Information Technology Service Management and Bank Efficiency in Nigeria: The Moderating Role of Branch Network

[1]Itai, M. M.,[2]Binuyo, A. O., &[3]Asikhia, O. U.

[1, 2 & 3] Department of Business Administration and Marketing, Babcock University, Illisan-Remo, Ogun State, Nigeria

Abstract: *Globally, bank efficiency has been of great interest to customers, shareholders' regulators and government. The banking industry today has faced with service challenges as the financial structure has changed rapidly due to the deregulation of financial services and increasing use of information technology services. Slow adoption of information technology services management has resulted in low level of patronage of banks products and services which include ease of use, security, privacy, accessibility, responsiveness, cost of usage, all these factors affect customer experience and profitability. This study examined information technology service management and bank efficiency in Lagos State, Nigeria with the moderating role of branch networkIt is against this backdrop that a better understanding of the relationship between information technology service management and bank efficiency is used for continuous improvement in the quality of service offered by banks in Nigeria. The study employed cross sectional survey research design. The total population was 6,975,037 of bank customers. Krejcie and Morgan (research advisors table) 2006 was used to select 1,019 that were used for the study and stratified sampling technique was used. Structured survey questionnaire was adapted and validated. The Cronbach's alpha coefficients for the constructs ranged between 0.705 and 0.873. The response rate was 97.84%. Data were treated, then analysed using descriptive and inferential statistics of multiple and hierarchical regression. Findings revealed that information technology service management significantly affect efficiency ofbanksin Lagos State, Nigeria (Adj.R^2 = 0.585; F (5.990) = 473.583, p<0.05); branch network do not significantly moderate the effect of information technology resources on efficiency (β = 0.028, t = 1.420, ΔR^2 = 0.001, ΔF= 2.017, P > 0.05).The study concludedthat information technology service management have significant effects on banks efficiency in Lagos State, Nigeria. The study recommended that Nigerian banks should evolve appropriate business models that will enhance adoption of continues upscale of information technology resources and embrace digital space in order to achieve overall bank efficiency.*

Keywords:*Bank Efficiency, Branch Network, Information Technology Resource, Profitability, Resource-Based View*

I. Introduction

Bank efficiency all over the world has been of great interest tocustomers, shareholders' regulators and government. The banking sector has an important role to play in the economic development of any nation. Efficiency of banks has raised much attention in recent years. Efficiency in the banking system lead to good customer experience, service innovations, improved profitability. In recent years, the banking industry has faced competitive pressure worldwide as a result of increasing use of information technology resources.

The use of information technology service management has become more universal and progressively. However, recently, there has been a shift from a technology focus to a service in managing information technology resourcesto enhance bank efficiency. Francis (2013) defines information technology service management as a service provided to one or more customers by an information technology service provider. The service is made up of a combination of people, processes, infrastructure, support and should be defined in a service level agreement (SLA). International Business Machine (IBM) research (2012) define information technology services management as conceptualised, designed, built, operationalised, maintained, improved and retired by actors using tools and relying on capabilities. A broad definition offered by Iden and Eikebrokk (2013) define information technology service management focuses on support business goals and customer needs.

In Sub-Saharan African (SSA) according to Abdelkader and Mansouri (2013) efficiency of the banking system in the context of customer experience, relationship management, competition, regulation and information technology service management is grossly underdeveloped. The banking systems in SSA countries remain underdeveloped and laced with inefficiencies (Akande 2018). Banking competition brings about a stable and an efficient banking sector where there is access to finance, low service charges and moderate interest rates spread

---

(Ariss, 2015). However, service charges and lending rates are extremely high with meagre deposit interest rates in SSA banking sectors (Mlachila, Park, &Yabara, 2013).

Despite some of the efforts to improve the sector, these problems have persisted with high costs of banking, poor service delivery and poor customer experience are being identified as factors militating against efficient banking sectors' financial intermediation role. Consequently, service charges are high, financial intermediation is low and high interest rate spreads stifle investment and savings, curtailing the efficient operation of banks in this region, hence their inability to finance SSA countries' developmental goals (Akande, 2018). These poor operating environments pose enormous challenges to the regulators of improving efficiency in banking system of the region to facilitate increased financial intermediation that could support the anticipated development in the region.

A few studies on banks' efficiency have been conducted in Nigeria. The results from Nyong (2017), revealed high record of inefficiency among banks in Nigeria, due to waste in utilisation of resources. The banks' inefficiency is due more to pure technical efficiency rather than scale efficiency. The sources of inefficiency were linked to: low capital-to-asset ratio; high operating expense-to-income ratio; low returns on equity; market share; interest expense-to-deposit ratio; and low liquidity ratio. Fagge (2019) investigated the consistency of technical, allocative and cost efficiency of deposit money banks in Nigeria over the period 2010 to 2017 using non-parametric, data envelopment analysis (DEA) techniques. The results suggested moderate consistency between cost and technical efficiency and higher allocative efficiency scores rankings. It is against this background that a better understanding of the information technology service management and bank efficiency with branch network as a moderating is used for continuous improvement in the quality of service offered by banks in Nigeria to customers which provides the basis for this study.

II. Literature Review

The general focus of information technology service management, would be customer satisfaction. As information technology service systems provide the potential to more efficiently gather, analyse data, codify, and transmit knowledge to the far corners of the globe (Syed, 2018). Information technology departments/functions are expected to respond with speed in light of new business opportunities, to demonstrate responsible financial management, and to satisfy internal staff and external customers (Mora, Gelman, O'Connor, Gomez &Raisinghani, 2015). This level of service can be achieved through effective relationships and communication between information technology and business. In response to these business demands, information technology service management frameworks have helped IT functions and vendors change from a product (hardware/application) focus to a service focus. As a performance measure it used to quantify the efficiency and/or effectiveness of past action. A performance metric is the scope, content and component parts of a broadly-based performance measure (Moretti, Vaia&Zirpoli, 2013). In information technology service management, an example of a performance metric would be planning, organising, leading and controlling of resources to achieve objectives for an organisation (Kopia (2019).

There may be barriers that impede the adoption of information technology service management. Reasons for failure of information technology adoption have been explored by Maria-Cruz, Elena and Miguel-Angel (2012). Their study attributed failure of information technology adoptions to many factors including lack of management commitment, work instructions, realistic goals, momentum, and process owners, as well as problems with time and staff management. The performance measurement of information technology service management is a major challenge faced by organisations adopting best practice frameworks. In a survey of information technology management in both the public and private sector in the Czech Republic, measuring the overall benefits, the question of how to measure and how to improve the effectiveness of information technology services is explored. The study found that it is difficult to provide a single recommendation about how to measure and what metrics to use because business executives have very different goals for information technology and the context in which information technology operates is a key factor that should be considered (David, 2012). Although a phenomenal rate of adoption of information technology service management frameworks, is observed, it is not accompanied by standardisation of performance measurement. A standardised performance measurement framework is required and the processes must be measurable in order to be controlled and improved (Rasa &Banu, 2019).

The literature review showed the advantages of information technology service management into two categories of empirical and theoretical studies. Empirical studies showed a trend in research on adoption and implementation. A case study of a government agency in South Africa finds that both customer satisfaction and operational performance improve as the activities in information technology service management framework increase. The study uses SERVQUAL in a quantitative survey that includes qualitative questions, service centre call statistics and management interviews (Potgieter, Botha & Lew, 2005). Similar findings are reported from case studies of six German organisations by (Syed, 2018) that identify three benefits: client/service orientation and the quality of information technology services; efficiency due to standardisation, optimising of processes

and process automation; transparency and comparability through process documentation and process monitoring. These case studies identify process-specific benefits from the information technology service management implementations. There are few studies of published theoretical research work on information technology service management benefits - The Actor Network Theory (ANT) is used by Parida, Kumar, Galar and Stenström (2015) in explaining the adoption of information technology resources management and in further application of theory to information technology resources management performance measurement the Resource Based View (RBV) and Normatively Regulated Activities (NRA) theories. Information technology resources benefits arise when information technology enables people to perform their roles in more efficient or effective ways (Muraliraj, Zailani, Kuppusamy, &Santha, 2018).

According to Farell (1957), efficiency is measured by comparing observed and optimal values of production, cost, revenue, profit or all that the production system follows as objective, and which is under appropriate quantities and prices constraints. Efficiency is linked to the possibility of avoiding waste by producing as much output as the utilization of inputs allows (output oriented measure), or by using less inputs that the production objective plans it (input oriented measure).

With regards to the theme of what explains bank efficiency, it is noteworthy that there is no clear widely-shared theory, but much is left to empirics. This helps to explain why the results are contrasting and often not comparable, as - at best - model specifications differ from one study to another, reflecting the paper-specific aim. For instance, much research regards the relationship between efficiency and market concentration, socio-economic external conditions, banking structure, and access to banking services (Battaglia., Farina., Fiordelisi., & Ricci, 2010; Bos& Kool 2006; Destefanis, Christian, &Lubrano, 2014; Hassan, Ali., & Muhammad, 2011). The study of Suzuki and Sastrosuwito (2011) suggests two ways of measuring bank efficiency, that is, using financial ratios and service management output.

According to Berger (1993) financial institutions efficiency relate with growth in profitability, greater amounts of funds intermediated, better prices, service quality for consumers, and greater safety. Efficiency is related to the ability to produce a result with minimum effort or resources. It measures how close a production unit gets to its production possibility frontier, which is composed of sets of points that optimally combine inputs to produce one unit of output. Diallo (2018) states that efficiency makes banks more resilient to shocks, thereby positively and significantly affecting growth. Indeed, a banking system which efficiently channels financial resources to productive utilization is a powerful mechanism for financial stability and economic growth (Levine &Renelt, 2012). Efficiency is a key factor in making economic changes unavoidable (Asmild, &Minyan, 2016). For banks, efficiency refers to cost minimization, improved profitability, channeling greater amount of liquidity through the financial system, service management, better prices for clients, and greater security in terms of improved liquidity position and capital buffers for absorbing risk (Meehyang., Han-Byeol, Yi-Mei., &Daecheol, 2017).For the purpose of this study, bank efficiency is define as the ability to use internal resources to achieve positive customer experience and good financial results with minimum effort.

Branches are the initial contact point between most financial institutions and their customers. In the right circumstances branches can take the lead in identifying prospective customers, determining their needs and matching products/services to these needs. This is the essence of branch based banking. According to World Bank (2018), the demand for better quality services, competitiveness, cost reduction and flexibility seems to be faced by Nigerian banks. The study further posited that Nigeria banking industry has witnessed an amazing growth in terms of number of branches, total asset, deposit base, volume of loans and advances, especially since the deregulation of the sector in the recent past years. In a relatively new delivery channel application with the platforms geared towards overcoming challenges in the traditional banking system

Starting with the 1990s, retails banks have faced several challenges. One of them is how to efficiently deliver their products and services to the customers. In fact, the most important challenge of a bank is how to efficiently reach the customer, with the right product or service, at the right time. Multichannel banking is, therefore, more relevant than ever. Multichannel banking is more than just offering multiple channels, but offering integrated channels, with the optimal balance of services, prices and offer across channels. Banks should have the ability to deliver the right service at the right time in the right channel. The bank should define exactly how they are going to use each channels, which services and products in which channels, how to mix and integrate the channels and how to support the channels.

Multichannel customer management is the use of more than one channel or medium to manage customers in a way that is consistent and coordinated across all the channels or media used. Multichannel integration does not come without its challenges. Problems experienced by companies include: Heavy investments in unconvincing multichannel strategies and technologies that result in a poor return on investment (ROI). Problems in bringing together and standardising data about customers or resulting from interactions with them. Problems unifying different systems which may have very different data models. Difficulties in reducing or abolishing organisational boundaries.

Advantages of branch network include increased convenience and an improved experience, reducing customer churn rates and increasing their motivation to buy more from the supplier. Increased organisational

flexibility. The identification and capture of opportunities for increasing value per customer. Increased choice in the way they can interact. The ability to switch easily between the various channels, when it suits them and wherever they want to, depending on their preference and the type of interaction, whether it be the exploration or purchase of a product or service. Furthermore, in Nigeria, KPMG (2017) reports revealed that despite the progress made on the digital front, human interaction continues to remain integral to the service management and customer experience, particularly at key experience points such as seeking financial advice and making complaints. The study revealed that75% of customers still visit a branch to make complaints today but are open to using digital or non-physical channels such as the contact centre, video and social media that still afford some form of human interaction.

This study is anchored on resource-based view (RBV), one of the most widely accepted theories of strategic management. The founding idea of Resource-based view was pioneered by Penrose in 1959. Penrose argued that it is the heterogeneity, not the homogeneity, of the productive services bundle available from its resources that give each firm its unique character. The notion of firm's resources heterogeneity is the basis of the RBV. Drawing on previous research in RBV, the theory illustrates the interrelationships between RBV and organizational innovation to deliver efficient service. Specifically, it focuses on those aspects of RBV that critically determine the firm's capacity to innovate (Amit &Schoemaker, 1993; Barney, 1986; Dierickx& Cool, 1989; Peteraf, 1993; Maijoor&Witteloostuijn, 1996; Wernerfelt, 1989).

In 1991, Barney presented a more concrete and comprehensive framework to identify the needed characteristics of firm resources in order to generate sustainable competitive advantage. These characteristics include whether resources are: valuable (in the sense that they exploit opportunities and/or neutralize threats in a firm's environment), rare among a firm's current and potential competitors, inimitable, and non-substitutable (Barney, 1991). Over the last decade, much of the strategy literature has emphasised resources internal to the firm as the principal driver of firm profitability, efficiency and strategic advantage. The theory goes beyond the issues of strategy implementation and analysis of organisational processes.

The central assumptions of the resource-based research are that firms are heterogeneous in terms of the strategic resources they own and control. The heterogeneity is an outcome of resource-market imperfections (Barney, 1991), resource immobility (Barney, 1991), and firms' inability to alter their accumulated stock of resources over time (Carroll, 1993). In this vein, each firm can be conceptualized as a unique bundle of tangible and intangible resources and capabilities (Wernerfelt, 1984). Resources, which are the basic unit of analysis for RBV, can be defined as those assets that are tied semi-permanently to the firm (Maijoor&Witteloostuijn, 1996; Wernerfelt, 1989). It includes financial, physical, human, commercial, technological, and organizational assets used by firms to develop, manufacture, and deliver products and services to its customers (Barney, 1991). Resources are classified as tangible (financial or physical) or intangible (employee's knowledge, experiences and skills, firm's reputation, brand name, organizational procedures). The resources-based process strategic analysis of business practice is clearly shown in Figure 2.1
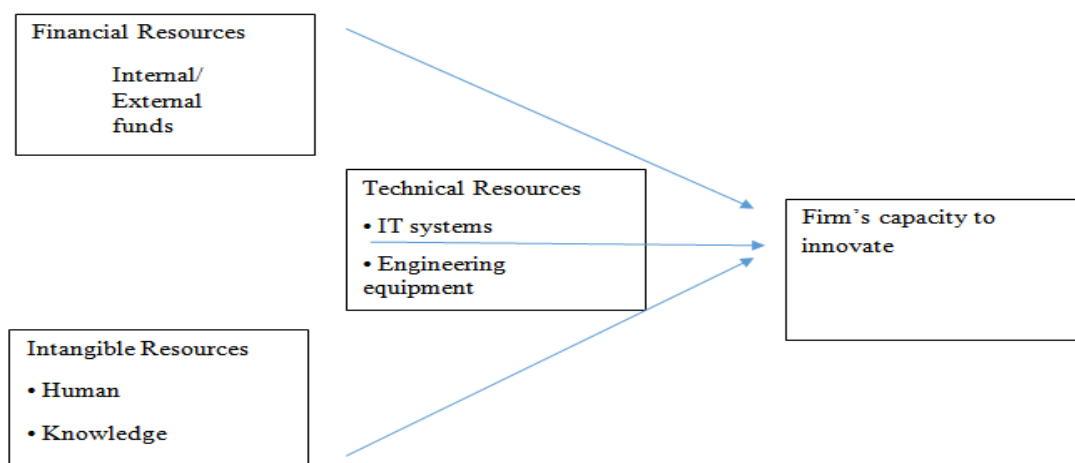

Figure 2.1: Resources determining a firm's capacity to innovate
Source: Barney (1991)

The availability of financial resources can expand a firm's capacity to support its innovative activities (Harris & Trainor 1995; Lee & Wong, 2011), whereas the lack of financial funds may limit firm level innovation (Baysinger&Hoskisson, 1989; Helfat, 1997; Teece& Pisano, 1994). According to Transaction-costs Economics and Agency literature, internally (firm) generated funds are more conductive to R&D activities and investments than external funds primary because there exist information asymmetries between the firm and the

external capital market (competitors get information on R&D projects, firm lose total control over their innovations).

Technical resources (engineering and production equipment, manufacturing facilities, IT systems) have also been found to positively affect innovation (Gatignon&Xuereb, 1997; Liyanage, Greenfield, Don, 1999; Mitchell &Zmud, 1999; Song & Parry, 1997). Carrying out innovation activities in many cases requires a minimum prior investment in highly sophisticated technical equipment, which raises the possibility of producing innovative output of increased value for the firm (unique, diversified products) and for its customers (increased quality).

Several empirical studies have established a link between information technology service management and bank efficiency. In their study, Gontur, Hassan and Arin (2017) examined the link between the information technology and bank service efficiency among deposit money banks in Jos Metropolis, North Central Nigeria. The study found out that when deposit money bank is using the latest technologies in their banking operations; this will lead to bank efficiency by sustaining its customers' loyalty in the long run. However, despite this seemingly importance of information technology resources, in a similar context, the research shows lots of challenges, long queues seen in some banking halls, problem of frequent network failure and customers are sometimes frustrated leading to inefficiency in service delivery and subsequent decline in revenue (Ololade&Ogbeide, 2017).

Furthermore, Odia, Eke and Kalu (2017) carried out a similar study on the emerging service delivery practices and efficiency of commercial banks in Port Harcourt. Commercial banks in Nigeria have as a result of the highly competitive nature of the financial services industry become very innovative in service delivery. Against the backdrop of economic recession and dwindling of the disposable income of customers profits have been affected. However, the study found a positive and significant relationship between innovativeness, concessions, monitored employee attitude and efficiency.

The impact of electronic banking technology services on the customers' loyalty of commercial banks in Jordan was conducted by Sulieman and Ahlam (2017). The electronic banking services represented by (ease of use, usefulness, cost of use, web site design, privacy & accessibility). The study found that there is statistical significant impact of the electronic banking technology services (Ease of use, usefulness, Web Site Design, privacy) on customers' loyalty of commercial banks in Jordan. Regarding the dimension of accessibility, the study indicates that it had insignificant impact on customers' loyalty. In the same vein, Muhammad, Masood and Ume (2018) also conducted a study on the impact of self-service technology (SST), service delivery on customer loyalty in service in Pakistan. Service quality has been a topic of extensive inquiry for decades that has emerged now in form of self-service technology (SST) which has profound effects on the way customers interact with firms to create positive service outcomes, that is, customer loyalty and behavioural intentions. The results of this study reveal positive and significant relationship between SSTs service delivery, loyalty, and behavioural intentions directly. These results provide insights for the service sector of the Pakistan to invest in the new technology in order to enhance the consumer experience and loyalty.

In an empirical survey conducted by Adelowotan and Oshadare (2016), that the branches in form of urban, rural and foreign have significant moderating influence on bank efficiency of Nigerian banks. The study further suggested that branching activities should be a major work and decision of the banks so as to bring more customers to the bank who will now use the various electronic platforms for service installed by the banks. Despite technological and regulatory innovations that might have been expected to reduce banking institutions' reliance on bricks-and-mortar branches to deliver financial services, the number of full-service bank and thrift branches has increased steadily in United States (Beverly 2005). The study further provided that there appears to be little relationship between branch network size and overall firm efficiency. While several studies have considered the impact of the expansion of large, multi-market banking organizations into local markets, relatively little analysis has taken a direct look at the influence of increasing branch network using recent branching data.

H_{01}:*There is no significant effect between information technology service management and bank efficiency in Lagos State, Nigeria.*
H_{02}: Branch network do not significantly moderate the effect information technology resources on bank efficiency in Lagos State, Nigeria.

The researchers' conceptual model in figure 1 depicted the link between information technology service management and bank efficiency with branch network moderates the relationship between information technology resources and bank efficiency in Lagos State, Nigeria. The researchers' conceptual model was anchored on RBV which showed how firms use information technology resources and branch network to create and sustain bank efficiency over other banks lower information technology resources. The RBV stated that firms' resources could be information technology resources and branch network which a bank use for

competitive advantage. Based on the RBV assertion on firm resources and market competitive advantage, a researchers' conceptual model was formulated in figure 1.

Figure 1: Conceptual Model
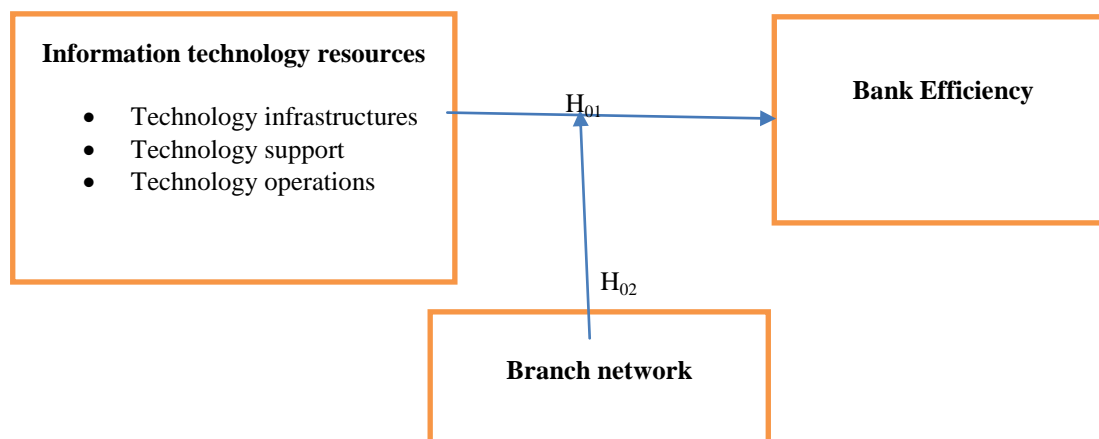
Source: Researchers' Conceptual Model 2019

III. Methodology

This study adopted survey research design to examine the effect of information technology service management and bank efficiency in Lagos State, Nigeria. The adoption of this design is influenced by the research problem and its corresponding research questions. The choice of survey research design is further considered appropriate because according to Onobrakpeya, (2018) it attempts to understand a particular population at a particular time and to ensure that the amount of uncertainty characterising decision situation is clearly defined. The use of this design is similar to this study work of Asikhia (2010),

The population of this study comprises 6,975,037 of bank customers in Lagos State, Nigeria. The population of this research comprises the total number of customers who registered for Bank Verification Number (BVN) in Lagos State as recorded by Nigeria Inter-Bank Settlement System (NIBSS 2019). The choice of Lagos is because it serves as the largest commercial centre in Nigeria, over 90% of the banks' head offices are in Lagos (CBN, 2010).

The study consists of eight systemically important deposit money banks operating in Lagos (CBN, 2014). The eight banks alone account for 75 per cent of the banking sector in terms of earnings, profitability assets, customer deposits and branch networks. Systemically Important Banks (SIBs) in the CBN paper includes First Bank of Nigeria, United Bank for Africa, Zenith Bank, Access Bank, Ecobank Nigeria, Guaranty Trust Bank, Skye Bank (now Polaris Bank) and Diamond Bank. (now merged with Access Bank).

The sample size for the study, the Research Advisors (2006) table was used to determine the sample size.
n = sample size
Confidence level = 95%
N = Population size which is 6,975,037, that is, the total number of registered bank customers with BVN.
e = Acceptable error margin which is 3.5%

The sample size of 784 is obtained from the Research Advisors (2006). According to Israel (2013), there is a need to give allowance of 30% non-response rate to enhance the sample size. Therefore, the non-response rate allowance of 30% is 235, which will be added to statistically calculated sample size of 784, which brings the total sample size for the study to 1,019 banks in Lagos State.

The questionnaire used was validated and the reliability of the study variables were established. The reliability of the research instrument was ascertained based on the Cronbach Alpha measure of reliability which is greater than 0.7. In this study, information technology resources is the independent variable, bank efficiency the dependent variable while branch network is the moderating variable.

The study adopted 6 point Likert-type scale for response items. The response scale format of (1 point) strongly disagreed; (2 points) disagree; (3 points) partially disagreed; (4 points) partially agreed; (5 points) agreed; and (6 points) Strongly Agreed. The scaling is in ordinal form where 6 points implies highest score and 1 point implies lowest score

The Validity and Reliability Result

Table 3.1: KMO, Bartlett's Test of Sphericity and Reliability Result

Variables	Number of Questions	KMO	Bartlett's Test of Sphericity	Cronbach's Alpha	Average Variance Explained
Bank Efficiency	6	0.794	0.000	0.873	0.621
Information Technology Resources	6	0.767	0.000	0.827	0.543
Branch network	6	0.783	0.000	0.705	0.562

Source: Researchers' Computation (2019)

From Table 3.1, the results of Kaiser-Meyer-Olkin measures (KMO) for all the variables were found to be greater than 0.5 and not above 1, hence acceptable indices. On the other side, the Bartlett's Test of Sphericity had p-values = 0.000 for all the variables which are less than 0.05. From the results of Bartlett's Test of Sphericity, it can be concluded that the factors were valid and suitable as there would be high significant correlation between the variables in the study. Furthermore, the Average Variance Explained for all the variables were greater than 0.5, hence the construct validity of all variable involved in the study were therefore ascertained. The factor loadings of these items were used to establish the Average Variance Extracted (AVE). It was confirmed that information technology resources and efficiency questionnaire developed for this study is valid for decision makings.

In this study, the dependent variable was bank efficiency, the independent variable is information technology resources while branch network moderating variable. The model for the study was denoted as;

Y = Dependent Variable = Bank Efficiency (BE)

X = Independent Variable = Information Technology Service Management (ITSM)

Z = Moderating Variable = Branch Network (BN)

The model formulated for each of the hypothesis will be functionally written as:

Y = f(X)--- Hypothesis 1

Y=f(XZ)

$Y = \beta_0 + \beta_i X_i + \beta_z Z + \beta_{iz} XZ + \varepsilon_i$

$BE = \beta_0 + \beta_i ITSM_i + \beta_z BN + \beta_{iz} ITSM*BN_i + \varepsilon_i$---------------------------- Hypothesis 2

$\beta_{0 =}$ the constant term; β_i= the regression coefficient for ITEM; β_z= the regression coefficient for BN while β_{iz} is the regression coefficient for both ITSM and BN and lastly, ε_i= Error Term.

IV. Data Analysis anddiscussions

Table 3.2: Correlation Results for Information Technology Service Management (ITSM) and Bank Efficiency (BE)

Variables	β	t	Sig.	R^2	Adj. R^2	F(df)	ANOVA (Sig)
Constant	0.045	.055	.956	0.585	0.583	279.658(5,990)	0.001
Information Technology Resources	0.189	5.631	.000				

a. Dependent Variable: Bank Efficiency

b. Predictors: (Constant), Information Technology Resources,

Source: Researcher's Field Results (2020)

The analysis in Table 3.2 reveals the result of the multiple regression analysis on the effect of information technology resources, bank efficiency in Lagos State, Nigeria. The results presented in the table 3.2 indicated that information technology resources, explained 58.3% of the variances in efficiency as indicated by adjusted coefficient of determination (Adj. R^2) of 0.583. The results indicate that the model was statistically significant. This was supported by an F statistic of 279.658 and the reported p value (0.001) which is less than the conventional probability of 0.05 significance level F (5,990) = 279.658, p = 0.001). The result inferred that information technology resources is significant predictors of bank efficiency in Lagos State, Nigeria. Based on the F statistics and adjusted coefficient of determination with p-value less than conventional probability of 0.05, the null hypothesis (H_{01}) was hereby rejected.The result of this study have been supported by findings of various empirical previous studies

Table 3.3: Results of Regression of Branch Network on the Effect of Information Technology Service Management on Bank Efficiency

Variables	*B*	*T*	*Sig.*	R^2	*Adj.* R^2	ΔR^2	ΔF	*Sig. F Change*
(Constant)	2.273	.875	.382	.690	.689	.690	2204.229	.001
ITSM	.830	46.949	.000					
F(1,991) = 2204.229, p=0.001								
(Constant)	-4.153	-1.663	.097	.727	.727	.038	136.796	.001
ITSM	.682	32.679	.000					
Branch Network	0.244	11.696	.000					
F(2,990) = 1321.382, p=0.001								
(Constant)	-6.717	-2.180	0.029	.728	.727	.001	2.017	0.156
ITSM	0.694	30.883	0.000					
Branch Network	0.250	11.764	0.000					
ITSM *Brach Network	0.028	1.420	0.156					
F(3,989) = 882.498, p=0.001								

a. Dependent Variable: Bank Efficiency
b. Predictors: (Constant), Information Technology Service Management
c. Predictors: (Constant), Information Technology Service Management, Branch Network
d. Predictors: (Constant), Information Technology Service Management, Branch Network, Information Technology Service Management and Brach Network
Source: Researcher's Field Results (2020).

Table 3.3 presents hierarchical regression analysis to determine effect of branch network on the information technology service management and banks efficiency of banks in Lagos State. The results in Table 3.3 shows the R Squared for Model 1 in which information technology service management was regressed on bank efficiency was 0.689. This indicates that 68.9% of the variation in bank efficiency is explained by the information technology service management. Also, the ANOVA results indicate that Model 1 is statistically significant (F = 2204.229, p = 0.001). The standardized coefficients show that the effect of information technology service management on bank efficiency is positive and significant ($\beta = 0.830$, t = 46.949, p = 0.001).

Model 2 shows that when bank efficiency was regressed on information technology service management and branch network, R Squared increased to 0.727, indicating that 72.7% of the variation in bank efficiency is explained by variation in information technology resources and branch network. The model shows that the inclusion of branch network in the model explains additional 3.8% variation in bank efficiency (R Squared Change = 0.038). The additional variation in bank efficiency explained by branch network is significant (F Change = 136.796, p = 0.001). The ANOVA results indicate that Model 2 which includes information technology service management and bank network as predictor variables is significant (F = 1321. 382, p < 0.05). The standardized coefficients show that the effect of branch network on bank efficiency is positive and significant ($\beta = 0.244$, t = 11.696, p < 0.05).

In Model 3, the interaction term (information technology service management * branch network) was introduced. The R Squared remained constant at 0.727, indicating that same 72.7% of the variation in bank efficiency as reported in model 2 is explained by the variations in information technology service management, branch network and the interaction term. Model 3 also shows that change in R Squared is 0.001, indicating that approximately no variations in bank efficiency is explained by the interaction between information technology service management * branch network. The result indicates that branch network did not significantly moderate the effect of information technology resources on banks efficiency of banks in Lagos State ($\Delta F = 2.017$, p = 0.156). The F statistics results show that the model which include information technology resources, bank network and the interaction term as predictor variables is however significant (882.498, p =0.001). The standardized coefficients show that the effect of interaction term on bank efficiency is positive but was statistically insignificant ($\beta = 0.028$, t = 1.420, p = 0.156). This implies that for every unit change in interaction term, bank efficiency would be unaffected by 0.028 units. The result revealed that branch network did not significantly moderate the effect of information technology service management on banks efficiency of in Lagos State. The results indicate that the branch network has no significant influence on the effect of information

technology resources on banks efficiency (β = 0.028, t = 1.420, ΔR^2 = 0.001, ΔF= 2.017, p = 0.156). Based on these findings, the null hypothesis two (H_{02}) cannot be rejected.

The results of hierarchical multiple regression analysis for the effect of branch network on information technology resources and bank efficiency shows the absence of a moderation effect. This result implies that branch network does not moderate information technology service management andbank efficiency in Lagos State, Nigeria.

The submissions of this study concerning the absence of a moderation effect of Branch network on the relationship between information technology service management and bank efficiency in Lagos State, found contrary submission in prior empirical studies. In an empirical survey conducted by Adelowotan and Oshadare (2016), that the branches in form of urban, rural and foreign have significant moderating influence on the service management and bank efficiency of Nigerian banks. The study further suggested that branching activities should be a major work and decision of the banks so as to bring more customers to the bank who will now use the various electronic platforms for service installed by the banks. Despite technological innovations that might have been expected to reduce banking institutions' reliance on bricks-and-mortar branches to deliver financial services, the number of full-service bank and thrift branches has increased steadily in United States (Beverly 2005). The study further provided that there appears to be little relationship between branch network size and overall firm efficiency. While several studies have considered the impact of the expansion of large, multi-market banking organizations into local markets, relatively little analysis has taken a direct look at the influence of increasing branch network using recent branching data. The result does not support previous studies The methodology used by the previous studies may have accounted for the different in results. Financial ratios and data envelopment analysis approach were used by the previous researchers.

V. Conclusion And Recommendations

Based on the empirical findings, this study concluded that there was a statistically significant effect of information technology service management on bank efficiency in Lagos State, Nigeria. In addition, branch network donot significantly moderate the effect of information technology service management onbanks efficiency in Lagos State, Nigeria. Finally, considering the findings, the study recommended that due to competitive pressure banks face worldwide as a result of global financial structure and deregulation of financial services and increasing use of information technology resources, banks should strategically focus on upscaling their investment in information technology resources to align with their products/services with the needs of both existing and potential customers to achieve efficiency. The essence is to become globally competitive.The management of banks should embrace the adoption of the resource-based view (RBV) to enhance the banks' capacity to support its innovative activities in order to accomplish efficiency. The understanding of banks going digital for better quality services, competitiveness, cost reduction and flexibility is a welcome development in line with this study as branch network do not moderate the effect of information technology service management onbankefficiency. Therefore, this study recommends that the banking industry should continue to embrace digital space in order to achieve overall firm efficiency.

References

[1].   Abdelkader, I. B., &Mansouri, F. (2013). Competitive conditions of the Tunisian banking industry: An application of the Panzar–Rosse model. African Development Review, 25(4), 526–536.
[2].   Adelowotan, M., &Oshadare, S. (2016). Branch network growth and banks performance in Nigeria (1981-2013).Research journal of finance and accounting, 3 (7), 19- 48.
[3].   Akande, J, O. (2018). Do competition, regulation and stability matter for efficiency in Sub-Saharan African banking sectors? Journal of cogent economics & finance, 2(1), 27 - 41
[4].   Amit, R, &Schoemaker, P. J. (1993). Strategic assets and organisational rent. Strategic ManagementJournal14(1): 33–46.
[5].   Ariss, R. T. (2015). On the implications of market power in banking: Evidence from developing countries. Journal of Banking & Finance, 34(4), 765–775.
[6].   Asikhia, O. U. (2010). Customer orientation and firm performance among Nigerian small and medium scale businesses. International Journal of Marketing Studies 2(1), 197- 212
[7].   Asmild, M., &Minyan, Z. (2016). Controlling for the use of extreme weights in bank efficiency assessments during the financial crisis. European Journal of Operational Research, 2(51), 999–1015
[8].   Barney, J. B. (1986). Firm resources and sustained competitive advantage. Journal of Management 17(1), 99–120.
[9].   Barney, J.B. (1991). Testing resource-based theory. InResearch Methodology in Strategy andManagement, 2(3), 1–13.
[10].   Battaglia F., Farina V., Fiordelisi F., Ricci O. (2010). The efficiency of cooperative banks: The impact of environmental economic conditions, Applied Financial Economics, 2(1)7, 1363- 1376
[11].   Baysinger, B.D., &Hoskisson R.E., (1989). Diversification strategy and R & D intensity in large multi-product firms. Academy of Management Journal, 32, 310-332
[12].   Berger, A.N. (1993). The efficiency of financial institutions‖. Journal of Banking and Finance, 3(1), 17-32
[13].   Beverly, H. (2005). The impact of network size on bank branch performance.Federal Reserve Bank of New York Staff Reports, (2)11, 23-47.
[14].   Bos, J.W.B., & Kool, C.J.M. (2006). Bank efficiency: The role of bank strategy and local market conditions. Journal of Banking and Finance, 3(1), 53-74
[15].   Carroll, G. R. (1993). A sociological view on why firms differ. Strategic Management Journal, 1(4), 237-249
[16].   David, C. (2012). Key element guide ITIL service strategy. Stationery Office, 0113313659.

[17]. Destefanis, S., Christian, B., &Lubrano., L. (2014). Financial Development and Local Growth: Evidence from Highly Disaggregated Italian Data. Applied Financial Economics, 2(4), 1605–1615.

[18]. Diallo, Boubacar. (2018). Bank efficiency and industry growth during financial crises. Economic Modelling, 6(8), 11–22.

[19]. Dierickx, I., & Cool, K. (1989). Asset stock accumulation and sustainability of competitive advantage. Management Science 35(12), 1504–1510.

[20]. Fagge, A. I. (2019). Comparative Analysis of Technical, Allocative and Cost Efficiency of Nigerian Deposit Money Banks. Central Bank of NigeriaEconomic and Financial Review, 57(1), 47- 60

[21]. Fagge, A. I., Hogan E. B., &Odey, L. I. (2012). How far has banks' efficiency changed overtime in Nigeria? An empirical investigation. CBN Economic and Financial Review, 50(3), 13- 30.

[22]. Farrell, M. J. (1957). The measurement of production efficiency. Journal of the Royal Statistical Society Series, 1(2), 253-281

[23]. Francis, P. (2013). Impact of information technology on accounting systems. Asia-Pacific Journal of Multimedia Services Convergent with Art, Humanities, And Sociology, 3(2), 93-106.

[24]. Gatignon, H., &Xuereb, J.M. (1997). Strategic orientation of the firm and new product performance. Journal of Marketing Research, 3(4), 77-90

[25]. Gontur, S., Hassan, S., & Arin, Y. (2017). Influence of information communication technology in building customer loyalty among deposit money banks in Jos Metropolis, North Central Nigeria. International Journal of Economics and Business Management, (3)7, 38-54

[26]. Harris, R., & Trainor, M. (1995). Innovations and R&D in Northern Ireland manufacturing: a Schumpeterian approach. Regional Studies, 29 (7), 593-604

[27]. Hassan, A., Ali, R., & Muhammad, A. (2011). A Financial Performance Comparison of Public Vs Private Banks: The Case of Commercial Banking Sector of Pakistan. International Journal of Business and Social Science, 2(11).

[28]. Helfat, C. E. (1997). Know-how and asset complementarity and dynamic capability accumulation: The case of R&D. Strategic management journal, 2(1)339-360.

[29]. Iden, J. &Eikebrokk, T.R. (2013). Implementing IT service management: A systematic literature review. International Journal of Information Management, 33 (3), 512– 523.

[30]. Information technology usage: A theoretical model and longitudinal test. MIS Quarterly, 28(2), 229-254.

[31]. International Business Machine Research (2012). Multiple version database concurrency control system, 6(3), 44-53

[32]. Kopia, J. (2019). Effective implementation of management systems. Management system as a success factor for the efficeiency of organization. SpingerGlabler. Dissertation, the Burcharest University of Economics Studies, Burcharest, Romonia.

[33]. KPMG (2017). Baking industry customer satisfaction survey (BICSS), Issue 11.

[34]. Lee, K. B., & Wong, V. (2011). Identifying the moderating influences of external environments on new product development process. Technovation, 31(10), 598-612.

[35]. Levine, R., &Renelt, D. (2012). A sensitivity analysis of cross- country growth regressions. The America Economic Review, 82(4), 942-953

[36]. Liyanage S., Greenfield P.F., & Don. R., (1999). Towards a fourth generation of R&D management model-research networks in knowledge management, International Journal of Technology Management, 18, 372-393

[37]. Maijoor S., Van Witteloostuijn A., (1996). An empirical test of the resource=based theory: strategic regulation in the Dutch audit industry. Strategic Management Journal, 1(7), 549-569

[38]. Maria-Cruz, V., Elena., G., & Miguel-Angel, S. (2012). Applying an ontology approach to IT service management for business-IT integration. Knowledge-Based Systems 2(8), 76–87

[39]. Meehyang, C., Han-Byeol, J., Yi-Mei, L., &Daecheol, K. (2017). The relationship between the efficiency, service quality and customer satisfaction for state-owned commercial banks in China. Journal of Hospitality, Tourism, and Sustainability, 1(2), 44-51.

[40]. Mitchell, V.L., &Zmud R.W. (1999). The effects of coupling IT and work process strategies in redesign projects, Organization Science, 1(1), 424-438

[41]. Mlachila, M., Park, S. G., &Yabara, M. (2013). Banking in Sub-Saharan Africa: The macroeconomic contex. European Investment Bank (EIB)

[42]. Mora, M., Gelman, O., O'Connor, R., Gomez, J., &Raisinghani, M. (2015). An Extensive Review of IT Service Design in Seven International ITSM Processes Frameworks. International Journal of Information Technologies and Systems Approach, 8(1), 69-90

[43]. Moretti, A., Vaia, G., &Zirpoli, F. (2013). The Role of Organizational Standards in IT Outsourcing Relations. Advances in Global sourcing. Models, Governance and Relationships, 35 -53

[44]. Muhammad, S., Masood, H., & Ume, H. (2018). Impact of self-service technology (SST) service quality on customer loyalty and behavioral intention: The mediating role of customer satisfaction. Journal of cogent business & management, (2), 5-12

[45]. Muraliraj, J., Zailani, S., Kuppusamy, S. &Santha, C. (2018). Annotated methodological reviewof Lean Six Sigma. International Journal of Lean Six Sigma, 9(1), 2-49.

[46]. Nyong, M, O. (2017). Relative efficiency of commercial banks in Nigeria: A nonparametric mathematical optimisation analysis, Noble International Journal of Economics and Financial Research, 2(2), 27-49.

[47]. Odia, I., Eke, H., &Kalu, S. (2017). Emerging service delivery practices and profitability of commercial banks in Port Harcourt. International Journal of Advanced Academic Research Social & Management Sciences, 6(3), 39-54

[48]. Ololade, B., &Ogbeide, S. (2017). E- Banking in Nigeria: Issues and challenges. Research Journal of Finance and Accounting, (8)2, 6-13

[49]. Onobrakpeya, A. S. (2018). Enhancing customer retention with interpersonal relationship strategies in the Nigerian deposit money banks. Journal of Management Sciences and Technology, 31(2), 127-145.

[50]. Parida, A., Kumar, U., Galar, D., &Stenström, C. (2015). Performance measurement and management for maintenance: a literature review. Journal of Quality in Maintenance Engineering, 21(1), 2-33

[51]. Peteraf, M A. (1993). The cornerstones of competitive advantage: a resource-based view. Strategic ManagementJournal, 14(3), 179–191.

[52]. Potgieter, B., Botha, J., & Lew, C. (2015). Evidence that use of the ITIL framework is effectiv', Proceedings of the 18th Annual Conference of the National Advisory Committee on Computing Qualifications, Tauranga, New Zealand, July 10-13, 160-167.

[53]. Rasa, G., &Banu, W. (2019). The Roles and Responsibilities of ITIL Release Management Process. EasyChair preprints publication, 1561.

[54]. Song, X.M., & Parry, M.E. (1997). The determinants of Japanese new product success. Journal of Marketing Research, 3(4), 64-76

[55]. Sulieman, I, &Ahlam, J. (2017). The impact of electronic banking services on the customers loyalty of commercial banks in Jordan. Jordan International Journal of Academic Research in Accounting, Finance and Management Sciences, 3(3), 17 -31.

[56]. Suzuki, Y., &Sastrosuwito, S. (2011). Efficiency and productivity change of the Indonesian Commercial Banks. 011 International Conference on Economics, Trade and Development IPEDR vol.7.IACSIT Press, Singapore

[57]. Syed, S. H. (2018). Performance measurement: How far has traveled and where it is headed. International Journal of Economics, Commerce and Management. 5(4), 238-251

[58]. Teece, D., Pisano, G., (1994). The dynamic capabilities of firms: an introduction, Industrial and Corporate Change, 3(1), 537-556

[59]. Wernerfelt, B. (1989). From critical resources to corporate strategy. Journal of GeneralManagement, 1(1), 4–12.

[60]. World Bank (2018). South Africa Economic update. Jobs and inequality. Edition 11

[61]. World Bank (2019). Nigeria biannual economic update. Investing in human capital for Nigeria's future.