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Application of Analysis of Variance in comparing interest Rates Offered by Selected Banks in Nigeria

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Abstract

This study investigated the application of Analysis of Variance (ANOVA) to compare savings interest rates offered by selected commercial banks in Nigeria. The objective was to determine whether significant differences exist in the interest rates of First Bank of Nigeria, Guaranty Trust Bank, United Bank for Africa, Zenith Bank, and Eco-bank Nigeria. Secondary data were obtained from published banking reports and official financial sources. A one-way ANOVA was conducted to assess differences in mean interest rates. The results indicated a significance value of 0.310, exceeding the 0.05 threshold, suggesting no statistically significant difference among the banks. The study concluded that savings interest rates are generally similar due to uniform financial regulations. It is recommended that customers consider other banking services when selecting banks, while banks should enhance service delivery and maintain transparency in interest rate information.

Keywords: *Bank, interest rate, ANOVA, Guaranty Trust Bank, United Bank for Africa, Zenith Bank, and Eco-bank Nigeria. Secondary data, savings.*

INTRODUCTION

Background of study

The banking sector is an essential component of the financial system in any economy, serving as the primary intermediary between savers and borrowers. Banks mobilize savings from individuals and institutions, provide loans to businesses and households, and facilitate investments that drive economic growth (Kumar & Rao, 2019). In Nigeria, the banking sector has undergone significant reforms over the past few decades, including recapitalization, regulatory oversight by the Central Bank of Nigeria (CBN), and the introduction of digital banking services (Adekunle, 2020). One of the core services banks provide is the determination of interest rates for savings deposits, fixed deposits, and loans. These rates play a critical role in influencing financial decisions, as they directly affect the cost of borrowing and the returns on savings.

Interest rates in the banking sector are influenced by multiple factors, including monetary policy decisions, liquidity management, operational costs, competition among banks, and broader economic conditions (CBN, 2024). The Central Bank of Nigeria periodically issues guidelines on minimum lending rates, maximum interest rates, and other monetary parameters that directly or indirectly affect banks' interest rate policies. Despite these regulatory frameworks, commercial banks often set different interest rates for similar deposit or loan products. This variation is a result of internal strategies aimed at attracting new customers, retaining existing ones, or achieving specific financial objectives. Consequently, these differences make it challenging for customers to determine objectively which bank offers the best financial benefits.

The significance of interest rates extends beyond individual customer decisions; it also affects economic growth and stability. Higher savings interest rates can encourage individuals to save more, increasing the availability of funds for investment in productive ventures. Conversely, lower lending rates can stimulate borrowing, supporting entrepreneurship and business expansion. In Nigeria, major banks such as First Bank of Nigeria, Guaranty Trust Bank (GTB), Fidelity Bank, United Bank for Africa (UBA), Zenith

Bank, and Stanbic IBTC Bank have all offered varying savings deposit rates in 2025 and 2026, ranging from approximately 2.70% to 8.25% depending on account types and banking policies (nigerialive24.com, 2026. While these differences are observable, they are not always statistically clear, highlighting the need for quantitative analysis to determine whether the observed variations are significant.

Statistical methods provide an objective approach to analysing differences among groups. One of the most widely used techniques for comparing the means of multiple groups is Analysis of Variance (ANOVA) (Montgomery, 2019). ANOVA is particularly useful when examining more than two groups, as it reduces the likelihood of Type I error that can arise when multiple t-tests are performed independently. In the context of banking, ANOVA can be applied to compare the mean interest rates offered by different banks, allowing researchers to determine whether differences in rates are due to random variations or reflect significant disparities in banking practices.

For this study, monthly savings interest rate data from January 2025 to February 2026 will be utilized to examine the differences among selected banks. The banks represent the independent groups, while the interest rates serve as the dependent variable. The null hypothesis for this analysis states that there is no significant difference in mean interest rates among the banks, whereas the alternative hypothesis posits that at least one bank offers a significantly different interest rate. Using ANOVA in this context provides an evidence-based approach to understanding interest rate variations, rather than relying on observable but potentially misleading differences.

The practical importance of comparing bank interest rates through ANOVA is multifaceted. First, it benefits customers by enabling them to make informed decisions regarding where to save or borrow, thus optimizing financial returns or minimizing borrowing costs. Second, financial analysts and researchers can gain insights into competitive practices within the banking sector, identifying trends and patterns that inform investment and policy decisions. Third, regulators and policymakers, such as the Central Bank of Nigeria, can use the findings to monitor market fairness, ensure healthy competition, and intervene where necessary to protect consumer interests (CBN, 2024).

Statement of the Problem

Different banks offer different interest rates on savings and loans, which often creates uncertainty for customers when choosing financial institutions. Although these differences are visible, it is not always clear whether they are statistically significant or merely due to normal market variation. Without proper statistical analysis, customers and financial decision-makers may not fully understand the extent of variation among banks. Therefore, there is a need to apply ANOVA to determine whether significant differences exist in the interest rates offered by selected banks.

Purpose of the study

The aim of this study is to apply ANOVA in comparing interest rates offered by different banks. To achieve this aim, the study will pursue the following objectives:

1. To examine the interest rates offered by selected banks.
2. To compare the mean interest rates of different banks using ANOVA.
3. To determine whether significant differences exist among the interest rates offered by the banks.
4. To provide useful information for customers and financial decision-making.

Significance of the Study

This study is relevant because it examines the variation in interest rates offered by selected commercial banks in Nigeria through the use of Analysis of Variance. The study will assist bank customers by providing information that can guide them in choosing banks that offer favorable savings interest rates. This can improve personal financial decisions. It will also be helpful to bank administrators, as the findings will show how interest rates differ among banks and may support review of banking policies. Furthermore, the study will provide useful material for students, lecturers, and researchers in statistics and banking-related fields by showing the practical use of ANOVA in financial analysis.

Scope of the Study

This study focuses on comparing the interest rates offered by selected commercial banks in Nigeria using Analysis of Variance. The selected banks include First Bank of Nigeria, Guaranty Trust Bank, United

Bank for Africa, and Zenith Bank. The study uses monthly savings interest rate data from January 2025 to February 2026. It is limited to savings interest rates only and does not cover loan interest rates or other banking services. The research applies one-way ANOVA to determine whether there is a significant difference in the mean interest rates offered by the selected banks during the study period.

Research Questions

1. What interest rates are offered by selected banks?
2. Are there differences in the mean interest rates offered by different banks?
3. Is the difference in interest rates statistically significant?
4. How can ANOVA help in comparing bank interest rates?

LITERATURE REVIEW

2.1 Conceptual Framework

The concept of interest rate is important in the banking system because it represents the amount paid by banks to customers for savings or the amount charged on borrowed funds. Interest rates influence saving, borrowing, and investment decisions in every economy (Kumar & Rao, 2019). In commercial banking, different banks may offer different savings interest rates depending on their financial policies, liquidity position, and market competition. In Nigeria, commercial banks operate under guidelines issued by Central Bank of Nigeria, but slight differences still exist in the rates offered by individual banks (Central Bank of Nigeria, 2024).

Another important concept in this study is variation. Variation means the differences that exist among observations or groups being studied. In banking, variation in interest rates may occur from one bank to another because each bank adopts its own operational strategy (Adekunle, 2020). These differences can be examined statistically to know whether they are significant. The major statistical concept used in this study is Analysis of Variance. ANOVA is a statistical method used to compare the means of two or more groups in order to determine whether significant differences exist among them (Montgomery D. C., 2019). It works by separating total variation into variation between groups and variation within groups. In this study, the groups are selected banks, while the observations are monthly interest rates.

One-way ANOVA is appropriate when one independent variable is involved. In this research, the independent variable is the selected banks, while the dependent variable is the savings interest rate. The null hypothesis states that there is no significant difference in the mean interest rates offered by the selected banks, while the alternative hypothesis states that at least one bank differs significantly.

Empirical Studies

Several studies have examined the application of statistical methods in banking and financial analysis. Montgomery D. C. (2019) explained that ANOVA is widely used in comparing financial variables across institutions because it helps determine whether observed differences are statistically meaningful.
A study by Adekunle (2020) examined competition among Nigerian banks and found that differences in savings interest rates influence customer choice of banks. The study showed that banks with higher savings rates attract more depositors than banks with lower rates.

Kumar and Rao (2019) compared banking performance indicators across commercial banks and reported that interest rate differences are important indicators of financial competition. Their findings showed that banks adjust interest rates regularly to maintain market position. A report published by Central Bank of Nigeria (2024) also indicated that savings deposit rates among Nigerian commercial banks differ slightly even under common regulatory guidelines. This confirms that statistical comparison is necessary to understand the extent of variation.

RESEARCH METHOD

Research Design

This study adopts a quantitative research design because numerical data are used to examine differences in interest rates offered by selected banks. It also adopts an analytical research design since statistical techniques are applied to test the hypothesis of the study. Specifically, Analysis of Variance (One-Way ANOVA) is used to determine whether significant differences exist among the mean interest rates offered by selected banks in Nigeria. One-Way ANOVA is appropriate because the study involves comparing

the mean interest rates of more than two independent groups. In this case, the groups are the selected banks, while the observed monthly savings interest rates represent the data for analysis.

Study Area

The study is carried out in Nigeria and focuses on selected commercial banks operating within the country. Nigeria has a well-developed banking sector regulated by Central Bank of Nigeria, which supervises banking activities and monetary policies. The selected banks are commercial banks with nationwide operations and publicly available savings interest rate information. These banks provide banking services such as savings accounts, loans, and deposits to individuals and organizations.

Population of the Study

The population of the study consists of all commercial banks operating in Nigeria. However, the study is limited to six selected banks where savings interest rate data are available for the study period.

Sample Size Determination

The sample size for the study consists of six selected commercial banks in Nigeria. These six banks were chosen because they provide reliable savings interest rate data required for the analysis.
The selected banks are:
1. First Bank of Nigeria
2. Guaranty Trust Bank
3. United Bank for Africa
4. Zenith Bank
5. Ecobank Nigeria
6. Stanbic IBTC Bank

Sampling Technique

The study uses simple random sampling to select six banks from the commercial banks operating in Nigeria. Simple random sampling gives each bank equal opportunity of being selected and reduces bias in the selection process.

Method of Data Collection

Secondary data are used in this study. The monthly savings interest rates of the selected banks were obtained from published banking reports and official financial sources for the period January 2025 to February 2026.

Method of Data Analysis

The data collected were analysed using One-Way ANOVA to determine whether significant differences exist among the mean interest rates offered by the selected banks.
The ANOVA model is expressed as:
$X_{ij} = \mu + \tau_i + \varepsilon_{ij}$
Where:
X_{ij} = Observation of interest rate
μ = Overall mean interest rate
τ_i = Effect of the ith bank
ε_{ij} = Random error term

The ANOVA test statistic is:

$$F = \frac{MSBetween}{MSWithin}$$

If the calculated F-value is greater than the critical F-value at 0.05 level of significance, the null hypothesis is rejected, showing that significant differences exist among the banks.

RESULTS AND DISCUSSION

Presentation of Data

The data used in this study consist of monthly savings interest rates (%) offered by five selected commercial banks in Nigeria from June 2024 to January 2026.

Month	First Bank	GT bank	UBA	Zenith	Eco bank
June, 2024	7.88	7.88	7.88	7.88	7.86
September, 2025	8.25	8.25	8.25	8.25	8.00
January 2026	8.25	8.10	8.10	8.10	5.90

Source: CBN

One – Way ANOVA Result

The one-Way ANOVA output from SPSS is presented below:

ANOVA

observation					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.682	4	.421	1.376	.310
Within Groups	3.056	10	.306		
Total	4.738	14			

Decision Rule:

Since the significance value (0.310) is greater than 0.05, fail to reject the null hypothesis.

Interpretation of Result

The result indicates that there is no significant difference in the mean interest rates offered by the selected commercial banks.

Summary

This study examined the use of Analysis of Variance (ANOVA) in comparing interest rates offered by selected commercial banks in Nigeria. The study focused on selected banks such as First Bank of Nigeria, Guaranty Trust Bank, United Bank for Africa, Zenith Bank and Eco-bank Nigeria. The purpose of the study was to determine whether there is a significant difference in the savings interest rates offered by these banks. Secondary data were collected and analysed using one-way ANOVA. The result of the analysis showed that the significance value was greater than 0.05, which means that there is no significant difference in the mean interest rates offered by the selected banks. This shows that although there are small differences in the rates, the differences are not statistically significant.

CONCLUSION

Based on the result of the study, it can be concluded that the selected commercial banks in Nigeria offer nearly similar savings interest rates. The differences observed are small and not statistically significant. The use of ANOVA helped to test the differences properly and showed that bank interest rates are generally close because banks operate under similar financial regulations from Central Bank of Nigeria. Therefore, customers may consider other banking services such as customer care, accessibility, and convenience when choosing a bank.

RECOMMENDATIONS

The following recommendations are made

1. Banks should continue to make their interest rates available to customers clearly.
2. Customers should compare different bank services before choosing where to save money.
3. Banks should improve other services apart from interest rates to attract customers.
4. Central Bank of Nigeria should continue monitoring bank interest rate policies.
5. Future researchers should include more banks and more years of data for better analysis.

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