

# ***International Journal of Social Sciences***

## ***Uluslararası Sosyal Bilimler Dergisi***

[www.sobider.net](http://www.sobider.net)

ISSN: 2548-0685

### **Automated Teller Machine and Performance of Deposit Money Banks in Nigeria**

**Victor Inim Edet, Ph.D.**

Department of Accounting and Finance

Nile University of Nigeria

victor.inim@nileuniversity.edu.ng

**Opusunju, Michael Isaac, Ph.D.**

Department of Business Administration

Nasarawa State University, Keffi

opusunjumike@gmail.com

#### **Abstract**

The study examines the effect of ATM on the performance of deposit money banks in Nigeria for the period of 7 years from 2012 to 2018. The study adopted ex-post research design. The population of the study is all the deposit money banks in Nigeria. The study collected data from the Central Bank of Nigeria statistical bulletin. The study adopted pre-test analysis of correlation and unit root test using Augmented Dickey-Fuller (ADF) test. After analyzing the unit root test, regression was used. The study found that there was a positive and insignificant effect of ATM on performance of deposit money banks in Nigeria. Other findings were that volume of transaction of ATM has positive and insignificant effect on the return on asset of deposit money banks in Nigeria while value of transaction of ATM also has positive and insignificant effect on return on asset of deposit money banks in Nigeria. The study recommended that ATM machines should be re-strategies by deposit money banks in Nigeria and they should careful increase the volume of transaction by ensuring that network is properly maintain. They should use ATM network that is very good to satisfy customers during weekends. They should provide more ATM and encourage customers to use ATM and try to reduce the problem of cash jam and lack of cash dispense.

**Keywords:** ATM, volume of transaction in ATM, value of transaction in ATM, Performance and return on asset.

## **Introduction**

Automated Teller Machine is a world-wide element that makes it easiest for banks to transact business with customers without considering frequent for monetary transaction(s). There is a wide range of banks providing services of ATM by installation of ATM machines not only in their premises but off-premises-public locations. The Automated Teller Machine (ATM) service qualities have help increase the performance of deposit money banks. The ATM in terms of volume of transaction and value of transaction ensure that performance in terms of volume of transaction and value of transaction increase daily, weekly and monthly. ATM machine provide customers with ease of use, good appearance of the machine and there is also effective security of the ATM machine and accuracy of the machine which leads to increase in performance of deposit money banks in Nigeria.

Over the years, the deposit money banks in Nigeria used ATM machine to increase performance in terms of return on asset. The ATM volume of transaction and value of transaction are obtained by deposit money banks but these measures of ATM failed to increase the performance of deposit money banks making so many deposit money banks to fail or merge with other banks in Nigeria.

Previous studies such as Jegede (2014); Jean (2018) and Anthony, Florence and Agnes (2017) studied the variables but none of them used volume of ATM and value of ATM to measured ATM. None of the studied reviewed used a period that included 2018.

The main objective of this study is to examine the effect of ATM on the performance of deposit money banks in Nigeria and the specific objectives of this study is to determine the effect of volume of transaction in ATM on the return on asset of deposit money banks in Nigeria and to evaluate the effect of value of transaction in ATM on the return on asset of deposit money banks in Nigeria.

The scope of this study is restricted to the effect of ATM on the performance of deposit money banks in Nigeria. The period of study is 7 years from 2012 - 2018. This period is chosen because

it involved the time Nigerian deeply used ATM and policies from Central of Nigeria regarding the charges in the use of ATM by customers were done mostly in this period.

The following hypotheses are stated in a null form: There are

H<sub>01</sub>: There is no significant effect of volume of transaction in ATM on the return on asset of deposit money banks in Nigeria

H<sub>02</sub>: There is no significant effect of value of transaction in ATM on the return on asset of deposit money banks in Nigeria

### **Concept of Automated Teller Machine**

Automated Teller Machine (ATM), also known as a automated banking machine (ABM) or Cash Machine and by several other names, is a computerized telecommunications device that provides the clients of a financial institution with access to financial transactions in a public space without the need for a cashier, human clerk or bank teller (Peter & Emenike, 2016). Automated Teller Machine (ATM) refers to a machine that acts as a bank teller by receiving and issuing money to and from the ATM account holders/users (Singh, 2009). ATM means neither “avoids travelling with money” nor “any time money,” but certainly implies both (Singh & Komal, 2009). ATMs can allow a customer to make cash withdrawals, make deposits and can also issue min statements. ATMs also allow loading of airtime payment of school fees and bills (Griffines 2002). ATM is a computerized communication device that provides services to the customer of a financial institution in a public place without the help of the human clerk or a bank teller. It is connected to a computer terminal, record keeping system and cash vault in one unit that permits a customer to enter personal identification number(PIN) or by punching a special code number into the computer terminal that is linked to the bank’s computerized records (Rose, 1999). The term ATM is a cash

withdraw, cash deposit, cash transfer, payment system which is generally designed to aid local and international financial transaction at every period, yearly, monthly, weekly, daily and hourly.

### **Concept of Bank Performance**

Bank performance is define and addressed as return on equity (ROE), return on assets (ROA) or the net interest margin (NIM) and is a product of external and internal determinants (Nassreddine, Fatma & Jarboui 2013). A bank's performance can also be shown on variables that are included productivity, customer satisfaction, growth or returns. Bank performance is a process of profit maximization or returns, return on assets and shareholders return) that defined bank's efficiency (Mihaela, 2012). But Barbosa and Louri (2005) noted that bank performance is return on investment, residual income, earnings per share, dividend yield, price/earnings ratio, growth in sales and market capitalisation. Also, performance of banks are in two forms which are financial performance and non-financial (Akyuz & Opusunju, 2019). In this study, bank performance is defined the ability of banks to achieve pre- determined goals and objectives when assessing it using return on asset.

The term return on asset is the measure of bank effectiveness in generating profit by expending it assets (Prastowo, 2002). To him, it is ratio which bank used as indicating good or bad investment in asset and profit. Brigham and Huston (2001) define return on asset as a mathematical tool used in understanding the rate of return on total assets reducing interest, expense and taxes from the banks day to day running of the business. Performance is defined as return or increase in asset of the firm use in pursuing their goals and objectives. It is a process of meeting organizational goals and objectives.

### **Empirical Studies**

Jegade (2014) investigated the variables using Nigerian banks. He used questionnaire to collect data and convenience sample of 125 employees of the selected banks in Lagos State using inters

witch network. Data were analysis with Chi-square with the aid of software package for social science version 20.00. He found that deployment of ATMs terminals contribute to performance of Nigerian banks.

Jean (2018) studied the variables using commercial bank and a period of 6 years from 2010 to 2016 was used to assess the variables in bank of Kigali. He uses quantitative and qualitative Methods of data collection. 334121 was the population of ATM users and 200 respondents were the sample size. He found that there was a significant relationship between ATM and profitability at bank of Kigali.

Anthony, Florence and Agnes (2018) addressed the variables in commercial banks in Kenya for the last 10 years. They used descriptive cross-sectional design. He used 41 commercial banks in Kenya. He used secondary data and primary data. Data were analysed using descriptive statistics Regression analysis and Pearson's Product Moment Correlation. They found that there is a statistically significant effect of the variables.

### **Technology Acceptance Model (TAM)**

This theory was developed by Davis in 1989 and he explained the determinants of user acceptance of a wide range of end-user computing technologies. He points out that perceived ease of use and perceived usefulness affect the intention to use the machine. Perceived ease of use also affects the perceived usefulness of the machine. The intention to use affects the real usage behaviour. TAM has been tested and extended by many researchers, including Davis himself. The theory helped to explain and predict user behaviour of information technology (Legris, Ingham, & Collerette, 2003) and why a user accepts or rejects information technology by adapting and also provides a basis with which one traces how external variables influence belief, attitude, and intention to use. According to TAM, one's actual use of a technology system is influenced directly or indirectly by the user's behavioral intentions, attitude, perceived usefulness of the system, and perceived ease of the system.

## **Methodology**

The study adopted ex-post research design. The population of the study is all the deposit money banks in Nigeria. According to CBN report, 2019, there is 27 deposit money banks in Nigeria. However, the population of this study is 27 deposit money banks in Nigeria and this is also used as the sample size in this study. The study collected data from the Central Bank of Nigeria statistical bulletin and data collected from the CBN is unique and reflect the position of the bank involvement in the variables used in this study. The study adopted pre-test analysis of correlation and unit root test using Augmented Dickey- Fuller (ADF) test. After analyzing the unit root test, a decision to used regression was determined the when all the variable has mixed order of integration. The theoretical model model is expressed as:

$$Y = f(X) \dots \dots \dots (1)$$

Where:

Y= dependent variable

X= Independent variable

The statistical expression of the model can be stated as:

$$ROA_t = b_0 + b_1 VOATM_t + b_2 VAATM_t + u_t \dots \dots \dots (2)$$

Where:  $b_0$ = Intercept of the model;  $b_1$ = Coefficient of volume of transaction in ATM for deposit money Banks in Nigeria;  $b_2$ = Coefficient of value of transaction in ATM for deposit money Banks in Nigeria  $u$ = Error term;  $t$ =time trend. The data collected from the Central Bank of Nigeria statistical package is logged to ensure that all the variables have the same level of measurement as indicated in question 3 below.

$$IROA_t = b_0 + b_1 LVOATM_t + b_1 LVATM_t + u_t \dots \dots \dots (3)$$

Where, L is defined as natural logarithms of the variable in question. IROA is logged of return on asset.

**Result and Discussion**

**Table 1**  
**Descriptive Statistics**

|              | ROA      | VOATM    | VAATM    |
|--------------|----------|----------|----------|
| Mean         | 2.21E+09 | 5.39E+08 | 4.34E+12 |
| Median       | 4454647. | 4.34E+08 | 3.97E+12 |
| Maximum      | 7.93E+09 | 8.76E+08 | 6.48E+12 |
| Minimum      | 1424592. | 2.95E+08 | 1.98E+12 |
| Std. Dev.    | 3.55E+09 | 2.24E+08 | 1.72E+12 |
| Skewness     | 0.960212 | 0.540918 | 0.088342 |
| Kurtosis     | 1.983958 | 1.724638 | 1.695297 |
| Jarque-Bera  | 1.376773 | 0.815768 | 0.505594 |
| Probability  | 0.502386 | 0.665056 | 0.776625 |
| Sum          | 1.54E+10 | 3.77E+09 | 3.04E+13 |
| Sum Sq. Dev. | 7.56E+19 | 3.01E+17 | 1.78E+25 |
| Observations | 7        | 7        | 7        |

The above table stated the mean value of return on asset, volume of transaction in ATM and value of transaction in ATM among deposit Money Banks in Nigeria. The table stated that ROA has a mean value of 2.21, VOATM has a mean value of 5.39 and VAATM has a mean value of 4.34. The table also indicates data used in the study are normally distributed since the Jargue-Bera probabilities are less than 5%. However, even with the normality of the data, the data is logged since the variables have different level of measurement.

**Figure 1: Trend analysis**

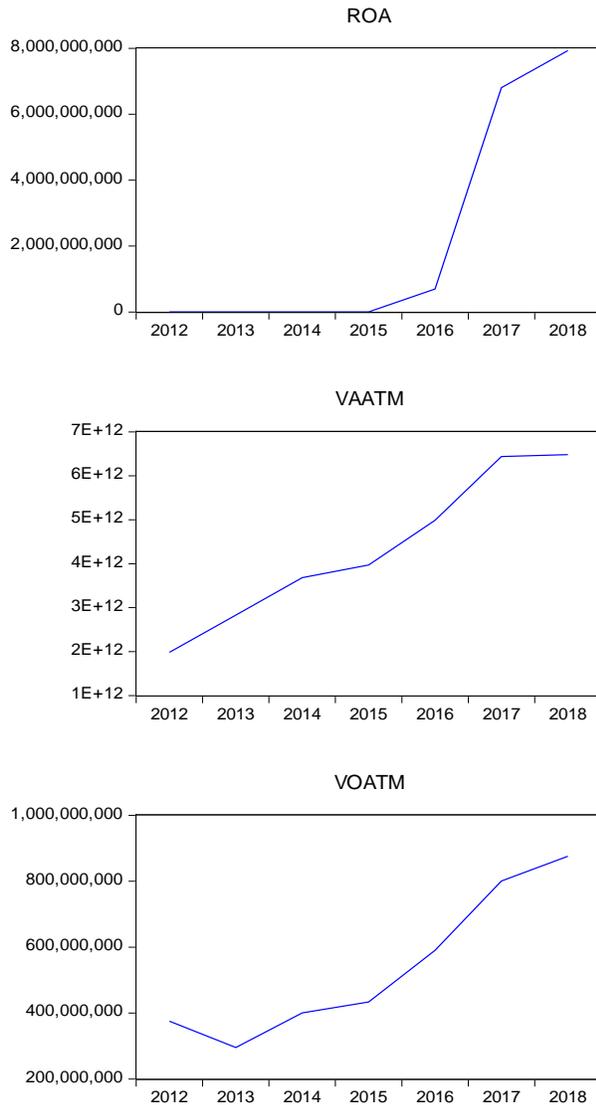


Figure 1 indicate that the return on asset of deposit money banks in Nigeria grow at a very little rate in 2012, 2013 and 2014. It was in 2015 that the deposit money Banks in Nigeria started to increase their return on asset but at very slow rate. In 2016, the return on asset started to increase drastically. It was in 2017 that the rate of increased of ROA in deposit money banks growing and eventually stop making a unique way for the deposit money banks return on asset to grow in 2018. The 2018 recorded very high increase in return on asset. The value of transaction in ATM in the deposit money banks in Nigeria increase at an increasing rate from 2013 to 2014. It was in 2015 that the value of transactions of ATM decreased but eventually increases in 2015 with an increasing rate. The 2016 and 2017 recorded an increase in the value of ATM transactions in Nigeria. The 2018 had steady increase in the value of ATM transactions in Nigeria. There was downward increase in the volume of ATM transaction in Nigeria. 2012 recorded increase in the volume of ATM transaction but instead of steady increase, 2013 recorded decrease in the volume of ATM. The 2014 recorded increase in the VOATM but a little decrease in the VOATM in 2015. The 2016 and 2017 recorded high increase but 2018 had steady increase in the volume of ATM in Nigeria

| <b>Table 2:</b>       |                       |               |                                |                      |           |
|-----------------------|-----------------------|---------------|--------------------------------|----------------------|-----------|
| <b>Unit Root Test</b> |                       |               |                                |                      |           |
| Variable              | Level of stationarity | ADF-statistic | Significant values 1%, 5%, 10% | Order of Integration | Prob.(5%) |
| ROA                   | constant              | 7.33          | -3.58, -2.92, -2.60            | 1(1)                 | 0.04*     |
| VOATM                 | constant              | 5.89          | -3.58, -2.92,-2.60             | 1(0)                 | 0.002*    |
| VAATM                 | constant              | 7.52          | -3.58, -2.92, -2.60            | 1(1)                 | 0.003*    |

Source: Author’s Computation using E-view 9.00

Probability values are indicated by \*

Table 2 indicate the LROA, LVOATM and LVAATM are stationary at level and stationary at first different but not stationary at second difference but due to the fact that the values of its ADF test statistics at first differences are greater than their corresponding critical values at 5% level of significance. Also, the variables are integrated of order one 1(1) and order 1(0) which signify that regression model is more suitable and appropriate for the study.

**Table 3: Regression result**

Dependent Variable: LROA

Method: Least Squares

Date: 02/04/20 Time: 06:06

Sample: 2012 2018

Included observations: 7

| Variable           | Coefficient | Std. Error         | t-Statistic | Prob.  |
|--------------------|-------------|--------------------|-------------|--------|
| C                  | -188.2903   | 36.53080           | -5.154290   | 0.0067 |
| LVOATM             | 7.008919    | 2.726072           | 2.571069    | 0.0619 |
| LVAATM             | 2.265790    | 2.559035           | 0.885408    | 0.4260 |
| R-squared          | 0.928426    | Mean dependent var | 17.87970    |        |
| Adjusted R-squared | 0.892639    | S.D. dependent var | 3.885735    |        |

|                    |           |                       |          |
|--------------------|-----------|-----------------------|----------|
| S.E. of regression | 1.273199  | Akaike info criterion | 3.618469 |
| Sum squared resid  | 6.484139  | Schwarz criterion     | 3.595287 |
| Log likelihood     | -9.664641 | Hannan-Quinn criter.  | 3.331951 |
| F-statistic        | 25.94315  | Durbin-Watson stat    | 2.315487 |
| Prob(F-statistic)  | 0.005123  |                       |          |

---

---

Source: E-view, version 9.00

Decision rule: 5%

The regression result shows that the model is fit for the study since the f-statistics is significant at 5% level of significant. The result also shows that volume of transaction of ATM has positive and insignificant effect on the return on asset of deposit money banks in Nigeria while value of transaction of ATM also has positive and insignificant effect on return on asset of deposit money banks in Nigeria. These effects are insignificant since the P-values are less than 5%. Thus, we can reject the alternative hypotheses and conclude that volume of transaction of ATM has a positive and insignificant effect on the return on asset of deposit money banks in Nigeria. Also, value of transaction of ATM has a positive and insignificant effect on the return on asset of deposit money banks in Nigeria.

The  $R^2 = 0.92$  indicates that only 92% of variation on ATM can be used to explain by performance of Deposit Money Banks in Nigeria but 8% can be explained by other factors not noted in the regression model which is refer to as error term.

### **Discussion of Finding**

The study found out that there was a positive and insignificant effect of ATM on performance of deposit money banks in Nigeria. Other findings were that volume of transaction of ATM has positive and insignificant effect on the return on asset of deposit money banks in Nigeria while value of transaction of ATM also has positive and insignificant effect on return on asset of deposit money banks in Nigeria. The study is not in line with the findings Jedede (2014); Jean (2018) and

Anthony, Florence and Agnes (2018) who found positive and significant effect relationship ATM and performance but this study found a different finding which is not in line with the empirical studies in this study. The study is also in line with the TAM theory which states that one's actual use of a technology system is influenced directly or indirectly by the user's behavioral intentions, attitude, perceived usefulness of the system, and perceived ease of the system. The use of ATM in Nigeria is positive but has significant effect to performance since majority of deposit money banks in Nigeria use ATM to replace with staff. The ATM machines can be malfunction during weak ends. The performance of deposit money banks is reduced since customers some customers no longer put their money in the bank for uninterrupted or lack of cash dispense problem at the deposit money banks ATM in Nigeria.

### **Conclusion and Recommendations**

Statistical results shown there was a positive and insignificant effect of ATM on performance of deposit money banks in Nigeria. Other conclusions were that volume of transaction of ATM has positive and insignificant effect on the return on asset of deposit money banks in Nigeria while value of transaction of ATM also has positive and insignificant effect on return on asset of deposit money banks in Nigeria.

The study recommended that

1. The ATM machines should be re-strategies by deposit money banks in Nigeria and they should careful increase the volume of transaction by ensuring that network is properly maintain. They should use ATM network that is very good to satisfy customers during weekends. They should provide more ATM and encourage customers to use ATM and try to reduce the problem of cash jam and lack of cash dispense.
2. The Deposit Money Banks in Nigeria should try to ensure that ATM machine pay customers what they want without limiting the require amount of cash that the customers can withdraw per transaction. They customer should select the amount he/she want to withdraw so that customers can adequate patronize the deposit money banks in Nigeria.

## References

- Anthony, M., Florence, S. M. & Agnes, U. (2018). The relationship between atm banking and financial deepening of commercial banks in Kenya. *International Journal of Economics, Commerce and Management*, 5(12) 44-62
- Akyuz, M. & Opusunju, M. I. (2019). Effect of Globalization on the Performance of Small and Medium Scale Enterprises in Nigeria. *American Journal of Environmental and Resource Economics*, 4(4) 125-131
- Barbosa, N. & Loury, H. (2005), Corporate performance: Does ownership matter? a comparison of foreign- and domestic-owned firms in greece and portugal. *Review of Industrial Organization*, 27(1), 73-102
- Brigham, E. F. & Huston, J. F. (2001). *Fundamentals of Financial Management*, Linguist Ali Akbar Yulianto, Book one, ten edition. Jakarta: PT. Salemba Empat
- Davis, F. D. (1989) Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*. 13( 3)
- Griffins, M. (2002). Adding more services to ATMs to suit customers. *The New Vision*, 27 (12),4.
- Jean, B. H.(2018). The Automated Teller Machines and Profitability of Commercial Banks in Rwanda. *Global Journal of Management and Business Research: C Finance*, 18(1)
- Jegede, C.A. (2014). Effects of Automated Teller Machine on the Performance of Nigerian Banks.” *American Journal of Applied Mathematics and Statistics* 2, no. 1 (2014): 40-46.
- Legris, P., Ingham, J., & Colletette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & Management*, 40, 191-204

*Automated Teller Machine and Performance of Deposit Money Banks in Nigeria*

- Nassreddine, G., Fatma, S. & Jarboui, A. (2013). Determinants of banks performance: viewing test by cognitive mapping technique (case of Biat). *International Journal of Contemporary Economics and Administrative Sciences*, 3(1) 22-46
- Mihaela, G. (2012). ATM and bank performance in Romanian. *International Journal of Business and Banking*, 2(3) 33-49
- Peter, I. A. & Emenike, K. O.(2016). Impact of automated teller machine on banking services delivery in Nigeria: a stakeholder analysis. *Cad. Ed. Tec. Soc., Inhumas*, 9(1) 64-72
- Prastowo, D. (2002). Analisis Laporan Keuangan : Konsep dan Aplikasi. YKPN : Yogyakarta
- Rose, P. S., (1999) "Commercial Bank Management"(4th Ed), Irwin/McGraw-Hill, Boston, USA.
- Singh S, Komal M (2009). Impact of ATM on customer satisfaction (A comparative study of SBI, ICICI & HDFC bank). *Business Intelligence Journal* 2(2):276-287.
- Singh, S. (2009). Impact of ATM on customer satisfaction. A comparative study of SBI, ICICI & HDFC banks. *Business Intelligence Journal* , 2(1)765-861