentials of these firms. And lastly, we profiled a number of obstacles confronting MEs which are making employment generation difficult for firms in Nigeria.

We found that the survey is actually a good representative of the six geo-political zones in the country. Each of the 12 selected states contributed on the average, 8 percent of the total survey. The study also discovered that the majority (74 percent) of the firms surveyed are sole proprietorship while the remaining 26 percent are into partnership business. The study also confirmed that about 81 percent of firms surveyed has no official business registration; they mere operate informally while just 19 percent showed evidence of business registration with the CAC.

In examining factors influencing employment potentials of the indigenous microenterprises, an ordered logistic regression estimation technique was adopted. Our results showed a positive and significant relationship ($P < 0.01$) between employment potentials and innovation activities of the firm, top manager's experience ($p < 0.1$), use of foreign technologies ($p < 0.5$) and the level of education of the top managers ($p < 0.01$). The positive sign of the coefficients of firms' experience in the industry (an indication of firms' survival) is positive and statistically significant. This implies that as the firms' experiences in the business increases so also is its capabilities to generate employment in a bid to adjust to the dynamics in the industry in particular and the economy at large. Also, as management education level is found to be positive and statistically significant with the probability of employment generation; implies that as the higher the top managers' education level, the higher the firms' capabilities to generate employment. Lastly, the adoption of superior foreign technologies in their operations equally improves the chances of the firm to generate more employment.

In investigating the impact of investment expenditure on the employment generation capability of these indigenous microenterprises, an ordered probit regression estimation technique was adopted.

We consequently found that as the level of investment increases in the firms, there is increasing chances for the firms to generate more employment. In the same vein, as the management get better access to credit, the probability to generate more employment increases in the firms.

Lastly, we found that the major constraints confronting these indigenous microenterprises in their operations in Nigeria are majorly access to capital (1st), poor infrastructure (2nd), access to inputs (3rd) and low demand (4th). This is followed by foreign competition (5th), access to foreign market (6th), and the least is insecurity.

5.2. Policy Recommendations

Consequent upon the above conclusions, the following policy implications are suggested to combat social-economic vices of unemployment among the teeming youth as well as achieving the macroeconomic goal of GDP growth:

- 1) These enterprises should be encouraged by the government either by offering technical assistance to these enterprises through trainings and workshops to horn their skillsets and build innovation capabilities that

result in improved employment potentials.

- 2) They need to be motivated to commit a sizeable part of their lean resources into activities such as training and re-training of employees that enhance innovation capabilities and employment potentials of these entities. Strategic alliance with big and very big enterprises as well as specialized research institutions should be encouraged in order to enhance R & D of these entities.
- 3) Technical assistance in forms of R & D spending that assist in upgrading the technologies use in these firms through a global collaboration between governments and international agencies such as ILO should be offered to these enterprises in a bid to increase employment generating capacity of these firms.
- 4) Investments in various forms such as specially tailored grants for these kind businesses, should be organized and channelled co-ordinately towards these indigenous enterprises in a bid to encourage and assist them to enlarge their economies of scale and consequently, enhances their employment generation capacities.
- 5) Increased and easy access to credit finance through less stringent conditions such as collaterals especially, by the Central Bank of Nigeria (CBN), should be created to allow these indigenous enterprises to flourish. And the existing CBN's financial interventions should be re-designed to give preference to these indigenous MEs.

Appendix

Table 11. Ordered logistic regression (Log of Odd Ratios).

Emp_Cap	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
RECODE of Innovati~o	0	.	.	.	.	.
Yes	.25	.055	4.55	0	.142	.357	***
RECODE of For_tech~c	0	.	.	.	.	.
Foreign	.193	.084	2.30	.021	.028	.357	**
RECODE of Man_Exp1~s	0	.	.	.	.	.
Experienced	-.221	.068	-3.23	.001	-.354	-.087	***
Highly Experienced	-.025	.063	-0.40	.691	-.148	.098	
RECODE of Man_Edu1~l	0	.	.	.	.	.
O'Level	.089	.061	1.46	.144	-.03	.207	
Graduate	.169	.075	2.24	.025	.021	.317	**
cut1	-.965	.074	.b	.b	-1.11	-.821	
cut2	-.592	.073	.b	.b	-.735	-.449	
cut3	.669	.073	.b	.b	.526	.811	
Mean dependent var	2.833			SD dependent var	1.179		
Pseudo r-squared	0.004			Number of obs	5214		
Chi-square	53.926			Prob > chi2	0.000		
Akaike crit. (AIC)	13134.382			Bayesian crit. (BIC)	13193.414		

*** p<.01, ** p<.05, * p<.1

Table 12. Ordered logistic regression (Odd Ratios).

Emp_Cap	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
RECODE of Innovati~o	1	.	.	.	.	.
Yes	1.284	.07	4.55	0	1.153	1.429	***
RECODE of For_tech~c	1	.	.	.	.	.
Foreign	1.212	.102	2.30	.021	1.029	1.429	**
RECODE of Man_Exp1~s	1	.	.	.	.	.
Experienced	.802	.055	-3.23	.001	.702	.917	***
Highly Experienced	.975	.061	-0.40	.691	.862	1.103	
RECODE of Man_Edu1~l	1	.	.	.	.	.
O'Level	1.093	.066	1.46	.144	.97	1.23	
Graduate	1.184	.089	2.24	.025	1.021	1.373	**
cut1	-.965	.074	.b	.b	-1.11	-.821	
cut2	-.592	.073	.b	.b	-.735	-.449	
cut3	.669	.073	.b	.b	.526	.811	
Mean dependent var	2.833			SD dependent var	1.179		
Pseudo r-squared	0.004			Number of obs	5214		
Chi-square	53.926			Prob > chi2	0.000		
Akaike crit. (AIC)	13134.382			Bayesian crit. (BIC)	13193.414		

*** p<.01, ** p<.05, * p<.1

Table 13. Ordered probit regression.

Emp_Cap	Coef.	St.Err.	t-value	p-value	[95% Conf Interval]	Sig
R & D: base No	0	.	.	.	.	.
Yes	.197	.032	6.08	0	.134 .261	***
RECODE of For_tech~c	0	.	.	.	.	.
Foreign	.143	.053	2.70	.007	.039 .248	***
RECODE of Man_Exp1~s	0	.	.	.	.	.
Experienced	-.104	.041	-2.51	.012	-.185 -.023	**
Highly Experienced	-.003	.036	-0.09	.93	-.074 .067	.
RECODE of Credit_A~	0	.	.	.	.	.
Yes	.046	.035	1.32	.188	-.022 .114	.
cut1	-.599	.04	.b	.b	-.678 -.52	.
cut2	-.374	.04	.b	.b	-.453 -.296	.
cut3	.408	.04	.b	.b	.33 .486	.
Mean dependent var	2.833					
Pseudo r-squared	0.005					
Chi-square	67.987					
Akaike crit. (AIC)	13118.322					
SD dependent var					1.179	
Number of obs					5214	
Prob > chi2					0.000	
Bayesian crit. (BIC)					13170.795	

*** p<.01, ** p<.05, * p<.1

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i NBS, 2021

ii ILO, 2013

iii World Bank. <https://www.worldbank.org/en/topic/sme/finance>

iv The number of employees is the most common standard for classification. An enterprise is a microenterprise if it has less than 10 employees, small enterprise if it has 10 to 49 employees and medium enterprise if it has 50 to 199 employees.

v The description as “pro-establishment” was first adopted by the Small & Medium Enterprises Development Agency of Nigeria 27. SMEDAN, *Enterprise Surveys*. 2017.

vi The number of male-owned MEs increased more significantly annually than women-owned MEs during the period of expansion 2010-2013 (male-owned – 3.7 million; female-owned – 2.9 million), the reverse was the case during the contraction 2013-2017 (male-owned – 76 thousand; female-owned – 1.0 million).

vii SMEDAN/ NBS., 2017

viii Notably, most of the employment increase during the period was contributed by Community, Social and Personal Services sectors where women dominate employment.

ix (SMEDAN/ NBS., 2017).