

Evaluating The Impact of Stock Market Performance on Economic Growth in Nigeria. A Generalized Additive Model Approach

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Introduction

Economic growth can be characterised as an increase in an economy's output of goods and services over a given period, as measured by a percentage change in real GDP. The stock market plays a vital role in driving economic progress. The stock market has fluctuated due to macroeconomic instability, regulatory changes, and external economic shocks. However, such processes significantly affect economic growth, with major consequences for policymakers and investors. Thus, the actual impact of stock prices on organisations and consumer confidence is one approach. The rise in stock prices can boost economic enthusiasm and investment expansion. This increased economic activity may aid overall economic growth.

Materials and methods

The analytical technique adopted for this research data is a Generalized Additive Model (GAM), model estimation will be conducted using appropriate statistical software, with careful consideration given to model diagnostics and validation procedures to ensure the robustness of the results.

A generalised linear model relates the response variable Y to the predictors X_1, X_2, \dots, X_p using the link function given by

$$g(\mu) = \eta = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p$$

Where: $g(\eta)$ is the link function relating to the linear predictors

Results and discussion

The estimated value of the intercept is 20.46188, the standard error of the estimate is 0.09913, and the T-value is 206.4, which is extremely large. The Generalized Additive Model (GAM) results show the associations between the response variable and four smooth-term predictors. With an effective degree of freedom (edf) of 1.583, the proportion of the index indicates some linearity. With a high p-value of 0.0367 and an F-statistic of 1.224, the significance level is stable. Likewise, Market Capital's edf of 3.176 indicates a modest degree of smooth function flexibility, while its F-statistic of 1.421 and p-value of 0.0267 demonstrate a significant effect. While the F-statistic for sales is 1.415 and the p-value is 0.0217, the edf for sales is 2.097, suggesting non-linear correlations. With a p-value of 2.00E-16 and an F-statistic of 125.952, the inflation rate, on the other hand, is modelled as a linear term (edf = 1) that is highly significant, indicating a strong and statistically significant link with the response variable. This suggests that each variable makes a significant contribution to the model.

Conclusions

The analysis of deviation influencing the stock market dynamics and the key factors driving sales trends. Significant predictors such as Share Index, Inflation Rate, GDP, and Volumes were identified, with the Inflation Rate and Share Index having a strong association. This emphasizes the sensitivity of macroeconomic conditions, especially inflationary pressures. The model demonstrated a high explanatory power, with an adjusted R-squared value of 96.7%. The robustness of the model was further validated by diagnostic plots, which indicated minimal residual deviations. These findings underscore the importance of economic indicators in understanding and predicting trends in the stock market.

Keywords: Economic Growth, Generalized Additive Model, GDP, Inflation, Stock Market, Trading Volume