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**BANK SIZE, OPERATIONAL EFFICINECY AND HUMAN CAPITAL  
DEVELOPMENT IN NIGERIA**

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**ABSTRACT**

The study investigated the impacts of bank size and human capital development on operational efficiency of banks in Nigeria. Eight banks which include the big five (GT Bank, First Bank, Zenith Bank, Access Bank and UBA) are covered in the study. The model specification expresses operational efficiency as a function of human capital expenditures, bank size (total asset), earning per share and interest rate. Panel data analysis is used and the results show that both bank size and human capital have significant impact on operational efficiency of the banks. The implication of the results is that accumulation of physical capital and human capital are very germane to the efficient operations of the banks in order to satisfy their ever increasing customers.

**Keywords:** Operational efficiency, human capital development, bank size

**INTRODUCTION**

Business organizations around the world are driven by essence of their existence such as the provision of excellent goods and services which is the primary objective of floating them in order to be profitable. Activities in most of these business organizations are either manufacturing or service on a wide spectrum. However, service organizations like other types of business organizations are constantly challenged by increasing expectations of their customers who will always demand for high quality services and improved service delivery. In the quest to achieve these expectations, many of these service organizations such as banks strife to increase their assets and human capital in order to meet up with ever increasing demands for better service by bank customers.

To achieve operational efficiency by meeting up with service quality and customers satisfaction, service organisations have been pre-occupied with how to continue to evolve services that can meet the desire and taste of their existing and potential customers with the assurance that through the provision of qualitative service, customers can be satisfied and retained with the organisation. However, central to achieving the expectations of customers is the calibre of employees the organisation has been able to employ and the level of assets or physical capital which measures the bank size (Becker, 2014).

Although there are many organisations within the service industry, bank as a service organisation is faced with increasing demands for high operational efficiency within reasonable charge. This is the reason why over the years, bank customers have not been pleased with the level of bank performance in some countries. For instance, banking industry in Nigeria has come under severe criticisms due to the inability of the industry to efficiently satisfy their ever increasing customers with their operations. and hence have not delivered to the expectations of customers (Oladele, 2016).

The above scenario made both physical capital (Bank size) and human capital development a critical strategy of organizations who desire to achieve operational efficiency and customers' expectations. With the growth of customer expectations, employees of the bank require sufficient knowledge, skills and abilities to ensure cordial relationships between the bank and her customers. Also the enlargement of the bank assets in terma of physical capital in other to reduce congestions on the insufficient existing bank facilities (Su-Chin, Jui-Shin & Hung-Chun, 2012).

Against this background this study hopes to empirically investigate the impacts of bank size and human capital on the operational efficiency of Nigerian banks. The study covers eight out of the 23 commercial banks, the ten is chosen since it has been shown that the BIG five constitute almost 60% of the size of the entire commercial banks in Nigeria. The big five are First Bank, Zenith Bank, GT. Bank, Access Bank and UBA Banks (CBN, 2015). These are the banks that are responsible for the largest volume of shares in the Nigerian Stock Exchange and most of them make the top first 500 banks ranking in the World. Notwithstanding, other commercial banks such as Union Bank, Diamond Bank and FCMB Bank are randomly selected and are also included in the study making a total of eight banks.

## **LITERATURE REVIEW**

Performance measurement is the process of collecting, analyzing and/or reporting information regarding the performance of an individual, group, organisation, system or component (Aguinis, 2009). In organisations, it has been very important for managers to know which factors influence an organisation's performance in order for them to take appropriate steps to initiate them. At the

organisational level in the banking industry, literature have identified conventional indicators of bank performance such as the net margin on loans and advances, return on equity (ROE), return on assets (ROA), return on investment (ROI), among others (Okafor, 2012; Ramadan, Qais & Thair, 2011). But, it is imperative to note that all these indicators would not have materialised without customers and employees. Thus, the study intends to look at the performance of banks from the customers' and employees perspectives. In this wise, such performance metrics has been captured in a wide spectrum by notable researchers like Overstreet *et al.* (2013) and Noruzy *et al.*, (2013) as operational performance. Existing studies identified service quality, customer satisfaction, customer retention and service innovation as leading operational performance proxies (Abdullah *et al.*, 2014; Golla & Johnson, 2013; Komaladewi *et al.*, 2012).

### **2.1.6.1 Service Quality**

Quality has been defined from different perspectives. One of such definitions is that of Schneider and White (2004) which defined quality from three different approaches namely, philosophical, technical and user-based approaches.

- i. **The Philosophical Approach:** This was attached to innate excellence. It can be easily felt by users but might not be able to define it.
- ii. **Technical Approach:** It is often expressed in conformance metric. When standard is examined against defects or deviation, the gap is often overt.
- iii. **User-based Approach:** It is based on the judgment of user. Therefore, quality depends on the perceptions of customers.

The definition of Chinh and Anh (2008) summarised that of Schneider and White (2004) as they described quality as excellence, value, conformance to specifications, conformance to requirements, and loss avoidance. Another definition perceived quality as the consumer's overall impression of the relative inferiority or superiority of the companies and its services (Siddique, Karim & Rahman, 2011).

From the above views, different possible types of quality can be inferred namely; technical quality which relate to the quality of what customers receive from the interaction with the company/service provider and has an important part on evaluating service quality, functional quality which is related to the way the service is delivered and interactive quality which explains the interaction between contact personnel and customers (Siddique *et al.*, 2011). Based on these clues, quality can be said to be a multifaceted concept which can be associated with descriptions such as physical quality, service quality, technical quality, functional quality, interactive quality, etc. However, within the context of this review 'service quality' is central to discussion.

Therefore, before delving into the concept of service quality, it will be helpful to examine the meaning of service.

Gronroos (1984) defined service as, "a process consisting of a series of more or less intangible activities that normally, but not necessarily always, take place in interactions between the customer and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems". In another definition, service was defined as "any intangible act or performance that one party offers to another that does not result in the ownership of anything" (Kotler & Keller, 2012). Angelova and Zekiri (2011) defined service as 'all economic activities which are intangible, not physical apparent like products, which provide value to the customer'. For instance, when an individual enters a bank for clarification and receive the information he or she needs. A service has been provided to him or her. Therefore, service is an identifiable intangible activity that is the main objective of transaction that serves to meet the needs of customers.

While services no doubt varies depending on sub-sector. In today's banking system, service categories can be classified into three major categories namely; general banking, credit and foreign exchange. The general banking activities include but not limited to accounts opening, deposit management and cash handling. In the credit banking service, loan disbursement and loan management are the main activities while for the foreign exchange banking, foreign currency and remittance management pre occupy the function (Masukujjaman & Akter, 2010). Specifically, in retail banking where targets are individual customers, personal financial services such as saving and current accounts, fixed deposit, remittances and loans like housing or hire purchase loans, personal loans, and mutual fund for investment are the common services.

Based on the above reviews, the following four distinguished characteristics are observable in service as noted by Zeithaml and Bitner (2003): intangibility, inseparability, heterogeneity, and perishability. **Intangibility** feature of service explains the immeasurability nature of service. While Schneider and White (2004) established it as philosophical approach to quality, Kotler & Keller (2012) clearly stated this characteristic of service as they defined service as "any intangible act or performance that one party offers to another that does not result in the ownership of anything". For service providers it is difficult to count or take stock of effect of service provided to customers. For the **inseparability** feature of service, it revealed the sequence of how services are sold, produced and consumed at the same time. In the case of the **heterogeneity** feature of service, such activity often vary with service provider as it has unavoidable consequence of simultaneous production and consumption while for the **perishability** nature of service, it explains the inability of individual to store service for later sales or use.

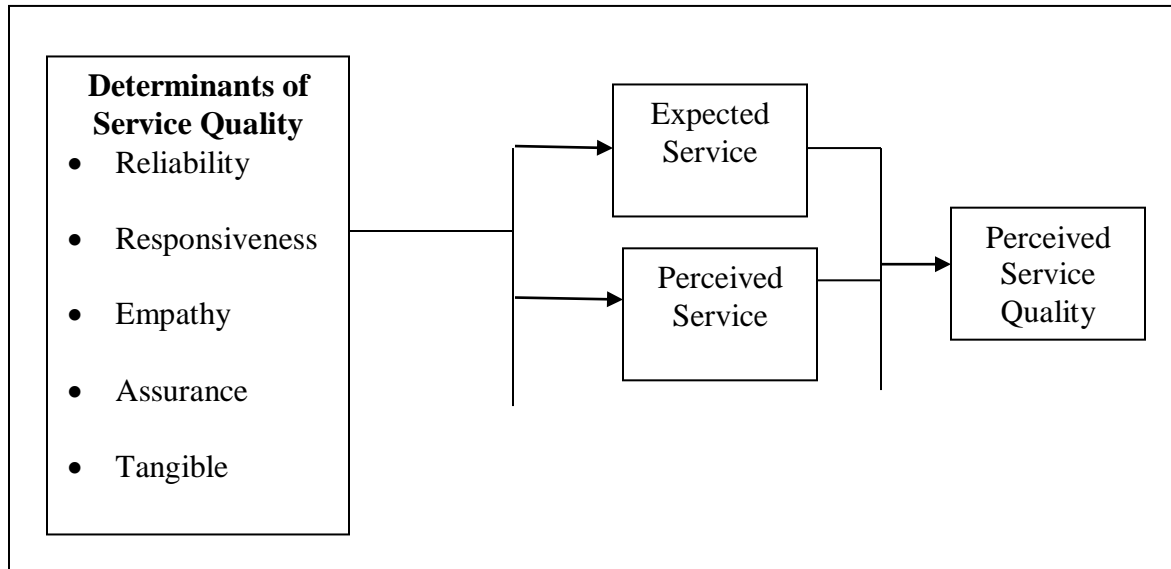
Modern day description of service quality can be traced to the work of Gronroos (1984) which defines service quality as ‘a set of perceived judgments resulting from an evaluation process where customers compare their expectations with the service they perceive to have received’. Therefore, service quality entails the perceived quality of a given service will be the outcome of an evaluation process, where the consumer compares his expectations with the service he perceives he has received that he puts the perceived service against the expected service (Gronroos, 1984). Service quality refers to the extent to which the level of service being delivered matches customer expectations (Herstein & Gamliel, 2006). Service quality can be described in terms of objective and perceptual characteristics. The objective characteristics include such things as service time, call wait time, credit application approval rates, etc. while perceptual characteristics on the other hand depend on the clients’ perceptions which include dimensions of service reliability, responsiveness and so on.

From the customers’ perspective, service quality means how well the goods/services provided by the organisation meet or exceed customer expectations (Parasuraman *et al.*, 1988). This position was recently embraced by Mathew & Jagannathan (2015) when they noted that service quality centres more on customers perceptions of the service delivered. However, at a more comprehensive level, service quality is the overall assessment of a specific service organisation performance in comparison with customer’s general expectations of how the organisation is in her industry (Lo, Osman, Ramayah & Rahim, 2010).

Models have been developed in an attempt to explain the meaning and description of service quality. In this review two of such models were reviewed namely SERVQUAL Model of Parasuraman *et al.*, (1988) and System approach model of Johnson, Tsiors and Lancioi (1995).

Parasuraman *et al.*, (1988) model of service quality was developed to address the challenge of service quality measurement. Initially, they presented ten which were access, communication, competence, courtesy, credibility, reliability, responsiveness, security, tangibles and understanding the customer as determinants of service quality however in 1988 the determinants were reduced to five namely, Tangibles, Reliability, Responsiveness, Assurance and Empathy as presented in Figure 2.2 below.

**Figure 2.2: Service Quality Model**



Source: Parasuraman, Zeithaml and Berry (1988)

According to the model above, five (5) measures of service quality were visible and they are discussed below:

- i. Reliability: This is the ability to perform the promised service dependably and accurately. It contains five elements to assess the accuracy and credibility of bank services. This dimension of service quality evaluates the promises of banks and its execution from customers' point of view. Reliability is very important determinant of product quality besides good personal service, staff attitude, knowledge and skills (Walker, 1990). Berry and Parasuraman (1991) reported that reliable service is the outcome of the continuous improvement. Similarly in another study, it is found that service reliability is the service “core” to most customers.
- ii. Responsiveness: This dimension reflects the willingness or readiness of employees to provide quick services to customers. Customers are very keen to employees' behaviour in services industry especially in the banking industry. It was reported that customers are very sensitive to employees' working environment in service organisations (Brown and Mitchell, 1993). It was found that correct match between staff skills and customers' expectation resulted in better service quality towards customers (Gollway & Ho, 1996).
- iii. Assurance: This element indicates the employees' knowledge, courtesy and their ability to convey trust and confidence. Service quality is also linked to the customer satisfaction as how employees use their knowledge and courtesy and their ability to incorporate trust

and confidence. Parasuraman *et al.* (1988) reported assurance as an essential dimension of service quality after reliability and responsiveness towards satisfaction. It is found that a bank can create customer satisfaction by ensuring trustworthy behaviour and reflection of genuine commitments to service provision (Nelson & Chan, 2005).

- iv. Empathy: This element shows the magnitude of caring and individual attention given to customers. In the banking sector customer care and individual attention is indispensable for the better performance due to stiff competition. Bank customers considered empathy as an important dimension of service quality (Jabnoun and Al-Tamimi, 2003). It is suggested that employees' commitment to deliver quality services, skillfully handling of conflicts and efficient delivery of services resulted in satisfied customers for long term benefits (Nelson & Chan, 2005).
- v. Tangibility: This element shows the physical aspects of the services as physical facilities, appearance of personnel and tools used for the provision of services. It is more concerned with aesthetic part of the banks. It is found that customers prefer tangible dimension of service quality in UAE banking industry (Jabnoun & Al-Tamimi, 2003).

## METHODOLOGY

The indicator of operating efficiency of the banks OPE, is the operation expenditure divided by total asset of the bank. This has been used by many authors to proxy operational efficiency of organizations.. This study makes use of OPE as the dependent variable. Consequently, the model is stated thus:

$$\ln OPE_{i,t} = \ln A + \alpha_1 \ln BZ_{i,t} + \alpha_2 \ln EPS_{i,t} + \alpha_3 \ln H_{i,t} + \alpha_4 \ln intr_t + e_i \dots \dots \dots (3.7)$$

Where, A is a constant in the model or the intercept.  $BZ_{i,t}$  is the bank size and proxy by total asset of bank i at period t.  $OPE_{i,t}$  is the operational efficiency of bank i at period t.  $EPS_{i,t}$  is earning per share in bank i at period t.  $H_{i,t}$  is the human capital development of bank i at period t and proxy by expenditure on human capital which is sum up in the personnel cost of the banks that also include expenses on training and retraining of staff on the job.  $intr_t$  is the monetary policy rate which affects the banks performance and it is external to the banks since it is fixed by the CBN and  $e_i$  is the error term.

## Estimation Technique

The study shall adopt the panel data regression analysis to analyze the impact of human capital development on bank performance in Nigeria.

There are four possibilities and options when it comes to panel data regression which is reviewed below:

**3.5.1 The Fixed Effect Model**

The term “fixed effect” is due to the fact that although the intercept may differ among firms, each firm’s does not vary overtime, that is time-variant. This is the major assumption under this model i.e. while the intercept are cross-sectional variant, they are time variant.

**i. Within-Group Fixed Effects**

In this version, the mean values of the variables in the observations on a given firm are calculated and subtracted from the data for the individual, that is;

$$Y_{it} - \hat{Y}_i = \sum_{j=2}^k \beta_j (X_{ijt} - X_{ij}) + \delta(t - \bar{t}) + E_{it} - \bar{E}_i \quad \text{----- (3.8)}$$

And the unobserved effect disappears. This is known as the within groups regression model.

**ii. First Difference Fixed Effect**

In the first difference fixed effect approach, the first difference regression model, the unobserved effect is eliminated by subtracting the observation for the previous time period from the observation for the current time period, for all time periods. For individual *i* in time period *t* the model may be written:

$$Y_{it} = \beta_i + \sum_{j=2}^k \beta_j X_{ijt} + \delta t + \omega_i + E_{it} \quad \text{----- (3.9)}$$

For the previous time period, the relationship is

$$Y_{it-1} = \beta_i + \sum_{j=2}^k \beta_j X_{ijt-1} + \delta(t-1) + \omega_i + E_{it-1} \quad \text{----- (3.10)}$$

Subtracting (3.8) from (3.7) one obtains.

$$\Delta Y_{it} = \sum_{j=2}^k \beta_j \Delta X_{ijt} + \delta + E_{it} - E_{it-1} \quad \text{----- (3.11)}$$



and again unobserved heterogeneity has disappeared.

**iii. Least Square Dummy Variable Fixed Effect**

In this third approach known as the least squares dummy variable (LSDV) regression model, the unobserved effect is brought explicitly into the model. If we define a set of dummy variables  $A_i$ , where  $A_i$  is equal to 1 in the case of an observation relating to firm  $i$  and 0 otherwise, the model can be written

$$Y_{it} = \sum_{j=2}^k \beta_j X_{ijt} + \delta_t + \sum_{i=1}^n \alpha_i A_i + E_{it} \quad \text{----- (3.12)}$$

Formally, the unobserved effect is now being treated as the co-efficient of the individual specific dummy variable.

**3.5.2 Random Effect Model**

Another alternative approach known as the random effects regression model subject to two conditions provide a solution to a problem in which a fixed effects regression is not an effective tool when the variables of interest are constant for each firm and such variables cannot be included.

The first condition is that it is possible to treat each of the first unobserved  $Z_p$  variables as being drawn randomly from a given distribution. This may well be the case if the individual observations constitute a random sample from a given population.

If 
$$Y_{it} = \beta_j + \sum_{j=2}^k \beta_j X_{ijt} + \delta_t + \alpha_i + E_{it} = \beta_j + \sum_{j=2}^k \beta_j X_{ijt} + \delta_t + \mu_{it} \quad \text{-----(3.13)}$$

where:  $\mu_{it} = \alpha_i + E_{it}$

The unobserved effect has been dealt with by subsuming it into the disturbance term.

The second condition is that the  $Z_p$  variables are distributed independently of all the  $X_j$  variables. If this is not the case,  $\alpha_i$ , and here  $\mu$ , will not be uncorrelated with  $X_j$  variables and the random effects estimation will be biased and inconsistent.

**3.5.3 Dynamic panel model**

To improve the performance of the estimators, we explored the dynamic panel data approach popularized by Arellano and Bond (1991). According to Franz (2009), when a static specification of the fixed effects model is joined with autoregressive coefficients, which is the lagged value of the dependent variable, it allows feedback flowing from the past or current shocks to the current value of the dependent variable. This method of specification is known as the generalized method of moments (GMM). The dynamic specification takes away the temporal autocorrelation in the residuals and prevents running a spurious regression, which may lead to inconsistent estimators. The GMM model is specified thus:

$$y_{it} = \beta_1 + \rho y_{it-1} + \beta_2 x_{2it} + \beta_3 x_{3it} + \beta_4 x_{4it} + \mu_{it} \dots \dots \dots (3.14)$$

Equation (3.14) is the modified form of the fixed effects model in equation (3.9) with the addition of the lagged value of the dependent variable.

Taking the first difference of equation (3.14), we obtain equation (3.15) as follows:

$$\Delta y_{it} = \beta_1 + \rho \Delta y_{it-1} + \beta_2 \Delta x_{2it} + \beta_3 \Delta x_{3it} + \Delta \psi_{it} \quad (3.15)$$

Avoiding possible correlation between  $y_{it-1}$  and  $\psi_{it}$  necessitates the use of an instrumental variable that will not be correlated with both, and through matrix transposition of the explanatory variable, instrumental variable  $Z'$  is obtained. Equation (3.15) is multiplied in vector form by  $Z'$  leading to:

$$Z' \Delta y_{it} = Z' (\Delta y_{-1}) \rho + Z' (x) \beta_{it} + Z' \Delta \psi_{it} \quad (3.16)$$

Estimating equation (3.16) using the generalized least square (GLS) yields one step consistent GMM estimators. However, additional input to the approach used by Arellano and Bond (1991) evolved over the years and was developed by Blundell and Bond (1998), and is referred to as system-GMM. There is not much difference between this approach and GMM except that system-GMM exercises more precaution in the usage of the instrumental variables. It was developed to tackle the problem of possible weak instrumental variables, which may occur in GMM. Therefore, the SYS-GMM is expected to yield more consistent and efficient parameter estimates. This will be explored in our dynamic panel data analysis.

**Sources of data**

All data used for the study are sourced from the annual reports of the eight banks. The data used for the analysis are purely secondary.

**RESULTS AND DISCUSSION**

**Panel unit root test**

The order of integration of the variables included in the model is determined using both the LLC and the ADF panel unit root tests. The rationale for using the two is to confirm the levels of consistency in the panel unit root tests. This ensures that all the variables are made stationary before the static panel data estimation ( Baltagi, 2012).

**Table 4.3 ADF, IPS and LLC Panel unit root tests**

Variable	ADF Panel unit root test		Livin Chu Panel unit root test		IPS unit root test	
	Chi squatter stat	Order of integration	Unadjusted stat	Order of integration	t-bar	Order of integration
BZ	73.3110	I(1)	-6.9964	I(1)	-3.1793	I(1)
EPS	42.0136	I(0)	-4.3895	I(0)	-4.2855	I(1)
OPE	126.3127	I(1)	-7.1668	I(1)	-4.2108	I(1)
H	118.6752	I(1)	-6.5875	I(1)	-3.9979	I(1)
INTR	73.8065	I(1)	-4.2180	I(0)	-3.4318	I(0)

*Source: Author's computation*

From table 4.3 all the three methods of panel unit root tests namely; IPS, ADF and LLC show that all the variables are stationary either at levels or first difference. The implication of the result is that all the variables are suitable for panel model estimation and the tendency of yielding spurious regression results is minimized. After the panel unit root test, we begin the panel models estimation.

the impact analysis of human capital development on banks performance focuses on the non-financial indicator of bank performance and the banks operating efficiency is used as a proxy for the operational efficiency of the banks. The results of the static panel data analysis which includes the fixed and random effects estimated models are presented in tables 4.18 and 4.19 respectively.

**Table 4.18 Fixed effect results**

Variables	Coefficient	Standard Error
Constant	5.00e+07	1.42e+07
BZ	.023268***	.0034732
H	.7102029**	.01465838
EPS	-.1633636**	6719.05
INTR	-.1993197	.6888726

$R^2 = 0.8490$  (within)  $R^2 = 0.8537$  (overall)  $F(4,116) = 163.03$  Prob> F = 0.0000

Source: Author's computation

**Table 4.19 Random effect results**

Variables	Coefficient	Standard Error
Constant	4.44e+07	1.39e+07
BZ	.0243646***	.003351
H	.7162694**	.1322044
EPS	-16525.15**	6414.456
INTR	-.1748424	.6800301

$R^2 = 0.8488$  (within)  $R^2 = 0.8543$  (overall) Wald  $\chi^2(4) = 706.53$  Prob>  $\chi^2 = 0.0000$

Source: Author's computation

The impact of human capital development on the operating efficiency of the banks is shown in the results of fixed and random effects as shown on tables 4.19 and 4.20. There is an indication of complete similarities between the two results which implies a high level of consistency in our results.

Firstly, human capital development contrary to what we obtained under the financial performance of the banks shows a positive and significant relationship with the operational efficiency of the banks. The coefficients in both the fixed and the random effects are .7102029 and .7162694 respectively. The two coefficients are also significant at 1% in their respective estimated models. The implication of the results is that human capital development has a significant positive impact on the operating efficiency of the banks. Considering the value of the coefficients, a unit rise in human capital expenditure will lead to about 71% rise in operating efficiency of the banks.

Secondly, bank size continues to maintain its important influence on bank performance. Bank size shows a significant positive relationship with operational efficiency of the banks. The coefficients in both the fixed and random effects estimated models are .023268 and .0243646 respectively and they are both statistically significant at 1%. This simply implies that as the bank size increases it will also lead to a significant increase in the operational efficiency of the banks.

Earnings per share EPS which is representative of the financial performance of the banks shows a significant relationship with the financial performance of the banks. Strife However, the relationship is inverse. The implication is that when banks strive to improve their financial performance their operational efficiency are likely going to be adversely affected significantly. It could be seen in both the fixed and random effects estimated models that the coefficients of EPS are negative.

Interest rate is also shown to be important determinants of operational efficiency of the banks. The coefficients of interest rate in both the fixed and random effects estimated model are negative and also significant. It should be noted that the interest rate used here represents the effect of the monetary authority CBN on the commercial banks since they fix the monetary policy rates which is the prevailing interest rate in the economy. The implication of the results is that the CBN regulatory role usually affects significantly the operational efficiency of the commercial banks in Nigeria.

The overall R squares of both model are very high they are 0.8537 and 0.8543 in both the fixed and the random effects models. The implication is that about 85% systemic variations in operational efficiency of the banks is explained by bank size, human capital development and other variables used in the model. The strong R square is evident from the fact all the independent variables used in the models including bank size and human capital are individually statistically significant.

The test of overall significance through the F test of the fixed effects model and the Wald test of the random effects model also support this fact that all the independent variables have overwhelming influence on the operational efficiency of the banks

Despite the complete similarities between the two models in terms of their parameter estimates, we compute the hausman test for them to know the model that is more suitable for this analysis. The result is presented in table 4.20

**Table 4.20 Hausman test for static panel**

Variables	Fixed Effects (b)	Random Effects (B)	Difference (b-B)	Standard Error sqrt(diag(V_b-V_B))
BZ	.023268	.0243646	-.0010965	.0011306
H	.7102029	.7162694	-.0060665	.0692796
EPS	-16336.36	-16525.15	188.7882	2379.512
INTR	-1993197	-1748424	-244773	171963.2

Test: Ho: difference in coefficients not systematic  $\chi^2(11) = (b-B)'[(V_b-V_B)^{-1}](b-B) = 6.79$ , Prob> $\chi^2 = 0.0336$ , (V\_b-V\_B is not positive definite)

Source: Author's computation

The results on table 4.20 compares the parameter estimates of both the fixed and the random effects estimated models and it is discovered that they are very similar, notwithstanding the chi square value of the hausman test is 6.79 with the probability of 0.0336. This is an indication that the fixed effect estimates are slightly more suitable for our analysis. Moreover, the high degree of similarities between the parameter estimates and the level of statistical significance in both models is an indication of consistency in our results which is a very good attribute of the empirical result.

**4.3.1.2 Cross sectional dependence test**

Again, after the pool OLS the generalization of our results for all the 8 banks captured in our analysis depends on the cross-sectional dependence test. The result is presented in table 4.20a. the results as usual indicates the presence of cross sectional dependence hence the use of the static panel data analysis but not withstanding the panel result is still adjusted for cross-sectional dependence to enable us examine the level of consistency in the estimated fixed and random effects models

**Table 4.20a: Breuch-Pagan/Pasaran Cross-sectional dependence test**

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	111.4709	28	0.0000
Pesaran scaled LM	10.08522		0.0000
Pesaran CD	2.707250		0.0068

Source: Author's computation

Consequently, the estimated static panel model is adjusted for cross-sectional dependence and the result is presented in table 4.20b.

**Table 4.20b: Cross-sectional time-series FGLS regression**

<i>Coefficients: generalized least squares</i>		
<i>Panels: homoscedastic</i>		
<i>Correlation: common AR(1) coefficient for all panels (0.7914)</i>		
Variables	Coefficient	Standard Error
BZ	.0133429***	.0032162
EPS	.1251837**	.4726088
H	.1104611**	.01280124
INTR	-1499917	675044.8
Constant	3.94e+07	1.38e+07

Wald chi2(4) =402.13 , Prob> chi2 = 0.0000

*Source: Author's computation*

The strength of the panel data also lies in the ability to generalize the results of the estimated panel model. Therefore table 4.20b provides estimates that have been adjusted to take care of the possible problems of cross-sectional dependence. It could be seen from the output that all the parameter estimates retain their respective signs as well as their levels of statistical significance as it were in the fixed and random effects models.

Furthermore, the robustness of the static panel results is put into test by estimating the dynamic panel data using the systemic dynamic panel data approach. The result is presented in table 4.21

**Table 4.21 The systemic GMM dynamic panel results**

Variables	Coefficient	Standard Error
OPEL1	.5534908	.0447527
BZ	.0005354***	.0016781
H	.7131478**	.0988934
EPS	-.1385289**	.03987434
INTR	-2089433	417837
Constant	4.97e+07	8607252

Wald chi2(5) = 2200.74, Prob> chi2 = 0.0000

*Source: Author's computation*

The results of the systemic dynamic panel data is a confirmation of all the results in the static panel data. All the variables maintain their respective signs and levels of statistical significance in the dynamic panel data results.

Just as we obtained under the fixed and random effects models human capital development exhibit a positive and significant relationship with operational efficiency of the banks. The same relationship is replicated in the dynamic panel data results. This again confirmed the strong positive link between human capital development and nonfinancial performance of the banks.

Other variables such as total asset, earning per share and interest rate all show positive, negative and negative relationships respectively in the dynamic panel model. And they are all statistically significant. As said earlier, the level of consistency in the empirical result generated from this analysis is a good advantage for the validity of the results.

However, the diagnostic test is concluded for the dynamic panel model and the result is presented in table 4.22.

**Table 4.22 Test for overall significance of the dynamic panel model**

Wald chi2(5)	2200.74
Prob > chi2	0.0000

22200 is the Chi square value in the WALD test and it is shown on table 4.22 also the value is significant at 1% level thus, indicating that the estimated dynamic panel data model is significant at 1% level. Therefore all the variables in the estimated dynamic panel model will jointly influence operational efficiency of the banks significantly.

**Table 4.23 Sargan test of over-identification**

chi2(114)	19.546
Prob > chi2	0.0837

The hypothesis that the over identifying restrictions are not valid is rejected at 5% level and we accept the null hypothesis that the over identifying restrictions are valid.. Hence we conclude that the instruments used in the dynamic panel model are valid and suitable for the analysis. The result further gives credibility to our dynamic panel data results. We also test for the serial correlation in the dynamic panel model.

**Table 4.24 Test for Autocorrelation**

Order	Z	Prob>z
AR1	-10.91	0.000
AR2	0.22	0.775



The null hypothesis of no autocorrelation is accepted at AR2 which is suitable for our result. The implication of the result is that the estimated dynamic panel model does not have the problem of autocorrelation. The result is also good for our parameter estimates as they are free from the problem of serial correlation that can render them inefficient. It is required that dynamic panel data estimates should be free from serial correlation problem and hence the result on table 4.24 is important.

## **CONCLUSIONS AND RECOMMENDATIONS**

The conclusion on the operational efficiency of the banks and human capital development is that human capital development has significant positive impacts on the operational efficiency of the banks. Operating efficiency of the banks is positively influenced by human capital development. In addition, the arrays of new banking products which requires upgrading of the skills of the banks employees via various human development programs is impacting positively and significantly on the operation efficiency of the banks. In other words bank operations become more efficient with increase in human capital development. The ease of transacting business with many banks in recent times has been largely traced to improvement in human capital development of the banks and this has improved the operational efficiency of the banks.

Another conclusion from the analysis again is the influence of bank size on the relationship operational efficiency. The results have overwhelmingly supported the fact that bank size has significant role to play in operational efficiency of the banks. Out of all the variables used as explanatory variable in the estimated models of static and dynamic panel models bank size which is proxy by total asset exhibit the most consistent significant positive impact on operational efficiency of the banks. According to the Chattered Institute of Bankers CIBN (2016), the expansion in bank size since the recapitalization exercise has led to improved performance of most the Nigerian banks. Therefore findings from this study appear to be supporting this assertion of the CIBN.

Finally, apart from human capital development, bank size which is proxy by the total asset of the banks has been described by the study through the empirical results as important factor that influence operational efficiency of the banks significantly.

Based on the forgoing it is recommended that Nigerian banks should improve on their human capital development programmes as well as increase their assets in other to achieve more operational efficiency that will improve customers' satisfaction and also increase the confidence of customers in the banks operations.

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