



Private Ownership Structure and Firm Productivity: A Firm - Level Empirical Evidence from Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Author MOU managed the literature searches and review. Author ANO designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript and managed the analyses of the study. Both authors read and approved the final manuscript.

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ABSTRACT

Private-owned firms make up a large chunk of the firms existing in different countries of the world, especially Nigeria, and as such, contribute its quota to economic activities and growth of the economy. This study examined private ownership structure and firm productivity from the angle of firm - level empirical evidence from Nigeria using World Bank, Nigeria enterprise survey 2014 data and applied econometric model based on OLS technique. It was found among others by the study that a percentage increase in firms owned by private domestic individuals, companies or organizations (private domestic owned firms), would on the average have a significant positive impact on firm productivity in Nigeria by about 0.217276 units. In line with this, the study concludes that private domestic owned firms has positive significant impact on firm productivity in Nigeria. The study recommended among others that government should create more enabling/conducive business environment for private domestic firms to thrive and contribute more to overall economic growth and development. When this done, it will significantly increase employment, especially youth employment, reduce poverty and the menace of insecurity, increase per capita incomes, raise overall standard of the living of the people, and finally contribute significantly to economic growth and development of not only Nigeria, but Africa at large.

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1. INTRODUCTION

Ownership structure and productivity of firms has gained increased attention in current literature [1]. Private-owned firms make up a large chunk of the firms existing in different countries of the world, especially Nigeria, and as such, contribute its quota to economic activities and growth of the economy [2]. These firms vary in sizes and their productivity as well. Some of these private firms are owned just by a single person, others by small select group of individuals, shareholders, organizations, and other private bodies that are non-governments [3].

The survival of any private enterprise/firm depends majorly on its productivity and competitiveness. Ownership structure make both the internal (shareholders, board of directors, and main committees) and external (unfavourable takeover negotiations, minority shareholder's legal protection, and manager's excesses control) mechanisms strong. Ownership structure is a major internal governance strategy that helps to mitigate governance issues in firms and as such, aids in productivity efficiency of firms [4].

State-owned enterprises has been privatised in many countries due to some observed variations in productive efficiency level among private and state-owned enterprises/firms [4,2]. These

productivity differences may have been attributed to firm age, the size of the firm, capacity utilization of these private firms, highest level of education of the top manager, years of experience the top manager has working in the sector, number of full-time employees of the firm/establishment, among others. Again, market regulations of government facing the firms and the competitive environment firms operate could also make their productivity to vary [4,2].

In Nigeria, private ownerships gained prominence at the end of 1980s, when Nigerian government resorted to restructuring of government or state owned enterprises/firms. This created enabling environment for private ownerships to thrive, given Nigerian investment base and geopolitical diversification. It continued up to the end of 1990s when another policy shift that allowed for ownership concentration, accompanied with more foreign involvement in the country were considered [5]. Therefore, ownership structure in Nigeria has varied over the years due to deliberate attempt by the government to control the economy, reduce poverty, increase incomes of the people through increased productivity, and hence, attain sustained economic growth and development. A look at the figure below shows the distribution of Nigeria's firm ownership structure in 2014 according to World Bank Nigeria Enterprise survey data.

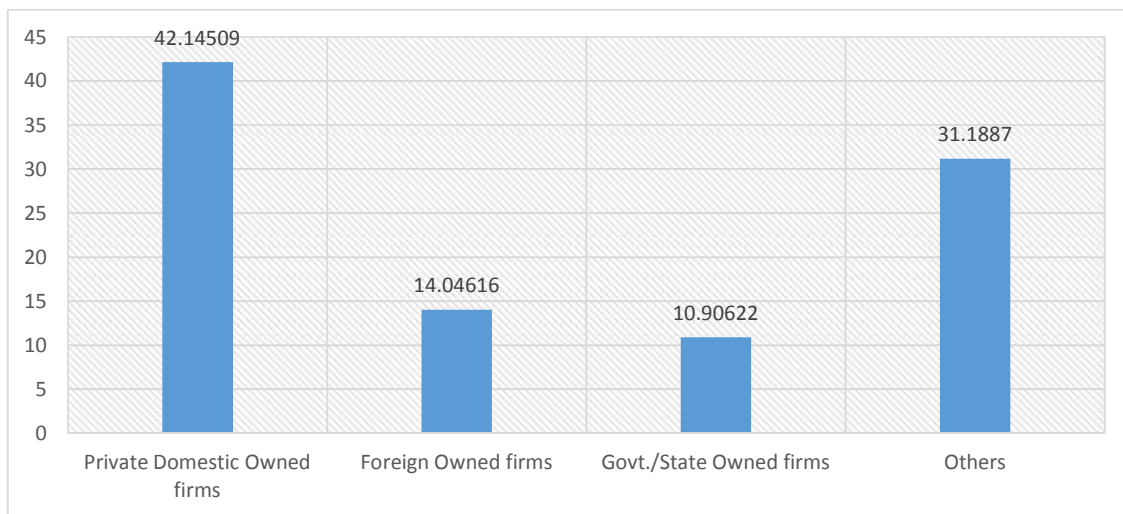


Fig. 1. Percentage distribution of firm ownership structure in Nigeria
 Source: World Bank Nigeria Enterprise Survey Data (2014)

Fig. 1 indicates that about 42% of the firms in Nigeria are private domestic owned firms, about 14% are foreign owned, about 11% are government or state owned firms, while about 31% of the firms belong to others which might be Non-governmental organizations (NGOs), institutions, corporate bodies, organizations, among others. The essence of this change in ownership structures are mainly because of their abysmal productivity, complemented by substantial loss of stakeholders' value [5,6,7]. This study therefore, empirically examines whether there is significant impact of private domestic ownership structure on firm productivity in Nigeria, using World Bank Nigeria firm - level enterprise survey data and multiple regression analysis based on Ordinary Least Squares technique.

2. LITERATURE REVIEW

In this study, the literature review is categorized into two, namely; the theoretical and empirical literature review. These are examined in the subsection that follows as given below:

2.1 Theoretical Review

In this study, the theoretical literature examined include; Marris managerial theory of firm, the behavioural firm theory, and Williamson managerial theory of firm. These are briefly looked at as given below:

2.1.1 Marris managerial theory of firm

This theory was first used by [8,9]. This theory was further developed and popularized by [10]. It was later modified by [11]. The theory originated from the differences that exist between ownership and control. It was of the view that managers of firms may exhibit varying objectives other than profit motives since it is likely other goals connected to sales/productivity and profits also contribute to the growth of the firms [10].

Therefore, manager's compensations and other rewards increase as the size of the firm increases. In this regard, firm size is a core factor in the utility equation of firms, in addition to the productivity of the firm. Thus, non-profit goals also encourage strongly, the size of firms/productivity, and may include; salary, status, security, and power. For [10], conflict of interest may not take place between managers and shareholders since growth maximization in some firms may correlate with that of profit

maximization. In another vein, [10] hypothesized that managers are faced with utility function that incorporates salary, prestige, status, power, security, among others, and are all very significant in determining the utility function. However, firm owners and/or shareholders show more interest in profits, market share and output/production. This managerial theory therefore believes that firm manager's utility maximization also maximizes the growth rate of firms with the intention of accumulating for the firm, optimum profit, which need to be high enough to make shareholders happy since they can fire or hire the manager of the firm.

2.1.2 The behavioural firm theory

The behavioural theory was first used and developed by [12]. The theory is based on modern, multi-product firm decision making, typical of firms that have ownership different from its management and are under uncertain, imperfect market. The theory posits that people have restricted cognitive capability and as such, can only deliver 'bounded rationality' during decision making in difficult, uncertain conditions. For this, people now have the tendency of "satisficing" (that is, the likelihood of accomplishing objectives that are realistic, instead of trying to maximize utility, profit, or production.

For [12], firms cannot be taken to be a monolith since different people in the firm exhibit conflicting interests and aspirations. This follows from the fact that firm behaviour is seen as a weighted outcome the conflicts that may arise in the firm. Firm mechanisms (like "satisficing" and logical decisions) normally take place in a bid to keep conflict levels low and unharmed to firm productivity. The theory further states that the firm may be interested in pursuing five basic objectives such as; production, inventory, sales, market share, and/or profit goals. This theory has implication on firm productivity since conflicting behaviours, against firm objectives, within the firm can hamper productivity [12].

2.1.3 The williamson managerial theory of firm

This theory was first used by [11]. It was later developed and popularized by [13,14,15,16]. The theory states that managers in contrast to the profit maximization behaviour of firms, pursue the maximization of their own utility. Further, it argues that the firm is a governance mechanism which makes for mergers and acquisition, and

competition laws. This theory of the firm asserts that transaction costs (which have implication on productivity) are important consideration where firms specifically make relative investments.

2.2 Empirical Review

In Romania, a study was carried out on the impact of firms on the overall performance of selected manufacturing firms using descriptive statistics analysis technique [17]. It was revealed that economic and financial performance and foreign ownership has a non-significant link between them. Therefore the study suggest among others that more additional variables measuring market conditions be included such as trade or tax policy variation, to know whether ownership structure changes dramatically [17].

Also in Kenya, this study examined the significance relationship of ownership structure on monetary performance of industries been privatized [18]. The study used descriptive statistics and correlation analysis. The result found that ownership structure has a significant relationship with financial performance. This study recommends that the Privatization Commission of Kenya should restructure ownership of privatized companies to reduce government and dispersed ownership further to pass more control and decision making to private investors.

Another study critically looked at the relationship existing between corporate ownerships in relation to financial performance of selected banks in Nigeria employing Ordinary Least Square (OLS) and Generalized Least Square method, however, the results of the analysis revealed that managerial ownership has statistically insignificant positive effects on both ROA and TBQ. The study also recommends among others that CBN need to come up with policies and regulations that promote participation of foreign institutional ownership in Nigerian banking industry [19].

A similar study examined how return on assets of deposit money banks in Nigeria could be impacted by ownership structure using cross sectional data of selected commercial banks [20]. The result found that ownership concentration, management ownership and institutional ownership have negative relationship with the dependent variable while private ownership and management ownership have positive relationship with the dependent variable which

shows return on investment. It was suggested among others by the study that regulatory authorities need to encourage more private investors to undertake investments in shares banks and also there was need for commercial banks to increase their ownership structure through public listing, right issue and other means of attracting public and institutional investors.

In Nigeria, another related study considerably looked at how corporate performance was influenced by privatization of listed companies using descriptive statistics and Spearman's rho coefficient of correlation for analyses. It was found that corporate governance has significant positive relationship with privatization in terms of its corporate objectives and in maximizing shareholders wealth. The study recommended among others that the privatization process in Nigerian should be open for competition to both foreign and local investors [21].

Another similar study investigated how in Nigeria, financial performance of listed Insurance Firms could be influenced by ownership structure using descriptive statistics for analysis [22]. It was revealed by the study that there is a positive significant relationship existing between ownership structure and firm's performance as measured by ROA and ROE. The study recommends that the code on owner's equity of listed insurance companies should be sustained and encouraged so that the firms can have a perpetual life, as a check and balance mechanism to enhance and strengthen the financial performance of the listed insurance firms in Nigeria.

Yet in Vietnam, a different but related study used multiple regression analysis based on OLS technique to examine the relationship existing between Productivity and performance of listed companies on the stock exchange market [23]. It was found that increasing labor productivity and increasing foreign ownership rates help increase firm performance. The study recommends among others that the Vietnamese government, relaxing the limit of foreign ownership and accelerating the divesting of State capital in State owned enterprises could help increase the investment scale of foreign investors and resulting in positive effects on the firm performance.

Empirically, studies has revealed the operational mechanism of the State or privately owned

businesses using descriptive statistical analysis. The results of the studies revealed that private ownership is an important but not sufficient determinant of firm prosperity, subsequently resulting in overall rise of wealth of nations. The study also suggested that the positive impact of private ownership on economic performance can occur only in an organized environment with relevant legal standards [24].

Another empirical study in Osun State, Nigeria, investigated how ownership structure could influence the style of leadership of private universities turnover intention of LIS professionals using descriptive statistics and correlation analysis [25]. It was observed in the study among others that the indices ownership structure has positive linear correlations with turnover intention of LIS professionals. The study further recommended among others that deployment of varying leadership styles, promotion of 'entity concept' and facilitation of inter-relationship among professionals should be promoted and implemented.

Similarly in Jordan, it was also investigated whether a firm's internal factors could significantly influence its profitability using time series and unbalanced panel data analysis for a sample of 1,663 observations over the period from 2011 to 2018. It was found that the overall results show a significant positive effect of a firm's size and asset growth on profitability. However, asset tangibility presents a significant negative effect on profitability, while financial leverage has an insignificant positive effect on profitability. It is suggested by the study that the study is expected to be of value to firm managers, investors, researchers, and regulators [26].

Using enterprise survey data from the World Bank, this study looked at the influence finance on productivity of firms in Africa [27]. This paper fills this gap by using cross-sectional firm-level data to estimate the effect of access to finance on labour productivity, total factor productivity (TFP), and the stochastic frontier trans-log model. The study found that the results obtained show that the lack of access to finance, especially overdraft facilities negatively affects the productivity of firms in Africa. This study suggests that the development of a balanced financial system should be of topmost priority to policy makers.

In a related but different study, it was explained using World Bank's Enterprise Survey data the

significant impact of power outage in MENA on the overall performance of manufacturing firms using a firm-level dataset [28]. The results emphasized the adverse consequences of power outages for the performance of manufacturing firms in the MENA region. These effects would naturally decrease the competitiveness of firms in the domestic and international markets, and they would eventually decelerate the national economic growth rate. The study recommends that policies should specifically focus on reducing rent-seeking activities that hinder the application of improvements to the power infrastructure.

Further study critically evaluates the impact on Nigeria economic growth by foreign private investment [29]. This study adapted a methodology with some modifications from [30] based on a neoclassical aggregate production function comprising exports. It was found that Foreign Private Investment, Domestic Investment growth and Net Export growth were positively related to economic growth in Nigeria. It is recommended among others that steps to attract more Foreign Private Investment should be undertaken by the Nigerian government as one of the ways of boosting the Nigerian economy.

In Nigeria, a study examined the relationship existing between leverage and selected Chemical and Paints industries quoted on the floor of Nigerian Stock Exchange [31]. The study used Ordinary Least Square (OLS) method of estimation covering the period of the study. The results showed that EQT finance has a significant and positive impact on ROA but DR has a negative and insignificant relationship on the performance measure. The study recommends among others that firms in the sector should be more of equity financed than debt by sourcing more of equity in their finance ratio and avoiding too many debts.

Yet in India, a related study looked at how Bombay stock exchange ownership structure and their associated firm performance could be impacted [32]. This research employed descriptive statistics, Pearson correlation coefficient and multiple linear regressions techniques. The findings show that concentrate ownership has a significant positive impact on Return on Assets, while managerial and institutional ownership have positive insignificant impact on ROA. Lastly, foreign ownership is found to have a negative insignificant impact on ROA. It is recommended that future researchers are encourage different industries with the same

framework to investigate the impact which might be different due to the difference in the nature of the industry.

Another similar study examined how Insurance ownership structure in Nigeria could impact on their financial performance applying descriptive statistics and correlation, multiple regression techniques. It found ownership structure having significant positive effect on financial performance of the listed insurance firms except concentrated ownership with negative effect. The study recommends that in order to enhance the financial performance, insurance firms in Nigeria should increase management equity holding in the firms as this can stimulate the managers to maximize their efficiency and create more wealth for stakeholders [33].

In yet another study, the causality between the ownership structure dominance as a stimulus to bank performance and risk in Nigeria was investigated using OLS regression analysis [34] and time series data. It was found among others that Private Nigerian's Ownership (PRIVTOWN) stake in banks has a positive influence on Net interest income (NIM) performance but was statistically insignificant. The study also suggested that less emphasis should be placed on ownership structure as a basis for policy formulation for improving bank performance in Nigeria due to its statistical insignificance in the Nigerian banking industry.

Further, a similar study examined how Nigeria governance performs her statutory functions/roles toward private investment using Auto-Regressive Distributed Lag model (ARDL), the result of the study revealed that differences exist between long run and short run determinants of domestic private investment such as degree of openness, savings, real GDP, inflation real interest rate and governance indicators. The study therefore recommended that governance indicators should be strengthened and duly recognized, inclusively, minimizing adverse cost of inflation, setting of tolerable real interest rates, adoption of fettering liberalization policies and encouraging thrift habits with the pledge of reaping bumper gains in the future will go a long way in guaranteeing private domestic investment [35].

Through the adoption of a generalized method of moments (GMMS), [36] performed econometric investigation on the relationship that exist between governance, FDI and private domestic

ownership investments in relation to West African Economic and Monetary Union (WAEMU). It was found among others that foreign direct investment crowds out domestic private investment in all countries covered by the study. The study also recommends by calling on countries governments to better structure macroeconomic environment, reinforce technology transfer, improve the absorption (or adaptive) capabilities of local enterprises and give more meaning to the role of governance in order to secure domestic investment and boost foreign direct investment [37].

3. METHODOLOGY

In a bid to empirically examine the impact of private domestic ownership structure on firm productivity in Nigeria, this study is anchored on the behavioural theory of firm developed by [12]. The theory is based on modern, multi-product firm decision making, typical of firms that have ownership different from its management and are under uncertain, imperfect market. Firm mechanisms (like "satisficing" and logical decisions) normally take place in a bid to keep conflict levels low and unharmed to firm productivity. Further, [12] states that the firm may be interested in pursuing five basic objectives such as; production, inventory, sales, market share, and/or profit goals. This theory has implication on firm productivity since conflicting behaviours, against firm objectives, within the firm can hamper productivity.

In line with this theory, productivity is a function of ownership structure (in this case, private domestic ownership) as specified in equation (1) given below:

$$prd = f(pdostr) \quad (1)$$

where;

prod = productivity of the firm
 pdostr = ownership structure (in this case, private domestic ownership)
 f = functional notation

However, there are other variables that can influence productivity of private domestic ownerships of firms, such as; firm size, firm ownership (other ownerships), shareholders, managers decisions, use of technology from foreign company, level of education of managers/owners, number of full-time employees, percentage of the firm owned by the

Table 1. Definitions of variables in the model

Variables	Definitions
prd	The establishment's output produced in financial year (proxy for productivity)
pdostr	% of the firm owned by private domestic individuals, companies or organizations
otherostr	% of the firm owned by others
fmsize	firm size
utchfc	use of technology licensed from a foreign-owned company
hledum	highest level of education of the top manager
nftime	number of full-time employees of the firm/establishment
pfoblo	percentage of the firm owned by the largest owner(s)
yexptm	years of experience the top manager has working in the sector
tlectr	total annual costs of electricity
acfin	establishment having a line of credit or loan from a financial institution

Source: Author's extraction from World Bank, Nigeria Enterprise Survey (2014)

largest owner(s), years of experience the top manager and other environmental factors like access to steady electricity and finance. Bearing these in mind, modifying equation (1) in order to capture these control variables, the study specifies equation (2) as follows:

$$prd = f(pdostr, ctrl) \quad (2)$$

where; all the variables remains as defined above

ctrl = other control variables that could affect firm productivity.

Consequently, this study specifies the empirical estimable econometric model of the study based on OLS technique as given in equation (3) below:

$$prd = (\lambda_0 + \lambda_1 pdostr + \lambda_2 otherostr + \lambda_3 fmsize + \lambda_4 utchfc + \lambda_5 hledum + \lambda_6 nftime + \lambda_7 pfoblo + \lambda_8 yexptm + \lambda_9 tlectr + \lambda_{10} acfin + \mu_t) \quad (3)$$

where; the variables are defined below in the Table 1.

λ_0 = the constant term

$\lambda_{i's}$ = the parameters of the model, for $i = 1, 2, \dots, n$.

μ_t = stochastic error term.

3.1 Data and Data Sources

The data utilized here is a cross-sectional enterprise survey data of Nigeria that was conducted in 2014 by the World Bank. The survey data has a sample size of 2676 and 317 variables, and covers every aspects of manufacturing firms. The stratified sampling technique was applied in the data generating process. The regional strata covers 19 states of the country which include; Abia, Abuja, Anambra, Cross River, Enugu, Gombe, Jigawa, Kaduna,

Kano, Katsina, Kebbi, Kwara, Lagos, Nasarawa, Niger, Ogun, Oyo, Sokoto, Zamfara. The size strata covers the micro, small, medium and large firms.

The major advantage of utilizing the World Bank, Nigeria's enterprise survey data, 2014, is that it incorporates almost all variables which can be comfortably and efficiently used for in-depth analysis of firms/enterprises in Nigeria. It is a country-wide data that considered all the enterprises/firms in Nigeria's geo political zones.

4. RESULTS AND DISCUSSION

This study first examines the nature and characteristics of the variables of the model by looking at the descriptive statistics of the variables. The descriptive statistics results presented in the Table 2 exhibits the raw level forms of the model data. Hence, given the information on the nature and characteristics of the model variables, the variable are examined to observe if there exist sufficient variable values variation through a close inspection of the variable's mean, standard deviation, and minimum and maximum values of these variables as can be seen in Table 2 .

Table 2 reveals that all the model variables exhibited sufficient variations in their mean, standard deviations, and their minimum and maximum values respectively. The output results show that 2676 is the maximum observational data in the enterprise survey of Nigeria conducted by World Bank in 2014. However, some variables showed smaller number of observations. This by implication means that some respondents were not able to respond to all the survey questions in the template used for the data generation.

Table 2. Descriptive Statistics Results of the Model Variables

Variables	Obs	Mean	Std. Dev.	Min	Max
prd	2676	45.78089	44.62592	0	100
pdostr	2676	70.59865	42.14509	0	100
otherostr	2676	14.15732	31.1887	0	100
fmsize	2676	1.326607	.790255	0	3
utchfc	2141	1.475022	2.074181	0	2
hledum	2652	5.316742	1.786189	1	10
nftime	2652	22.477	169.8457	0	5000
pfoblo	2063	69.81562	39.44144	0	100
yexptm	2644	12.89391	8.698691	0	72
tlectr	2658	766801.5	2.00e+07	0	10000000
acfin	2651	1.415692	2.303722	1	2

Source: Author's Computation from Available Data

4.1 The OLS Model Results

In this section, the study presents the results of the OLS model in order to determine the objective of the study (that is; to empirically examine whether there is significant impact of private domestic ownership structure on firm productivity in Nigeria). To achieve this objective, this study utilised World Bank Nigeria firm - level enterprise survey data, 2014, and econometric regression model based on Ordinary Least Squares technique. The results can be seen in Table 3.

The results indicate that a percentage increase in firms owned by private domestic individuals, companies or organizations (proxy for private domestic owned firms – pdostr), would on the average have a significant positive impact on firm productivity (prd) in Nigeria by about 0.217276 units. This result is not surprising since it is expected that the higher the number of private owned firms in Nigeria, the more firm productivity in the country would rise. The implication here is that any rise in private domestic owned firms

must be accompanied by a corresponding increase in the productivity of the firm in Nigeria. This finding supports the finding by [38,7] who found that managerial, employee, and private ownerships positively and significantly influence firm performance.

A percentage increase in other forms of firm ownership structure (otherostr) indicates that firm productivity (prd) in Nigeria would rise significantly by about 0.119902 units. This result is not also surprising since it is expected that increase in other ownership structures such as shareholding, managerial, among others, would definitely raise many firms in the country thereby, raising firm productivity levels in Nigeria significantly. The implication here is that increased number of other forms of firm ownership structures in Nigeria increases the more, firm productivity significantly in Nigeria. This finding supports the finding by [38] who found that managerial, employee, and private ownerships positively and significantly influence return on equity of firms.

Table 3. Summary results of the OLS model (dependent variable = prd)

Variables	Coef.	Std. Err.	t	P> t
pdostr	0.217276	0.0573361	3.79	0.000
otherostr	0.119902	0.0269595	4.45	0.000
fmsize	7.308289	2.526962	2.89	0.004
utchfc	-1.465172	0.8876885	-1.65	0.100
hledum	3.59887	1.169915	3.08	0.002
nftime	0.0029845	0.0068777	0.43	0.665
pfoblo	0.0881602	0.06213	1.42	0.157
yexptm	0.5078605	0.2184691	2.32	0.017
tlectr	-2.860800	0.4020800	-7.12	0.000
acfin	1.907837	0.7773249	2.45	0.015
_cons	-15.62983	7.278372	-2.15	0.020

Source: Author's Computation from Available Data

It was also found from the study's results that increasing firm size (fmsize) by one, increases firm productivity (prd) significantly by about 7.308289 units. The implication here is that with adequate capacity and finance (access credit or finance), expanding firm size will no doubt, raise the productive capacity of firms in Nigeria and as such, raise firm productivity. This is because, the more firms are expanded in sizes, the more they are expected to produce more, thereby, making them to be more competitive and as such, bring about positive significant impact on firm productivity. This finding is also in agreement with the study by [10,39,40], among others, who revealed that firm size are the core determinants of firm productivity.

In another vein, it was found by the study's results that a rise in the use of technology licensed from a foreign-owned company (utchfc) by firms Nigerian would on the average, insignificantly decrease firm productivity (prd) by about 1.465172 units. This result is not surprising since it is expected anytime a Nigerian firm uses technology licensed from a foreign-owned companies, there is high probability that the foreign-owned firms may give the Nigerian firm stringent conditions for using their license in a bid to operate, which may definitely affect their productivity adversely. Again, the needed skills for efficient use and operation of the foreign technology may also be at its low ebb in the Nigerian-owned firm using foreign-owned technology license and as such, may need importation of foreign experts who would help in the production process, and/or train local personnel. This may not be cost effective as it could lead to rise in production cost hence, making the firm to operate under increasing cost and as such, make the firm to be less competitive. This will eventually turn to a fall in productivity of firms in Nigeria. This therefore suggest that in Nigeria, use of technology licensed from a foreign-owned company has negative and insignificant impact on firm productivity. This finding is in agreement with the study by [41] who found that lack technology among firms reduces their performance.

Again, when the highest level of education of the top manager (hledum) rises, productivity of firms in Nigeria would on the average rise significantly by about 3.59887 units. This result is not surprising since it is expected that the highest level of education a top manager has would expose him the more on various ways the firm can minimize cost while maximizing profits that

would eventually lead to increased productivity and more competitiveness of the firm. In addition, requisite skills needed for efficient management of the firm would increase with an increase in the level of education top manager has acquired. This would surely bring about increased firm productivity and competitiveness of the firm. Thus, in Nigeria, the highest level of education acquired by the top manager is statistically, a positive significant determining factor of firm productivity. This finding is in consonance with the study by [41] who found that on managerial efficiency/effectiveness, technical skills, technology, among others, encourage firm productivity.

Further, an increase in the number of full-time employees of the firm/establishment (nftime) by one person, raises firm productivity (prd) although, insignificantly by about 0.0029845 units. The implication of this result is that anytime one person is added to the number of full-time employees a firm/establishment has, it is expected that the productivity level of the firm would rise although, insignificantly. This indicates that it is positively related to firm productivity, but not a significant determinant of firm productivity in Nigeria, since diminishing marginal productivity could occur at a certain point if employees are continuously employed without checking each employee's share (that is; marginal product of employees) in the total production. This finding is not in consonance with the finding by [38] who revealed that managerial, employee, and private ownerships positively and significantly influence firm performance.

Further, a rise in percentage of the firm being owned by the largest owner(s) (pfoblo), increases firm productivity (prd) although, insignificantly by about 0.0881602 units. This implies that for any given percentage increase in the firm being owned by the largest owner(s), firms in Nigeria would on the average raise their productivity level although, insignificantly. This suggests therefore, that it has positively relationship with firm productivity but has no significant impact on firm productivity in Nigeria.

With an increase in the years of experience the top manager has worked in the sector (yexptm), firm productivity (prd) in Nigeria would rise significantly by about 0.5078605 units. The implication of the result here is that higher number of years of experience of firm's manager(s) increases their on the job skills, expose them to various production channels that

are cost efficient, and as such, bring about significant rise in productivity of firms in Nigeria. This therefore indicates that in Nigeria, the years of experience the top manager has worked in the sector encourages firm productivity and as such, it is a positive significant factor that impacts firm productivity in the economy.

On total annual costs of electricity, a one Dollar increase in the total annual costs of electricity (tlectr) would on the average bring about a significant fall in firm productivity (prd) in Nigeria by about 2.860800 units. The implication of the result here is that higher electricity costs, firms would not make more profits that would raise their incomes. This result is not surprising since higher electricity bills given erratic electricity supply and estimated billing, would always discourage firm productivity significantly. Hence, firms that are unable to pay these bills would switch to alternative electricity supply such as generating set and solar energy. Unfortunately, these alternative electricity sources may not be cost effective and as such, discourage firm productivity in Nigeria. Therefore, in Nigeria, cost of electricity has negative significant impact on firm productivity. The implication here is that any given rise in electricity cost would transcend to a fall in productivity, as firms may find it difficult to pay off their electricity bills given the cost. This finding agrees with the finding by [42] who found that electricity cost in Nigeria contributes to the cost of doing business.

A One Dollar rise in the establishment/firm having a line of credit or loan from a financial institution (acfin), would on the average significantly increase firm productivity (prd) in Nigeria by about 1.907837 units. The implication of this result is that rise in access to finance would give firms more financial capacity to boost their productivity level. With access to finance, firms can undertake different productions, mechanize their production process, buy more inputs at discount rates, raise their incomes and profitability, and finally increase their productivity. Another implication of this result is that any given Dollar rise in access to finance by firms, firms would use the finance to either procure inputs that would help them in efficient productions and as such, increase productivity of these firms. This is true since firms in Nigeria are always constrained by access to finance and as a result, they operate below capacity and mainly on micro, small, and medium levels. Hence, access to finance by firms has positive significant impact on firm productivity in Nigeria. This finding

supports the finding by [39,43] who revealed that access to credit significantly determine productivity although, for the less productive firms.

Accounting for other variables not included in the model and/or holding other factors constant in the model (_cons), the results of the model indicate that a unit increase in these factors significantly decreases firm productivity by about 15.62983 units on the average.

5. CONCLUSION AND POLICY RECOMMENDATIONS

This study empirically examined private ownership structure and firm productivity in Nigeria, adopting econometric approach based on OLS technique and anchored on the behavioural theory of firm. The study employed World Bank, 2014 Nigeria enterprise survey data for the analysis. Therefore, given the objectives of the study, which sought to examine whether private domestic owned firms has significant impact on firm productivity in Nigeria, it was revealed by the study's results that; a percentage rise in firms owned by private domestic individuals, companies or organizations (private domestic owned firms), would on the average have a significant positive impact on firm productivity in Nigeria by about 0.217276 units. This result is not surprising since it is expected that the higher the number of private owned firms in Nigeria, the more firm productivity in the country would rise. The implication of this result is that any given increase in private domestic owned firms would automatically lead to an increase in the productivity of the firms in Nigeria. In line with this, the study concludes that private domestic owned firms has positive significant impact on firm productivity in Nigeria.

Based on the empirical findings of the study, the policy recommendations put forward by this study are given as follows:

1. Given that firms owned by private domestic individuals, companies or organizations have significant positive impact on firm productivity in Nigeria, government should create more enabling business environment for private domestic firms to thrive and contribute more to overall economic growth and development. When this done, it will significantly increase employment, especially youth employment, reduce poverty and the menace of insecurity,

- increase per capita incomes, raise overall standard of the living of the people, and finally contribute significantly to economic growth and development of not only Nigeria, but Africa at large.
2. Results of the study revealed that an increase in the number of full-time employees of the firm/establishment by one person insignificantly raises firm productivity. For full-time employees to make significant contribution to productivity in Nigeria, employers of labour in the firm (that is private domestic owned firms) should ensure that workers with the required skills and experience are employed. Employment should be based on merit and not on who knows who that is common in Nigeria. When this is taken care of, any employment of full-time employees carried would begin to have positive significant contribution to firm productivity in Nigeria.
 3. Domestic firms should strive more to develop their own local technology and apply them in all their production processes since use of technology licensed from foreign-owned company by Nigerian firms reduces firm productivity. When this is done, it will encourage the growth and development of local firms, create employments, raise income, and reduce poverty in Nigeria.
 4. It was also revealed by the study that years of experience the top manager has worked in the sector significantly increases firm productivity in Nigeria, hence, there is need to encourage top managers employed in these firms the more through increased employee development such as increased education, trainings, among others, in order to make them contribute significantly to the firm the more. This will definitely raise overall firm productivity in Nigeria.
 5. Total annual electricity cost was found to have negative significant impact on firm productivity, the study recommends that government and its power/electricity agencies should strive harder to reduce electricity tariffs/bills, provide prepaid meters to firms and the general public, and at the same time, provide steady/constant electricity supply. This will help firms not to lose man-hours and some value of their products due to power outages, and hence, significantly raise their productivity.
 6. Access to finance was found to have positive significant impact on firm productivity in Nigeria, the study therefore suggests that government should encourage firms by ensuring that they have increased soft loan/finance access in a bid to be more buoyant to enable them improve on their products and expand the sizes of their firms for more significant rise in their productivity levels.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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