

# Performance Measurement in an Organization Via Budget and Budgetary Control

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## Abstract

The research focuses on performance measurement in an organization via budget and budgetary control using Nigeria bottling company plc, Owerri plant as a case study from 2007 to 2021. The objectives of this study were; to examine the impact of budgeted sales on budgeted profit as a tool for measuring performance in organization; and to determine if budgeted production, and budgeted sales jointly have influence on budgeted profit as a tool for measuring performance in organization. The methodology employed was the Ordinary Least Square (OLS). The diagnostic tests such as normality, serial correlation, heteroscedastic and multicollinearity were all examined. The result of the analysis revealed that budgeted production and budgeted sales jointly have significant effect on the budgeted profit as a tool for measuring performance in Nigerian bottling company plc, Owerri plant during the year under study with a coefficient of variation of 44.6%. It was also concluded that budgeted sales have a significant but negative relationship with the budgeted profit as a tool for measuring performance in organization indicating that budgeted sales impacted negatively on budgeted profit in the organization with a coefficient of variation of 44.6%. The result also showed that budgeted production has no relationship with the budgeted profit as a tool for measuring performance.

**Keywords:** performance measurement, organization, budget, budgetary control, normality, multicollinearity, homoscedasticity, autocorrelation

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## 1. Introduction

The word budget is derived from an old French word “Bougette” meaning a pouch or small bag. In the medieval times, the seal of the Court of Exchequer was kept in a leather pouch bougette

and the word became corrupted into the word budget. Whenever the Chancellor was presenting the crown’s financial proposal to parliament, the bag in which he carried the proposal was referred to as his budget (Mukah, 2018). In making his

presentation, he was said to be opening his budget. Eventually, the word came to mean the content of the bag rather than the bag itself. Not only did the word originate in government practice but also did modern concept of budgeting. It developed slowly as a consequence of the conflict between the crown and parliament to decide where the legitimate right to ultimate authority over the nation affairs resided. The national budget system came into existence as a means by which parliament could exercise control over the crown. Budgeting became one of the ways effective democratic government is safe-guarded (Chircir & Simiyu, 2017).

Isaac, Lawal and Okoli (2018) defined budget as “a financial plan summarizing the financial experience of the past, stating the current plan and projecting it over a specified period of time in future”. Hence, a budget is the blueprint of financial administration through which different operations in the field of public finance are linked. In public sector accounting, budgets refer to financial proposals, which are placed before the legislative assemblies periodically for approval and allow governments spend money for the benefit of the citizenry. Thus, it entails the entire financial operations of the government, which may form the basis of future fiscal planning for the economy.

During the ninetieth and early twentieth century's the chancellor took pride in and in some measures were judged by their ability to balance their budget. This involved being able to forecast the expenditure necessary to attain the objectives contained in the government proposal and to forecast the amount that would be collected by the taxes proposed. The system of government accounting is termed vote accounting. Proposal for the forthcoming expenditure is coded under vote heads and parliament in passing the appropriate acts approves expenditure to the amount sanctioned, vote head by vote head (Imo & Des-Wosu, 2018).

However, budget in modern has become a fundamental activity in almost all organization. It is a means by which plans for the future may be expressed in terms of financial input and outputs and which will show the results in financial terms by adhering to the proposed plans (Akshita, 2022). Budget is usually expressed in quantitative,

usually monetary terms, covering a specific period of time, usually one year. In other words, a budget is a systematic plan for the utilization of manpower and material resources. In an organization a budget represents an estimate of future cost and revenues. Budget may be divided into two basic classes; capital budget and operating budget. Capital budget are directed towards proposed expenditures for new projects and often requires special finance. The operating budgets are directed towards achieving short term operational goals of any organization or profit goals in organizations.

Also, budgetary control is the use of the comprehensive system of budget to aid management in carrying out its functions. There are two types of control namely: budgetary and financial. Budgetary control is defined by the Chartered Institute of Management Accountant (CIMA) as the establishment of budget relating the responsibilities of executive to the requirement of policy and the continuous comparison of policy and the continuous comparison of actual with budgeted results. While financial control is the action of management of an organization taken to ensure that the costs incurred and revenue generated are at acceptable limit (Mulani, Chi & Yang, 2019).

## 2. Statement of Problem

Reliable estimates of linkage between budget and budgetary control as a tool for measuring organizational performance are important in improving efficiency in production, sales and profile of organization. It is important in establishing projection and making comparison with actual result of key variables in organizational operations. Organizational planning without articulates and well-designed budget and budget control system could lead to waste of resources. Therefore, to ensure efficiency performance of goals vis-a-vis production sales and profit management are to make budget and budgetary policies to help co-ordinate effective use of available resources to enhance performance in their operations. Non-compliance with budget and budgetary procedures and lack of strict adherence to budget details, control performance, participatory budget process and non-constitution of budget committee could result in the non-attainment of above-mentioned performance

goals. One potential difference is that level of performance that can guarantee these goals. This study intends to add to the pool of existing literature budget and budgetary control as a major determinant in performance of organizations.

### 3. Literature Review

Egbunike and Unamma (2017) worked on budgeting, budgetary control and performance evaluation: evidence from hospitality firms in Nigeria. The study was carried out with the view to address two fundamental issues: First, to determine if there was any association between budget, budgetary control and performance evaluation; second, to ascertain if there was any significant variation in the budget, budgetary control and performance evaluation measures of hospitality firms in Nigeria. The study employed descriptive design and primary data (questionnaire) was the major source of data collection. Questionnaire was administered to a total of six hundred (600) employees of ten (10) selected hospitality firms in Nigeria. The data obtained were analyzed using both descriptive and inferential statistics. Findings indicated that budget and budgetary control could serve as an avenue through which hospitality firms in Nigeria can be evaluated. In addition, it was revealed that there is a significant variation in the budget, budgetary control and performance evaluation of hospitality firms in Nigeria. On the basis of the findings, it was recommended that hospitality firms in Nigeria should carry out performance evaluation on every aspect of their budget and budgetary activities as a way of ensuring that budgeted outcomes are met. Also, budgetary costs should be a basis of choosing the most-fit performance evaluation technique for hospitality firms since such performance evaluation systems can provide economic benefits of different sorts to them.

Etale and Idumesaro (2019) worked on analyzing the link between budgetary control and performance: A Case Study of Bayelsa State of Nigeria. The study examined the link between budgetary control and performance with a focus on Bayelsa State of Nigeria as a case study. The study adopted actual expenditure (AEX) representing performance as the dependent variable, while capital expenditure budget (CEB) and recurrent expenditure budget (REB) were

used as the independent variables. Time series data on the variables were obtained from the Budget Department of the Ministry of Budget covering the period 2007 to 2016. The type of research design adopted in the study was ex-post facto research design. Data collected were analyzed using descriptive statistics and multiple regression analysis based the E-view version 10 computer software. Based on the findings, the study concluded that the two independent variables had no statistical effect on actual budget performance. It implied that there was no link between budgetary control and performance in Bayelsa State. The study recommended among others that government should encourage budgetary participation, consider resource availability in budgeting, strive to improve the state internally generated revenue, and employ qualified and highly skilled personnel in budget administration to ensure that budgetary control would bring about improved performance.

Schubert and Kirsten (2021) carried out a research on the effect of budgeting control on the financial performance of SMEs in Germany. The study used the quantitative technique where data was gathered from the local business owner of SMEs located in Germany's three cities Munich, Berlin and Stuttgart because they have a high number of SMEs. Surveys were self-administered and also sent out to the business owners. The research instruments adopted included questionnaires and the interview guide. The study found that budgetary control integrates the organization's strategic planning with budgets and processes of cost control. The budgetary control also identified the budgeting/financial skills required for better decision-making and identifies key financial indicators for the business and how and when to monitor them. The budgetary control identified sources of financial and business data that provided insights into business and financial strategies when converted into budgets. The budgetary control helped interpret budgets and performance measurements as communication tools and finally helped to think pro-actively beyond budgeting. The study also found that budgetary control economized management time by using the management by exceptional principle. The study concluded that budgeting control had a significant and positive relationship with financial

performance. The adoption of the budgeting control allows SMEs to boost their financial performance while improving contributions to the economic situation, and employment in Germany. The study recommended that SMEs in Germany should pay very close attention to the budget control procedure.

#### 4. Materials and Methods

A Secondary data set was collected from Nigeria bottling company plc, Owerri plant. The time series data covered the period of 2007 to 2021, which was considered long enough to establish a long-run linearity relationship among the variables.

#### 5. Model Specification

The model to be estimated expresses performance in an organization as a function of budget and budgetary control represented by, budgeted production (BP or  $Z_1$ ) and budgeted sales (BS or  $Z_2$ ). There are several measures of performance in an organization but, budgeted profit (BPF or  $Y$ ) will be used for this study. The relation is expressed mathematically thus:

$$Y = f(Z_1, Z_2) \quad (1)$$

This is further written as a regression equation

thus:

$$Y = \beta_0 + \beta_1 Z_1 + \beta_2 Z_2 + e \quad (2)$$

Where  $Z_1$  = Budgeted Production,  $Z_2$  = Budgeted Sales,  $\beta_0$  is a constant (intercept); while  $\beta_1$ , and  $\beta_2$  represent slope coefficients and  $e$  is the error term.

#### 6. Analytical Procedure

In the analytical procedure, the data collected for this study will be subjected to diagnostic tests before proceeding to the proper analysis. The multiple linear regression shall be used in this study via the statistical software packages known E-views and SPSS.

##### 6.1 Diagnostic Tests

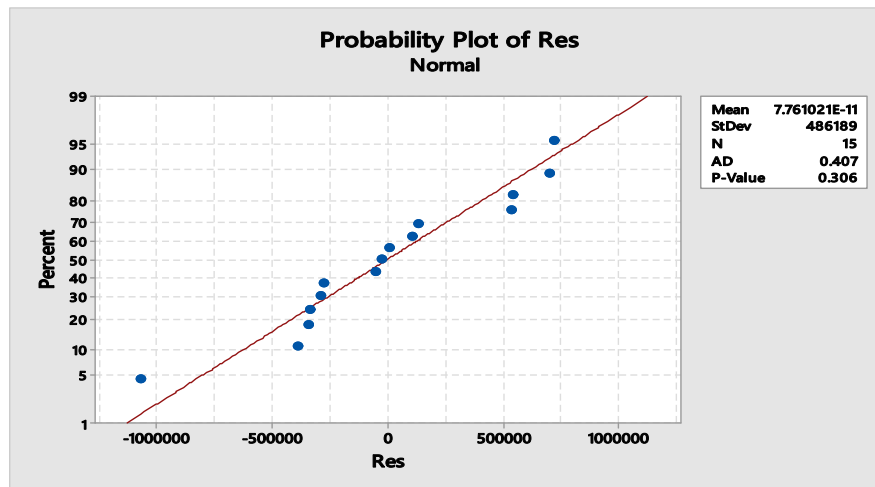
In this section, the diagnostic tests that the study shall consider are normality, serial correlation, heteroscedasticity, and multicollinearity.

##### 6.2 Testing for Normally Distributed Errors

To test for normal distributed errors, the study employed use Anderson-Darling test for normality. The hypotheses of the Anderson-Darling test are as follows:

$H_0$ : Errors are normally distributed

$H_1$ : Errors are not normally distributed



**Figure 1.** Testing for Normally Distributed Errors

Source: Minitab software

Since the p-value (0.306) is greater than 0.05 from Figure 1, the null hypothesis is not rejected. This implies that the assumption of normality distributed errors is satisfied.

##### 6.3 Testing for Serial Correlation

To test for serial correlation, we use the Breusch-Godfrey Serial Correlation LM Test. The hypotheses of the Jarque-Bera test are as follows:

$H_0$ : There is no serial correlation of the equation errors up to lag  $k$

$H_1$ : There is serial correlation of the equation

**Table 1.** Testing for Serial Correlation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	4.671207	Prob. F(2,10)	0.0369
Obs*R-squared	7.245022	Prob. Chi-Square(2)	0.0267

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-61238.15	257376.9	-0.237932	0.8167
Z1	0.020321	0.082394	0.246627	0.8102
Z2	0.093682	0.193335	0.484561	0.6384
RESID (-1)	0.609746	0.314065	1.941464	0.0809
RESID (-2)	0.269221	0.347795	0.774081	0.4568
R-squared	0.483001	Mean dependent var		6.21E-11
Adjusted R-squared	0.276202	S.D. dependent var		486188.7
S.E. of regression	413631.4	Akaike info criterion		28.96454
Sum squared resid	1.71E+12	Schwarz criterion		29.20056
Log likelihood	-212.2340	Hannan-Quinn criter.		28.96203
F-statistic	2.335603	Durbin-Watson stat		1.781402
Prob(F-statistic)	0.126136			

Source: E-view software

The null hypothesis of these two tests is that there is no serial correlation of the equation errors up to lag  $k$  (mentioned above). Since the probability associated to the two tests is below 0.05, then the null hypothesis is rejected, so we reject the nonexistence of serial correlation.

#### 6.4 Testing for Heteroscedasticity

To test for heteroscedasticity, we use the Breusch-Pagan-Godfrey Test. The hypotheses of the Breusch-Pagan-Godfrey test are as follows:

$H_0$ : There is presence of homoscedacity

$H_1$ : There is presence of heteroscedacity

**Table 2.** Testing for Heteroskedacity

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	6.617455	Prob. F(2,12)	0.0116
Obs*R-squared	7.867024	Prob. Chi-Square(2)	0.0196

Scaled explained SS                      4.545344                      Prob. Chi-Square(2)                      0.1030

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.42E+11	1.38E+11	4.640036	0.0006
Z1	-36008.89	45304.28	-0.794823	0.4422
Z2	-378561.5	104062.8	-3.637816	0.0034
R-squared	0.524468	Mean dependent var		2.21E+11
Adjusted R-squared	0.445213	S.D. dependent var		3.07E+11
S.E. of regression	2.29E+11	Akaike info criterion		55.32484
Sum squared resid	6.27E+23	Schwarz criterion		55.46645
Log likelihood	-411.9363	Hannan-Quinn criter.		55.32333
F-statistic	6.617455	Durbin-Watson stat		1.627066
Prob(F-statistic)	0.011563			

Source: E-view software

Table 2 shows that heteroskedacity does seem to be a problem since the p-value (0.0116) is less than 0.05. Hence, the null hypothesis is rejected in testing for heteroskedacity.

#### 6.5 Testing for Multicollinearity

To test for multicollinearity, we use the VIF.

Making process in Multicollinearity test, the decision criteria are:

- 1) If the VIF value lies between 1 – 10, then there is no multicollinearity
- 2) If the VIF < 1 or > 10, then there is multicollinearity

**Table 3.** Testing for Multicollinearity

#### Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	1.955E6	317683.459		6.154	.000		
Z1	-.001	.104	-.002	-.010	.992	.948	1.055
Z2	-.724	.239	-.668	-3.027	.011	.948	1.055

a. Dependent Variable: Y

Source: SPSS software

The VIF value of 1.055 obtained as shown in Table 3 shows that the value is between 1 and 10, which implies no multicollinearity symptoms.

#### 6.6 Test of Hypothesis

H<sub>0</sub>: Budgeted Production and Budgeted Sales have no significant effect on the budgeted profit as a



tool for measuring performance in organization  
 $H_1$ : Budgeted Production and Budgeted Sales have

significant effect on the budgeted profit as a tool for measuring performance in organization.

**Table 4.** Summary of Regression for Hypothesis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1955066.	317683.5	6.154133	0.0000
Z1	-0.001061	0.104093	-0.010197	0.9920
Z2	-0.723860	0.239100	-3.027438	0.0105
R-squared	0.445785	Mean dependent var		1221333.
Adjusted R-squared	0.353416	S.D. dependent var		653079.2
S.E. of regression	525143.8	Akaike info criterion		29.35759
Sum squared resid	3.31E+12	Schwarz criterion		29.49920
Log likelihood	-217.1819	Hannan-Quinn criter.		29.35608
F-statistic	4.826129	Durbin-Watson stat		0.635389
Prob(F-statistic)	0.028978			

Source: E-view software

The results as displayed in Table 4 show that budgeted production and budgeted sales jointly have significant effect on the budgeted profit as a tool for measuring performance in organization since the p-value for F-statistic (0.03) is less than significance level  $\alpha = 0.05$ . The t-test shows that t-cal for Budgeted Production ( $Z_1$ ) is -0.010197 with a prob. value of 0.9920 while Budgeted Sales ( $Z_2$ ) has a t-cal value of -3.027438 with a prob. value of 0.0105. This shows that Budgeted Sales has a significant but inverse relationship with the budgeted profit as a tool for measuring performance in organization. The result also shows that Budgeted Production has no relationship with the budgeted profit as a tool for measuring performance.

#### 6.7 Discussion of Findings

The empirical results emanating from the analysis indicate that budgeted production and budgeted sales jointly have significant effect on the budgeted profit as a tool for measuring performance in Nigerian bottling company plc, Owerri plant during the year under study. Further empirical analysis revealed that budgeted sales have a significant but inverse relationship with the

budgeted profit as a tool for measuring performance in organization. The result also shows that Budgeted Production has no relationship with the budgeted profit as a tool for measuring performance.

#### 7. Conclusion

From the results obtained in this study, it can be concluded that budgeted production and budgeted sales jointly have significant effect on the budgeted profit as a tool for measuring performance in Nigerian bottling company plc, Owerri plant during the year under study. It is also concluded that budgeted sales have a significant but negative relationship with the budgeted profit as a tool for measuring performance in organization indicating that budgeted sales impacted negatively on budgeted profit in the organization. The result also shows that Budgeted Production has no relationship with the budgeted profit as a tool for measuring performance.

#### 8. Recommendations and Suggestions for Further Research

From the above findings and in order for the

manufacturing companies to operate profitably, they must take the following critical steps:

- 1) Adopt a budgetary system of adequate planning with strict adherence to implementation, which cuts across the finance, production, administration, marketing etc;
- 2) The finance department should review all existing standards and introduce measures that will tighten the internal control system to prevent leakages of financial resources;
- 3) Only judicious and profitable investments should be undertaken;
- 4) Top executives of Nigerian bottling company plc, who presently have firm grip on the beverages and confectionary market in the country, should assess the current marketing and distribution policies as well as economic, political, technological and other socio-economic factors that affect the company;
- 5) Budgeting and budgetary control system should not be too complex for the people to understand;
- 6) To enhance the attainability of budgets, resources should be provided to complement the budgets;

The results obtained in this study did not show that the organization is doing well as it signifies poor performance based on the available figures employed during the year under study. Again, some of the assumptions of multiple linear regression like homoscedasticity and serial correlation were not met in this study. Hence, similar study should be carried out to examine the assumptions and probably transform the data or employ its non-parametric equivalent for data analysis.

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