International Information and Engineering Technology Association
Advancing the World of Information and Engineering

Revue d'Intelligence Artificielle
Vol. 38, No. 1, February, 2024, pp. 323-330
Journal homepage: http://iieta.org/journals/ria

Assessing the Impact of ATM and POS Transactions on Currency Circulation in Nigeria: A Comparison of Artificial Neural Network and Linear Regression Models

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https://doi.org/10.18280/ria.380134

Received: 13 April 2023
Revised: 15 October 2023
Accepted: 8 December 2023
Available online: 29 February 2024

Keywords:
Artificial Neural Network, multiple linear regression, ATM, POS, currency

ABSTRACT

This work is aimed at assessing the impact of ATM and POS transactions on currency in circulation in Nigeria via the comparison of the Artificial Neural Network and Linear Regression models. The Pearson product moment correlation coefficient was used to assess the degree of relationship between currency in circulation and ATM transactions, currency in circulation and POS transactions, ATM transactions and POS transactions. In addition to this, a multiple linear regression model was also fitted on the data to in order to assess the impact of currency in circulation on ATM transactions and POS transactions. From the results obtained, it was observed that POS transactions have a significant impact on the amount of currency in circulation compared to ATM transactions because the value of POS transactions has a P-value of 1.5542E-13 which is significant at 0.05. This was further studied using the Artificial Neural Network (ANN). The Multilayer preceptor of ANN was adopted, with 70 percent of the data initially subjected to training and 30 percent for validity. Thereafter, the amount of training data was increased to 61.4% and testing data was increased to 38.6% and it was observed that there was corresponding increase in the R-square from 0.809 to 0.839. This shows that the R-square of the ANN can be improved by increasing the amount of training data and testing data.

1. INTRODUCTION

In the rapidly evolving landscape of financial technology, the assessment of the impact of ATM (Automated Teller Machine) and POS (Point of Sale) transactions on currency circulation in Nigeria has become a topic of paramount importance. POS (Point of Sales) is a payment method that allows individuals to make transactions like fund transfers and cash withdrawals without visiting banking halls or ATMs. However, charges apply depending on transaction volume. Nigeria, as one of the largest economies in Africa, has experienced a significant surge in the use of electronic payment methods, such as ATMs and POS terminals, in recent years [1, 2]. These technologies have transformed the way people conduct transactions, leading to a shift away from traditional cash-based transactions [3]. This transformation raises essential questions about its effects on the circulation of physical currency within the country.

ATMs and POS terminals have revolutionized the accessibility and convenience of financial transactions, making them a pivotal component of the modern banking and retail ecosystem [4]. ATM machines enable individuals to withdraw cash, check account balances, and make deposits at any time of day or night, reducing the need for physical bank visits [1]. On the other hand, POS terminals facilitate cashless transactions at various points of sale, further encouraging the use of digital payments [2]. These technological advancements not only enhance financial inclusion but also have the potential to influence the circulation of banknotes within the economy.

To decrease the amount of cash in circulation in Nigeria and promote the use of electronic-based systems or e-payment systems for transactions, the Central Bank of Nigeria (CBN) introduced the cashless policy initiative in 2011. The purpose was to help Nigeria reach its Vision 2020 objective of joining the top 20 economies on the planet. The program aimed to stimulate the use of electronic-based systems or e-payment systems for transactions and decrease the amount of currency in circulation [5, 6].

In many developed countries, cash remains the most common payment method at the point of sale (POS), but technological advancements have caused a decline in cash usage. Central banks are talking about the potential of using cash, but cashless payment is considered as a more viable substitute [7]. For the stability of the financial system to be ensured, to understand the demand for cash, and to assess the costs of payment systems, it is crucial to study the impact of POS payment on the use of cash [8]. Identifying potential trends in the demand for cash is a pertinent monetary policy issue.

While there is still a significant amount of cash in circulation, the current governor of the CBN, Godwin Emefiele, stated in an interview in February 2020 that the cashless policy would be reinstated in April 2020. This is demonstrated by the steadily rising volume of bills that the CBN prints each year [9, 10]. The situation surrounding the apex bank's potential reintroduction of the cashless policy was the impetus for this study. Interestingly, a rise in the usage of electronic payment methods does not appear to have resulted in a decline in the use of cash. Nonetheless, as seen in Figure 1 below, the amount of currency in circulation has increased.

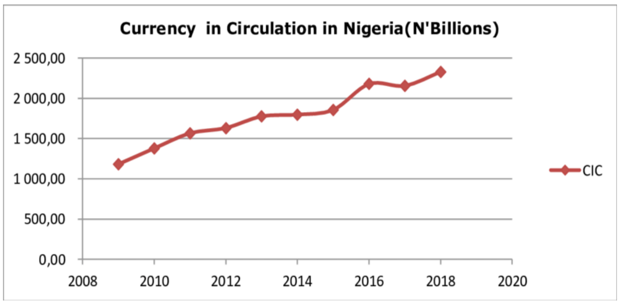

Figure 1. Nigerian currency in circulation
Source: CBN Annual Report for 2018

POS transactions have, in comparison to ATM terminals, contributed to the increased circulation of cash in Nigeria. This is primarily due to the greater accessibility of POS terminals for individuals across the country, even in remote rural areas where traditional banks and ATMs are scarce. In such areas, POS vendors play a crucial role by offering transaction services through these terminals. The driving force behind this study lies in the imperative to comprehend the impact of both POS and ATM transactions on the overall volume of currency in circulation within Nigeria. Remarkably, this research represents the pioneering endeavor of its kind in Nigeria since the stringent implementation of the cashless policy by the Central Bank of Nigeria. Furthermore, this study aims to expand the general public's understanding of how POS and ATM transactions can potentially curtail the circulation of physical cash. Thus, this study aims at studying the impact of ATM and POS transactions on currency in circulation in Nigeria using a multiple linear regression model and Artificial Neural Network. The Multilayer preceptor of ANN was adopted, with 70 percent of the data initially subjected to training and 30 percent for validity.

This study is organized into several sections to systematically explore and analyze the impact of ATM and POS transactions on currency circulation in Nigeria. The research will begin with an in-depth review of the literature to provide a comprehensive background on the subject. Subsequently, the methodology section will outline the data collection process, model selection, and analytical techniques employed. The results of the analysis will be presented and discussed, followed by conclusions, policy recommendations, and avenues for future research. By comparing Artificial Neural Network and Linear Regression models, this research aims to contribute valuable insights into the evolving financial landscape of Nigeria and inform decisions aimed at optimizing currency circulation strategies in an increasingly digitized economy.

2. LITERATURE REVIEW

The impact of ATM and POS transactions on currency circulation has become a subject of increasing interest in both academic research and policy discussions. This section reviews relevant literature to provide a comprehensive background on the topic, focusing on studies that have explored the dynamics of electronic payments, their effects on cash usage, and the use of modeling techniques such as Artificial Neural Networks (ANN) and Linear Regression to analyze these impacts. The Central Bank of Nigeria (CBN) introduced the cashless policy initiative in 2011 to promote electronic-based payment systems and reduce cash usage [5]. This policy aimed to align Nigeria with its Vision 2020 goal of becoming one of the top 20 economies globally. It has led to increased adoption of electronic payment methods, including ATMs and POS terminals, across the country [1].

The emergence of POS transactions has significantly impacted the way people conduct financial transactions in Nigeria. Studies have examined the relationship between POS adoption and cash usage, but findings have been mixed. While some research suggests that POS adoption can lead to reduced cash usage [11], others have found no significant effect on cash demand [12].

The relationship between electronic payment adoption and cash demand has been examined in various countries. Some studies indicate that the increased use of debit cards can lead to a decline in the demand for low-denomination banknotes and coins [13]. However, the impact of ATMs on cash demand remains less clear [14].

Artificial Neural Networks (ANNs) have gained popularity in financial research due to their ability to capture intricate and nonlinear relationships within complex datasets. ANNs consist of interconnected processing units (neurons) that mimic the human brain's information processing capabilities. In the context of assessing the impact of ATM and POS transactions on currency circulation in Nigeria, ANNs can be employed to handle the multifaceted, nonlinear nature of financial data. Researchers have utilized ANNs to model and predict various financial phenomena, such as stock market behavior [15], credit risk assessment [16], and even currency exchange rate movements [17]. When applied to the study of electronic payments and currency circulation, ANNs can uncover hidden patterns and nonlinear dependencies that may not be apparent through traditional linear modeling techniques. Linear Regression models have long been a staple in financial analysis, offering simplicity and interpretability. These models assume a linear relationship between the independent and dependent variables. In the context of studying electronic payments and currency circulation, Linear Regression models can provide valuable insights into the direct and indirect effects of various factors on cash usage.

Researchers have employed Linear Regression to analyze factors affecting currency demand, such as interest rates, economic growth, and electronic payment adoption [10]. By estimating coefficients and assessing the significance of variables, Linear Regression facilitates the identification of key drivers and the quantification of their impact on cash circulation. These modeling techniques, ANN and Linear Regression, offer distinct advantages for understanding the complex dynamics of electronic payments and their implications for currency circulation in Nigeria. By combining their strengths, researchers can gain a more comprehensive understanding of the multifaceted relationship between electronic payment adoption and the demand for physical currency. Various researchers have also recently worked in this area applying these methodologies [18-23].

Although Nigeria has witnessed a rise in electronic payments, the volume of currency in circulation has continued to grow [8, 9]. This phenomenon challenges the assumption that increased electronic payment adoption leads to reduced cash usage, warranting further investigation. This review highlights the multifaceted nature of the impact of ATM and POS transactions on currency circulation in Nigeria. It sets the stage for the research by emphasizing the need to employ advanced modeling techniques, including ANN and Linear Regression, to assess this impact comprehensively.

2.1 Theoretical background

The Baumol-Tobin model is expanded in the study [24] framework to account for developments in transaction technologies. The expense of operational learning, the cost of using and adopting a payment card, and the accessibility of POS terminals are all potential adoption costs for POS payments. The merits of payment innovations grow as transactional efficiency rises. Because it gives room for a fast payment process, this increases the tendency that POS payment will be adopted. POS payment cards are the first payment method to be quicker than cash, according to research [25]. One of the most crucial considerations when selecting a payment method is transaction speed [26, 27]. This is because it decreases line wait times, which lowers the cost of payment for consumers [28]. According to the study [29], consumers who are precisely react negatively to prolonged payment processing than older consumers do. As a result, they have a higher tendency of adopting POS payment. Due to longer transaction times associated with higher spending, benefits also tend to increase as consumption expenditures and transaction values increase. The adoption of POS payment varies depending on consumer demographics like income, age, education, and cash demand. High-income people are more likely to use POS payment to cut their transaction costs, whereas non-adopters tend to use cash less frequently. People need time to complete transactions, and cash payments settle more slowly than POS payments. People must choose between holding cash liquidity and giving up interest on deposited assets in the traditional Baumol-Tobin setting [18, 30]. In the classic Baumol-Tobin scenario, people must choose between keeping cash on hand and giving up the interest earned on deposited assets. Consumers choose the best money holdings in Attanasio et alextended.'s version of the model to trade off transaction costs against the costs of holding cash. Transaction time costs are a result of the "shoe-leather" costs associated with cash withdrawals as well as the shadow value of time. The need for cash is decreasing due to advances in transaction technology and falling transaction costs, and POS payment makes it possible to instantly access liquid assets in accounts for making payments. Greater incentives to park cash are created by higher deposit interest rates, while greater consumer spending boosts supply.

3. MATERIALS AND METHODS

3.1 Pearson product moment correlation

A correlation coefficient measures the degree of relationship that exists between two variables and it takes the range of value $-1 \le r \le +1$.

The Pearson product moment correlation coefficient is given by:

$$r = \frac{n\sum_{i=1}^{n} xy - \left(\sum_{i=1}^{n} X\right)\left(\sum_{i=1}^{n} Y\right)}{\sqrt{\left(n\sum_{i=1}^{n} X^2 - \sum_{i=1}^{n} (X)^2\right)\left(n\sum_{i=1}^{n} Y^2 - \sum_{i=1}^{n} (Y)^2\right)}} \quad (1)$$

3.2 Multiple linear regression model

An improved predictive model can be obtained for a dependent variable by using more than one independent variable. Models that contain extra independent variables are called multiple regression models.

A multiple regression equation is given as:

$$\hat{Y} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_k X_k + e_{ij} \quad (2)$$

where, X_k, X_k, X_k, …, X_k are the independent variables, β_0 the intercept, $\beta_1 \ldots \beta_k$ are the parameters to be estimated and Y the dependent variable.

The above model is a system of n equations that can be expressed as:

$$Y = X\beta + e_i \quad (3)$$

$$\mathrm{Y} = \begin{bmatrix} Y_1 \\ Y_2 \\ . \\ . \\ Y_k \end{bmatrix} \quad (4)$$

$$X = \begin{bmatrix} 1 & X_{11} & X_{12} & X_{13} & . & . & X_{1k} \\ 1 & X_{21} & X_{22} & X_{23} & . & . & X_{2k} \\ . & . & . & . & . & . & . \\ . & . & . & . & . & . & . \\ 1 & X_{n1} & X_{n2} & X_{n3} & . & . & X_{nk} \end{bmatrix} \quad (5)$$

$$\beta = \begin{bmatrix} \beta_0 \\ \beta_1 \\ \beta_2 \\ . \\ . \\ \beta_k \end{bmatrix} \quad (6)$$

$$e = \begin{bmatrix} e_1 \\ e_2 \\ e_3 \\ . \\ . \\ e_k \end{bmatrix} \quad (7)$$

In matrix notation, the normal equations written as:

$$X^1 X \hat{\beta} = X^1 Y \tag{8}$$

$$\hat{\beta} = \left(X^1 X\right)^{-1} X^1 Y \tag{9}$$

which gives the least square estimate of β.

The general form of $X^1 X$ is:

$$\begin{bmatrix} n & \sum X_{11} & \sum X_2 & \sum X_3 & . & . & \sum X_k \\ \sum X_1 & \sum X_1^2 & \sum X_1 X_2 & \sum X_1 X_3 & . & . & \sum X_1 X_k \\ \sum X_2 & \sum X_1 X_2 & \sum X_2^2 & \sum X_2 X_3 & . & . & \sum X_2 X_k \\ . & . & . & . & . & . & . \\ . & . & . & . & . & . & . \\ \sum X_k & \sum X_1 X_k & \sum X_2 X_k & \sum X_3 X_k & . & . & \sum X_k^2 \end{bmatrix} \tag{10}$$

$$X^1 Y = \begin{bmatrix} \sum Y_i \\ \sum X_1 Y \\ \sum X_2 Y \\ \sum X_k Y \end{bmatrix} \tag{11}$$

3.3 Artificial Neural Network (ANN)

This is a machine learning algorithm and a semi parametric method used for predictive modeling and studying the trend in a data set. Artificial Neural Network is a form of semi parametric method where the output is executed by a programmed nonlinear function on multiple inputs. Neurons in the neural network model re grouped into the input layer, hidden layer and output layer. A neural network processes information from one layer to another through an activation function. Feed-forward neural network architecture with one hidden layer is given in Figure 2. Figure 2 is a feed-forward neural network with one input layer having three nodes, one hidden layer having 4 nodes and one output layer having two nodes.

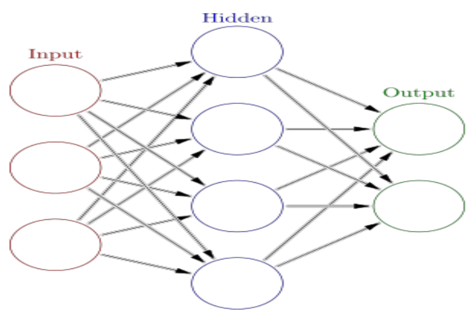

Figure 2. Feed-forward neural network architecture

Considering a feed-forward neural network with one hidden layer, the kth node in the hidden layer is defined as:

$$t_k = f_k\left(\beta_{ok} + \sum_{i \to k} w_{ik} x_i\right) \tag{12}$$

where, x_i the value of the ith input node is, $f_k(\,)$ is an activation function which is a logistic function.

$$f_k(z) = \frac{\exp(z)}{1 + \exp(z)} \tag{13}$$

where, β_{ok} is the bias, the summation $i \to k$ means summing over all input nodes feeding to k, w_{ik} are the weights.

The node for the output layer is defined as:

$$o = f_0\left(\alpha o_o + \sum_{j \to 0} w_{jo} h_j\right) \tag{14}$$

The Artificial Neural Network used in this study is a multilayer preceptor consisting of one input layer, one hidden layer and one output layer. The MLP adopts a supervised learning approach called iteration or epoch for training. 70% of the data were initially used for training while 30% of the data were used for validity test along with hyperbolic tangent as the activation function. In order to improve the R-square, the amount of training data was increased to 61.4% while the testing data was increased to 38.6%.

4. RESULT AND DISCUSSION

4.1 Data

The data used for this study is a secondary data obtained from http://statistics.cbn.gov.ng/cbn-onlinestats/QueryResultWizard.aspx. The data consist of the amount of transactions carried out via POS, ATM and Cash.

4.2 Descriptive statistics

Table 1 gives the descriptive summary statistic of the amount of POS transactions, ATM transactions and currency in circulation. The mean, median and mode of the amount of currency in circulation are 1812799.8267, 1796133.3550 and 1425507.77 respectively which show that the amount of currency in circulation is approximately normally distributed. The mean, median and mode of the amount of ATM transactions in billions are 417.2352, 413.4950 and 178.29 respectively which shows that the amount of ATM transactions in billions is approximately normally distributed. The mean, median and mode of the amount of POS transactions in billions of Naira are 4.2317, 4.1784 and 2.08respectively which shows that the amount of POS transactions in billions is approximately normally distributed.

Table 1. Descriptive statistics

	Currency in Circulation	Value of ATM Transactions (Naira Billion)	Value of POS Transactions (Naira Billion)
Mean	1812799.8267	417.2352	4.2317
Median	1796133.3550	413.4950	4.1784
Mode	1425507.77	178.29	2.08
Std. Deviation	254943.21002	125.74851	1.08208
Variance	64996040334.808	15812.687	1.171
Range	1017477.88	492.69	3.85
Sum	159526384.75	36716.70	372.39

4.3 Correlation coefficient

Table 2 shows the correlation coefficient between value of ATM transactions and amount of currency in circulation, value of POS transactions and amount of currency in circulation, ATM transactions and POS transactions.

The correlation coefficient between ATM transaction and the amount of currency in circulation is 0.831. This indicates a relationship that is positive between the two variables, which means that as the value of ATM transactions increases, so does the amount of currency in circulation. The relationship is significant at α=0.05 level of significance. The correlation coefficient between ATM transaction and POS transaction is 0.911. This indicates a very strong positive relationship between the two variables, which means that as the value of ATM transactions increases, so does the value of POS transaction. This positive linear relationship can be attributed to the fact that both payment methods are card dependent. The relationship is also significant at α=0.05 level of significance. The correlation coefficient between POS transactions and the amount of currency in circulation is 0.915. This a relationship that is positive between the two variables, which means that as the value of ATM transactions increases, so does the amount of currency in circulation. The relationship is significant at α=0.05 level of significance.

4.4 Regression model

Table 3 presents the regression model for the data with the amount of currency in circulation as the dependent variable, value of POS and ATM transactions as the independent variables. From the table, it can be observed that the value of ATM transactions in Nigeria has no significant impact on the amount of currency in circulation with a p-value of 0.865370 which is greater than 0.05. However, reverse is the case when compared with the value of POS transactions. The value of POS transactions in Nigeria has a significant impact on the amount of currency in circulation because the value of POS transactions has a P-value of 1.5542E-13 which is significant at 0.05.

The coefficient of value of ATM transactions which is -36.610935 implies that for a increment in the value of ATM transactions, there is a -36.610935 decrease in the amount of currency in circulation while the coefficient of the value of POS transaction which is reported as 219492.608264 implies that for every increment in the value of POS transactions, there is a 219492.608264 increase in the amount of currency in circulation.

Table 4 presents the ANOVA table of the multiple regression model. Considering a level of significance of 0.05, the ANOVA table shows the regression model is significant as it has a P-value of 2.8368E-34.

The R-squared which measures the degree of relationship between the model and the dependent variable is presented in Table 5 as 0.838. The R-squared can also be referred to as a value that shows how much variation s in the dependent variable that can be explained by the independent variable. This value simply indicates that roughly 84% of the variation in the dependent variable can be explained by the independent variables.

Table 2. Correlation coefficient

		Value of ATM Transactions (Naira Billion)	Currency in Circulation	Value of POS Transactions (Naira Billion)
Value of ATM Transactions (Naira Billion)	Pearson Correlation	1	0.831	0.911
	Sig. (2-tailed)		0.000	0.000
	N	88	88	88
Value of POS Transactions (Naira Billion)	Pearson Correlation	0.911	0.915	1
	Sig. (2-tailed)	0.000	0.000	
	N	88	88	88

Table 3. Regression model

Model	Coefficients		t	sig	Confidence Interval	
	B	Std Error			Lower Bound	Upper Bound
Constant	899240.8970	45460.1115	19.7808	1.4743E-33	808854.016149	989627.777969
Value of ATM transaction	-36.610935	215.2870	-0.17005	0.865370	-464.659344	391.437474
Value of POS transaction	219492.6082	25018.4044	8.773246	1.5542E-13	169749.317558	269235.898971

Table 4. ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	4736193688235.932	2	2368096844117.966	219.158	0.000
Residual	918461820892.344	85	10805433186.969		
Total	5654655509128.275	87			

Table 5. Model summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.915	0.838	0.834	103949.18560

4.5 Artificial Neural Network

Table 6 presents the summary of the model. The table shows the relative percentage error at the training stage and testing stage with errors of 2.148 and 0.206 respectively. This depicts a high percentage of accuracy in the neural network model.

Table 6. Model summary

Training	Sum of squares error	6.062
	Relative error	0.199
	Stopping rule used	5 consecutive steps with no decrease in error
	Training time	0:00:00.01
Testing	Sum of squares error	2.148
	Relative percentage error	0.206

Artificial Neural Network architecture

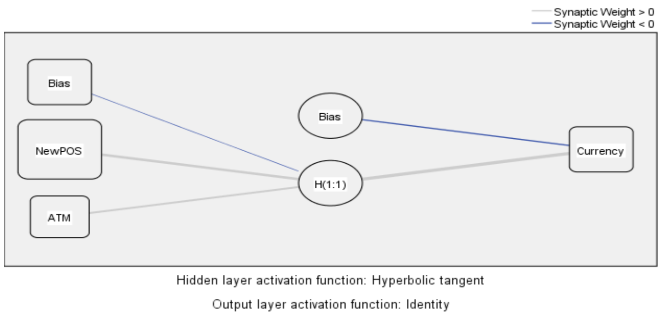

Figure 3. Artificial Neural Network architecture

Figure 3 presents the Artificial Neural Network architecture consisting of one input layer, one hidden layer and one output layer, with the hidden layer having one node. The bias in Figure 3 represents the error term. The thicker the lines in Figure 2, the stronger the relationship that exists between them. The parameter values of Figure 2 are presented in Table 7.

Table 7. Parameter estimates

Predictor		Predicted	
		Hidden Layer 1 H(1:1)	**Output Layer Currency**
Input Layer	(Bias)	-.005	
	POS	.776	
	ATM	.284	
Hidden Layer 1	(Bias)		-.032
	H(1:1)		1.114

Table 8 presents the importance of each of the independent variables in predicting the dependent variable. From the table, it can be observed that POS transactions account for 100 percent importance in predicting the amount of cash in circulation compared to ATM transactions.

Table 8. Independent variable importance

	Importance	Normalized Importance
POS transactions	.727	100.0%
Value of ATM Transactions (Naira Billion)	.273	37.6%

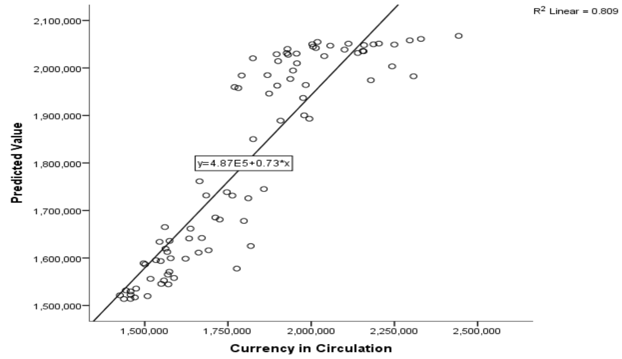

Figure 4. Predicted amount of currency in circulation with an R^2 of 0.809

Figure 4 shows the predicted amount of currency in circulation with an R^2 of 0.809. This by extension means that the Artificial Neural Network model can account for 80.9% of the variability in the data set. Ki et al (2017) suggested that the R-square can be improved by increasing the amount of training data and reducing the number of hidden layers. While this has been proven to be valid, we also observed that an increase in the amount of training data (increased to 61.4%) and testing data (increased to 38.6%) leads to a corresponding increment in the R-square layers as shown in Figure 5.

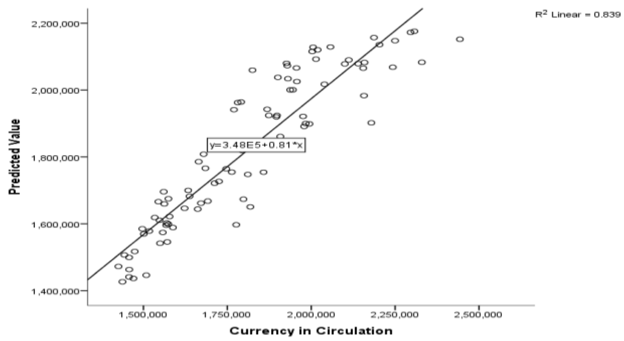

Figure 5. Predicted amount of currency in circulation with an R^2 of 0.839

5. SUMMARY, CONCLUSION AND RECOMMENDATION

This study is aimed at studying the impact of ATM and POS transactions on currency in circulation in Nigeria. The Pearson product moment correlation coefficient was used to assess the degree of relationship between currency in circulation and ATM transactions, currency in circulation and POS transactions, ATM transactions and POS transactions. In addition to this, a multiple linear regression model was also fitted on the data to in order to assess the impact of currency in circulation on ATM transactions and POS transactions. From the results obtained, it was observed that POS transactions have a significant impact on the amount of currency in circulation compared to ATM transactions. This is a clear indication that most Nigerians now patronize POS agents for their transactions such as cash withdrawal, cash deposits and so on. It can also be seen that a lot of Nigerians prefer the POS as a mode of transaction especially when it comes to cash withdrawal compared to the ATM terminals.

This was further studied using the Artificial Neural Network (ANN). The Multilayer preceptor of ANN was adopted, with 70 percent of the data initially subjected to training and 30 percent for validity. Thereafter, the amount of training data was increased to 61.4% and testing data was increased to 38.6% and it was observed that there was corresponding increase in the R-square. This shows that the R-square of the ANN can be improved by increasing the amount of training data and testing data. Ki et al (2017) showed that the R-square can be improved by increasing the amount of training data and reducing the number of hidden layers. However, it was observed in this study that the R-squared can be improved by increasing the training data and testing data. The ANN model which comprises the input layer, hidden layer and output layer shows that POS transactions account for 100% importance in the model.

In view of the above, the following recommendations have been made.

(1) There is need for more POS agents especially in rural areas considering the implementation of the cashless policy. The government can make loans more accessible for the small and medium scale enterprises so that people can access capital in order to have more POS operators across the country. Also, security measures must be put in place for the POS operators.

(2) The government through the central bank of Nigeria should come up with an empowerment scheme that will encourage Nigerians venture into the POS business as this will reduce poverty to some extent.

(3) Nigerian banks should improve the network services on their cards to avoid recurrent declined transactions on POS terminals.

(4) R-squares can be improved by increasing the amount of training data and testing data.

(5) Banks should improve the security architecture of their online services to avoid fraud on customers' account. If the security of online transactions can be improved, individuals can seamlessly carryout transactions using their mobile devices without fear of their account being hacked.

If the above recommendations can be implemented, there will be an increase in the number of POS operators in the country which by extension will be creating jobs for the unemployed, there will be a significant improvement in the implementation of the cashless policy because individuals will be more confident carrying out seamless transactions online and by extension, it will greatly improve the country's economy.

ACKNOWLEDGMENT

The Centre for Research, Innovation, and Discovery (CUCRID) at Covenant University is acknowledged by the authors for its invaluable assistance in completing and publishing this research.

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