

# Modeling Job Creation to Aid the Attainment of SDGs: Firm Level Evidence from Nigeria

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**Abstract:** *Employment is one of the most important social and economic issues in every country across the globe. Job creation however requires the combined effort of both government and private sector particularly considering that the private sector is recognized to have the leverage to provide jobs so long as a conducive investment environment is provided by the government. This study models the determinants of employment in the private sector to ascertain their ability to willingly contribute their quota towards the realization of SDGs 3, 8, and 10 through job creation and in the spirit of owners' resources, firms' specific characteristics, returns to owners, and tax and social cost burden. The study augmented the profit maximization framework of firms as contained in Jehle and Reny (2011) and applied a generalized least square technique on a panel data set of 13 banks quoted on the Nigerian Stock Exchange, over 17 years period. The study confirms that the level of employment is largely determined by resources available to firms, firm-specific characteristics as well as the level of profitability. The results also indicate that tax serves as a disincentive to job creation. Consequently, to encourage firms to create more jobs to aid the realization of SDGs in Nigeria, the study recommends amongst others, the establishment of the Private Sector Equity Development Fund (PSEDF), the entrenchment of a conducive environment to enhance the inflow of foreign direct investment, as well as tax incentives and other policies that enhance the long-term survival of firms in Nigeria.*

**Keywords:** Private sector, SDGs, profit maximization, employment, GLS

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## 1. Introduction

Most of the developed countries of the world have set full employment as one of their core macroeconomic goals to spur economic expansion and progress. The overall objective is to increase output and consequently create jobs. This is because of the near consensus amongst economists that increasing employment opportunities is one of the end objectives of economic development not only in emerging markets and developing economies but the world over. Having more people gainfully employed boosts the economy, enhances tax income, improves the standard of living, and the likelihood that the economy will continue to expand in the future. Ukwuegbu (2012) argues that an increasing number of potential jobs even encourages individuals to advance their skills to compete for better-paid roles, hence enhance the quality of the workforce and consequently output. From another perspective, sustained job growth supports improvements in the level of education, skill, and abilities of the labor force, making the nation a more attractive location for international investors.

According to Amoranto & Chun, (2011), it can be argued that at the microeconomic level reducing the unemployment rate, enhancing the quality of employment, and improving labor productivity can serve as a precursor for improving the well-being of the poor as well as the middle-income earners. Whereas enhancing the quality of employment and improving labor productivity can be a direct consequence of government efforts/policies, reducing unemployment has long been proven to require the collaborative effort of the private sector.

According to Collier & Venables (2017), the private sector is a major stakeholder in job creation and economic growth. Venables (2015) opined that the private sector provides about 90% of the total global employment. The survival of the private sector, however, depends on the ability, resilience, and diligence of the entrepreneurs and in some cases, the operators. They need to grow, and the growth rate is a function of their ability to make profits (Giwa, 1996).

Following ILO (2002), the importance of the private sector in the growth and development of a country has assumed a phenomena role in many emerging market economies as it is for developed countries. A larger proportion of the economically active population of developed and emerging market economies are engaged mostly in the private sector, especially with the restructuring and rationalization of the public sector all over the world, including Nigeria. The contribution of the private sector to the growth and development of Nigeria is also enormous not only in terms of employment generation but also from the perspective of capital formation, intermediation, and strong linkages with other sectors of the economy, mobilization, and utilization of local technology, as well as a training field for new entrepreneurs (Fagge & Zubairu, 2014; Osoba, 1987).

However, despite the ample contribution of the private sector to both employment generation and output growth, one of Nigeria's most pressing economic and social concerns is still the chronically high unemployment rate. Worse still, the sustainable development goals (SDGs) initiatives of the United Nations (UN) had identified 17 global goals to be achieved by 2030 and the private sector is still expected to contribute more to the process (Shulla, & Leal Filho, 2023). It is our belief that the attainment of SDG 8 (Decent Work and Economic Growth) will facilitate, to a large extent, the achievement of other SDGs and particularly SDG 10 (Reduced Inequalities) and SGD 3 (Good Health and Well-Being). The effort of the private sector to further facilitate more employment, however, translates to additional pressure on the potential of their survival as it will amount to additional costs on their operations. Since private firms are profit-oriented and their sustenance depends on profit, it, therefore, follows that they can only aid job creation to the extent that they can make enough profit to remain in the business.

Considering the profit constraint of the private firms/banks as well as the known fact that the public sector is not a large employer of labor but a facilitator of a veritable investment environment for the private sector to strive, the question then becomes, to what extent can the private sector engage workers to help in facilitating and/or creating more jobs? The objective of this study is therefore to examine the determinants of job creation at the firm level in Nigeria, with emphasis on banks, within the context of their willingness to engage more workers as their contribution to the realization of the SDGs. The data covers thirteen (13) banks quoted on the Nigeria Stock Exchange (NSE) from 2006 to 2022. The choice of the sample banks and the study period is determined by data availability.

In order to accomplish the study objective, the study is grouped into 5 sections. Following this introduction is section 2 which provides a literature review and conceptual framework for the study. The third section describes the methodology and its application procedures, including the estimated equations. Section 4 analyses and present the results of the study. The final section summarizes the study and provides recommendations.

## 2. Literature Review

There is ample literature on the Job creation role of bank/firm performance and vice versa. For instance, Tessema (2012) used a survey approach to study the impact of human capital on firm performance in Ethiopia. The survey covered a total of one hundred and forty-three (143) footwear firms and then applied ordinary least squares for the regression. Human capital was measured via four different metrics namely, skill factor, education factor, experience factor, and general human factor. The general human factor covers the entire workforce as it encompasses the first three factors. Company performance, on the other hand, was measured by seven variables including issues related to sales growth, employment growth, market growth, gross profit, return on assets (ROA), return on investment (ROI), and overall performance. The results show that employment positively influences firm performance. However, the quality of the employment was reported as more important.

Based on the perception that small banks/firms are the major drivers of job creation in Ireland. Lawless (2013) utilized an annual survey track of employment data from 1972 to 2010 covering manufacturing and internationally traded services firms. The survey was conducted in such a way that each firm was allocated a unique identifier so that field staff can always identify them over time while the anonymity of the firms and data is maintained. The result of the study reveals a remarkable variance between job turnover and firm growth across firm size groups. The results also confirmed that smaller firms indeed contributed to new job creation during the study period. They however noted that firm age appeared to be more important than size in terms of job creation. The emphasis placed on size could be attributed to the substantial overlap between the age of firms and their sizes. The results also indicate that infant firms seem to be far more dynamic than the older ones. Moreso, the impact of employment level on firm growth also existed but largely for infant firms. Harald & Vincelette (2013) in a similar framework adopted the World Bank (2013) approach to empirically investigate the industry characteristics and firm-specific determinants of employment generation in eleven European Union (EU11) economies utilizing the Amadeus dataset of firms in the EU, covering the period 2002-2009. The result shows that, prior to the global financial crisis (GFC), local industries played a critical role in net jobs-creation in the EU11. Moreso, of all, small and infant firms employed more workers than others. The result further revealed that although employment helps firms' performance the quality of employment is far more important in firms' growth and performance as it tends to enhance productivity.

Bowale & Ilesanmi (2014) investigate the determinants of the employment capacity of Enterprises in Nigeria with emphasis on firms and banks in the Lagos metropolitan. The study which collected primary data through a questionnaire from a sample of 180 small firms used descriptive statistics and inferential techniques for analysis. The results indicate that firm size, ownership structure, and sources of capital were the major determinants of firm income while firm age, level of education of the employees, and ease of accessing raw materials are determinants of the employment generation capacity of firms. To explore the relationship between firm specific characteristics and employment of firms in Kwara state of

Nigeria, Subairu (2016) used questionnaire to collect information from over 200 firms in 2015 and adopted multiple regression for the analysis. The variable used include geographic cluster, firm age, employment level, technology innovation, skill intensity and access to finance. The results favored cluster, ease of access to finance, and technology as critical determinants of employment level. The author argued for the establishment of Private Firms Development Funds (PFDF) to intervene in closing the funding gap for firms in Nigeria.

Issam & Peter (2019) embarked on extensive empirical research on the Job Creation capabilities of firms in the European Union. The study utilized a very large data set on employment across a large sample of firms during the period 2004 to 2015. The data was obtained from Orbis and published by Moody's Bureau van Dijk. Over 20 of the 28 EU Member States were covered. The study defines job creation as the total number of jobs created by firms, while net job creation was measured as the difference between job creation and job destruction. The net job creation rate was used to proxy the growth rate of employment and implies the capacity of firms to create new employment. The study found among others that the infant SMEs category contributed more to job creation during the period of study contributing to about 40% of total jobs created. Furthermore, the employment by start-ups varies between 2% and 9% across member countries with new Member countries taking the larger share of the job creation.

Esaku (2020) applies OLS and feasible generalized least squares techniques on a micro dataset of Kenyan manufacturing firms, to assess the determinant of job creation and destruction in Kenya. The results reveal that the rate of employment destruction in the sector in Kenya outweighs employment creation and that this happens regardless of firm size and age. The study also shows that infant firms account for a larger percentage of the net job created during the study period implying that new firms serve as a major source of employment in Kenya's manufacturing sector. The study, therefore, recommends that both job creation policies and job destruction prevention policies should be given almost the same priority. Moreso, the study advocated that government policy efforts should be geared largely towards supporting infant firms to enhance their growth and survival rate. These could include issues such as tax relief, exposure to new technology, and subsidy, among others.

### **3. The Model**

The methodological framework is built on the profit maximization theory of the firm as contained in Jehle & Reny (2011). To significantly reduce unemployment implies that private firms must be willing to employ more workers since employment is generally believed to be driven by the private sector. Employing more workers is only feasible to firms if the resultant output is sufficient enough to generate revenue that is big enough to cover the total cost of production (i.e., both fixed and variable including wages) and still have a margin called profit.

Consequently, therefore we built an increasing level of employment, as a proxy for the attainment of job creation into the profit maximization framework of firms to see how important it is to them to generate income large enough to keep firms in production to sustain the production process.

#### **3.1 Profit Maximization Framework of Firms**

Profit constitutes the margin or balance after which all the cost of production including labour and, in some cases, transportation to the destination of sales are deducted. In other words,

profit following Jehle & Reny (2011) is the difference between revenue earned by firm for selling her output and the cost of producing or acquiring that output. The cost includes but not limited to factor inputs such as raw materials, capital, land, and labour.

If a firm that produces ( $y$ ) level of output and sells each unit of the output at the prevailing market price ( $p$ ), since revenue is a function of output, we have:

$$R(y) = py \quad (1)$$

If the firm considers employing additional labor to contribute to the realization of SDG3, the intended output level of the firm will change to say  $y'$  and if  $x$  is the initial input, the input also changes to  $x'$ . Assuming  $w$  represents the vector of prices of factor inputs, the cost of adopting  $x$  to generate  $y$  becomes:

$$w(x') \quad (2)$$

And the profit to the firm can thus be formulated as:

$$py' - w(x') \quad (3)$$

It is important to note that  $y'$  may not necessarily be the optimal level of output and/or  $x'$  may not be the best mix of input. There is therefore the need for the firm to contemplate the optimal output and the best mix of input to produce the optimal.

Considering that unemployment is overarching and assuming firms are willing to contribute their own quota to the attainment job creation, they may for instance decide on additional labour input (say  $x''$ ). Now, if for simplicity, we assume that  $x' + x'' = x^*$ , the new form of equation (3) becomes:

$$py' - w(x^*) \quad (4)$$

However, given that  $p$  is outside the control of the firm, we expect  $y'$  to also change to enable the firm maintains at least the same level of profitability for sustainability. Thus equation (4) becomes:

$$py^* - w(x^*) \quad (5)$$

Where  $p$  is the prevailing market price,  $y^*$  stands for the new level of output generated as result of the new level of input boosted by additional employment  $x^*$  and  $w$  remains the vector of prices of factor inputs.

It is well known that the overriding objective of firms is profit maximization. Consequently, the firm's effort will be to maximize the following problem:

$$\max_{(x,y^*) \geq 0} py^* - w \cdot x^* \quad s. t. f(x^*) > y^* \quad (6)$$

Note that the production function  $f(x^*)$  is required to satisfy the assumption around the properties of the production function. The firm, based on the solution to equation (6) will be able to determine total sales from total output hence also determine the level of input

including the additional labour that can be accommodated to help contribute to the achievement of job creation.

However, since we expect the production function to increase as input rises, we can decide to use equality sign as against inequality sign as contained in equation (6) such that  $y^* = f(x^*)$ . Thus, we have:

$$\max_{(x \in \mathbb{R}^n)} pf(x^*) - w \cdot x^* \quad (7)$$

According to Jehle & Reny (2011), if we have an interior solution to the profit maximization, then we have the input solution as  $x^{**} > 0$  and output maximization stands as  $y^{**} = f(x^{**})$  and the first order condition to equate to zero, the gradient of the maximand is given as:

$$p \frac{\partial f(x^{**})}{\partial x_i} = w_i \quad \text{for every } i = 1, \dots, n.$$

Now, the left-hand side is termed as the Marginal Revenue Product (MRP) of input  $i$ . It shows the response of revenue per additional unit of input (in this case labour).

If  $w_i$  are in the positive territory, the following first order condition ensued to equate the two ratios:

$$\frac{\partial f(x^*)/\partial x_i}{\partial f(x^*)/\partial x_j} = \frac{w_i}{w_j}, \quad \text{for all } i, j$$

Alternatively, the Marginal Rate of Technical Substitution (MRTS) between two goods can be an equal of the ratio of the prices of the two goods. This can be likened to the necessary condition for minimizing input.

A firm's profit maximization problem can also be looked at from the perspective of cost minimization as against profit maximization earlier explored here. Let's consider the following two step procedure.

One, calculate the possible cost of each possible level of outputs and then choose the level of output which gives the highest difference between revenue and cost. The cost function of per output cost of  $y$  can be represented as:

$$c(w, y^*)$$

The step two is to solve the maximization problem of the form:

$$\max_{(y \geq 0)} py - c(w, y^*) \quad (8)$$

Note now that if  $y^{**}$  greater than zero is considered the optimal output, then the first order condition is satisfied.

$$p = \frac{dc(w, y^{**})}{dy^*} = 0$$

Output can also be chosen in such a way that price is equal to marginal cost. In this case second order condition should ensure that marginal cost is non-declining when output is at optimum or that:

$$d^2c(y^{**})/dy^2 \geq 0$$

### The Profit Function

It is well known in economics that the profit function of firm is dependent on input (input cost) and output prices. The maximum function is then given as:

$$\pi(p, w) \equiv \max_{(x, y^*) \geq 0} py^* - w \cdot x^* \quad s. t. \quad f(x^*) \geq y^* \quad (9)$$

There are preconditions for the usefulness of the profit function. Most important is the validity of the profit maximization hypothesis. Now, if technology follows an increasing return to scale and given that  $x^{*t}$  and  $y^{*t} = f(x^{*t})$  maximizes profits at  $p$  and  $w$ . Having in mind, the concept of increasing return, we have:

$$f(x^{*t}) > tf(x^{*t}) \quad \text{for all } t > 1 \quad (10)$$

If we multiply by  $p > 0$  and subtract  $w \cdot tx^*$  from both sides and rearranging such that  $t > 1$  and considering the non-negativity of profits, we arrived at:

$$pf(x^{*t}) - w \cdot tx^{*t} > pf(x^{*t}) - w \cdot tx^{*t} \quad \text{for all } t > 1 \quad (11)$$

Equation (11) indicates that increasing profits is achievable through rising inputs but in proportion  $t > 1$ . This is made so such that firms can have the opportunity to employ more labour to help in job creation. Note that with this submission, our initial assumption that  $x^*$  and  $f(x^*)$  maximizes profit have been invalidated.

### Output Supply and Input Demand Function

If  $f$  is in the form of a concave production function and satisfies the cost minimization problem<sup>1</sup>. If also, the accompanying profit function:  $\pi(p, y^*)$  is differentiable twice unceasingly. For all  $p > 0$  and  $w \gg 0$ , we have:

a) Homogeneity of degree zero:

$$y^*(tp, tw) = y(p, w) \quad \text{for all } t > 0$$

$$x_i^*(tp, tw) = x_i^*(p, w) \quad \text{for all } t > 0 \text{ and } i = 1, \dots, n$$

b) Own price effects:

$$\frac{\partial y^*(p, w)}{\partial p} \geq 0 \quad (12)$$

$$\frac{\partial x_i^*(p, w)}{\partial w_i} \leq 0 \text{ for all } i = 1, \dots, n. \quad (13)$$

<sup>1</sup>  $\min_{(x \in \mathbb{R}_+^n)} w \cdot x^* \quad s. t. \quad y = f(x^*)$

c) The substitution matrix:

$$\begin{bmatrix} \frac{\partial y^*(p, w)}{\partial p} & \frac{\partial y^*(p, w)}{\partial p} & \dots & \frac{\partial y^*(p, w)}{\partial p} \\ -\frac{\partial x_1^*(p, w)}{\partial p} & -\frac{\partial x_1^*(p, w)}{\partial p} & \dots & -\frac{\partial x_1^*(p, w)}{\partial p} \\ \vdots & \vdots & \ddots & \vdots \\ -\frac{\partial x_n^*(p, w)}{\partial p} & -\frac{\partial x_n^*(p, w)}{\partial p} & \dots & -\frac{\partial x_n^*(p, w)}{\partial p} \end{bmatrix} \quad (14)$$

Note that  $x$  and  $y$  stand for the existing level of input and output, respectively. Now the  $x^*$  is the suggested increase arising from the willingness of firms to help. To attain output  $y^*$ . In term of application, emphasis may either be placed on  $x$ , at firm level, to determine if it influences  $y$  or vice versa. If the influence does exist and positive, we can then submit that firms can move to adopt  $x^*$  to achieve  $y^*$ .

### The Firms Production Function

Since the demand for labour is a derived demand, it implies that demand for labour depends on the demand for output that is facilitated by labour. Thus, demand for labour depends on the level of productivity of labour as well as its market value. In a nutshell therefore even if firms want to contribute to the realization of SDGs 3, 8 and 10, by engaging more labour, they have to take cognizance of the marginal productivity of labour and the value of the output from the labour.

Consequently, the firms' short-run production function will take the form of:

$$TP_{sr} = f(L, K) \quad (15)$$

Where  $TP$  stands for total production,  $L$  represents labour,  $K$  denotes capital and the subscript  $sr$  is short run. If we assume that the input  $K$  is fixed only  $L$  varies over time. Note that the varying  $L$  encompasses the initial optimum plus additional workers the firm may be willing to employ to contribute to SDGs 3, 8 and 10.

Considering the profit maximizing tendencies of firms, it behooves to note that they will continue to increase labour (i.e., hire workers) up to the extent that marginal revenue is at least equal to marginal cost. In other words, in a perfectly competitive market, firms regardless of its willingness to help in the realization of SDGs 3, 8 and 10, will only hire workers so long as additional engagement of workers add more to total revenue than to the total cost (i. e., marginal revenue of product *equals* marginal wage cost).

### 3.2 Data and Application of the Model

In this study, we consider employment, equity, debt, retained earnings, size of the firm proxy by total assets, age of firm, profit, and return on assets, tax burden, and corporate social responsibility. While funds invested in the business covers equity, debt, retained earnings; size, and age of firms are treated as firm specific characteristics. Profit, and return on assets are recognized as returns or margin that is required to keep the investors on the business, while tax burden, and corporate social responsibility are recognized as additional cost which serves as a social distraction.



Our empirical estimation is based on annual data of thirteen (13) Nigerian banks quoted on the Nigeria Stock Exchange (NSE). The data covers the period 2006 to 2022. The annual data was extracted from Annual reports of the firms and the Securities and Exchange Commission (SEC) Fact Books.

### 3.3 The Econometric Model Specification

Following the theoretical exploration, relevant literature review and in line with the work of Yazdanfar & Salman (2012), the following specification ensued.

$$Lempl_{it} = \alpha_i + \beta_1 Lequity_{i,t} + \beta_2 Ldebt_{i,t} + \beta_3 re_{i,t} + \beta_4 Lsize_{i,t} + \beta_5 Lage_{i,t} + \beta_6 PBT_{i,t} + \beta_7 EPS_{i,t} + \beta_8 roa_{i,t} + \beta_9 Ltax_{i,t} + \beta_{10} Lcsr_{i,t} + \mu_{i,t} \quad (16)$$

Where *Empl* stands for employment, *equity* represents equity which implies the stakes of the firm owners in term of shares, *debt* is the total debt burden of the firm, *re* connotes retained earnings, *profit* implies profit before tax, *size* is the total assets of the firm, *tax* is tax paid by the firm during the period, dividend stands for dividends accrued to firm owners during the period, and *csr* represents the corporate social responsibility carried out by the firm. The notations  $\alpha$  is a constant,  $\beta$ 's are the coefficients of the estimated parameters,  $\mu$  is the error term while the subscripts  $i$  and  $t$  are firms and time respectively.

The study then adopted Generalized Least Square (GLS) to implement equation 16. The choice of the GLS is due to its efficient in handling situation where ordinary least square (OLS) is not BLUE (best linear unbiased estimator), because one of the main assumptions of the Gauss-Markov theorem (homoskedasticity and lack of serial correlation) is violated. Under such circumstances and provided that the other assumptions of Gauss-Markov theorem are satisfied, then GLS estimator exhibits BLUE characteristics<sup>2</sup>. Thus, it can be said that GLS is highly good in tackling outliers, heteroskedasticity as well as bias in data. It yields estimators that are BLUE and hence can be said to be an unbiased, consistent, efficient, and asymptotically normal estimator.

## 4. Discussion of Results

Both descriptive and inferential statistics were used. In order to reflect these analyses, the findings are grouped into two categories. The descriptive analysis gives summary statistics of important variables to define the data set. The inferential analysis is conducted to explain the influence of the independent variables (equity, debt, retained earnings representing owners fund in the business; size, turnover and age of firm representing firm's specific characteristics; profit before tax, earnings per share, and return on assets representing return for the firm stakeholders; and tax and corporate social responsibility representing social cost that can serve as social distractions to the firm) on the dependent variable proxy by employment.

### 4.1 Summary Statistics and Correlation Matrix

The data is a panel data of some thirteen (13) firms quoted on the Nigerian Stock Exchange (NSE) market over a period of seventeen years (i.e., 2006 to 2022). Thus, there is a total of

<sup>2</sup> Panel ARDL would have been used to implement equation 16 considering its advantage of having the ability to account for long-run and short-run relationships, regardless of the order of integration of variables but the nature of some of the data will render the results less robust and interpretation more difficult.

221 observations. The data was extracted from the NSE fact book and Annual Reports of the respective firms.

As reported in Table 1, the minimum employment level of the sampled firms is 93 while the maximum is 11,791. In other words, the smallest of the sampled firms during the study period had 93 employees while the biggest had 11, 191 employees, thereby yield the mean of 3,370 employees indicating that most of the firm have large employment base. The smallest equity of the sampled firms stands at ₦1,280.00 million while largest equity stands at ₦765,000.00 million during the 17 years study period. Given the mean equity of ₦160,000.00 million, it can be concluded that the sampled firms are mostly big, in term of owners' fund invested in the businesses.

The minimum debt acquired during the study period was ₦161.00 million with maximum standing at ₦6,970,000.00. Given the mean and standard deviation of debt which stand at ₦603,000.00 million and ₦1,180,000.00 million respectively, it is obvious that the firms do not have equal access to debt market. In other words, their ability to access debt to carry out their production activities varies largely. The biggest and smallest of the firms had total asset of ₦19,400.00 million and ₦7,690,000.00 million, respectively.

**Table 1: Summary Statistics of Variables used for Regression**

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.	Obs.
<b>Emply</b>	3,370.19	2,593.00	11,791.00	93.00	2,462.83	1.38	4.16	81.89	0.00	221
<b>Equity</b>	160,000.00	122,000.00	765,000.00	1,280.00	157,000.00	1.51	5.10	123.49	0.00	221
<b>Debt</b>	968,000.00	603,000.00	6,970,000.00	161.00	1,180,000.00	2.52	10.86	795.15	0.00	221
<b>RE</b>	19,000.00	7,350.00	178,000.00	(76,700.00)	32,700.00	2.15	10.86	732.41	0.00	221
<b>Size</b>	1,130,000.00	718,000.00	7,690,000.00	19,400.00	1,320,000.00	2.40	10.06	665.88	0.00	221
<b>Age</b>	46.48	31.00	126.00	2.00	31.78	0.92	2.86	30.75	0.00	221
<b>PBT</b>	20,100.00	8,220.00	205,000.00	(103,000.00)	37,500.00	2.23	11.28	806.09	0.00	221
<b>EPS</b>	1.06	0.52	43.00	(21.18)	3.89	5.37	70.82	43,026.13	0.00	221
<b>ROA</b>	2.22	1.38	100.00	(29.64)	9.78	7.50	74.22	48,343.84	0.00	221
<b>Tax</b>	3,850.00	1,420.00	70,600.00	4.00	7,090.00	4.92	39.24	12,865.57	0.00	221
<b>CSR</b>	982.00	161.00	156,000.00	0.77	10,500.00	14.66	216.18	422,513.70	0.00	221

Source: Author's Computation.

Note: While Equity, Debt, Retained Earnings (RE), Size proxy by total assets, turnover Profit Before Tax (PBT), Dividend, Tax and Corporate Social Responsibility (CSR) are in Naira Billion, Employment (Empl) is in absolute number, Return on Asset is calculated as Net income/Total assets multiply by

The youngest firm at the beginning of the study period was 2 years old while the oldest was 126 years old. This yield a mean age of 46.48 years which implies that most of the firms are old. In terms of profits before tax (PBT) the minimum and maximum stand at -₦103,000.00 million and ₦205,000.00, respectively. Whereas there are instances or firms which recorded an impressive Return on Assets to the tune of 100% some or in some instances there were negative ROA of as low as -29.64%. Overall, the data is positively skewed (see Table 1) but considering the probability of one percent significance level, the distribution can be said to be normal.

The correlation matrix among variables of interest is reported as Table 2. Cursory examination of the table shows that the highest positive correlation of 60% is reported for employment vs. age, followed by employment vs. turnover (59%), employment vs. debt, and employment vs. TA (57% each). Others are employment vs. equity which are 55% correlated. The absence of serial correlation is presupposed by the moderate degrees of association between all variables.

**Table 2: Correlation Matrix**

	<i>Emply</i>	<i>Equity</i>	<i>Debt</i>	<i>RE</i>	<i>Size</i>	<i>Age</i>	<i>PBT</i>	<i>EPS</i>	<i>ROA</i>	<i>Tax</i>	<i>CSR</i>
<i>Emply</i>	1.00										
<i>Equity</i>	0.55	1.00									
<i>Debt</i>	0.57	0.89	1.00								
<i>RE</i>	0.23	0.66	0.54	1.00							
<i>Size</i>	0.57	0.90	1.00	0.56	1.00						
<i>Age</i>	0.60	0.30	0.33	0.00	0.32	1.00					
<i>PBT</i>	0.29	0.75	0.61	0.91	0.64	0.06	1.00				
<i>EPS</i>	0.03	0.16	0.11	0.40	0.12	-0.05	0.38	1.00			
<i>ROA</i>	0.15	-0.03	-0.03	0.12	-0.03	0.07	0.13	0.16	1.00		
<i>Tax</i>	0.30	0.48	0.38	0.59	0.38	0.15	0.56	0.27	0.05	1.00	
<i>CSR</i>	-0.07	-0.04	-0.03	-0.02	-0.03	-0.06	-0.01	0.00	0.02	-0.02	1.00

Source : Author's Computation.

Note: While Equity, Debt, Retained Earnings (RE), Size proxy by total assets, Profit Before Tax (PBT), Tax and Corporate Social Responsibility (CSR) are in Naira Billion, Employment (Empl is in absolute number, Return on Asset is calculated as Net income/Total assets multiply by 100.

## 4.2 Inferential Results

The result of the Generalized Least Squares (GLS) regression is reported as Table 3. The second column of the table presents the results of the pooled effect regression, while the third and fourth columns shows those of the fixed effect and random effects regressions, respectively.

The Hausman test to determine the most suitable model is reported on the last row preceding the  $R^2$ . In line with Tian & Zeitun (2007) and Salawu (2007), the Hausman (1978) specification test is the best method for determining the level of correlation between the unobserved unit of the dependent variable and the regressors; if there is a significant correlation between the variables of interest, the fixed effects model can be said to be more appropriate; otherwise, the random effects model is taken into consideration and recognized as being more appropriate. Scholars such as Shaba, Yaaba, and Abubakar (2016) have argued that random effects models are likely to be inconsistently estimated in the presence of significant correlations among variables of interest. The decision criterion is that, if the p-value for the test is less than 5.0% (i.e.,  $p < 0.05$ ) then the fixed effects specification is to be preferred otherwise the random effects model is considered more suitable (see also Nazah, Duasa & Arifin, 2021 on how to choose the best model among PMG, MG, and DFE estimators).

Cursory examination of Table 3 reveals that the Hausman test yield a chi-square statistic of 10.8388 with the probability value of 0.4569. This implies that we do not reject the null hypothesis which states that the random effect are independent of the explanatory variables<sup>3</sup> and hence Random effect regression is most suitable. Thus, the interpretation of result will concentrate on random effect.

The  $R^2$  and Adjusted- $R^2$  of 0.77 and 0.74 respectively show that, overall, the Random Effect (RE) model is well fitted as the variations in the dependent variable can be explained up to 74% by the independent variables.

<sup>3</sup> Note that the alternative hypothesis is that the random effect correlates with the explanatory variables.

The equity of the shareholders returns a positive (0.025915) and statistically significant (5%) coefficient signifying that equity and employment are positively related. This indicates that as equity increases, employment follow suit. Precisely, for every 1% increase in equity, employment is expected to increase by approximately 0.03 percent<sup>4</sup>. This satisfies the *a priori* expectation and is in line with conventional wisdom. The result is in line with Yazdanfar and Salman (2012) who found, amongst others, that owners fund positively affects employment.

Similarly, debt returns a statistically significant (i.e., 1% significance level) positive coefficient (0.132365). Like equity, as the debt profile of firms increases, so do their level of employment. In specific term therefore, a 1% increase in debt, leads to about 13.2% rise in employment. This can be interpreted to mean that as firms acquire more debt, so do they make effort to expand production so as to enhance output in order to be able to efficiently service the debt. The result corroborated the findings of Yazdanfar & Salman (2012) as well as Subairu (2016) who reported that access to debt facilities exert positive influence on employment by firms.

Retained earnings is negative and statistically significant only at 10%, implying that increase in retained earnings inversely affects employment. This could probably be because firms' owners may be unwilling to re-invest their profit into the business in all cases, except it is necessary.

The size of firm in term of asset yields a positive and statistically significant coefficient. This shows that as firm grows, so does the employment. A 1% increase in firm size, leads to over 48% increase in the firm work force. The result is in line with Hema & Gary (1996), Amoranto & Chun (2011) Yazdanfar & Salman (2012) who found positive relationship between firm age and job creation. It also agrees with the 'resource-based approach' which argues that larger firms take advantage of economies of scale and hence employ more workers to enhance their overall output.

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<sup>4</sup> Note that both dependent and independent variables are log transformed, hence the interpretation as elasticity.

**Table 3: Regression Results and Hausman Test**

Dependent Variable: <b>Le</b> mployment			
Variable	Pool Effect	Fixed Effect	Random Effect
C	-4.6093*** (0.911384)	-2.451138*** (0.860581)	-2.53058*** (-2.9595)
Lequity	0.0653 (0.055952)	0.0310 (0.049059)	0.025915** (0.533636)
Ldebt	-0.1159*** (0.041556)	-0.1426*** (0.036125)	0.132365*** (3.717356)
RE	0.0000 (0.00000)	-0.0000* (0.000000)	-0.00000* (-1.704263)
Lsize	0.402904*** (0.091739)	0.5279*** (0.08334)	0.488491*** (6.059901)
Lage	0.312289*** (0.051574)	-0.1460 (0.1768)	0.0814 (0.670602)
PBT	-0.00000* (0.000000)	0.0000 (0.0000)	0.0000 (1.370128)
EPS	-0.0029 (0.0099)	0.0068 (0.008451)	0.0067 (0.802493)
ROA	0.0116*** (0.003636)	0.0107 (0.0031)	0.010694*** (3.419932)
Ltax	0.0371 (0.026904)	0.0092 (0.0241)	-0.0528 (-2.171618)**
LCSR	0.078*** (0.026465)	0.0200 (0.02290)	0.0219 (0.964291)
Hausman Test			10.8388 (0.4569)
R <sup>2</sup>	0.61	0.53	0.77
Adjusted R <sup>2</sup>	0.59	0.50	0.74
S.E. of regression	0.51	0.41	0.41
Sum squared resid	54.02	32.49	
Log likelihood	-157.48	-101.80	
F-statistic	29.00	27.34	20.91
Prob(F-statistic)	0.00	0.00	0.00
AIC	1.55	1.15	
SBC	1.73	1.52	
HQC	1.62	1.30	
DW stat	1.78	1.89	1.92

*Source:* Author's computation.

*Note:* Leemployment is the natural logarithm of employment, Lequity stands for the natural logarithm of equity, Ldebt denotes natural logarithms of debt, RE is retained earnings, Lturnover represents natural logarithm of turnover, Lsize connotes the natural logarithm of size proxy by total assets, Lage is the natural logarithm of age of the firm, PBT is profit before tax, EPS stands for earnings per share, ROA is return on assets, Ltax is the natural logarithm of tax, LCSR stands for the natural logarithm of corporate social responsibility. AIC is Akaike information criterion, SBC is Schwarz Bayesian Criterion, HQC is Hannan-Quin Criterion and DW stands for Durbin Watson.

In line with theory and *a priori* expectation, tax is statistically significantly negatively related to employment. A 1% increase in tax brings about 5.28% fall in employment. This shows that tax is detrimental to job creation. This is in line with conventional wisdom.

### 4.3 Summary of Findings

In a nutshell, therefore, it can be concluded that owners fund in the business (equity), borrowed fund (debt), firm size and return on asset exert positive influence on employment level. Improvement in these four aspects can substantially lead to improvement in the level of employment in firms and by extension the economy. Overall improvement in the level of employment enhances the living standard of the people, makes growth not only robust but also inclusive and consequently enhances welfare as well help in facilitating the creation of some jobs.

On the other hand, retain earnings and tax serve as disincentive to employment. Increase in tax and retained earning hit deep into the return of firm owners thereby discourages additional engagement of workers. The age of firm, overall profit and earning per share are reported not statistically significant hence are not determinants of employment of the sample firms during the study period.

### 5. Conclusion and Policy Remark

Employment is one of the most important social and economic issues in every country across the globe. Job creation however requires the combined effort of both government and private sector particularly considering that the private sector is recognized to have the leverage to provide jobs so long as conducive investment environment is provided by the government.

This study models the possibility of private sector to consider engaging more workers to contribute their own quota to the employment and in the spirit of owners' resources (both owned and borrowed), firms specific characteristics (such as age, size of firm etc.), returns to owners (such as profit, ROA, etc. and tax burden. Thus, the study augmented the profit maximization framework of firms as contained in the Jehle and Reny (2011) with firms' willingness to engage additional labour until marginal cost at least equals marginal revenue. Thereafter, applied generalized least square technique on panel data set of Nigerian Stock Exchange, over 17 years period (i.e., 2006 to 2022). The study confirms that indeed the level of employment is largely determined both by resources available to firms in the production process, their characteristics as well as level of profitability. This is so because, equity, debt, firm size and return on asset exert positive influence on employment level while retain earnings and tax serve as disincentive to employment. The study therefore conclude that it is possible for the private sector to help contribute to the creation of jobs.

### Reference

- Amoranto, G., & Chun, N. (2011). Quality employment and firm performance: Evidence from Indian firm-level data. *ADB Economics Working Paper Series No. 277*.
- Bowale, K. E., & Ilesanmi, A. O. (2014). Determinants of factors influencing capacity of small and medium enterprises (SMEs) in employment creation in Lagos State, Nigeria. *International Journal of Financial Research*, 5(2), 133- 141.
- Esaku, S. (2020). Job creation, job destruction and reallocation in Sub-Saharan Africa: Firm-level evidence from Kenyan manufacturing sector. *Cogent Economics & Finance*, 8:1, DOI: [10.1080/23322039.2020.1782113](https://doi.org/10.1080/23322039.2020.1782113)
- Fagge, A. M. & Zubairu, M. A (2014). Private sector and youth employment generation in Nigeria: A review. *International Journal of Business & Law Research* 2(3), 45-56.
- Giwa, R. F. (1996). The Role of the public and private sectors in economic development, *CBN Economic & Financial Review*, 34(4), 891-902.

- Harald, O., & Vincelette, G. A. (2013). Determinants of job creation in eleven new EU member states: Evidence from firm level data. Policy Research Working Paper; No. 6533. World Bank, Washington, DC. Retrieved from <https://openknowledge.worldbank.org/handle/10986/15891> License: CC BY 3.0 IGO.”
- Issam, H. & Peter, H. (2019). Job Creation in Europe: A firm-level analysis. JRC Science Policy Report.
- Jehle, G. A. & Reny, P. J. (2011). *Advanced microeconomic theory*, Third Edition, Financial Times, Prentice Hall.
- Nazah, N., Duasa, J., & Arifin, M. I. (2021). Fertility and Female Labor Force Participation in Asian Countries; Panel ARDL Approach. *Jurnal Ekonomi & Studi Pembangunan*, 22(2), 272-288.
- Osoba, A. (1987). Towards the development of small scale industries in Nigeria. *The Nigerian Institute of Social and Economic Research*, Ibadan.
- Salawu, R. O. (2007). An empirical analysis of the capital structure of selected quoted companies in Nigeria. *The International Journal of Applied Economics and Finance*, 1(1), 16-28. DOI:[10.3923/ijaef.2007.16.28](https://doi.org/10.3923/ijaef.2007.16.28)
- Shaba, Y., Abubakar, I., & Yaaba, B. N. (2016). Corporate governance and market performance: empirical evidence from Nigerian banks. *International Journal of Research in Management, Economics and Commerce*, 6(12), 9-20.
- Shulla, K., & Leal Filho, W. (2023). Achieving the UN Agenda 2030: Overall actions for the successful implementation of the sustainable development goals before and after the 2030 deadline. Policy Department for External Relations Directorate General for External Policies of the Union, European Union.
- Subairu, H. T. (2016). Analysis of relationship between SME’s employment growth and firm specific characteristics. *Arabian Journal of Business & Management Review*, 5(8), 30-39.
- Tian, G. G., & Zeitun, R. (2007). Capital structure and corporate performance: Evidence from Jordan. *Australasian Accounting Business and Finance Journal*, 1(4), 40-61.
- Tessema, M., Ready, K., & Malone, C. (2012). Effect of gender on college students’ satisfaction and achievement. *International Journal of Business and Social Science*, 3(10), 1-11.
- Venables, T. (2015). Making cities work for development (GC Growth Brief 2) London. International Growth Centre.
- Yazdanfar, D., & Salman, A. K. (2012). Assessing determinants on job creation at the firm level Swedish micro firm data. *International Journal of Economics and Finance*, 4(12), 105-113.