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ANALYZING THE DETERMINANTS OF BOND MARKET DEVELOPMENT IN NIGERIA

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ABSTRACT

This study uses quantitative research techniques and time series data from the World Bank spanning from 1981 to 2022 to analyze the factors influencing the development of the Nigerian bond market. Using EViews software for analysis, the data shows a strong long-run correlation between the variables, corroborated by the cointegration bonds test. Important discoveries show that the variables move together throughout time, pointing to a steady and trustworthy relationship. Suggestions for policy include holding steady on bond market regulations, advocating for steps to bolster market expansion, purchasing inflation-indexed bonds, and putting anti-inflation plans into action. Long-term plans should prioritize technology advancements, balanced debt management, investment diversification, enhanced legal clarity, and better access to bond issuance. It also advised supporting the bond market and economic development through public-private partnerships.

Keywords: Gross Domestic Product; Foreign Direct Investment; Real Interest Rate; Monetary Policy Rate; Fiscal Deficit.

INTRODUCTION

Indeed, for many years now, the bond market strongly supports the world's financial markets as it has provided businesses and governments with ways to finance projects by selling debt securities. Bonds markets in the past have been crucial in facilitating growth in the economy because they have facilitated

investment, stability and have funded infrastructure development. Fixed income markets particularly bond markets have expanded notably worldwide over the last couple of decades; by 2020, the outstanding bonds will rise from $20 trillion in the 1990s to over $100 trillion (SIFMA, 2020). Africa has had a mixed bond market where some countries, especially the south African countries, have had well-developed markets, yet others have for one reason or the other experienced slow growth in this front. The need to tap new sources of funds apart from loans and aid from other countries, financing infrastructural development and reducing foreign borrowings have led to the development of bond markets in Africa. However, many African bond markets are still facing challenges including the ones outlined as follows: The bond markets remain limited by factors including restricted liquidity, a limited pool of investors, and regulation (African Development Bank, 2018).

In recent decades, there has been significant growth in bond market in Nigeria. Earlier the number of different kinds of debts instruments was very limited and the market was under-developed and it was inactive. On the other hand, capital market especially Nigerian bond market has recorded tremendous improvement from the mid of 2000s. Some of the reasons include the establishment of new regulation system, government alteration towards the development of other sources for economic other than oil, and efforts to attract both local and international investors for the expansion. Thus, Nigeria's bond market has expanded in terms of its size; from $74. The result is from $1 million in 2001 to $23. 660 in 2007, the overall volume of the outstanding government bonds and bills increased, and reached the level of about $21. $317 billion was the total foreign exchange reserve of the country in the year 2008 (Central Bank of Nigeria, 2019). In general, bond markets play pivotal roles in the growth of economic activities and maintaining of financial systems all over the world. In developed economies these markets are relatively evolved and are characterized by the availability of a wide range of products and number of players. Foreign, especially African markets have been yearning for such level of class.

Mainly focusing on Nigeria, it could be seen that the country's bond market is relatively much younger compared to that of other developed countries but it has revealed great potential. In theory, corporate bonds, government bonds, and other debt securities that include Eurobonds constitute Nigeria's bond market. The authorities have taken action. to boost the confidence of the

investors, increase the level of transparency of the market, and also to enhance the regulatory framework as part of the measures towards improving the market. However, these efforts can be said that the market still facing challenges like limited availability of corporate bonds, issues related to less liquidity, and a small investor base. From the latest statistics, it can be pointed out that the growth of Nigeria's bond market is still, but the pace is slowing down and is no longer maximum. The amount of the market capitalization of government bonds in 2019, for instance, stood at about N195. Ninety-four billion US dollars in the country's foreign reserves, by the Central Bank of Nigeria. Similar changes have occurred in corporate bonds, although at a more moderate scale, and significant spikes have been recorded right before the end of the previous ten years. For instance, the amount of corporate bonds mobilized to the market enhanced to $2 by the end of the study period. Naturally, the volume of investments has gradually increased from 174 million to the figure of 657 million USD more than in the private sector (Central Bank of Nigeria, 2019).

The market size, trading frequency and the regulatory framework, the amount and source of investors and the macroeconomic stability are some of the key concepts in bond market analysis; Romney & Stotsky (2013) post those long-term bonds and economic balance are promoted by a well-developed bond market. Additionally, Ifionu and Omojefe (2013) also highlight the inevitability of maintaining long-term relations while focusing on furthering economic predictability. Thus, the object of study in this paper is the bond market in Nigeria since its promotion can contribute towards stability and economic development. FGN bonds are the most frequently traded bonds in the Nigerian bond market with the latter being characterized by the high relevance of government bonds. This market however faces challenges that include; limited issues in corporate bonds and few investors despite tremendous growth in the recent past. For these reasons, the mentioned problems be inevitably solved to attain the optimal potential of the market and to attract domestic and foreign investors at the same time.

RESEARCH METHODS

Data

Time series data from the World Bank covering the years 1981–2022 were used in this analysis. The researcher chose World Bank data because of its

dependability, accessibility, and comprehensiveness. Additionally, the study used a quantitative research methodology. Furthermore, the research employed EViews statistical software for data analysis.

Variable's description

Dependent variable

Bond Market Development (BMD) was used as the dependent variable while Credit to the Private Sector, Fiscal Deficit, Per capita income, Monetary Policy Rate, Real Interest Rate, Foreign Direct Investment, Inflation, and GDP were used as independent variables.

Model

This section used the time-series analysis technique which is the Autoregressive Distribution Lag Model. The ARDL (Autoregressive Distributed Lag) model is a popular econometric tool used to analyze the relationship between a dependent variable and one or more independent variables, both in the short run and long run. The ARDL approach is particularly useful when the underlying variables are integrated of different orders, i.e., I(0) or I(1). ARLD Model has several procedures and tests.

Stationarity

It was vital to determine if the variables under consideration were stationary or non-stationary because the study used time series data. The Augmented Dickey-Fuller (ADF) test was used to determine the stationarity of the series.

Lag order selection criteria

The choice of lag length for the model was made before beginning the analysis of the time series data. When choosing the lag to be used in the model Akaike (AIC) is better than other criteria in the case of a small sample size of sixty (67) observations and below because it increases the likelihood of determining the actual lag length.

Bound Test for Cointegration

In an autoregressive distributed lag (ARDL) model framework, the limits test for cointegration is a process that was used to assess if a long-run equilibrium relationship exists between variables.

Autoregressive Distribution Lag Model consists of a vector system that has two or more exogenous variables. When the variables are integrated in the same sequence, it can be used as evidence of a long-term relationship between them. After then, the error term was considered the equilibrium error and included in the short run coefficients. The following model equation is represented:

$$\Delta Yt=a+i=1\sum p\beta i\Delta Yt-i+j=0\sum q\gamma j\Delta Xt-j+\lambda Yt-1+\delta Xt-1+\epsilon t$$

where;

Δ denotes the first difference.

a is the intercept.

βi and γj are short-run coefficients.

λ and δ represent the long-run relationship.

ϵt is the error term.

RESULTS AND DISCUSSION

RESULTS

Descriptive statistics

The statistical overview of the study's factors, with 62 observations overall for each variable, is displayed in Table 1 below. The statistics also demonstrate that during the period, Bond Market Development (BMD) averaged roughly 5.08%, with minimum and maximum values of 1.51% and 11.27%, respectively. Throughout the time, the Fiscal Deficit (FD) ranged from a minimum of 0.67% to a top of 0.80%, with an average of -2.56%. Additionally, the outcome indicates that Stock had an average of 0.86% throughout the period, with a high value of 29.36% and a minimum value of 0.67%. Furthermore, the findings demonstrate that during the time, Per Capita Income (PCI) averaged roughly 5.42%, with a maximum value of 5.58% and a minimum of 5.30%. Furthermore, throughout the period, the average inflation rate was roughly 18.95%, with a maximum value of 72.84% and a minimum value of 5.39%. For the time, the

monetary policy rate (MPR) ranged from a minimum of 6 to a maximum of 26. Over time, the GDP increased by 3.05%, reaching a maximum of 15.33% and a minimum of 13.13 percent. Throughout the period, the real interest rate was 0.45%, with a maximum of 8.84% and a minimum of _1.87%. In summary, the findings indicate that foreign direct investment averaged roughly 2.47% during the period, with a maximum of 8.84% and a minimum of 1.87%.

Table 1: Describe The Summary Statistics of The Variables

	BMD	FD	STOCK	PCI	INF	MPR	GDP	RIR	FDI
Mean	5.08	-2.56	8.06	5.42	18.95	13.08	3.05	0.45	2.47
Maximum	11.27	0.80	29.36	5.58	72.84	26.00	15.33	18.18	8.84
Minimum	1.51	-8.60	0.67	5.30	5.39	6.00	-13.13	-65.86	-1.87

Source: Author's compilation from EViews

Inferential statistics

Stationarity test

The alternative was put to the test against the null hypothesis, which claims that the data are not stationary. Because the p-value for each of the variables in Table 2 below was less than the level of significance, the results showed that variables like GDP, FD, INF, and MPR were stationary in level. The ADF test statistic p-value was found to be greater than the p-value 5%, indicating that the null hypothesis that the variables are not stationary was accepted at the 5% level of significance. However, BMD, FDI, PCI, and STOCK proved to be non-stationary in level.

Table 2: Summarizes The Results of the Unit Root Tests
(5% level of significance)

VARIABLES	P VALUES IN LEVEL	STATIONARY IN LEVEL	P VALUES AT 1st DIFFERENCE	STATIONARY AT 1st
BMD	0.1052	Non-Stationary	0.0000	Stationary
FD	0.0344	Stationary		
FDI	0.4936	Non-stationary	0.0000	Stationary
GDP	0.0271	Stationary		

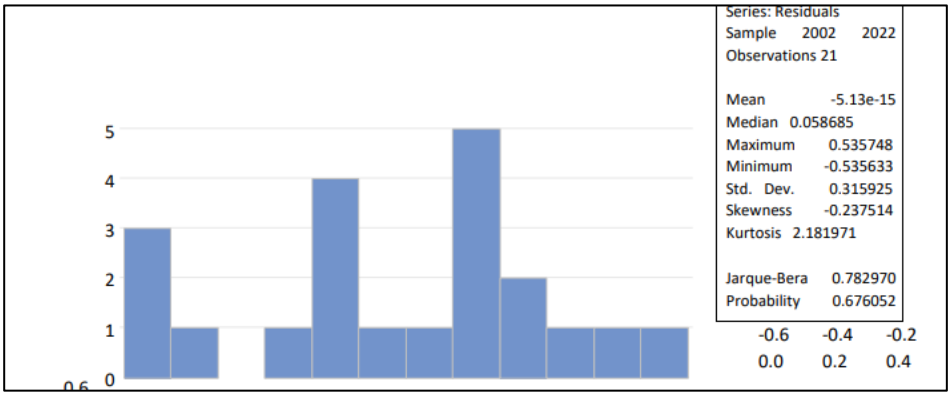
INF	0.0385	Stationary		
MPR	0.0172	Stationary		
PCI	0.7030	Non-Stationary	0.0022	Stationary
RIR	0.0000	Stationary		
STOCK	0.2373	Non-Stationary	0.0000	Stationary

Source: Author's compilation from EViews output

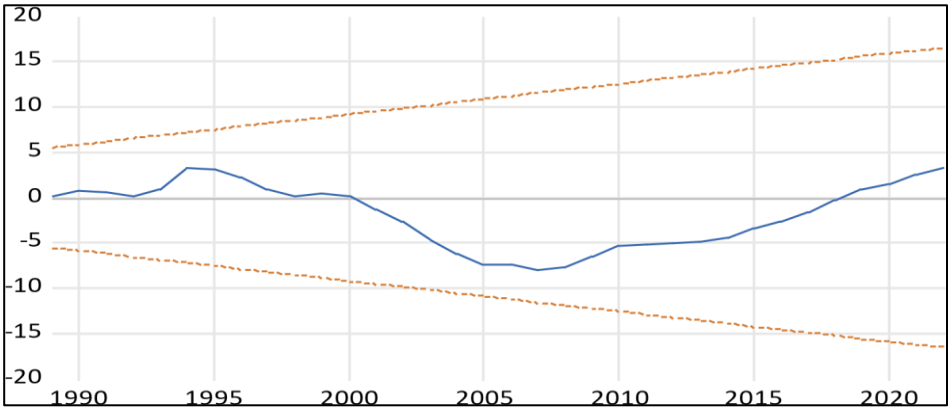
Diagnostic check

i. **Test for Normality**

The P-value is 0.676052, which is larger than 0.05, and the Jarque-Bera value is 0.782970. This demonstrates the regularly distributed nature of the data used.



ii. **CUSUM Test of Stability**



Since the blue line is within a 5% critical line, it shows that this model is stable

iii. **Heteroskedasticity**

Breusch-Pagan-Godfrey Heteroskedasticity Test Null hypothesis: Homoskedasticity

F-Statistics	1.186496	Prob. F(17,23)	0.3455
Obs R-Squared	19.15634	Prob. Chi-Square (17)	0.3196

Scaled Explained SS 6.036688 Prob. Chi-Square (17) **0.9929** We accept the null hypothesis that there is homoskedasticity because the p-value is 0.9929, which is greater than 0.05. This indicates that the assumption is met.

iv. **Serial correlations**

LM Test for Breusch-Godfrey Serial Correlation

Null hypothesis: No Serial Correlation at up to 2 lags

F-statistics	1.061658	Prob. F(2,21)	0.3637
R^2	3.764856	Prob. Chi-Square	**0.1522**

Given that the Prob. Chi-Square value is 0.1522, more than 0.05, we can rule out serial correlations.

Output

a. **Short-run output**

ECM Regression

	Variable Coefficient	***Std. Error***	***T-statistics***	***Value***
D(FD)	-0.539154	0.103892	-5.189577	0.0000
D(FDI)	2.42E-10	1.12E-10	2.168965	0.0407
D(GDP)	-0303472	0.048831	-6.214693	0.0000
D(INF)	-0.015861	0.011611	-1.366003	0.1851
D(MPR)	0.101228	0.046000	2.200600	0.0381

D(PCI)	34.90730	10.03041	3.480145	0.0020
D(RIR)	0.025768	0.014835	1.736970	0.0958
D(STOCK)	0.107374	0.039024	2.751469	0.0114
CintEq(-1)*	-0.532280	0.061320	-8.680302	0.0000

Source: Author's compilation from EViews

Interpretation for the short-run:

EC term (cointEq(1)) has a -0.532280 associated coefficient estimate, indicating a negative value. This suggests that 53.22% of disequilibrium movements are corrected in a single period. Furthermore, at a 5% level of significance, the p-value of 0.0000, which is less than 0.05, indicates that the coefficient is very significant. Since the p-value of FD is 0.000 less than 0.05, the effect is statistically significant at 5%. The coefficient value for FD is -0.53, meaning that a one unit increase in FD from the previous value will reduce the current value of BMD by 0.53.. This effect is statistically significant at 5% since the P-value is 0.04, which is less than the 0.05 threshold. The coefficient value of FDI is 2.42, meaning that a 1% increase in foreign direct investment in the previous value will increase the current value of MBD by 2.42%. A 1% rise in GDP from the previous value reduced the current value of BMD by 0.30%, according to the coefficient value of GDP -0.30. This effect is statistically significant at 5% since the P-value is 0.00, which is less than 0.05. A one unit increase in the previous value raised the current value of BMD by 0.11, according to the coefficient value of Stock 0.11. This effect is statistically significant at 5% since the P-value is 0.01, which is smaller than 0.05. With a coefficient value of PCI 34.9, an increase of 1 unit in the prior value will result in a 34.9 rise in the current value of BMD. Since the P-value is less than 0.05 at 5%, this effect is statistically significant. RIR and INF, however, were not significant because their p-values were higher than 0.05%.

Long-run output

Variable	Coefficient	Std. Error	Statistic	P-Value
BMD(-1)	0.467720	0.117304	3.987240	0.0006
FD	-0.539154	0.162943	-3.308850	0.0031
FD(-1)	0.018570	1.66E-10	1.461717	0.9252

FDI	2.42E-10	1.66E-10	1.461717	0.1573
FDI(-1)	3.76E-11	1.73E-10	0.217975	0.8294
GDP	-0.303472	0.344325	-0.881352	0.3872
GDP(-1)	-0.068818	0.052747	-1.304682	0.2049
INF	-0.015861	-0.821985	-0.821985	0.4195
INF(-1)	0.060477	0.016720	3.617055	0.0014
MPR	0.101228	0.072566	1.394988	0.1763
MPR(-1)	0.071156	0.073502	0.968089	0.3431
PCI	34.90730	81.00408	0.430933	0.6705
PCI(-1)	-34.27608	81.08437	-0.422721	0.6764
RIR	0.025768	0.036520	0.705583	0.4875
RIR(-1)	0.034679	0.018525	1.871993	0.0740
STOCK	0.107374	0.053672	2.000551	0.0740
STOCK(-1	0.034229	0.067626	0.506148	0.6176
C	-5.834932	17.13129	-0.340601	0.7365

b. **Long run form and bound test for cointegrations**

Test Statistics	**Value**	**Significant**	**1(0)** Asymptotic: n=1000	**1(1)**
F-statistics	**5.4156128**	10%	1.85	2.85
		5%	2.11	3.15
		2.5%	2.33	3.42
		1%	2.62	3.77

F statistics refers to 5.42 is higher than the maximum value of 3.77 at 1%, 3.42 at 2.5%, 3.15 at 5%, and 2.85 at 10%. The null hypothesis, according to this series, is that there is an equilibrating relationship (cointegration).

The bond test of cointegration results show that the variables under investigation have a substantial long-term link. Cointegration is strongly supported by the F-statistics value of 5.42 and the corresponding p-values below

the selected significance levels. This implies that the variables move in tandem over time, pointing to a steady and dependable link between them.

DISCUSSION

In the short-run

FDI and BMD

As evident from the results, the p-value is less than 0. 05, which in this case means that the coefficient is statistically significant at a 5% significance level. 04. Concerning the above results, this suggests that, at a 95% confidence level, it is possible to reject the null hypothesis which asserts that FDI does not in any way influence the growth of the bond market. It is also revealed that there is a long-term causality between FDI and BMD, and this interconnection is positive as suggested by the coefficient of 2. 42. Especially, ceteris paribus, FDI has the positive effects and about a two-unit rise in FDI is associated with a 2 to 4 percent raise in investment ratio. Minimum incremental development of the bond market by 42 units in the near term.

GDP and BMD

If the coefficient is statistically significant at any atttional level such as 1%, 5%, 10%, etc, then the p-value is less than 0. 00. That is why it is reasonable to reject the null hypothesis stating that the real GDP growth does not influence the development of the bond market. The coefficient of 0. 30 meaning that the Bond Market and GDP have a negative long-term relationship. To be more precise the relative change of GDP is connected with the relative change of unemployment and if everything else remains constant a one unit increase of the GDP is associated with 0. Reduction of the bond market development index by 30 units over the short term.

MPR and BMD

The coefficient of the independent variable is statistically significant at 5% level of significance since the calculated p-value is 0. 03. It is therefore possible to reject the null hypothesis suggesting that there is no significant relationship between the monetary policy rate on the evolution of bond market with a 95% confidence level. It means that according to obtained coefficient of determination equal to 0 – there is no relation between studied variables. 10

substantiates that the MPR and BMD bear a healthy long run relationship. In the short term, the value of the dependent variable or bond market development increases by 0. Each rise of the monetary policy rate by an equivalent unit means a decrease in the volume of credit within the economy by 10 units of the rate, all conditions held constant.

PCI and BMD

If the coefficient is considered statistically significant at any conventional level of significance for example 1%, 5% or 10%, this should be returned by the p-value of 0. 00. This implies that based on the findings of this study it is possible to reject the null hypothesis that per capita income does not affect the development of the bond market. BMD and PCI registered a significant long run positive relationship with the coefficient of 34 implying that BMD has a significant positive effect on PCI. 9. Short-term, where all other things are kept constant, a one unit increase in per capita income is associated with a 34. An increase in bond market development from 64 to 73, that is by 9 units.

Stock and BMD

Thus, the coefficient is statistically significant at the 5% level of significance, and the value of the p- p-statistic is 0. 01. Thus, with the 99% level of confidence, we can reject the null hypothesis, which in this case, stated that the stock market has no impact on the growth of the bond market. Analyzing the coefficient of the prospective long-term relationship, it can be stated that there is a positive correlation between BMD and the stock market. 11. In other words, holding other variables constant, a one unit addition on the stock market indicator means 0. Near-term improvement of 11 units in the index of bond market development

In the Long-run

Fiscal Deficit and Bond Market Development

The coefficient of the age of the car is statistically significant at any conventional level of 5%, according to the p-value of . 00. Therefore, the null hypothesis is that there is no short-term effect of fiscal deficit on the development of the bond market is rejected. The correlation value is equal to -0. Meaning that the fiscal deficit (FD) and bond market development (BMD) have a negative short-run correlation of - 53. Especially, other conditions being equal, a one-unit

increase in fiscal deficit has an expected value of 0. 53 units short-term regression in the bond market development.

Inflation and Bond Market Development

That is, any conventional level of significance (for instance, 1%, 5%, 10%) at which the coefficient is statistically significant is denoted by a p-value of 0. 00. Therefore, the null hypothesis that inflation does not affect in any way the pattern of the short-term evolution of the bond market should be rejected. Looking at the short-run relationship between BMD and inflation the coefficient of -. 02. In other words, parallel to the analysis of all variables remaining and other conditions are constant a pressure of one unit in inflation leads to a response of 0. The exchange rate proved to be detrimental to the bond market's long-term development by reducing its value by 02-units.

Stock and Bond Market development

At the 5% significance level, the coefficient is statistically significant, as indicated by the p-value of 0.05. With a 95% confidence level, we can thus rule out the null hypothesis, which states that there is no short-term impact of the stock market on the growth of the bond market. The bond market development (BMD) and the stock market appear to have a positive short-term association, as indicated by the coefficient of 0.11. In other words, assuming all other factors remain the same, a one-unit increase in the stock market indicator corresponds to a 0.11-unit increase in bond market development over the long term.

In the long run, FDI, GDP, INF, MPR, PCI, and RIR were not significant in Bond market development.

CONCLUSION

The analysis of the short-run dynamics of the ARDL model shows that the variables affecting bond market development are its own previous value (BMD(-1)), financial development (FD), as well as inflation lagged by 1 period (INF(-1)). BMD(-1) indicates a positive and significant impact, which implies that previous value has a positive relationship with the current BMD. Thus, FD leads to a negative relationship between BMD, meaning higher levels of financial development reduce BMD. The coefficient of the lagged value of inflation is positive implying that inflation enhances current BMD. Other control variables

like the log of GDP, FDI, MPR, PCI, RIR, and STOCK and their lagged values do not have a short-run effect on BMD.

In the long run, the fiscal deficits are detrimental to BMD since it lead to crowding out of private sector credit, raise doubt of fiscal realism, and induce inflation. On the other hand, FDI has a positive effect on BMD through market liquidity, confidence, and technological transfer and also boosts up economic growth. Government debt undermines BMD in a counterintuitive way and GDP growth may decrease BMD by changing investors' attention towards other assets and thus reducing demand for government bonds. High monetary policy rates are helpful for BMD because investors will flock to it in search of greater returns while at the same time reducing inflation. Higher growth in per capita income enhances BMD through a direct impact on spending, savings and investment levels as well as the general stability of the economy. Finally, growth in stock markets helps BMD through facilitating developmental changes in the market structure, investors' confidence, and stability of the economy.

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