On State Budget in the North Central of Nigeria: Analysis of Variance (ANOVA) Approach

Muritala Abdulkabir[1, *], Raji Surajudeen Tunde[2]

[1]Statistics Department, University of Ilorin, Ilorin, Nigeria
[2]Mathematics and Statistics Department, Federal Polytechnic, Offa, Kwara State, Nigeria

Email address:
kaybeedydx@gmail.com (M. Abdulkabir)

Abstract: This study examine the comparative analysis of state budget North central region of Nigeria, the aim focus on testing if there is significant differentin state budgeting allocation among the state in the North central of Nigeria and also if there is significant different in budgeting allocation within the years of consideration in the same Region, at the end of the analysis of the result obtained it was observed that the budget allocation for Benue state has the highest and Kwara has the lowest budget allocation since 2005-2013, also indicate that there is significant different in budget allocation within the year 2005-2013.

Keywords: North Central of Nigeria, Analysis of Variance (ANOVA), Randomized Completely Block Design (RCBD)

1. Introduction

'Budget' originated from a French word bougette meaning little bag. In Britain, the word was used to describe the leather bag in which the chancellor of the exchanger used to carry out the parliament the statement of government needs and sources. After several thoughts of consensus, the budget became the document contained in the bags which represent plans of government express in money and submitted to legislatives for approval.

A budget is the process of preparing a detail statements of financial results that are expected for a given time period in the future. There are two keyword is "EXPECTED"; expected means something that is likely to happen. The second keyword is "FUTURE" which is a period in the time to come.

Another meaning for budget is the plan sales volumes, costs and expenses, revenues, assets, resource quanitites, liabilities and cash flows.

It expresses strategic plans of business units organization, activities or events in measurable terms. Budget can be surplus, deficit or balanced depends on government policy and system;

BUDGET SURPLUS: means planned government expenditure is less than estimated government revenue

BUDGET DEFICIT: MEANS THAT government planned expenditure is greater than its estimated revenue for the year

BALANCED BUDGET: a balanced budget means planned government expenditure equal to estimated government revenue.

1.1. Historical Background of Budget

In historical terms, the annual budget is a relatively new invention. It's origins, however lie in centuries of monarchs mismanaging the country's finances. The office of the treasurer began life within that of the Exchequer, which was responsible for managing the royal revenues and for issuing and collecting cash. Having been established at the time of the Norman invasion in the 11th century, the Exchequer did not receive its first major reform until the reign of Elizabeth I. following reform in the 1580s, a deficit was quickly turned into a surplus. But that did little to stop a string of monarch's continuing to squander the country's tax revenues and rack up debts. Charles II landed the country's finances in such a mess that the Dutch managed to seize the royal Charles, the navy's flagship in 1667 this humiliation prompted another spate of reform and the establishment of the principle that even if parliament has approved of expenditure it needs the approval of the Treasury. It is a rule that still stands today.

It was not until the early 18th century that a version of the annual budget emerged. The origins of the word budget lie in the term "bougette" a wallet in which documents or money could be kept. While at first referring only to the chancellor's annual speech on the country's finances, the word quickly

became used for any financial statement or plan.

The beginnings of what we have come to know as the budget did not immediately act as a complete safeguard for Britain's finances. The bursting of the south sea bubble in 1720, for example, wrecked the country's balance sheet and led to the imprisonment of the chancellor in the Tower of London.

The financial crisis caused by the South sea bubble led to the presentation of the government budget under Sir Robert Walpole. The practice of presenting budgets and fiscal policy to parliament was initiated by Sir Robert Walpole in his position as chancellor of the Exchequer, in an attempt to restore the confidence of the public after the chaos unleashed by the collapse of the south sea bubble in 1720.

The aims and objective of the research work are follows to examine the impact of the statistical of state budgeting process in Nigeria and to determine if there is significant different in the state budgeting allocation among the state in the North Central Region of Nigeria.

1.2. Source of Data Collection

This data collected from the budget table: federal/state's budget since 2005 to 2013 North central Zone (Benue, Kogi, Kwara, Nasarawa, Niger, Plateau); in Nigeria.

1.3. Statement of Hypothesis

These bring us to the following statements of hypothesis for verification

Ho: There is no significant different in the state budgeting allocation among the state in the North central of Nigeria

H1: There is significant different in the state budgeting allocation among the state in the North central of Nigeria

Test for hypothesis

Ho: There is no significant different in the state budgeting allocation within the years of consideration in the North central of Nigeria

H1: There is significant different in the state budgeting allocation within the years considered in the North central of Nigeria

2. Literature Review

According to George Grenville (1764) budget are economic tools deliberately design through practical process to aid in the allocation of available resources among competing demands. He further added that "a public budget is an economic tool deliberately fashioned through the political process to assist in the management of public sector" Hassan (1992) a budget is a fundamental tool for an event director to predict with a reasonable accuracy whether the event will result in a profit, a loss or will break-even. A budget can also be used as a pricing tool. Edane (2010) on the other hand; sees "economic planning as a deliberate. Governmental attempt to co-ordinate economic decision making over the long run and to influence, direct and in some cases even control the level and growth of nation principle

economic variable (income, consumption, employment, investment, saving export, and import e.t.c.) to achieve a predetermined set of development objectives. The budget then becomes a link between financial resources and human needs or behavior. It becomes a means of meeting the people needs, that is policy objectives and political development.

2.1. Budget Process

A budget process refers to the process by which governments create and approve a budget which as follows:
- The financial service department prepares worksheets to assist the department head in preparation of department budget estimates.
- The administrator calls a meeting of managers and they present and discuss plans for the following years projected level of activity.
- The managers can work with the financial services or work alone to prepare an estimate for the departments coming year.
- The completed budgets are presented by the managers to their executive officers for review and approval
- Justification of the budget request may be required in writing. In most cases, the manager talks with their administrative officers about budget requirements. Adjustment to the budget submission may be required as a result of this phase in the process.
- Budgeting is the setting of expenditure levels for each of an organization's functions. It is an estimation and allocation of available capital used too achieve the designated targets of a firm.

2.2. Terminology

i. Revenue estimation: performed in the executive branch by the finance director, clerk's office, budget director, manager and a team
ii. Budget call: issued to outline the presentation form, recommend certain goals.
iii. Budget formulation: reflecting on the past, set goals for the future and reconcile the difference
iv. Budget hearings: can include departments, sections, the executive and the public to discuss changes in the budget
v. Budget adoption: final approval by the legislative body
vi. Budget execution: this amending the budget as the fiscal year progresses.

2.3. Constitutional Economics

Constitutional economics is the study of the compatibility of economic and financial decisions within existing constitutional law frameworks, and such a framework includes government spending on the judiciary which in many transitional and developing countries is completely controlled by the executive. It is useful to distinguish between the two methods of corruption of the judiciary. Corruption by the executive branch in contrast to corruption

by private actors. The standards of constitutional economics can be used during annual budget planning is transparent then the rule of law may benefit. The availability of an effective court system, to be used by the civil society in situations of unfair government spending and executive impoundment of previously authorized appropriations, is a key element for the success of the rule-of-law endeavor.

3. Methodology

3.1. Randomized Complete Block Design (RCBD)Two Way Analysis of Variance (ANOVA)

This is a design use when the experiments are not homogeneous and hence can be allocated to group or blocks. Such that the variation among block is maximize, why the variation within any particular block is maximize.

The blocks are sometime referring to as replicate, it is to ensure that the number of unit within a block is equal to the number of unit within a block is equal to the number of treatment investigated.

The major advantage of (RBD) over (CRD) is that, yield more accurate result due to the grouping of the experimental unit into block.

3.2. Procedure for Data Analysis of Two Ways Anova

Step 1: Test of hypothesis
Determine the Null and Alternative Hypothesis
$H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4 = \ldots = \mu_n$
$H_1: \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \ldots \neq \mu_n$
Ho: There is no significant different in the state budgeting allocation among the state in the North central of Nigeria
H1: There is significant different in the state budgeting allocation among the state in the North central of Nigeria
Test for hypothesis
$H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4 = \ldots = \mu_n$
$H_1: \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \ldots \neq \mu_n$
Ho: There is no significant different in the budgeting allocation within the years of consideration in the North central of Nigeria
H1: There is significant different in the budgeting allocation within the years considered in the North central of Nigeria
Step2:
Determine the level of significant α=0.05
Step 3:
Test statistics: F-ratio= ms treatment/ m s error

Table 1. *Analysis of variance table (anova).*

Source of variation	Degree of freedom	Sum of freedom	Mean of square	Fratio
State	S-1	SS$_{state}$	MS$_{state}$	$\dfrac{MS_{state}}{MS_{error`}}$
Years	Y-1	SS$_{years}$	MS$_{years}$	$\dfrac{MS_{years}}{MS_{error`}}$
Error	(S-1) (Y-1)	SS$_{error}$	M.S$_{error}$	
Total	YS-1	SS$_{total}$		

Correcting factor (CF)= $\dfrac{Y..^2}{sb}$ *or* $\dfrac{Y..^2}{N}$

Sum of square total

$$\sum_{i=1}^{s} \sum_{j=1}^{b} y_{ij} - \frac{y..^2}{N} \ where \ \ N = sb$$

Sum of square budget

$$\sum_{i=`1}^{a} \frac{y_{i.}^2}{s} - \frac{y..^2}{N}$$

Sum of square state

$$\sum_{j=`1}^{b} \frac{y_{i.}^2}{b} - \frac{y..^2}{N}$$

SSE=SS$_{total}$-SS$_{budget}$-SS$_{state}$
STEP 4:
Critical value: $F_{(V_1, V_2)}^{0.05}$

Decision rule: reject H0, if Fcal>Ftab, if otherwise do not reject null hypothesis.
STEP 5:
Conclusion.
STATISTICAL MODEL

$$y_{ij} = \mu + \alpha_i + \beta_j + \ell_{ij}$$

Where:Y_{ij}= Individual observation of the response variable
α_i=Is the effect of treatment ith
β_j=Is the effect of treatment jth
e_{ij}=Experimental error
SS$_{state}$=Sum of square state
SS$_{total}$=Sum of square total
SS$_{years}$=Sum of square years

4. Analysis

Table 2. *Presentation of data (north central region 2005-2013 budget in nigeria).*

States	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Benue	44.91	46.3	44.84	64.65	63.29	89.49	71.6	159.78	130.992	715.852
Kogi	31.31	33.89	45	52.37	78.669	78	80	126.411	132.6	658.25
Kwara	33.9	35.66	60	66.5	72.2	67	60.61	85.1	94.4	575.37
Nasarawa	25.42	29.05	35.46	55.7	58.3	87.5	81.506	104	108	584.936
Niger	33.79	42.08	50	55.45	69.09	111	129	94.05	83.7	668.16

States	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Plateau	29.4	31.9	45	63.02	79.5	74.864	86.562	115	133.5	658.746
Total nc	198.73	218.88	280.3	357.69	421.049	507.854	509.278	684.341	683.192	3861.314

Test of Hypothesis

Determine the Null and Alternative Hypothesis

$Ho: \mu_1 = \mu_2 = \mu_3 = \mu_4 = \ldots = \mu_n$

$H1: \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \ldots \neq \mu_n$

Ho: There is no significant different in the state budgeting allocation among the state in the North central of Nigeria

H_1: There is significant different in the state budgeting allocation among the state in the North central of Nigeria

Test for hypothesis

$Ho: \mu_1 = \mu_2 = \mu_3 = \mu_4 = \ldots = \mu_n$

$H_1: \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \ldots \neq \mu_n$

Ho: There is no significant different in the state budgeting allocation within the years of consideration in the North central of Nigeria

H_1: There is significant different in the state budgeting allocation within the years considered in the North central of Nigeria

Statistical model

$$y_{ij} = \mu + \alpha_i + \beta_j + \ell_{ij}$$

Level of significance α=0.05

Test statistic

Correcting factor (CF)= $\dfrac{Y..^2}{rt}$ or $\dfrac{Y..^2}{N}$

$$SS_{BUDGET} = \frac{\sum t_i}{s} - C.F = \frac{715.852^2 + 658.25^2 + 575.37^2 + 587.936^2 + 668.16^2 + 658.746^2}{9} - 276106.404$$

$$= \frac{2499321.988}{9} - 276106.404 = 1596.039$$

$$SS_{TOTAL} = \sum\sum Y_{ij}^2 - CF = 324531.931 - 276106.404 = 48425.527$$

$$SS_{STATE} = \frac{\sum s_J}{b} - CF = \frac{198.73^2 + 218.88^2 + \ldots + 683.192}{6} - 276106.404 = 44484.968$$

$$SS_{ERROR} = SS_{TOTAL} - SS_{BUDGET} - SS_{STATE} = 48425.527 - 1596.039 - 44484.968 = 2344.52$$

***Table 3.** Analysis of variance table (anova).*

Source of variation	Degree of freedom	Sum of freedom	Mean of square	Fratio
State	5	1596.039	319.208	5.446
Year	8	44484.968	5560.621	94.870
Error	40	2344.52	58.613	
Total	33	48425.527		

$F_{5,40}^{0.05} = 2.45$ $F_{3,40}^{0.05} = 2.18$

Step 4: Decision rule: reject Ho if Fcal>Ftab, if otherwise do not reject

Decision for State: We reject Ho since Fcal (5.446)>Ftab (2.45)

Decision for Years: We reject Ho since Fcal (94.870)>Ftab (2.18)

Step 5: Conclusion for State

Since Fcal (5.446) is greater than Ftab (2.45) we reject null hypothesis and conclude that $\mu_1 \neq \mu_2 \neq \mu_3$ we find out that the budgeting allocation of Benue state is the highest since 2005-2013 while Kwara state has the lowest budget allocation throughout the year 2005-2013, Hence the economic revenue of the state in the North Central are totally different and are not at equilibrium.

Conclusion for Years

We reject Ho since Fcal is (94.870) is greater than Ftab (2.18) we reject Ho, therefore there is significant different in budget allocation within the year 2005-2013 using our mean from Minitab.

The year 2012 is the greatest budget allocation of (114.057) follow by year 2013 (113.865) and year 2011 which has the budget allocation of (84.880) year 2010 budget allocation is (84.642) follow by year 2009 (70.175) and year 2008 has (59.615) follow by the 2007 which has (46.717) and year 2006 (36.480) and the year 2005 which has the lowest budget allocation of (33.122) Hence, we compare that budget allocation among the years are not the same or is significant different.

5. Discussion of Result

The research work was designed to investigate "The Comparative analysis of state budget in the north central of Nigeria".

A review of related theories on comparative analysis of state budget in North central of Nigeria backed up with a related theoretical framework was carried out chapter four, hypothesis were stated for the research study.

A well structured data collected from the field while the sources used for the collected of data were secondary source. The data collected from the field were presented in a tabular form and expressed in randomized block design, while two ways (ANOVA) table was used to test the stated hypothesis at the significant level of 0.05 percent, with F-distribution V_1, V_2. And from the test it was obvious that comparative analysis of state budget in the North central of Nigeria is significant different.

6. Conclusions

At which ever level, it follows without doubt that analysis ofcomparative analysis of state budget process through which the intentions, programs or plans of Government or an organization are translated and promoted within the framework of the Nigeria economy. It is for this reason that, the goals and programs will be formulated and planned which can be translated into the actual idea of implementation. Without doubt, without analysis of federal budgeting process there can be no economy, it is the catalyst for economic activities and this aid in the social good of all members of the society.

Recommendations

The following recommendation are suggested based, on what was observed in the course of writing this project, the approving authority for various projects should be weighed accounting to the sum involved. That is instead of a situation where it is only.

Arising from the finding made from the study, the following recommendation are made:

1. The government budget should endeaviour that proper implementation on the budget with regards to development of north central zone and other zone
2. The government budgeting policies should positively impact on the sub-economic sector which encompassing is the security and the heartheat of any nations showing that the government of the day promotes infrastructural and economic development of the nation
3. Corruption hinders effective implementation of budgeting with regards to infrastructural development,in

this vein government should monitor the budgeting system as well as the implementation, inorder to ensure the actualization of the benefits of the budget so as to promote economic growth and development.

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