Statistical Analysis Of 2015-2024 Revenue Allocations to Enugu State Local Government

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Abstract
This study statistically analyzes the revenue allocations made to local governments in Enugu State, Nigeria, from 2015 to 2024. It aims to uncover patterns, disparities, and trends in the distribution of funds among the 17 local government areas (LGAs) in Enugu State. The data were sourced from the Federal Account Allocation Committee (FAAC) publications and Enugu State Ministry of Finance reports. Descriptive and inferential statistical techniques such as measures of central tendency, time series analysis, and Analysis of Variance (ANOVA)were used to determine whether allocations were equitable and responsive to local needs. Findings reveal significant disparities in allocations among LGAs and a steady increase in overall revenue over the decades, largely driven by inflation and policy changes. Gini coefficient value revealed the extent of the fluctuation in the allocations. Needs-based and population-driven allocation models were recommended so as to promote fiscal equity and regional development.
Keywords:*Revenue Allocation, Enugu State Ministry of Finance, Local Government, Statistical Analysis, Fiscal Equity, ANOVA, Time Series*

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I.   Introduction
Revenue allocation in Nigeria, particularly at the local government level, remains a cornerstone of fiscal federalism and grassroots development (Ezeani & Ugwu, 2022). Local Government Areas (LGAs) are constitutionally mandated to deliver essential services such as primary education, healthcare, rural infrastructure, and community development. However, persistent questions about the equity, adequacy, and transparency of these allocations have fueled debate regarding the effectiveness of the current distribution framework (Ibrahim & Nwankwo, 2023; Okon & Opara, 2021). In Enugu State, as in other parts of Nigeria, statutory revenue allocation is based on constitutionally defined formulas determined by the Federation Account Allocation Committee (FAAC), comprising components such as statutory allocations, Value Added Tax (VAT), and excess crude revenue.

The period from 2015 to 2024 witnessed numerous fiscal and macroeconomic disruptions in Nigeria, including two economic recessions, fluctuations in global oil prices, currency instability, and shifts in national fiscal policy. These developments have implications for intergovernmental transfers and revenue distribution at the subnational level (Adebayo & Chukwuma, 2020). Against this backdrop, this study seeks to statistically analyze the trends and disparities in federal revenue allocations to the 17 LGAs in Enugu State over a ten-year period.Specifically, the study aims: (1) to examine the trend of revenue allocations to Enugu State LGAs from 2015 to 2024, (2) to analyze the disparities in revenue distribution across the 17 LGAs, (3) to determine the statistical significance of variations in allocations among LGAs, and (4) to provide data-driven policy recommendations that enhance equitable and efficient fund distribution. In doing so, the study builds upon existing empirical research (e.g., Ojo, 2021; Okonkwo & Hassan, 2023), which highlights how skewed or inefficient allocation practices can hinder local development outcomes and foster fiscal inequality. The dataset for this analysis includes monthly FAAC revenue records for the 17 LGAs of Enugu State between January 2015 and November 2024, obtained from the Enugu State Accountant General's Office. The dataset categorizes allocations into three primary components: (a) Statutory Allocations, which are mandatory disbursements to LGAs for constitutional duties; (b) Value Added Tax (VAT), a consumption-based tax levied throughout production and sales chains; and (c) Excess Crude and Others, which encompasses non-oil revenues, exchange gains, and intervention funds. Notably, deductions are often made from statutory or VAT allocations before final disbursement, resulting in what is termed Net Remittance to Local Governments.

In order to extract meaningful insights, statistical techniques, including descriptive and inferential statistics as well as regression analysiswere employed to assess revenue trends, quantify LGA disparities, evaluate the impact of deductions, and support equitable allocation policies. Gini coefficient measure was applied to assess the fairness of revenue allocation across the 17 Local Government Areas (LGAs) of Enugu State from 2015 to 2024. By focusing on a single state over a sustained period, this study contributes a detailed and data-rich evaluation of local fiscal dynamics in Nigeria, offering practical recommendations for policymakers, researchers, and development planners.

II.   Material and Methodology
This section provides the data and the methods of data analysis used in this study.
2.1 Material
The following were the sources of the data used in this study: the FAAC disbursement reports (2015–2024), Enugu State Ministry of Finance bulletins and National Bureau of Statistics (NBS) online database. Hence, secondary data were collected and used. The collected data were analysed using excel solver in order to achieve the objectives of the study.

2.2 Methodology
Statistical tools such as the descriptive Statistics which include the mean, median and standard deviation which analyze central tendencies and variability, Time Series Analysis for assessing trends and seasonal variations, Analysis of Variance (ANOVA) for testing whether differences in allocations among LGAs arestatistically significant, and the Gini Coefficient,for measuring the extent of inequalities in allocation distribution.Pivot tables and excel functions for computing descriptive statistics such as mean, to indicate the average amount allocated to each local government, median to investigate the base-line amount for which half of the local governments would be allocated more than the amount and the other half allocated less; standard deviation and coefficient of variation, to measure variability in revenue allocation for each LGA, spanning across the years under review. In addition to that is skewness, to show whether some LGAs significantly receive higher (positively skewed)/lower (negatively skewed) allocations than others, and kurtosis toshow whether the allocations had extreme values or a uniform spread.

III.   Data Analysis
Fig. 1 shows the computation of the descriptive statistics, shown by the **green** arrow for each of the revenue categories from 2015-2024. However, the analysis was much easier using Pivot table, which is represented by the **red** arrow considering the number of rows (2023). The data is made up of filters represented by the **yellow** arrow, which makes it possible to know the allocation for specific quarters (Q1, Q2, Q3 and Q4), months (January – December) and year of interest and not just the total consideration of all the parameters in fig. 1. In other words, these filters can be used to display the allocations shared in Q1 of 2018 on the Pivot table for instance. Since the Local Governments column on the pivot table with the filter button can be used to choose the local governments whose allocations are to be viewed.
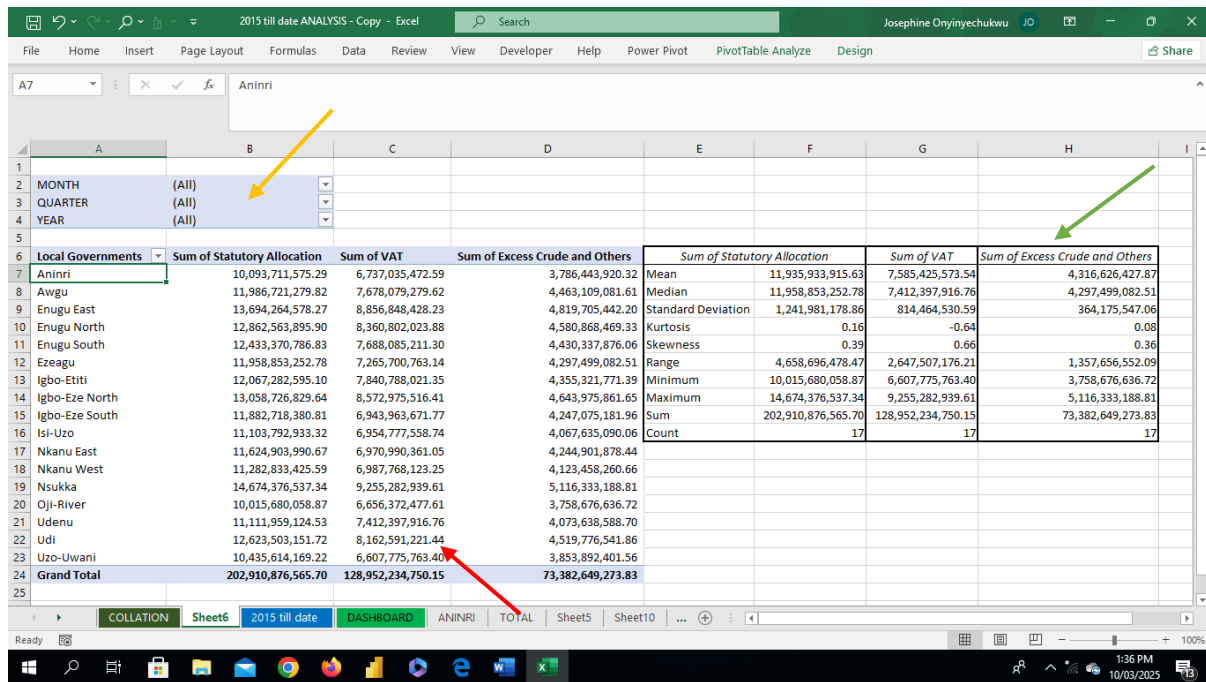
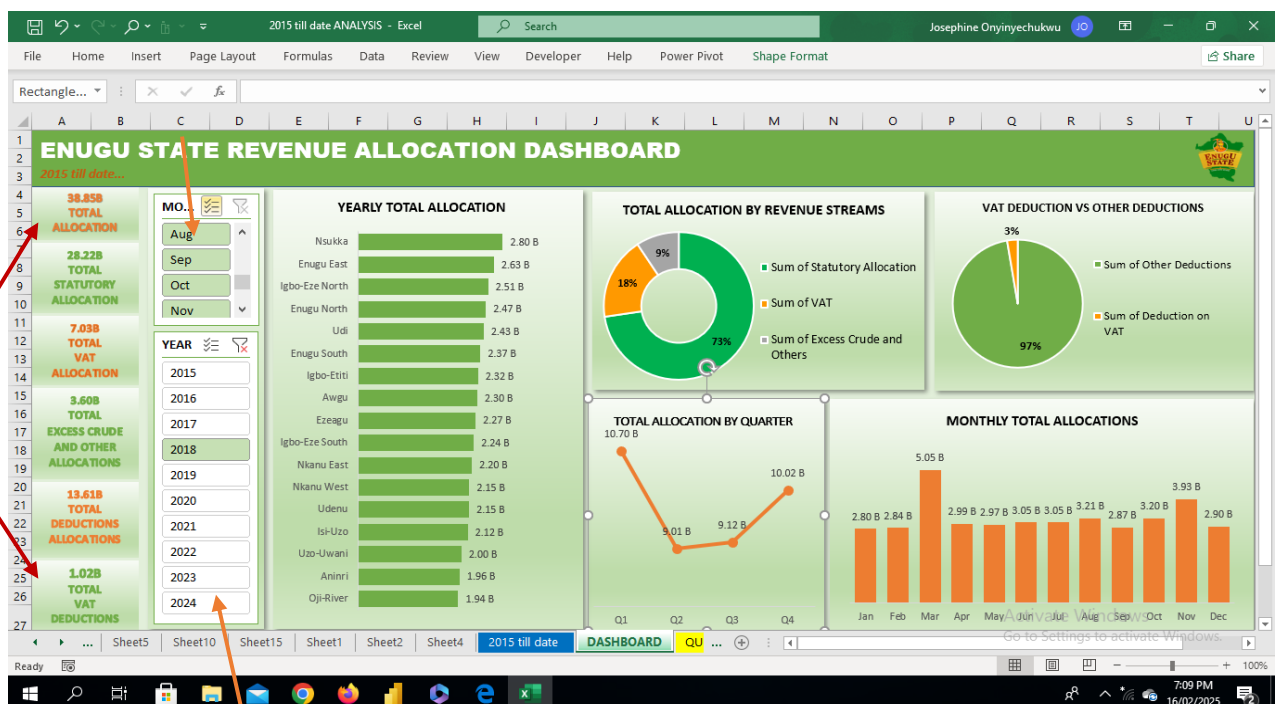**Fig. 1: Descriptive Statistics of Revenue Categories using Excel**

Fig. 2: Excel Dashboard of Enugu State Revenue Allocations from 2015-2024

In order to help make quick decisions, draw insights and interpret revenue allocation patterns faster, an excel dashboard shown in Fig 3 was created in which the charts, KPIs (represented by the red arrows), trend line and slicers (represented by the orange arrows) were added. Descriptive statistics were explained using both statistical summaries and visual representation.

3.1 Hypothesis Testing

In this section, the inferential statistics were used to examine significant differences and relationships within the revenue allocation dataset. By testing various hypothesis, conclusions about revenue distribution were made across years and local governments. The following tests are hence conducted:

ANOVA: ANOVA is a statistical technique used to determine whether or not significant differences exist among the means of several populations or groups of observations. The following questions were answered using ANOVA

(1) Do the mean revenue allocations differ significantly across years? (2) Do the mean revenue allocations differ significantly across quarters? (3) Is there a significant difference in revenue allocation across the 17 local governments? (4) Do the different revenue categories contribute significantly different amounts to total revenue?

Hypothesis

H_0: There is no significant difference in mean revenue allocations across different years

H_1: There is a significant difference in mean revenue allocations across different years

Decision Rule: Reject the null hypothesis if the p-value is less than the level of significance (α) and accept the null hypothesis if otherwise.

Table 1: ANOVA Results for the first hypothesis

Source of Variation	SS	df	MS	F	P-value	F criteria
Between Groups	1.36693E+20	9	1.51882E+19	237.0984434	1.0294E-87	1.938819
Within Groups	1.02494E+19	160	6.40585E+16			
Total	**1.46943E+20**	**169**				

Table 2 : The ANOVA Result for the second hypothesis

Source of Variation	SS	df	MS	F	P-value	F criteria
Between Groups	9.12035E+18	16	5.70022E+17	0.632795142	0.00853483728	1.710007341
Within Groups	1.37822E+20	153	9.008E+17			
Total	**1.46943E+20**	**169**				

Since the p-value (1.0294×10^{-87}) is less than the level of significance ($\alpha=0.05$), we reject the null hypothesis and conclude that there is a significant difference in mean revenue allocations across different years. However, the extremely small p-value indicates that the differences are not due to random variation but rather due to actual changes probably in the allocation system, economic factors or policy changes generally.

On the contrary, this data was used to verify that allocations have indeed been distributed/shared unequally just like Kurtosis in descriptive statistics suggested. The second hypothesis to be tested is stated thus:H_0: There is no significant difference in mean revenue allocations shared among local governments versusH_1: There is a significant difference in mean revenue allocations shared among local governments.

Using the decision rule already stated above, we reject the null hypothesis since the p-value (0.00853483728) is less than the level of significance, $\alpha=0.05$. Hence, we conclude that there is significance difference in the total allocation shared among local governments across the years.

IV.   Discussion of Results

The value of the skewness in Fig. 1 shows that the allocations are **positively-skewed** (right-skewed), which means that few local governments received allocations less than the average while more local governments received allocations greater than the average. The values of the kurtosis, (<3) shows that the distribution is platykurtic, which suggests that allocations are not distributed evenly but with very few outliers. Hence, we can say that revenue allocation is not stable over time. Notably, Nsukka LGA consistently received the highest allocations, while Oji River received the lowest, suggesting persistent disparities likely driven by factors such as population size, economic activity, and internally generated revenue (IGR) potential.Also, the standard deviations among the revenue categories were compare, and it was discovered that the statutory allocations had the highest standard deviation, which implies that statutory allocation fluctuates more than the other categories across local governments. Lastly, the values from the summary results show that within the years under review, statutory allocation has been the revenue category with the highest allocation. The results from fig. 1 show that the total revenue allocations to Enugu State LGAs increased from ₦38.2 billion in 2015 to ₦72.5 billion in 2024, representing an 89.8% increase over the period. The mean annual allocation per LGA was approximately ₦3.4 billion, with a standard deviation of ₦1.1 billion, indicating moderate variability.The time series plot shows a general upward trend in allocations, with noticeable dips in 2016 and 2020 due to national

economic recessions. Peak allocations were recorded in 2023 and 2024, aligning with increases in oil revenue and improved FAAC performance.The ANOVA results showed p-values< 0.05, indicating a statistically significant difference in allocations among the LGAs and among the years. A Gini coefficient of 0.27 suggested a relatively fair but not perfect distribution of revenue among the LGAs. However, the allocation disparities may still have practical implications for development equity.The disparities in allocations could be attributed to population size, political influence, and internally generated revenue (IGR) capabilities. Urban LGAs tend to receive more funds due to higher population density and stronger economic activities. However, rural LGAs with weak IGR and infrastructure still require more targeted allocations to bridge the development gap.The Gini coefficient of 0.27 indicated a relatively fair distribution of revenue allocations, though not perfectly equitable.

V. Conclusion and Recommendation

In conclusion, while revenue allocation in Enugu State has shown overall growth and moderate fairness, the observed disparities highlight the need for more inclusive and equitable allocation frameworks. Special attention should be directed toward underfunded rural LGAs to promote balanced development across the state. Based on the findings in this study, the following are recommended:

❖ Enugu State should adopt needs-based allocation formular by incorporating poverty indices, infrastructure deficits, and demographic data in determining LGA allocations.
❖ The State should enhance IGR in rural LGAs by investing in capacity-building and economic infrastructure to enable rural LGAs to generate more internal revenue.
❖ Enugu State government should periodically review and adjust the allocation framework to reflect changing socioeconomic realities.
❖ There should be transparency and monitoring strategyin order to strengthen oversight mechanisms making sure that funds are used effectively by LGAs.

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