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Firm size and enterprise productivity in Nigeria: Evidence from firm-level data

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Anchored on the economies of scale of production theory, this study utilized Nigeria's firm-level enterprise survey data of the World Bank collected through stratified random sampling of 2 676 firms and face-to-face interviews with the application of the multinomial logit model to examine how enterprise productivity influences the size of firms in Nigeria. It was found that raising enterprise productivity relates to about 0.0009261 insignificant fall in the relative log odds of running micro-sized firms, about 0.010299 significant rise in relative log odds of having medium-sized firms, and about 0.0201428 significant encouragement in relative log odds of running large-sized enterprises/firms when related with small-sized enterprises/firms. It is recommended that governments at all levels (state, federal, and local), should encourage micro-sized firms in a bid to make them increase their productivity level. This encouragement can come in the form of providing increased access to credit, the provision of raw material inputs, and constant electricity supplies. The original contribution of this research work is hinged on its empirical contribution in the study area since there is dearth of literature in the study area as no study has looked at firm size and enterprise productivity in Nigeria using evidence from firm-level data.

Keywords: firm size, enterprise, productivity, Nigeria, firm-level data, multinomial logit, economies of scale

JEL Codes: C1, C19, D00, L25, L26

Introduction

The productivity of any enterprise has been attributed to its size as a major indicator of enterprise growth and performance (Oyelade 2019). In order to favourably compete with other enterprises, both local and international, and to continue to remain in business, firms strive hard to increase their size. Also, to take the advantage of scale economies in production, enterprises tend to increase their size. However, in Nigeria, some firms that have tried to increase in size have been faced with low productivity over the duration of time.

The fall in productivity of these firms may be attributed to various firm characteristics and business environmental factors internal to firms. Some of these factors include, among others, size of the firm (that is, whether the firm is a micro, small, medium or large firm), type of output produced, total labour cost (constituting salaries, wages, bonuses, among others), total annual costs of electricity (Omeje, Mba, and Ugwu 2022), raw material costs and goods employed in production at intermediate level, machine, vehicle and equipment values used in production, number of permanent full-time employees, access to finance, percentage of capacity utilization of the firm, and age of the firm.

The extant body of literature asserts that size of the firm (that is, whether the firm is a micro, small, medium or large firm) and other business environmental factors affect its productivity (Asad et al. 2018; Babalola 2013; Biesebroeck 2005; Bolarinwa and Obembe 2017; Eyigege 2018; Kijkasiwat and Phuensan 2020; Ogunleye, Adeyemi, and Asamu 2018; Omeje, Mba, and Ugwu 2022; Oyelade 2019; Suyanto, Sugiarti, & Kartikasari, 2023). For instance, Biesebroeck (2005) was of the view that firm size matters for firm productivity irrespective of whether the firm is located in a developed or

developing country. In studies by Babalola (2013), Bolarinwa and Obembe (2017), Asad et al. (2018), and Ogunleye, Adeyemi, and Asamu (2018), there is unanimous agreement that higher productivity levels could be achieved by large-sized firms, making their survival a greater likelihood.

Organization for Economic Cooperation and Development – OECD (2014), Eyigege (2018), Oyelade (2019), and Kijkasiwat and Phuensan (2020) were also of the view that the size of the firm matters for productivity, since greater number of firms that are large in size, produce more goods when compared to the micro, small, and medium ones. Larger-sized firms enjoy more economies of scale in production by using especially, capital-intensive method of production (Omeje, Mba, and Ugwu 2022; Suyanto, Sugiarti, & Kartikasari, 2023). For this reason, capacity utilization of firms, type of firm's output to be produced, total annual costs of electricity, raw material costs and goods employed in production at intermediate level, machine, vehicles and equipment values used in production, and even the age of the firm may influence the productivity of firms. However, OECD (2014) was of the view that it may not be totally true world over that larger-sized firms always have greater productivity than other firms with smaller sizes. This is because OECD (2014) revealed that in some economies, like Switzerland, higher productivity was found to be more common among medium-sized firms than larger firms, mainly because they specialized more in products of high-value.

In terms of labour influence on productivity, the number of permanent full-time employees, and total labour cost (constituting salaries, wages, bonuses, among others) also determine productivity of firms

(Omeje, Mba, and Ugwu 2020), and which in turn influences firm size. This is because labour market moves labour or job seekers to firms that are most productive and with better pay or remuneration (Biesebroeck 2005), and mostly with higher size. This reinvigorates the essence of firm size in influencing productivity growth and vice versa (Biesebroeck 2005; Suyanto, Sugiarti, & Kartikasari, 2023).

Access to finance is another factor that influence firm's productivity (Eyigege 2018; Oyelade 2019), and even the size of the firm. Firms that have formal access to credit from formal financial institutions tend to do well in terms of productivity than those without access to finance. Most formal financial institutions tend give more financial access to large-sized firms (Biesebroeck 2005). For Biesebroeck (2005) increased access to finance is positively related to firm productivity, and also conditional to the size of the firm.

These factors have stagnated the productivity of some firms in Nigeria and as such, made them to be small-sized firms, militated against their international competitiveness when compared to other countries' firms in Africa. The deterioration of firm productivity and size recently can also be attributed to other factors such as; poor investment climate, lockdown policy of the government to contain COVID-19 pandemic (Omeje et al. 2022), inadequate infrastructure that raises the cost of production, among others. Figure 1 shows the distribution of firm size and percentage distribution of firms in Nigeria.

The figure indicates that there are 316 micro-sized firms, with fewer than 5 employees, constituting about 11.81% of all the firms in Nigeria. Small-sized enterprises/firms, with between 5 and 19 employees, numbered 1 395, constituting about 52.13% of all the firms in Nigeria. Medium-sized firms, with about 20 to 99 employees, numbered 740 and constitute about 27.65% of all the firms in Nigeria, while large-sized firms, with above 100 employees, numbered 225, making up about 8.41% of all the firms in Nigeria. This is worrisome as a large number of the small- as well as medium-sized enterprises/firms (constituting the greatest chunk of firms in the

country) are not owned by Nigerians since some of them operate with foreign firm licenses. These firms are also primary and intermediate producers that produce at high cost, export the products and sell them at cheaper rates. This has implications for firm competitiveness and their optimal productivity. It is on this premise that this study examines how enterprise productivity influences the size of firms in Nigeria. The difference between this study and other related reviewed studies is that unlike the other studies, this study utilized a multinomial logit model and the most recent firm-level World Bank, Nigeria enterprise survey data to examine how enterprise productivity influences the size of firms in Nigeria. The study is guided by the hypothesis that enterprise productivity does not significantly influence the size of firms in Nigeria.

Literature review

Theoretical underpinning of this study is anchored on returns to scale technological theory following Oyelade (2019). The theory of returns to scale was derived from firm production function and as such, shows the level of rise in output as a result of long-run rise in inputs. Firm's returns to scale are technologically constrained rather than being market determined. Here, it stresses on scale economies and physical capital to explain firm sizes that indirectly or directly influence productivity. The main focus of this theory is on production process and inputs or physical capital investment which is a lever to output production. When firms experience increasing economies of scale, they are more likely to spread the fixed costs of production over their increasing output produced, hence making the firm have fall in average cost of production and rising return on capital invested that would in turn, make firm size to increase (Oyelade 2019).

On empirical basis, Biesebroeck (2005) tried to know if firm size contributes to growth and encourages productivity growth of firms in Africa through the adoption of panel data, and panel data analysis. It was shown by the empirical evidence that the size and productivity of

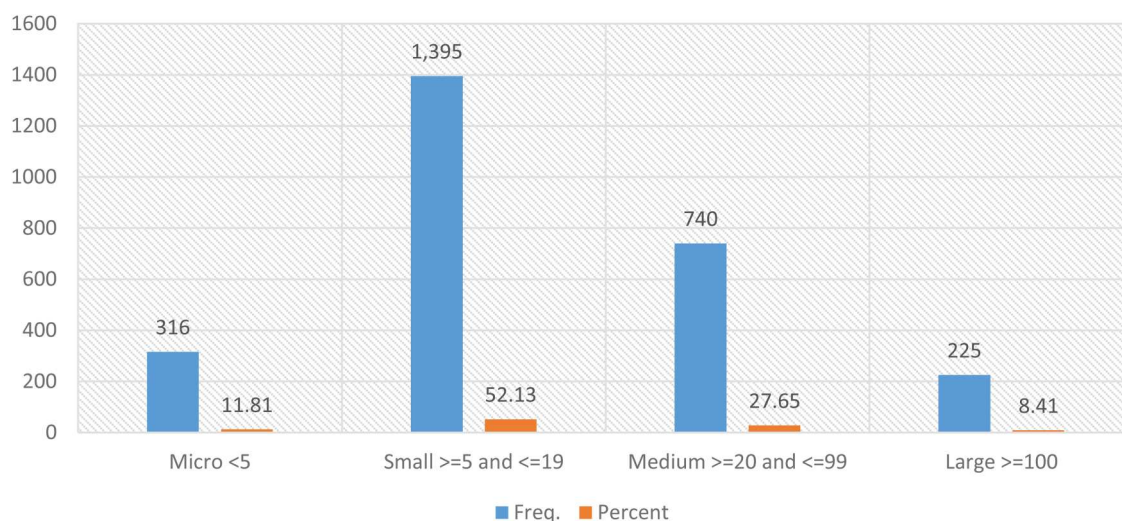


Figure 1: Frequency of and percentage distribution of firm size in Nigeria.
Data source: World Bank, Nigeria Enterprise Survey Data (2014).

firms evolve following life cycle in developed countries while it was revealed that in Africa, firm's survival depends on size. It was shown further by the study that productivity distribution of firms differed greatly by size compared with age groups. The study recommended that micro firms should employ fewer than 5 full-time employees. This current study varies from that of Biesebroeck (2005) by concentration on enterprises in Nigeria using firm level data and applying multinomial logistic regression. The current study did not focus on entire Africa but Nigeria.

In a related study Oyelade (2019) also looked at how firm size could influence its performance in Nigeria utilizing annual time series data from selected firms in building industry between 2004 and 2017. Adopting panel data analysis, it was found that size was seen to be a statistically significant determinant of firm performance. Other significant determinants of productivity were shown to include labour, age of firm, liquidity ratio, among others. The recommendation here was that government need to encourage firms to increase their sizes in order to raise productivity levels or their output per capita. Our current study also differs from that of Oyelade (2019) in the sense that it adopted annual time series data and panel data analysis, while our current study applied firm level enterprise survey data from World Bank and multinomial logistic regression.

Bolarinwa and Obembe (2017) checked the causality that could exist between size of firms and their profitability using panel data generated from 45 quoted firms in Nigeria and applying PVAR (panel vector autoregressive) model and GMM (generalized method of moments). It was found that there exist bidirectional causality between Nigeria firms' size and profitability. It was further revealed that current profitability level was determined significantly by past profitability, current size and past size levels of firms. Among others, the study recommended that corporate managers should look inwards on firm size while designing their firm policies in order to achieve optimal profitability. This study is different from our study since it used only used 45 quoted firms in Nigeria and applied PVAR and GMM models, but our current study is composed of a nationwide firm level survey data that is made up of about 2 676 enterprises, with multinomial logistic regression approach that was adopted for the results analysis.

Similarly, Abdu and Jibir (2018) studies determining factors of firm's innovation in Nigeria using World Bank enterprise survey data and employed probit and Tobit models. It was found by the study that R&D (research and development) investment, official training/education, competitors, firm's size, firm's level of exports, firm's locality, sector, type of firm, and firm's activities significantly encourage firm's innovation. However, firm age and educational levels of employees, were found to be inversely influencing firms innovation chances. It was therefore, recommended by the study that firms in their quest to boost production and innovation should concentrate on the significant factors identified by the study. This study also differs from our study

even though that it used similar firm level Nigerian data and applied probit and Tobit models, however, the study used different variables of interest with respect to our current study, with methodology (multinomial logistic regression model) to our current study.

Olubiya et al. (2019) also in a similar study, tried to know how entrepreneurial orientation could influence SME's profitability/productivity in Lagos, Nigeria using survey data generated from 4,535 SMEs in Lagos State and applying descriptive statistics. It was empirically revealed that proactiveness and risk taking significantly encourage profitability. Further, there is negative significant influence of competitive aggressiveness on profitability. It was recommended among others by the study that owners and managers should not ignore proactiveness, risk-taking, and entrepreneurial orientation as their major elements that could drive profitability for the firms. This study also differs from our current study since it was done only for Lagos State Nigeria with only descriptive statistics. Therefore, the current study's content, scope and methodology differs with that of Olubiya et al. (2019).

In another related study, Ogunleye, Adeyemi, and Asamu (2018) looked at the link that exist among Nigerian firms' size, growth and profitability/productivity, adopting panel data spanning from 2007 to 2011 and panel data analysis. It was found that independent links exist among Nigerian firms' size and growth. Further, positive association was found for Nigerian firms' growth and profitability/productivity, although, not significant, while an inverse link was found to exist between firm size and profitability. Hence, the study suggested that government need to encourage policies geared towards enhancement of firm profitability so as to help boost their performances and encourage create employment. Babalola (2013) also in a similar study, tried to study the size of a firm could influence profitability quoted firms of Nigerian Stock Exchange utilizing panel data that spans from 2000–2009 and adopting, panel data analysis. Empirical finding indicated that firm size, positively and significantly affect firm profitability in the country. It was empirically suggested among others that government need to try harder to stem the high level of interest rates in Nigeria in order to encourage firms through cost reduction. While these studies applied time series data and panel data analysis, our current study adopted survey data.

In another related study, Odusanya, Yinusa, and Ilo (2018) investigated the determining factors of firm profitability using panel data generated from 114 firms quoted in Nigerian Stock Exchange (NSE) for the years covering 1998–2012, and employing system Generalized Method of Moments (GMM). It was found by the study that past firm profitability has a positive significant influence on firm profitability but is influenced inversely and significantly by inflation, short-term leverage, interest rate and financial risk. It was recommended that there is need for reduction in the cost of borrowing in a bid to reduce production cost, encourage productivity, and raise profitability. Eyigege (2018) also studied the influence of firm's operational scale/size on the finances/productivity

accomplishment of commercial banks listed in Nigerian stock exchange through the adoption of panel data, pooled OLS, fixed/random effect, descriptive statistics, and correlation analysis. It was found among others that firm size showed inverse insignificant influence on firm financial performance. It was recommended that firms should minimize their costs by limiting their expansions in a bid to enjoy economies of scale. These studies also vary from our current study because the studies also applied time series data and panel data analysis, GMM model, descriptive statistics, and correlation analysis however, our current study adopted survey data and multinomial logit model.

In yet another study, Kijkasiwat and Phuensan (2020) studied how firm size associates firm innovation and performance using panel data generated from 29 countries found within Central Asia and Eastern European. Applying partial Least Squares and structural equation models, it was found that size of firms and capital finances have innovating mediating and moderating influence on performance/productivity of firms. It was recommended by the study that policy makers need to plan in accordance with firm size and financial capability while introducing innovation in a bid to encourage firm performance when. Again, another similar study by Olayemi et al. (2020) was carried out to study innovative behaviour and firm performance in the Nigeria. The study adopted descriptive statistics, univariate analysis of variance (ANOVA), and survey data to determine whether innovativeness significantly encourage fluctuations in firm performance. It was found by the study that innovativeness significantly determines firm performance in Nigeria. It was recommended among others, that firms and industries should be captured in government's industrial policies to help them innovate and contribute their quota to economic development and social wellbeing of the people. The studies by Kijkasiwat and Phuensan (2020); Olayemi et al. (2020) also varies from our current study because they utilized panel data and panel data analysis, with ANOVA and descriptive statistics. However, the study by Kijkasiwat and Phuensan (2020) was not done in Nigeria. Our current study is carried out in Nigeria with the application of survey data and multinomial logit model.

The study by Asad et al. (2018), Asad et al. (2020), and Khan et al. (2021) also examined how the performance of micro and small enterprises and/or SMEs could be affected by their sizes and other moderating factors. Using survey data and econometric approach it was found that innovation and the possession of resource competitive advantage could significantly influence the size and performance of enterprises. Again, enterprise size was shown to have moderating impact on risks and business performances, in conjunction with innovation and enterprise performance. In a similar study by Asad and Kashif (2021) as well, survey data and descriptive statistics were employed to unveil the performance of SMEs during COVID-19 pandemic period. The study found that due to COVID-19 many SMEs were almost closing businesses due to large business losses. However, those SMEs that were able to innovate and

explore other business opportunities were able to survive in the meantime.

Suyanto, Sugiarti, and Kartikasari (2023) examined how firm size and the concentration of markets influence the productivity firms with special reference to Indonesian manufacturing firms. Firm-level panel data obtained from 6,783 manufacturing firms making an overall sample of 47 481 firms from 33 provinces of Indonesia were utilized. Therefore, using random effect GLS model, it was found that firm size significantly encourages productivity of firms, which by implication means that a larger-sized firms usually have higher productivity than firms of smaller sizes. Again, market concentration was found to exert a reverse influence on the productivity of firms thereby, implying that firms that are more concentrated within an industry tends to produce less. It was recommended that firm should try harder to increase the size of their productions in order to compete favourably in markets that are less concentrated. This current study differs from the study by Suyanto, et al. (2023) in scope and methods. Our study uses national wide enterprise survey data conducted by World Bank in Nigeria and applies multinomial logit model but that of Suyanto, et al. (2023) was done in Indonesia with a panel of manufacturing firms and random effect GLS model. The majority of the extant literature reviewed focused more on the impact of firm size on productivity of firms, however, this current study focuses on the impact of enterprise productivity on firm size with a categorization in terms of micro, small, medium, and large-sized firms in Nigeria. These categorization informed our choice of model for the study analysis.

Methodology

The multinomial logit model anchored on returns to scale economies technological theory following Oyelade (2019) was employed by the study in a bid to examine the impact of enterprise productivity on firm size (that is categorizing them in terms of; micro, small, medium, and large) in Nigeria. A major reason for the adoption of the multinomial logistic model is that the size pattern of firms as used by the study has four (4) categories (i.e. micro, small, medium, and large) which would help in comparing the probability of being in one category with that of the probability of being in the reference category (Omeje, Mba, and Ugwu 2020).

Therefore, for N categories, the calculation would be N-1 equations, in which each category has one with respect to the reference group/category. In this respect, multinomial logistic model for $n = 2, \dots, N$, can be specified as given below:

$$\ln \frac{P(Y_i = n)}{P(Y_i = 1)} = a_n + \sum_{k=1}^k b_{nk} X_{ik} = W_{ni} \dots \quad (1)$$

where i = i th individual, n = n th category/group of the explained variable (in our study, firm size – micro, small, medium, and large). b_{nk} = vector of parameters relating to n th independent variables and k th outcome. a_n = constant term, while X_{ik} = vector of independent

variables (prodt, labourcost, electricitycost, costrawmintguiproduct, vomachineequip, labour, creditaccess, capacityutil, and firmage) (Omeje, Mba, and Ugwu 2020; Omeje, Mba, and Anyanwu 2022). Productivity for instance is expected to enter the model since it influences firm size. Labour cost electricity cost, costs relating to intermediate goods and raw materials utilized in production, value of machinery, vehicles, and equipment, number of full-time permanent employees, establishment possessing from a financial institution, credit line or loan, percentage of capacity utilization of the establishment, and age of the firm are all expected to affect firm size, and as such, should enter the model. The independent variables are defined as shown in Table 1.

With respect to each case in equation (1), N-1 estimated logarithm of the odds exists, in which each firm belonging to different firm size/group has one size/class considered in relation to the firm regarded as the reference firm/category. Therefore, since firms have the size of n = 1, ln(1) = 0 = W₁₁, and exp(0) = 1).

Given that the study has more than 2 groups of firms with respect to the size of firms, that is; micro-, small-, medium-, and/or large-sized, the probability computation for n = 2, ..., N can be given below as:

$$P(Y_i = n) = \frac{\exp(W_{ni})}{1 + \sum_{h=2}^n \exp(W_{hi})} \tag{2}$$

However, in terms of the firm that is regarded as the reference firm/category, it is specified as:

$$P(Y_i = 1) = \frac{1}{1 + \sum_{h=2}^n \exp(W_{hi})} \tag{3}$$

Given equation (3), it implies that N-1 log odds each firm size must be computed and exponentiated in order to allow for straightforward probabilities calculation. It is worthy of note here that whenever N = 2, the multinomial logistic, logistic, and ordered logistic regression models produce same results.

In this respect, it has been established by extant theories and literature that multinomial logistic regression model is appropriate in researches that have nominal dependent variable with more than two categories (in our case, size of the firm (i.e, micro, small, medium and large)). Multinomial logit model can also be applied to examine links that exists between one dependent nominal factor (firm size)

and a few independent factors (i.e. prodt, labourcost, electricitycost, costrawmintguiproduct, vomachineequip, labour, creditaccess, capacityutil, and firmage), hence making it a very powerful tool for predictive analysis (Omeje, Mba, and Ugwu 2020).

Splitting up and/or listing the factors/model variables that determine firm size in Nigeria and re-specifying the functional form of the model to allow for its estimation produces equation 4 given below:

$$size = f(\text{prodt, labourcost, electricitycost, costrawmintguiproduct, vomachineequip, labour, creditaccess, capacityutil, firmage}) \tag{4}$$

where; all the factors/model variables are defined as presented as given in Table 1.

The estimable mathematical for of the model is specified below in equation (5):

$$size = a_0 + b_1\text{prodt} + b_2\text{labourcost} + b_3\text{electricitycost} + b_4\text{costrawmintguiproduct} + b_5\text{vomachineequip} + b_6\text{labour} + b_7\text{creditaccess} + b_8\text{capacityutil} + b_9\text{firmage} \tag{5}$$

The econometric estimable model of the study is given in equation (6) below:

$$size = a_0 + b_1\text{prodt} + b_2\text{labourcost} + b_3\text{electricitycost} + b_4\text{costrawmintguiproduct} + b_5\text{vomachineequip} + b_6\text{labour} + b_7\text{creditaccess} + b_8\text{capacityutil} + b_9\text{firmage} + \mu \tag{6}$$

where μ = the error term

Data and data sources

The analysis was conducted using the most recent cross-sectional firm – level data of the World Bank Nigerian enterprise survey of the year 2014. The World Bank enterprise survey data is just a firm-level survey which is a representative sample of the Nigerian private sector. It extends from business environmental area like credit access, infrastructure, corruption, performance, and

Table 1: The factors/model variables and their definitions.

Variable	Definition of the variables
Size	size of the firm (i.e, micro, small, medium and large)
Prodt	enterprise productivity proxied by establishment’s output produced in the last financial year
Labourcost	total cost of labour (including salaries, wages, bonuses, etc) in last fiscal year
electricitycost	electricity total annual costs in last fiscal year
costrawmintguiproduct	costs relating to intermediate goods and raw materials utilized in production in last fiscal year
vomachineequip	value of machinery, vehicles, and equipment in last fiscal year
Labour	Number of full-time permanent employees at end of last fiscal year
creditaccess	establishment possessing from a financial institution, credit line or loan
Capacityutil	% of capacity utilization of the establishment in last fiscal year
Firmage	age of the firm (proxied by year establishment began operations)

Source: Extracted from World Bank, Nigeria Enterprise Survey Data (2014).

competition measures. The data which was fielded through a manufacturing or service questionnaire has a sample size of 2 676 from which 317 variables were generated. The size of the sample was obtained through a stratified sampling method and the strata include; industry, region, and size. The regional stratification included 19 states of the federation which are Abia, Abuja, Anambra, Cross River, Enugu, Gombe, Jigawa, Kaduna, Kano, Katsina, Kebbi, Kwara, Lagos, Nasarawa, Niger, Ogun, Oyo, Sokoto, Zamfara while the firm size stratification was divided into four (micro, small, medium and large firms). This survey data captured most of the observable characteristics of firms/enterprises in Nigeria. The variables of the model applied in the study were presented in Table 1. This data set is the most recent World Bank enterprise survey data for Nigeria.

Empirical findings and discussions

Descriptive statistics

Table 2 indicates that the size of firms which consists of micro, small, medium, and large-sized firms are 2 676. It also shows that some of the variables vary across observations. Variables with smaller observations show that the respondents were unable to provide all the responses to the questions in the instrument used in data collection. The study applied STATA 13 econometric software to obtain the study's results presented in Table 2 through

Table 5. From the results in Table 2, the number of observations (Obs.), the mean, the standard deviations (std. dev.), minimum (min), and maximum (max) values of each of the variables were shown and as such, indicates that all the variables exhibited sufficient variations in their mean and standard deviation values.

The results of the likelihood ratio test (LR) chi-square (chi2 (24)) value, 595.21 and p -value, 0.0000 show that there is a significant better fit of the model and the associated variables. The reference category of this study falls on small-sized firms (Small__5_and__19) and as such, became the reference/base in which other group/categories' results were compared.

However, in order to examine how enterprise productivity influences the size of firms in Nigeria, the study estimated the multinomial logistic regression model presented in the summary as given in Tables 3–5, respectively. Table 3 compares micro- and small-sized enterprises/firms, Table 4 compares medium- and small-sized enterprises/firms, while Table 5 compares large- and small-sized enterprises/firms. These are presented in Tables 3 to 5.

Analysing micro-sized and small-sized firms

The multinomial logit results reveal that a unit increase in enterprise productivity (prodt) brings about a 0.0009261 insignificant fall in the relative log odds of running a

Table 2: Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
size					
micro <5..	2676	.4215034	.2766318	0	1
Small >= 5..	2676	.5213004	.4996394	0	1
Medium >= ..	2676	.2765321	.4473666	0	1
Large >= 100	2676	.0840807	.2775607	0	1
prodt	1141	45.78089	44.62592	0	100
labourcost	2658	8.17e+07	1.49e+09	0	5.30e+10
electricit~t	2658	766801.5	2.00e+07	0	1.00e+09
costrawmin~d	1147	1.33e+09	2.15e+10	0	6.22e+11
vomachinee~p	260	2.58e+07	2.58e+08	0	3.50e+09
labour	2652	22.477	169.8457	0	5000
creditaccess	2651	1.415692	2.303722	1	2
capacityutil	1141	48.57669	44.47328	0	100
firmage	2652	1826.836	559.114	60	2014

Source: Author's computation using STATA 13 and World Bank, Nigerian enterprise survey (2014).

Table 3: Multinomial logit summary results comparing micro-sized and small-sized firms.

size	Coef.	Std. Err.	z	$P> z $
Micro__5				
prodt	-.0009261	.0046049	-0.20	0.841
labourcost	1.360812	2.220812	0.61	0.540
electricitycost	-9.301308***	2.991307	-3.11	0.000
costrawmintguiproduct	-1.661021***	.3111012	-5.34	0.000
vomachineequip	-1.033407**	.3808340	-2.71	0.007
labour	-.0210597*	.0090607	-2.32	0.020
creditaccess	-.0800224*	.0375152	-2.13	0.033
capacityutil	.0128976**	.0046172	2.79	0.005
firmage	-.0003691**	.0001564	-2.36	0.018
_cons	-.0585661	.2816446	-0.21	0.835
Small__5_and__19 (base outcome)				

Legend: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: Author's computation using STATA 13 and World Bank, Nigerian enterprise survey (2014).

Table 4: Multinomial logit summary results showing the comparison between medium-sized firms and small-sized firms.

size	Coef.	Std. Err.	z	P> z
Medium__20_and__99				
prodt	.010299***	.0030476	3.38	0.000
labourcost	1.640877***	.6808771	2.41	0.009
electricitycost	-6.051029***	1.721028	-3.52	0.000
costrawmintguiproduct	-1.260923***	.3210523	-3.93	0.000
vomachineequip	2.090118***	.8102811	2.58	0.004
labour	.0281647***	.0037055	7.60	0.000
creditaccess	-.0797701**	.0344769	-2.31	0.021
capacityutil	.0031783	.0031162	1.02	0.308
firmage	-.000074	.0001454	-0.51	0.611
_cons	-1.083797***	.2830097	-3.83	0.000

Small__5_and__19 (base outcome)

Legend: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: Author's computation using STATA 13 and World Bank Nigerian enterprise survey (2014).

Table 5: Multinomial logit summary results revealing the comparison between large-sized firms and small-sized firms.

size	Coef.	Std. Err.	z	P> z
Large__100				
prodt	.0201428***	.006341	3.18	0.000
labourcost	1.380258**	.6808125	2.03	0.012
electricitycost	-2.480781***	.8212071	-3.02	0.000
costrawmintguiproduct	-2.301011***	.3410212	-6.75	0.000
vomachineequip	5.750900***	1.814081	3.17	0.000
labour	.056633***	.0045602	12.42	0.000
creditaccess	-.0359984	.071949	-0.50	0.617
capacityutil	.0060378	.0063137	0.96	0.339
firmage	.0000553	.000298	0.19	0.853
_cons	-4.03883***	.6158318	-6.56	0.000

Small__5_and__19 (base outcome)

Legend: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: Author's computation using STATA 13 and World Bank, Nigeria enterprise survey data (2014).

micro-sized firms instead of small-sized firms. This means that even as firms are advised to increase their productivity, micro-sized firms have no capacity to sustain increase in output compared to small-sized businesses/firms in Nigeria. The productivity of micro-sized firms with respect to those that are small-sized, are still very insignificant in the economy. This is because, most of them are engaged in the production of primary products that they cannot even export or store for a long period since the products are still in their crude state and have not been refined. This study's finding is in consonance with that of Eyigege (2018) who found that size has inverse insignificant impact on firm performance, but disagrees with the finding by Oyelade (2019), Bolarinwa and Obembe (2017), Kijkasiwat and Phuensan (2020), who found that size encourages firm profitability. Theoretically however, the application of the scale of production theory to this study is very appropriate, since rise in productivity of micro-sized firms or enterprises tends to make them move away from micro-sized firms or enterprises to establish bigger firms or enterprises. Hence, as productivity increases, micro firms tend to expand the size of their firms in Nigeria by leaving micro firms to bigger ones.

A Naira rise with respect to total labour cost, including salaries, wages, bonuses, among others, (labourcost) is related to a 1.360812 insignificant increase in relative

log odds of enterprises existing as a micro-sized firm when related to that of small-sized ones. This implies that given a high labour cost, more enterprises would not be able to afford the cost of labour and as such, would resort to micro-sized firms rather than opening small-sized firms. Put differently, small-sized firms would begin to dislike investing in businesses in Nigeria thereby, resorting to micro-sized firms and as such, increasing their size. Hence, with high labour cost, enterprises in small-sized firms compared to those in micro-sized firms may start entering into micro productions (that is, reduce the size of their firms from small to micro) while some would move to other economies with relatively cheap labour. The reverse happens when there exists cheap labour cost. With cheap labour cost, the relative log odds of enterprises existing among micro-sized firm with respect to those of small-sized ones rises. Here, micro-sized firms may tend to enter into small-sized firms by hiring more labour.

With regard to total annual costs of electricity (electricitycost), a one Naira rise in electricity cost would on the average bring about a 9.301308 significant fall in relative log odds of enterprises being in micro-sized firm compared to enterprises in small-sized. This result is expected since higher electricity bills, given erratic electricity supply and estimated billing, discourage enterprise

productivity significantly, and in turn affects its size negatively. However, the implication of this result is that micro-sized firms compared to small-sized firms that cannot pay the bills would switch to alternative electricity supplies such as generators and solar energy, although, these may not be cost effective, thereby discouraging firm productivity causing a reduction in firm size. This finding agrees with that of George and Oseni (2012) who found that electricity cost in Nigeria contributes to the cost of doing business.

A Naira rise in raw material costs and intermediate goods utilized in production (*costrawmintguiprod*) brings about a 1.661021 significant reduction in relative log odds of enterprise investment falling under micro-sized when related to those in small-sized firms. This outcome is also expected, since it's a priori expectation reveals that high raw material costs as well as that of intermediate goods utilized in production process would on the average scare away investors in micro-sized firms compare to small-sized firms. The reverse is the case with low raw material costs as well as that of intermediate goods utilized in production process, which will of course, encourage micro-sized investors compared to small-sized firms. The implication is that firms/enterprises in micro-sized enterprises relative to those in small-sized firms would increase with cheap raw material costs and intermediate goods employed in production, but would fall when they become expensive.

Further, a one Naira increase in the value of machinery, vehicles and equipment (*vomachineequip*) is associated with about 1.033407 significant reduction in relative log odds of existing as a micro-sized firm relative to the ones in small-sized firms. This particular finding is expected since it is always the case that any investment in the capital stock component of micro-sized firms compared with small-sized firms, would transcend to, on the average, an increase firm level productivity and firm size as well. However, given that this is a micro-sized firm, the more it expands its investment in capital stock without a corresponding increase in the size of its labour force, the less the productivity and size of the firm would be compared with small-sized firms. The implication of this result is that the more mechanized and/or automated a micro-sized firm compared with small-sized firm is, the less efficient and productive the firm is expected to be. This finding is in negation with the finding by Awoyemi (2011) who found that capital investment is a major determinant of output growth of firms.

An increase in the number of permanent, full-time employees (labour) by one, is linked to about 0.0210597 significant reduction in relative log odds of undertaking a micro-sized firm compared to that of small-sized firms. This empirical finding is surprising since it is expected that any additional number of permanent, full-time employee would raise firm productivity and size of the firm since another labour was added. However, increasing labour without a commensurate increase in value addition per worker would automatically decrease total productivity and as such, shrink the micro-sized firm the more compared with the small-sized firm. Hence, the implication of this result may be that majority

of the Nigerian micro-sized firms lack credit access and other capacities to expand their carrying capacity and labour demand as well compared with the small-sized firms. For these micro-sized firms, increasing labour demand implies increasing their expenditures on wages, salaries, bonuses, among other things that would motivate employees to work more in order to achieve increased productivity, but the reverse is the case with respect to labour demand of firms in Nigeria as rise in labour demand by Nigerian micro-sized firms would bring about increasing cost of production and as such, reduction in firm productivity and the size of the firm. This finding aligns with the study by Kaimbo (2015) who found that employment growth in a firm reduces labour productivity among firms.

The inability of the enterprise establishment to possess from a financial institution, a credit line and/or access to loan facility (*creditaccess*) brings about a 0.0800224 significant fall in relative log odds of existing in micro-sized firm/enterprise relative to enterprises that are small-sized. This means that if enterprises who belong to micro-sized firms against those ones that are small-sized do not have more increased financial access, the firm size would tend to be very limited. This finding agrees with the finding by Ugwu and Omeje (2021), Okoli and Okoli (2013) and Ukpong and George (2012) who revealed that with increased access to credit, supports, and skills, firms would tend to raise job creation especially to accommodate the unemployed and by implication, raise the size of the firm.

A percentage increase in capacity utilization of the enterprises (*capacityutil*) in micro-sized firm brings about a 0.0128976 significant rise in relative log odds of existing as a micro-sized firms against those ones in small-sized firms. This implies that with a rise in capacity utilization of micro-sized firms compared with small-sized firms, would on the average increase productivity and as such, lead to the expansion of the size of the firm. The reverse becomes the case with a low capacity utilization.

An increase in number of years the firm/establishment began operations (*firmage*) brings about a 0.0003691 significant reduction in relative log odds of being in micro-sized firm versus those ones that are small-sized firms. This outcome is not surprising since it is expected that the higher the age of an establishment (number of years the firm began operations), the more likely it would overcome credit constraints, increase its profitability, productivity and size due to business experiences in the field. Hence, the implication here is that the age of enterprises/firms in Nigeria significantly determine its survival through financial viability and/or its ability to overcome credit constraints, raise its production, profitability and size as well. So, the longer established a micro-sized firm is in operation, the less likely it will continue to operate as micro-sized firm due to the fact that, with increased productivity, incomes, profits, operational efficiency, and increased competitiveness, the micro-sized firm may tend to exit its operation as micro-sized firm and expand its operation to another firm size higher than micro-sized, depending on its financial and technical capacity. This finding is in consonance with the study by Abdu and

Jibir (2018) who found that firm age has inverse relationship with firm's innovation chances and expansion.

Finally, holding other factors constant ($_cons$) suggests that a unit increase in these factors brings about a 0.0585661 insignificant fall in relative log odds of the enterprise existing among micro-sized firm against those in small-sized firms.

Analysing medium-sized and small-sized firms

It was found from Table 4 that a rise in enterprise productivity ($prodt$) brings about a 0.010299 significant rise in relative log odds of running medium-sized firms versus small-sized firms. Here, the implication is that as enterprises increase their productivity, they tend to switch to medium-sized firms as they gain more capacity to sustain increase in output compared to small-sized businesses/firms in Nigeria. The productivity of medium-sized firms with respect to those that are small-sized, are very significant in the economy. This is because, most of them now move away from producing core crude primary products to a more refined intermediate products that can be exported for increased foreign exchange and/or to products that can be stored for a given number of times. This finding disagrees with the finding by Eyigege (2018) who found that size has inverse insignificant impact on firm performance, but agrees with the finding by Oyelade (2019), Bolarinwa and Obembe (2017), Kijkasiwat and Phuensan (2020), who found that size encourages firm productivity and profitability as well. Theoretically also, the application of the scale of production theory to this study is very appropriate, since rise in productivity of medium-sized firms or enterprises tends to make them increase investment of the firms or enterprises in order to have the business sustained. Hence, as productivity increases, medium-sized firms also tends to expand the size of their firms in Nigeria.

A rise in total labour cost, bearing in mind salaries, wages, bonuses, among others, ($labourcost$) by one Naira is linked to about a 1.640877 significant rise in relative log odds of enterprises existing within medium-sized firm against those ones seen under small-sized firms. Hence, the insinuation here is that given high labour cost, more enterprises would not be able to afford the cost of labour and as such, would resort to micro-sized firms rather than opening small-sized firms. Put differently, investors in medium-sized firms may tend to have a loss of investment interests in these businesses in Nigeria. This will make them to redirect their investments to either micro-sized or small-sized firms. Therefore, with high labour cost, enterprises in medium-sized firms compared to those in small-sized firms may start entering into micro productions (that is, reduce the size of their firms from medium to micro) while some would move to other economies with relatively cheap labour cost. When labour cost becomes cheap, the reverse to the above takes precedence. With cheap labour cost, the relative log odds of enterprises falling under medium-sized firm as against those in small-sized would statistically and significantly rise as well.

It was also shown by the results that a one Naira increase in total annual costs of electricity ($electricitycost$), leads to about a 6.051029 significant fall in relative log odds of enterprises undertaking medium-sized firm compared to that of small-sized firms. This empirical evidence is not unexpected since higher electricity bills, estimated billing coupled with erratic electricity supply, significantly militates against enterprise productivity which in turn, influences firm size negatively. The implication of this result is that medium-sized enterprises and/or firms juxtaposed with small-sized firms, that cannot pay higher electricity bills would tend switch to alternative electricity supply such as use of generating set and solar energy. However, these alternative electricity supply may not be cost effective. This, therefore, explains the reason for the firm productivity discouragement and reduction in firm size. This empirical result is also in consonance with the finding by George and Oseni (2012) who found that electricity cost in Nigeria contributes to the cost of doing business, which limits firm productivity, profitability and size.

Raising raw material costs and intermediate goods utilized in production ($costrawmintguiproduct$) by ₦1 brings about a 1.260923 significant fall in relative log odds of enterprise investment existing under medium-sized firm against those seen under the small-sized firm. This empirical finding is expected since high raw material costs and intermediate goods utilized in production process, would on the average scare away investors in medium-sized firms compare to small-sized firms. The reverse is the case with a low raw material cost and intermediate goods employed in production process, which will encourage medium-sized investors compared to small-sized firms. The essence of this results here is that firms/enterprises investing in medium-sized enterprises against that of small-sized firms would increase when there is cheap raw material cost and intermediate goods employed during production but would fall when they become expensive.

In another vein, a one Naira increase in the value of machinery, vehicles and equipment ($vomachineequip$) is linked to about 2.090118 significant enhancement of the relative log odds of running medium-sized firm in contrast with the ones seen under small-sized firms. This finding is not unexpected since it is usually anticipated that any investment in the capital stock component of medium-sized businesses and/or firms in contrast with small-sized businesses and/or firms, would transcend to, on the average, an increase firm level productivity and firm size as well. However, given that this is a medium-sized firm, the more it acquires more machinery, vehicles and equipment, the more it expands its investment in capital stock, and increase its employment level. This would no doubt raise productivity, profitability and the size of the firm in medium-sized businesses or firms against that of small-sized businesses or firms. The implication of this result is that the more mechanized and/or automated a medium-sized firm compared with small-sized firm is, the more effective, efficient and productive the firm is expected to be. This finding is in agreement with the finding by Awoyemi (2011) who found that capital investment is a major determinant of output growth of firms.

Further, a rise in the number of permanent, full-time employees (labour) by one, is associated with about 0.0281647 significant rise in relative log odds of existing under medium-sized firms against that of small-sized firms. The result is also not unexpected since it is usually the norm that any additional number of permanent, full-time employee, would on the average increase firm productivity and size of the firm since extra labour was added. However, the addition in labour input must not go beyond the point where the peak value of the firm output equilibrates with the marginal product of the firm, since after this point, any addition of extra labour would lead to a fall in marginal product of the firm. Hence, extra unit of labour added in the production process must be complemented with a commensurate increase in value addition of the extra labour added. When this happens, output per worker would automatically raise total productivity and as such, make medium-sized firm to expand the more compared with the small-sized firm. This finding is not in consonance with the finding by Kaimbo (2015) who found that employment growth in a firm reduces labour productivity among firms.

The inability of the enterprise establishment to have credit access or access to loan from a financial institution (creditaccess) brings about a 0.0797701 statistically significant decrease in relative log odds of being captured under medium-sized firm/enterprise versus enterprises that are small-sized. The resulting implication of this finding is that if enterprises within medium-sized firms in relation to those that are small-sized do not have more access to credit, the firm size would tend to be very limited. Hence, an inability to access to credit for a firm's productive investment expansion would definitely mar the growth and size of the firm. This empirical finding supports that of Ukpong and George (2012) and Okoli and Okoli (2013) who revealed that increased credit extension and/or access to firms would create more employment of resources, raise productivity and profits and, by implication, make firms increase their size.

In addition, a percentage rise in capacity utilization of the enterprises (capacityutil) in medium-sized firms is linked to about 0.0031783 statistically insignificant improvement in the relative log odds of running medium-sized firm as against that of small-sized firm. The economic undertone here is that a rise in capacity utilization of medium-sized firms against that of small-sized firms, would on the average increase productivity, profitability, efficiency, and as such, lead to the expansion of the size of the firm. The reverse becomes the case with a low-capacity utilization.

Again, a rise in the number of years the firm/establishment began operations (firmage) is related to about 0.000074 insignificant fall in relative log odds of partaking in medium-sized firm compared to that of small-sized firm. This finding is also not unexpected since it is also usually anticipated that the higher the age of an establishment (number of years the firm began operations), the more likely it would overcome credit constraints, increase its profitability, productivity and size due to business experiences in the field. Hence, the implication here is that the age of enterprises/firms in Nigeria significantly

determine its survival through financial viability and/or its ability to overcome credit constraints, raise its production, profitability and size as well. So, the longer a medium-sized firm is in operation, the less likely it will continue to operate as medium-sized firm due to the fact that, with increased experience, productivity, incomes, profits, operational efficiency, and increased competitiveness, the medium-sized firm may tend to exit its operation as a medium-sized firm and expand its operation to another firm size higher than medium-sized, depending on its financial and technical capacity. This finding is in agreement with the finding by Abdu and Jibir (2018) who found that firm age has inverse relationship with firms' innovation chances and expansion.

Finally, holding other factors constant (_cons), it was found that a unit increase in all the factors excluded in the model brings about 1.083797 significant fall association in relative log odds of existing in medium-sized firm compared to that of small-sized firms.

Analysing large-sized firms and small-sized firms

Table 5 reveals that the multinomial logit results show that when enterprise productivity (prodt) rises by one unit, it brings about a 0.0201428 associated/corresponding statistically significant increase in relative log odds of running large-sized firms against that of small-sized firms. The economic connotation and/or implication of this finding is that as enterprises increase their productivity level, they tend to switch to large-sized firms as they gain more capacity to sustain increase in output compared to small-sized firms in Nigeria. The productivity of large-sized firms with respect to those that are small-sized, are very significant in the economy. This is because, almost all the large-sized firms invest more on refined intermediate products that can be exported for increased foreign exchange and/or to products that can be stored for a given number of times, thereby, adjusting backward towards crude/primary products. More productivity among large-sized firms transcends to more sales, profits, income, increased efficiency, more competitiveness, and overall expansion of the firm. This finding disagrees with the finding by Eyigege (2018) who found that size has inverse insignificant impact on firm production, but agrees with the finding by Oyelade (2019), Bolarinwa and Obembe (2017), Kijkasiwat and Phuensan (2020), who found that size encourages firm productivity and profitability. Again, theoretically, the application of the scale of production theory to this study is very appropriate, since rise in productivity of medium-sized firms or enterprises tends to make them to also raise their investment in order to have the business sustained and expand as well. Hence, as productivity increases, large-sized firms also tend to expand their size in Nigeria.

In addition, a rise in total labour cost (including wages, salaries, bonuses, etc) (labourcost) by one Naira is linked to a 1.380258 statistically significant increase in relative log odds of enterprises existing as large-sized firm relative to that of small-sized firms. By indication, it implies here that with higher labour cost, larger enterprises would be able to afford the cost of labour but

must ensure that output per worker corresponds to and/or above the remuneration given to an employee. In other words, as investors in large-sized firms strive harder to be more competitive, an increase in labour cost maybe a sign of more productivity, sales, income, rise in overall profitability and improvement in the firm's competitiveness. Again, the relative log odds of enterprises existing in large-sized firm against that of small-sized firms, rise significantly as the firm expands in size.

The multinomial logit model results also show that a one Naira increase in total annual costs of electricity (electricitycost), leads to about a 2.480781 statistically significant decrease in relative log odds of enterprises existing as large-sized firms against that of small-sized firms. The outcome is not unexpected since higher electricity bills, estimated billing coupled with erratic electricity supply in Nigeria, significantly militates against enterprise productivity, profitability, competitiveness, and in turn, influence the firm size negatively. The implication of this result is that large-sized firms compared to small-sized firms, may be charged higher electricity bills that may make them switch to alternative electricity supply such as use of generating set and solar energy. However, these alternative electricity supply may not be cost effective. This, therefore, explains the reason for the firm productivity discouragement and reduction in firm size. This result is also in consonance with that of George and Oseni (2012) who found that electricity cost in Nigeria contributes to the cost of doing business, which limits firm productivity, profitability and size.

With a one Naira increase in the raw material costs and intermediate goods employed in production (costrawmintguiprod), there would be a 2.301011 significant decrease that would be associated with the relative log odds of enterprise investment concentrating on large-sized firm as compared with that of small-sized firm. The empirical finding here is also not unexpected since it is often the case that high raw material costs and intermediate goods employed in production process would, on average, scare away investors in large-sized firms compared to small-sized firms, to look out for other countries where they can find cheap raw materials and intermediate goods that they can utilize in their production process. The reverse is the case with a low cost of raw materials and intermediate goods used in production process, which will encourage large-sized investors compared to small-sized firms to invest more in the economy. The implication here also is that firms/enterprises undertaking investments in large-sized enterprises compared with small-sized firms would on the average rise higher in the economy with cheap raw material costs and intermediate goods employed in production but would fall when they become expensive.

Further, a one Naira increase in the value of machinery, vehicles and equipment (vomachineequip) is associated with about 5.750900 significant enhancement in relative log odds of running large-sized firm against that of small-sized firms. The empirical outcome here is also not surprising since it is believed that any investment in the capital stock component of large-sized firms compared with small-sized firms, transcends on the average,

to an increase firm level productivity, sales, income, profitability, competitiveness, and expansion in firm size. Hence, since this is a large-sized firm, the more it acquires machinery, vehicles and equipment, the more it expands its investment in different areas of the economy, increase its capital stock, and raise employment level in the country. This would no doubt reduce unemployment, increase productivity of the firm, and hence, lead to higher income, profits, and increased expansion of the large-sized firms compared with small-sized firms. The implication of this result is that the more mechanized and/or automated a large-sized firm compared with small-sized firm is, the more effective, efficient, productive, and competitive the firm is expected to be. This finding is in consonance with the finding by Awoyemi (2011) who found that capital investment is a major determinant of output growth of firms.

Again, an increase in the number of permanent, full-time employees (labour) by one person, is associated with about 0.056633 significant rise in relative log odds of possessing large-sized firm compared to that of small-sized firms. This finding is as well not unexpected since it is also believed that any expansion in the number of permanent, full-time employees would, on average, lead to an increase in firm productivity, sales, income, profits, and size. However, the addition in labour input must not go beyond the point where the peak value of the firm output equilibrates with the marginal product of the firm, since after this point, any addition of extra labour would lead to a fall in the marginal product of the firm. Therefore, extra unit of labour added in the production process must be complemented with a commensurate increase in value addition of the extra labour added. When this happens, output per worker automatically increases total productivity and, as such, make large-sized firm expand more than small-sized firm, making them more competitive. This finding disagrees with the finding by Kaimbo (2015) who found that employment growth in a firm reduces labour productivity among firms.

It was also found from the results that the inability of the enterprise establishment to obtain a credit line and/or loan access (creditaccess) from a financial institution is linked to about 0.0359984 insignificance fall in relative log odds between large-sized firm/enterprise against enterprises and those that are small-sized. The economic indication of the insignificant nature of this result here is that large-sized enterprises always have more chances of obtaining credit and/or loan from a financial institution compared to their counterparts who are in small-sized firms. However, their inability to access these credits or loans for productive investment expansion, limits the firm size, employment level, and overall productivity, income, profits, and competitiveness of the enterprises. Hence, this would definitely mar the growth and size of the firm, although, insignificantly with large-sized firms relative to small-sized firms in Nigeria. This finding agrees with the finding by Ukpong and George (2012), Okoli and Okoli (2013), and Ugwu and Omeje (2021) who revealed that firms that possess more credit access would create more employment of resources, raise productivity and profits, and by implication, make firms to increase their size.

In another vein, a percentage rise in capacity utilization of the enterprises (capacityutil) in large-sized firms is related to about 0.0060378 insignificant rise in relative log odds of being in large-sized firm versus that of small-sized firms. This by implication shows that a rise in capacity utilization of large-sized firms compared with small-sized firms, would on the average lead to an increase productivity, profitability, efficiency, and as such, lead to the expansion of the size of the firm. The reverse becomes the case with a low-capacity utilization.

Considering the age of the enterprise, a rise in the number of years the firm/establishment began operations (firmage) is associated with a 0.0000553 insignificant increase in relative log odds of having large-sized firm compared with that of small-sized firms. This outcome is also not unexpected since it is always believed that the higher the age of an establishment (number of years the firm began operations), the more likely it would overcome credit constraints, increase its profitability, productivity and size due to business experiences in the field. Hence, the implication here is that the age of enterprises/firms in Nigeria significantly determine their survival through financial viability and/or its ability to overcome credit constraints, raise its production, profitability and size as well. So, the longer a large-sized firm is in operation, the more likely it will continue to operate as larger-sized firm due to the fact that, with increased experience, productivity, incomes, profits, operational efficiency, and increased competitiveness, the large-sized firm would continue to expand its operation, even to other parts of the country or world at large. This finding disagrees with the finding by Abdu and Jibir (2018) who found that firm age has inverse relationship with firms' innovation chances and expansion.

Finally, holding other factors constant (_cons), it was found that a unit increase in all the factors excluded in the model brings about 4.03883 significant decrease, associated with relative log odds of being in large-sized firm compared with those firms that are small-sized.

Conclusion

This study examined how enterprise productivity influences the size of firms in Nigeria. It was therefore found by the study that in Nigeria, enterprise productivity statistically and significantly influences firm size positively, especially the medium-size and large-sized firms when compared with small-sized firms. However, enterprise productivity has insignificant negative impact on micro-sized firms when compared with small-sized firms. This implies that the productivity of micro-sized firms with respect to those that are small-sized in Nigeria, are still very insignificant in the economy. This is because, most of them are engaged in the production of primary products that they cannot even export or store for a long period since the products are still in their crude state and have not been refined. Again, micro-sized firms have no capacity to sustain increase in output compared to small-sized firms in Nigeria.

Recommendations

This study therefore recommends that governments at all levels (state, federal, and local) should encourage

micro-sized firms in a bid to make them increase their productivity level. This encouragement can come in the form of providing increased access to credit, provision of raw material inputs, and constant electricity supplies.

The government should also strive harder to help enterprises address business environmental factor issues that are internal to them in order not to retard firm size growth especially, that of micro-sized, small, and medium-sized firms. Also, to help encourage global competitiveness of different sizes of firms in Nigeria, firms themselves need to work hard to control these internal business environmental factor issues (e.g., cost of raw materials and machines used in production). This would encourage their productivity, income, profitability, growth, and the overall economic growth and development of the country.

Electricity cost was found to have negative and significant impact on firm size (micro, medium, large, relative to small-sized firms). The Government of Nigeria and its agencies that oversee and regulate electricity in the country should ensure that firms do not pay exorbitant and estimated electricity bills. To avoid, prepaid meters should be installed at affected business premises. The recently supplied postpaid meters being circulated should be called back by the government and electricity regulators and prepaid meters should be given to all, especially firms. A stable electricity supply should also be made available in the country. When these are achieved, they will significantly encourage enterprise productivity, increase income, raise standard of living of the people, encourage profitability of firms, raise firm competitiveness, both domestic and international, and, hence, help to expand the size of firms at all levels.

Cost of cost of raw materials and intermediate goods used in production was also found to have a significantly negative impact on the size of all the firms under consideration. The government and manufacturers are advised to establish a common, stable price for raw materials and intermediate goods used in production processes since firms in Nigeria are still in their infancy and unstable prices discourage investors from investing in these fledgling businesses. If stable prices are established, this will attract more investors, create more employment, and raise firm productivity, profitability, and size, and make Nigerian firms more competitive both locally and internationally.

In addition to the above, because of poor infrastructural facilities, poor local raw material development, and the lack of access to credit by most of the Nigerian firms, all levels of government need to commit to providing infrastructural facilities. They must also refine raw materials and encourage firms to use these in all their production processes. Further, they need to address the issue of firms' inadequate access to credit. Access would encourage employment, alleviate poverty, increase income per head of the population and, as such, raise government income/revenue. It would as well encourage economic diversification of the economy, thereby boosting Nigeria's growth and development.

Firms are also advised to operate within their capacity and avoid unhealthy competition among local and international firms. Firms should strive harder to increase


their effectiveness and efficient utilization of resources within their reach, especially the micro, small and medium-sized firms, to help them survive, increase productivity and profitability and attain increased efficiency and global competitiveness. When all these recommendations have been implemented, they will help in poverty reduction, economic diversification, jump-starting the economy, and repositioning Nigeria on to its economic growth and development paths.

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