Montenegrin Journal of Economics

ELIT
Economic Laboratory Transition
Research Podgorica

Public-Sector Bonds and Economic Growth in Nigeria

CORDELIA ONYINYECHI OMODERO[1] and PHILIP OLASUPO ALEGE[2]

[1] Department of Accounting, College of Management and Social Sciences, Covenant University Ota, Ogun State, Nigeria, e-mail: onyinyechi.omodero@covenantuniversity.edu.ng, ORCID ID: 0000-0002-8758-9756.

[2] Department of Economics and Development Studies, College of Management and Social Sciences, Covenant University Ota, Ogun State, Nigeria.

ARTICLE INFO

ABSTRACT

Most times, state and local borrowing takes the form of bond issuing to the general public, which creates ease of accessibility by the investing community. The investing public finds the opportunity a suitable time to buy security assets which have government backing and serve as collateral for future loan contractions. Curiously, this study tries to investigate the effect of each type of government bond on economic growth. Thus, the study examines the impact of various public-sector bonds on economic growth of Nigeria from 2003-2019. To achieve the set objective, the study employs multiple regression technique to assess the impact of each class of government bond on GDP. The findings indicate that treasury bills and FGN bond impact positively and significantly on economic growth of Nigeria. On the contrary, Treasury bond and inflation affected growth negatively and substantially. However, other government bonds and debts exert insignificant negative influence on economic growth. The study suggests that the government should endeavor to enhance the content of Treasury bond and other bonds. Furthermore, the inflation rate should be brought under control by the relevant government agencies.

INTRODUCTION

Investment in state-owned bonds have become very attractive in the recent times among African Countries. The concept of economic diversification has alienated many economies from reliance on a single source of project financing. It is important to note that economic growth sustainability entails that all sectors of the economy must play an active role. The public and the private sectors are the major role players to ensure sustainable economic growth in a nation. These roles are diverse in nature and may take the toll of borrowing through saleable securities to ensure economic movement in the right direction. Thus, an economic viability is not all about buying and selling to keep the economy liquid but a conscious effort to avoid monetary stagnation. An economy suffers recession when there is absence of innovative schemes to keep it economically viable. One of the innovative schemes identified by (Omodero & Alege, 2021) is the introduction of public sector bonds which allows the government to borrow from

individuals and firms at any given time. When the government issues these bonds to the public, individuals and firms purchase the securities with their money. There is a dual purpose for the bonds, they serves as investments to the individuals and firms acquiring them and also provide the government with financial resources to embark on government projects. The firms and individuals holding the securities can as well dispose them at a gain in the Nigerian Stock Market at any given time.

Nigerian Stock Market has both primary and secondary market. The primary market is where both the public and private sectors offer securities such as stocks and bonds for sale to the public. Investors go through the prospectus and declare their intention to purchase the shares or debentures put forward for sale. Conversely, the secondary market is where investors and security holders resale their existing securities to interested buyers. At this point, the Stock Market brokers are involved to carry out the deals. The Nigerian Stock Market helps the government to offer for sale bonds such as Federal Government of Nigeria (FGN) savings bond, FGN bonds, FGN green bond, development stocks, treasury certificates, treasury bonds, treasury bills, promissory note and FGN Sukuk. These are the various security instruments the Federal Government of Nigeria uses to source fund internally. The buyers are given certificates which are assets and can be used as collateral to obtain loans from the bank. The government bond also attracts a steady interest known as coupon (Omodero & Alege, 2021). Government bonds is structured in such a manner that the bond holders do not have anything to lose because it is a marketable security. At any time the holder wishes to dispose it, there are always ready buyers. On the other hand, the government makes regular payment of the interest attached to the bonds. All incomes accruable to government bonds in Nigeria are tax free and the bonds act as a liquid assets.

The fact that these bonds have not been fully examined by researchers and scholars to ascertain their various contributions to economic growth of the country is the motivation for this research. This investigation is a further inquiry to determine the economic benefits of various classes of government bonds in Nigeria. Omodero and Alege (2021) considered the effects of government bonds on capital market growth in Nigeria but did not investigation the interaction with the GDP growth. Other relevant studies (Kapingura & Makhetha-Kosi, 2014; Muharan, Ghoxali & Arfinto, 2018; Teixeira, Vieira & Ferreira, 2021) have their focus on bond market development and bank liquidity and profitability. This study aims at providing insight on the effectiveness and usefulness of various classes of government bond in driving economic growth.

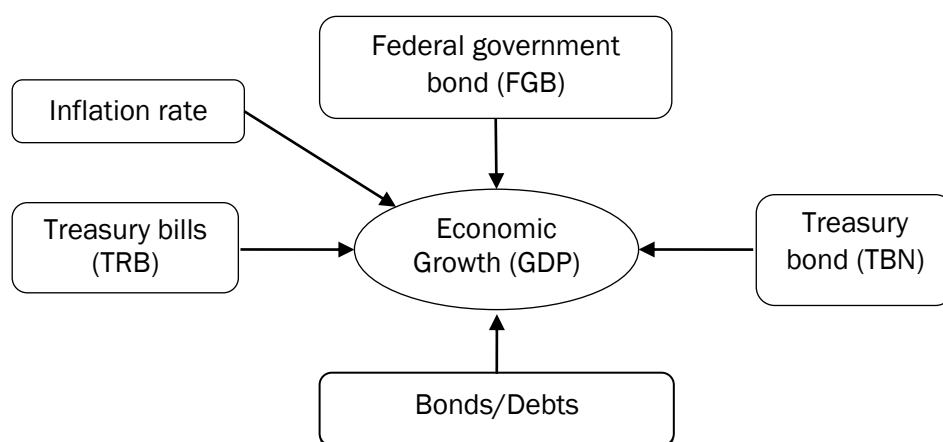# 1 CONCEPTUAL FRAMEWORK AND ELUCIDATION

Figure 1. Conceptual framework (Designed by authors, 2021

Government bond. A state-owned bond is a commitment founded asset, which allows persons to lend money to the government and in return obtain a fixed interest (IG International, 2021). Administrations use these monies to raise resources for innovative ventures and provision of infrastructures for

social development purposes. The resources the government realizes from the bond issued to the public helps in economic growth sustainability and planning. Government bonds also enable investors to receive a steady yield at intervals. When individuals buy a government bond, they loan money to the government at a fixed interest rate for an agreed time frame. Consequently, the government pays back a coupon which is a fixed interest paid at steady intervals. Following this scenario, government bond is referred to as a fixed-income asset. Also, bond holders get back their original investment as soon as the bond terminates. The day an investor recovers his/her original investment is known as the maturity date. Thus, different bonds have diverse maturity dates which could be either less or more than a year and above. Government bonds are associated with interest rate risk, inflation risk and currency risk (IG International, 2021). The point is that when interest, exchange and inflation rates increase, the value of bonds decline.

Federal government bond (FGB). Federal government bond in Nigeria comprises green bond and savings bond. The FGN green bond is the kind of bond mechanism that uses its earnings for the sponsorship of green projects. These projects are referred to as green because they are viable and promise to enhance the nation's economic growth. The projects may be fresh or already in existence but must comply with the green bond principles. These principles are the conditions that projects are required to align with before finances could be directed to them. The requirements include: procedure for project assessment and selection, reporting of list of qualified green projects, management and usage of project incomes (The Nigerian Stock Exchange, 2019). On the other hand, FGN savings bond is an innovative marketable security introduced by the Debt Management Office (DMO) of Nigeria, on behalf of the Federal Government of Nigeria. FGN savings bond has been launched to support the savings culture among Nigerians. It provides all citizens, a chance of contributing to the nationwide economic expansion, regardless of their income level. Relatively, it has the most tolerable outcomes as compared to other securities available in the capital market. There is three-monthly coupon outflows to bondholders. FGN Savings Bond is harmless and supported by the complete assurance and recognition of the Federal Government of Nigeria.

Treasury bond (TBN). Treasury bond is a part of the greater set of government bonds, a sort of bond allotted by a state government with an obligation to pay periodic interest known as coupon, as well as the principal upon maturity (Chen, 2019). Treasury bond was not introduced as just an innovative borrowing tool for the government, using the term, but as an indispensable aspect of local debt management arrangement designed to lengthen the duration of government loan reimbursement. The consequence of this conception is that the existing devices were not apposite for exchange in the money market and cannot function as a scheme for open market operations. The key objective of treasury bonds is to offer a cost effective basis for shortfall financing for the government (Nzotta, 2004). It also seeks to curtail debt service commitments caused by the extraordinary degree of deficit funding by the government (Nzotta, 2004).

Treasury bills (TRB). Treasury bills are temporary sovereign obligation securities which have a duration of less than one year or maximum one year. It implies that its maturity for refund upon commitment by the government is one year or less. Treasury bills are traded with a rebate and redeemed at par. These bills are the greatest floating money market securities and are supported by warranty of the Federal Government of Nigeria. The Federal Government of Nigeria, via the nation's Apex Bank, issues Nigerian Treasury Bills to offer short-range finance for government budget shortage. The treasury bills are typically issued through a competitive bidding method, quoted and transacted on the Nigeria's foremost debt capital, foreign exchange and derivatives over-the-counter securities exchange (FMDQ OTC) platform (FMDQ, 2019). Therefore, treasury bills are debt instruments used by the federal government to acquire domestic loan for a short period of about three months but not more than one year.

2. EMPIRICAL REVIEW

Kapingura and Makhethan Kosi (2014) assessed the causal relationship between bond market development and economic growth in South Africa from 1995 – 2012. The study employed Engle Granger

co-integration method and Pairwise Granger Causality test for data breakdown. The findings revealed a nexus between bond market capitalization and economic growth. Thus, the study suggested appropriate policies by the African Countries to boost bond market for more economic progress. In addition, Matei (2015) substantiated the interconnection between bond market growth and the increase in real GDP using bond return of 10 years maturity and bond income of 1 year duration as substitutions of bond market advancement in 16 Eurozone republics. The result of the study exhibited that economic activity of a nation that is materially influenced by bond market underlying forces were traced to Portugal, Finland, Italy, Greece, and France for the period of 2001 – 2011 covered by the research work. Spilioti (2015) used panel data of the Euro area countries spanning from 1981 – 2014 to examine the relationship between government debt and GDP growth. The study found evidence that government debt impacted positively and significantly on economic growth.

Pegkas (2017) discovered that government internal borrowing and population had a negative long-run effect on Greece economic growth. The study also revealed the effect of debt break to be negative on growth after year 2000. Muharan et al. (2018) used Vector Autoregressive, Vector Error Correction Model and Granger Causality methods to examine the relationship among bond market development, economic growth and foreign investment in some developing countries. The study covered a period from 2004 – 2015 and found both short and long run co-integrations in all the samples. The findings also revealed no causality but the study discovered univariate correlation in Indonesia, Mexico and Thailand. Butkus and Seputiene (2018) studied the growth effect of public debt on government effectiveness. The study used a panel data of 152 countries for a period from 1996 – 2019. The findings had that debt turning point would depend on effective government but that the government's effectiveness might be too insufficient to avert negative effects of debt.

Teixeira et al. (2021) analyzed the effects of government bonds on liquidity risk and bank profitability in Cape Verde from 2000 – 2017. The study employed ordinary least squares estimation method. The findings showed that government debt securities had no effect on bank liquidity risks. It was also re-vealed that government bonds had positive effect on banks assets' profitability. The study concluded that it was more beneficial for banks to hold government bonds as safe assets and risk-free substitutes. Omodero and Alege (2021) investigated the impact of government bond on capital market growth in Nigeria from 2003 – 2019. The study employed multiple regression technique to examine the effects of various government bond on total market capitalization. The findings indicated that the Federal Government bond had significant positive impact on total market capitalization. It was also found that the other classes of bonds did not exert significant impact on capital market growth in Nigeria.

3. METHODOLOGY

The statistical model adopted for this research is the multiple regression analysis. The study investigates the effect of public-sector bonds on economic growth in Nigeria. This study makes use of Statistical Package for Social Sciences (SPSS) to analyze the data obtained from the sources specified in Table 1. The data covered a period from 2003-2019.

Table 1. Variables description and sources

Variable	Description	Source
GDP	Gross Domestic Product	CBN Statistical Bulletin
TRB	Treasury Bills	CBN Statistical Bulletin
FGB	Federal Government of Nigeria (FGN) Bond	CBN Statistical Bulletin
TBN	Treasury Bond	CBN statistical bulletin
BND	Other Bonds and Debts not classified	CBN statistical bulletin
INF	Inflation	World Development Indicators

Source: Compilation by Author, 2021

The model specified for this study is as follows:

$Y = \beta_0 + \beta X_1 + \beta X_2 + \dots \mu_{it}$
Where,
Y = Gross Domestic Product (dependent variable); X = Public-Sector bonds (independent variable)
β = Coefficient
μ_{it} = Error term

The above model can be specifically applied to this study as:

$LOGGDP = \beta_0 + \beta_1 LOGTRB + \beta_2 LOGFGB + \beta_3 LOGTBN + \beta_4 LOGBND + \beta_5 LOGINF + \mu_{it}$
Where:
GDP = Gross Domestic Product; TRB = Treasury Bills; FGB = Federal Government of Nigeria's Bond; TBN = Treasury bond; BND = Bond and Debt; INF = Inflation rate.
β_0 = Coefficient of the parameter estimate
β_1-β_5 = intercept
μ_{it} = Error term

4. DATA SCRUTINY AND EXPLANATION

The descriptive statistics for this study include the minimum and maximum values, mean and standard deviation. From Table 2, the Minimum Values of the Gross Domestic Product (GDP), Treasure Bills (TRB), Federal Government of Nigeria bonds (FGB), Treasury bond (TBN), Bond and Debt (BND) and Inflation are: 4:12; 2.67; 1.86; 2.10; 0.54 and 1.19 respectively. The Maximum Values for GDP, TRB, FGB, TBN and BND are: 4.73; 3.17; 3.29; 2.48; 1.90 and 1.23 individually. The Mean Values for GDP, TRB, FGB, TBN and BND are: 5.16; 3.55; 4.02; 2.63; 3.15 and 1.32 in that order. The Standard Deviation of GDP, TRB, FGB, TBN and BND are: 0.31; 0.29; 0.69; 0.17; 0.88 and 0.03 correspondingly. Thus, Standard deviation is only a mathematical tool that helps to determine how far the values of data are spread above and below the mean. The point is that, the higher the dispersion or variability, the greater the magnitude of the deviation from the mean value. The descriptive statistics on Table 2 shows that the standard deviation values of the distribution in all the variables has a lower spread and below the mean values. The result also depicts that the distribution of the data sets are clustered around the mean. However, Figure 2 provides evidence of the normality of the distribution.

Table 2: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
LOGGDP	17	4.12390	5.15900	4.7336283	.31288248
LOGTRB	17	2.67388	3.55386	3.1688760	.29733935
LOGFGB	17	1.86070	4.02219	3.2919600	.69064288
LOGTBN	17	2.10033	2.63407	2.4819138	.16986628
LOGBND	17	.54283	3.14626	1.9000466	.88372662
LOGINF	17	1.18667	1.31618	1.2348884	.03195732
Valid N (listwise)	17				

Author's calculation, 2021.
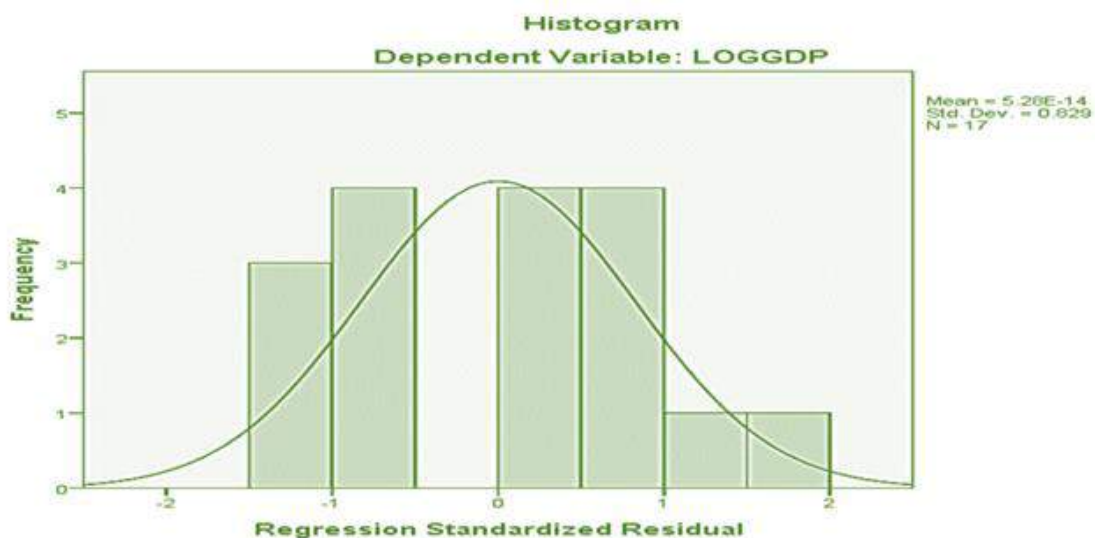
Figure 2. Histogram normality

Table 3. Correlations

		LOG GDP	LOG TRB	LOG FGB	LOG TBN	LOG BND	LOG INF
LOG GDP	Pearson Correlation	1	.838**	.974**	-.835**	.797**	-.666**
	Sig. (2-tailed)		.000	.000	.000	.000	.004
	N	17	17	17	17	17	17
LOGTRB	Pearson Correlation	.838**	1	.733**	-.775**	.825**	-.288
	Sig. (2-tailed)	.000		.001	.000	.000	.262
	N	17	17	17	17	17	17
LOG-FGB	Pearson Correlation	.974**	.733**	1	-.731**	.760**	-.716**
	Sig. (2-tailed)	.000	.001		.001	.000	.001
	N	17	17	17	17	17	17
LOGTBN	Pearson Correlation	-.835**	-.775**	-.731**	1	-.574*	.421
	Sig. (2-tailed)	.000	.000	.001		.016	.092
	N	17	17	17	17	17	17
LOG BND	Pearson Correlation	.797**	.825**	.760**	-.574*	1	-.517*
	Sig. (2-tailed)	.000	.000	.000	.016		.034
	N	17	17	17	17	17	17
LOG INF	Pearson Correlation	-.666**	-.288	-.716**	.421	-.517*	1
	Sig. (2-tailed)	.004	.262	.001	.092	.034	
	N	17	17	17	17	17	17
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							

Source: Author's calculation, 2021.

The result on Table 3 shows the correlation existing among the variables used in this study. It could be observed that the variables perfectly correlate with themselves individually as each has the correlation value of 1 to itself. GDP has strong positive correlation with TRB, FGB, BND and a strong negative

correlation with TBN and INF. The Pearson Correlation for all the variables are significant at 1% level of significance. Similarly, TRB has a strong positive correlation with GDP, FGB, and BND but negatively and significantly correlate with TBN. However, there is an insignificant negative correlation with INF. FGB has a strong positive relationship with GDP, TRB and BND. However, there is existence of material negative connection with TBN and INF. TBN correlate positively and strongly with INF at 10% level of significance but has strong negative correlation with GDP, TRB, FGB and BND. BND has a strong positive correlation with GDP, TRB, and FGB at 1% level of significance. The relationship with TBN and INF is negatively significant at 5% level. INF has a significant negative connection with GDP and FGB at 1% level but at 5% level with BND. At 10% level, there is a positive correlation with TBN while it expresses insignificant correlation with TRB.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.997ᵃ	.994	.992	.02870412	2.026

Predictors: (Constant), LOGINF, LOGTRB, LOGTBN, LOGBND, LOGFGB Dependent Variable: LOGGDP

Source: Author's calculation, 2021.

The result on Table 4 provides summarized statistical information of the model applied in this study. From Table 4, the correlation value is 99.7% and the R-Square is 99.4%. The result indicates a strong positive correlation between the dependent and the independent variables employed in this study. In addition, the independent variables explain about 99.4% of the variability in the response variable which is GDP. It implies that government bonds determine up to 99.4% of economic growth in the Sub-Saharan African Country Nigeria. That is, the government depends on borrowed money to expand the economy. However, the good aspect of it is that, the securities used in the borrowing is marketable and the income (interest element) is stable. The meaning is that the attributes of government bond actually make them agents of economic growth. From the result on Table 4, the Standard Error of the Estimate is 0.02870412 which is less than the value of 1. The result shows that the model forecast is error free. There is also absence of multi-collnearity as found in Table 6 and auto-correlation as the Durbin-Watson in Table 4 indicates the value of 2.

Table 5. ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.557	5	.311	378.011	.000***
	Residual	.009	11	.001		
	Total	1.566	16			

Significant at ***1%.
Dependent Variable: LOGGDP

Predictors: (Constant), LOGINF, LOGTRB, LOGTBN, LOGBND, LOGFGB

Author's calculation, 2021

Table 5 provides evidence that the model used in this study is statistically significant and the independent variables jointly impact on economic growth positively and significantly.

Table 6. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	4.741	.523		9.059	.000		
	LOGTRB	.254	.070	.241	3.632	.004***	.119	8.388
	LOGFGB	.288	.025	.635	11.544	.000***	.174	5.754
	LOGTBN	-.294	.081	-.160	-3.642	.004***	.273	3.662
	LOGBND	-.007	.019	-.020	-.378	.713	.188	5.327
	LOGINF	-.822	.407	-.084	-2.019	.069*	.304	3.289

Dependent Variable: LOGGDP
Significant at: ***1%; **5%; *10%

Source: Authors' calculation, 2021

Table 6 implies that the model for this study can now be presented as follows:

Y = 4.741 + 0.254TRB + 0.288FGB – 0.294TBN – 0.007BND – 0.822INF

The study tests the impact of government bond on economic growth of Nigeria. Using the t-statistics TRB and FGB have significant positive impacts on GDP at 5% level of significance. At the same 5% level, TBN has material adverse effect on GDP and inflation is also negatively affecting GDP at 10% materiality level. However, BND is negative but does not have substantial influence on GDP.

SUMMARY

The study investigates the impact of state-owned bond on economic growth in Nigeria from 2003-2019. The findings reveal that Treasury bills has significant favourable influence on economic growth. The results also show that Federal Government of Nigeria (FGN) bond has a robust positive impact on GDP. On the contrary, Treasury bond is negatively and significantly affecting the GDP. Inflation is used as a moderating variable but equally has significant negative impact on GDP. It implies that increase in inflation rate is absolutely a bad experience for investments in government bonds. The other forms of bonds and debts are insignificant. The examination of government classes of bond will help the government to understand the type of bonds to improve their features. Therefore, the study suggests that the government should enhance the marketable qualities of TBN and other bonds and debt. It is also advisable to control inflation. The government bonds (TRB and FGB) that are already improving the economy should be made more attractive to the existing investors and potential investors. In a nutshell, this study suffers lack of sufficient empirical evidences. Therefore, upcoming researchers are encouraged to carry out more studies on the effect of government bonds on all Sub-Saharan African countries. Sufficient researches on the role of government bond to boost economic growth will ensure more empirical evidences emerge to boost literatures in this study area.

ACKNOWLEDGEMENT

REFERENCES

Butkus, M., Seputiene, (2018), "Growth effect of public debt: The role of government Effectiveness and trade balance", *Economies,* Vol. 6, No. 4, pp. 1-27. https://doi.org/10.3390/economies6040062.

Chen, J. (2019), *Treasury Bond (T-Bond),* https://www.investopedia.com/terms/t/treasurybond.asp, Retrieved on August 24

FMDQ (2019), *Treasury bills,* https://www.fmdqgroup.com/markets/treasury-bills, Retrieved on August 24.

IG International (2021), *What are government bonds? Accessible,* https://www.ig.com/en/bonds/what-are-government-bonds.

Kapingura, F., Makhetha-Kosi, P. (2014), "The causal relationship between the bond markets Development and economic growth in Africa: case study of South Africa", *Mediterranean Journal of Social Sciences,* Vol. 5, No. 3, pp. 126–131. DOI: 10.5901/mjss.2014.v5n3p126.

Matei, I. (2015), *Eurozone bond market and economic growth: Evidence from a time series Analysis,* Recent Developments in Alternative Finance: Empirical Assessments and Economic Implications, pp. 39–51.

Muharan, H., Ghozali, I., Arfinto, E.D. (2018), "Bond market development, economic growth and the role of foreign investment", A paper presented in the 2018 International Conference of Organizational Innovation, KnE Social Sciences, pp. 811-819, DOI: 10.18502/kss.v3i10.3426.

Nzotta, S.M. (2004), *Money, Banking and Finance, Theory and Practice,* Hudson Jude Publishers, Owerri.

Omodero, C.O., Alege, P.O. (2021), "The innovation of government bonds in the growth of an Emergent capital market", *Journal of Open Innovation: Technology, Market, and Complexity*, Vol. 7, No. 1, pp. 1-10, https://doi.org/10.3390/joitmc7010103.

Pegkas, P. (2017), "The effect of government debt and other determinants on economic growth: The Greek Experience", *Economies*, Vol. 6, No. 1, pp. 1-19. DOI: 10.3390/economies6010010.

Spilioti, S. (2015), "The relationship between the government debt and GDP growth: evidence of the Euro area countries", *Investment Management and Financial Innovations*, 12(1-1), 174-178.

Teixeira, J.C., Vieira, C., Ferreira, P. (2021). The effects of government bonds on liquidity risk and bank profitability in Cape Verde. *International Journal of Financial Studies,* Vol. 9, No. 2, pp. 1-23. https://doi.org/10.3390/ijfs9010002.

The Nigerian Stock Exchange (2019), *Green bonds,* http://www.nse.com.ng/products/debt-instruments/green-bonds, Retrieved on August 24.