

Macroeconomic Factors and Financing Decision of Quoted Firms in Nigeria

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Abstract: This study examined the relationship between macroeconomic factors and financing decision of industrial goods manufacturing firms in Nigeria. The study modelled debt to equity ratio as the function of inflation rate, nominal interest rate and real interest rate. Panel data were sourced from central bank of Nigeria statistical bulletin and financial statement and annual reports of the industrial goods firms from 2012-2021. Panel regression models were formulated to analyze the relationship between inflation and capital structure. The study found from the fixed effect model that 45 percent variation on debt equity ratio of Nigeria quoted industrial goods manufacturing firms can be explain by variation on macroeconomic factor. The regression coefficient indicated that there is no statistically significant relationship between inflation rates and debt equity ratios of the listed companies in Nigeria; there is no statistical evidence that there is an effect of the consumer price index on the debt equity ratio, and also no statistical evidence that there is a significant effect on the debt equity ratio from the nominal interest rate. However, the debt equity ratio increases with the changes in the nominal interest rate when the industry performance improves. The study concludes that it is advantageous for a company to reduce its debt portfolio and increase its equity holdings to improve its financial condition and its long-term growth when the economy is doing well. For this to happen, however, the company's management must recognize that there are risks when it decides to go the equity route, and therefore it requires them to take a disciplined approach to managing its balance sheet. We recommend that company with high debt levels should consider reducing its debt in order to reduce its borrowing costs and improve its financial strength and it is in the best interest of a company to increase its level of

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equity financing in order to take advantage of the higher returns that an adequately funded balance sheet can offer.

Keywords: Inflation, Fisher effect, Capital structure, Debt equity ratio, Nominal interest rate and Real interest rate

1. INTRODUCTION

Theories about capital structure determinants have been mostly developed around firm-specific factors. Titman and Wessels (1988) argue that firm's choice of financing is related to firm characteristics. These characteristics are, among others, asset structure, growth, size, operating income volatility, profitability, industry classification, non-debt tax shields, operating leverage, and uniqueness of firm's business line. Harris and Raviv (1991) later provided the survey for the literature. Another firm-specific characteristic that is found to be related to firm's capital structure choice is business risk. There is a disagreement regarding the sign of the effect of this variable on the optimal debt level, which may be due to different measures business risk. Castanias (1983) uses tax shelter bankruptcy cost to measure business risk and finds that ex-ante default costs are large enough to induce firms to hold an optimal mix of debt and equity. Meaning, there is roughly positive relationship between bankruptcy costs and optimal debt level, which contradicts static tradeoff theory. Carleton and Silberman (1977) use variance of return on assets as proxy for business risk and find negative effect on debt levels. This is due to variance of return increases cost of capital, hence reduces firm's leverage level. Conversely, Bradley, Jarell, and Kim (1984) find that operating income volatility lowers the use of debt as it increases uncertainty in tax shields. Long and Malitz (1985) use firms' unlevered beta as a measure of business risk and find an inverse relationship between beta and financial leverage. On the other hand, Ferri and Jones (1979), Flath and Knoeber (1980), and Titman and Wessels (1988) conclude that there is no significant relationship between business risk and debt levels. Several possible links have been provided between both variables. In all cases the link is provided through the demand or supply of corporate bonds. For instance, Corcoran (1977), Zwick (1977), and DeAngelo and Masulis (1980) theoretically explain that inflation leads to more debt: since inflation lowers the real cost of debt, the demand for corporate bonds increases during

inflationary periods. On the other hand, if corporate bond return becomes higher relative to stocks return as inflation decreases, the aggregate demand of corporate bonds increases.

However, the study of the economic effects of macroeconomic factors has long occupied the economics and finance literature at both the theoretical and the empirical levels. Economists and financial economists agree that inflation is a social ill that imposes welfare costs, the size of which depends upon whether inflation is anticipated or not. Even fully anticipated inflation can cause distortions in the distribution of income and wealth. For example, at the firm level, expected and steady inflation involves a transfer of real wealth from the firm's bondholders to its shareholders. The historical record suggests, however, that inflation is rather unanticipated, thus generating additional welfare costs because it reduces the efficiency of the market system by distorting the functioning of relative prices as coordinators of economic activity and thus causing a misallocation of economic resources.

Inflation uncertainty increases the firm's business risk, which refers to the volatility of the firm's earnings, caused by the volatility of the firm's volume of sales as well as the volatility of the firm's price and cost structures. The greater the volatility of the firm's sales, product prices, and input prices, the higher its business risk. It is also true that, *ceteris paribus*, the greater the degree of operating leverage (DOL), the higher the business risk. Inflation uncertainty increases the volatility of the firm's operating income and the probability of insolvency. In deciding the appropriate capital structure of the firm, it is extremely important for its management to look at both the magnitude and the stability of the firm's cash flows relative to the fixed charges associated with the use of debt. Therefore, in a highly inflationary environment with heightened inflation uncertainty, a firm with highly uncertain cash flows and high business risk that needs to raise funds for capital investment may choose to issue new equity capital. The greater the inflation uncertainty, the higher the firm's business risk and the lower its debt-to-equity ratio will be. If instead the firm issues debt and the business environment deteriorate, the firm may be forced to issue new stock on unfavorable terms in the future. In other words, it may be appropriate for a firm, given its highly uncertain cash flows, to maintain some flexibility and preserve some unused debt capacity for the future. Inflation uncertainty also

makes the corporate tax shield more uncertain, since it increases the firm's business risk and the probability of losing the tax shield benefit associated with the use of debt. In such an uncertain environment, as more debt is used, beyond some point, the tax savings associated with the use of debt will become highly uncertain. Inflation uncertainty reduces the debt-to-equity ratio and causes a loss of value to the firm's stockholders due to the loss of the tax advantage associated with the use of more debt. It is in the light of the identify problems above that this paper seek to examine the effect of inflation on capital structure of quoted firms in Nigeria.

2. LITERATURE REVIEW

2.1. Theoretical Framework

This paper underpin by the Modigliani and Miller (MM) theory of capital structure and the fisher effect hypothesis. MM do not agree with the tradition view they argue that in perfect capital markets without taxes and transaction costs, a firm's market value and the cost of capital remain invariant to the capital structure changes. The value of the firm depends on the earnings and risk of its assets (business risk) rather than the way in which assets have been financed. The MM hypothesis can be best explained in terms of their two propositions. MM's proposition 1 is that for firms in the same risk class the total market value is independent of the debt-equity mix and is given by capitalizing the expected net operating income by the capitalization rate (i.e, the opportunity cost of capital) appropriate to that risk class.

Value of levered firm = Value of unlevered firm

$$V_l = V_u$$

$$\text{Value of the firm} = \frac{\text{Net operating income}}{\text{Firm opportunity cost of capital}}$$

$$V = V_l = V_u = \frac{NOI}{K_d} \quad 2.1$$

Where

V is the market value of the firm and it is sum of the value of equity, E and value of debt D

NOI = EBIT = X, the expected net operating income, and
 K_d = the firms opportunity cost of capital.

The Fisher effect, also known as the Fisher Hypothesis, is an economic theory which was proposed by an economist Irving Fisher. The theory states that the real interest rate is independent of monetary measures, specifically the nominal interest rate and the expected inflation rate. It describes the underlying relationship between inflation and both real and nominal interest rates. The theory proposes that the difference between the nominal interest rate and the expected inflation rate is equal to the real interest rate. Consequently, a rise in inflation leads to a fall in real interest rates, unless the same rate of increment occurs in nominal rates as with inflation. Mathematically,

$$\text{Real Interest Rate} = \text{Nominal Interest Rate} - \text{Inflation Rate.}$$

The most common form of this relationship expresses the expected nominal rates of return of assets as a summation of the expected rate of inflation and the expected rate of real return. The Fisher effect implies that the expected nominal returns on assets should provide a complete hedge against inflation; if this is the case, a positive relationship is expected between stock returns and inflation, which implies that investors are compensated for the loss in purchasing power due to inflation.

2.2. Empirical Review

In literature, diverse studies with mixed results exist on the subject under investigation in this paper.

Camara (2012) examine the effects of macroeconomic variables and macroeconomic conditions on capital structure decisions of US based multinational firms relative to domestic firms using an integrated dynamic partial-adjustment model. The empirical results show that consumer price index and other macroeconomic factors have significant impact on financial decisions of the sampled firms. In Thailand, Tongkong (2012) uses both multiple linear panel regression and dynamic panel GMM regression to examine whether inflation is among the significant factors affecting capital structure decision of 39 quoted real estate firms for the period 2002 – 2009. The results suggest that inflation and other macroeconomic variables are

not among the significant explanatory factors for firm capital structure. Taddese Lemma and Negash (2013) examine the influence of institutions, macroeconomic factors, industry and firm-specific factors on firm's capital structure decision in nine African countries using the system GMM and seemingly unrelated regression. The sample 986 firms the period spans from 1999 to 2008. The results show that among the factors that influence capital structure decisions are legal and financial institutions, GDP growth rate and inflation.

Phung and Le (2013) investigated the impact of the foreign ownership ratio on the financial structure of listed businesses in Vietnam, particularly the capital structure as measured by the market value of the debt ratio. The results of the empirical analysis of Phung and Le (2013) showed an advantageous linkage between the foreign ownership ratio and the leverage of Vietnam's listed companies. Because of the high level of information asymmetry in Vietnam, the findings suggest that overseas investors have an incentive to compel firms to borrow more to reduce agency difficulties. Mishra (2013) examined the factors affecting Australian firms' foreign ownership in 2001–2009. The book value of the debt ratio is used to describe capital structure. Analytical results from the generalized method of moments (GMM) method showed that the debt ratio positively affects the foreign ownership ratio and the floating rate of foreign ownership of Australian firms. Sivathaasan (2013) investigated the effect of ownership arrangements (foreign and local ownership) on the capital structure of listed manufacturing companies in Sri Lanka. In this study, Sivathaasan (2013) used the book value of debt ratio to represent capital structure. The ordinary least squares (OLS) method's analytical findings revealed a positive relationship between foreign ownership and the leverage of Sri Lankan listed companies.

Mokhova and Zinecker (2014) examine the effects of macroeconomic factors on firm capital structure for seven European countries from 2006 to 2011. The countries included are Czech Republic, Hungary, Slovakia and Poland, Greece, France and Germany. Empirical results obtained from both correlation and regression analysis indicates mixed evidence. They find that inflation and capital structure are weakly and insignificantly correlated in most of the countries except France and Hungary. For France, inflation has a strong positive correlation with total leverage ratio and short-term debt

ratio but has a strong correlation with long-term debt ratio. For Hungary, inflation has a negative and insignificant correlation with all the capital structure variables. Li & Zhang (2014) analyze the insecure impact of the inflation; an analysis model is proposed to reflect the inflation's effect on the capital structure of the company, in this paper. They use the parameter CPI to measure the inflation. Because the inflation is a time series that affects the capital structure for a long time, we choose different CPIs for different time, i.e. the current month (CPI), three months ago (CPI3), six months ago (CPI6), one year ago (CPI12), half and one year ago (CPI18), and two years ago (CPI24). With the financial data of the companies listed in the Chinese stock market, they empirically testified the outcomes of this model. The results show that only the increasing inflation or the decline of corporate income tax rate will increase the company's debt ratio. However, these two factors together will decrease the debt level of the company and cause the insecure financial impact

Köksal and Orman (2015) examine the capital structure determinants in Turkey using an unbalanced panel of 11726 non-financial firms over the period from 1996 to 2009. The study includes firm-specific factors, tax related factors, industry-specific factors and macroeconomic factors in a firm leverage model and compares two capital structure theories; trade-off and pecking order theories. According to the authors, while the trade-off theory argues that exists positive relationship between inflation and capital structure, pecking order theory argues that inflation plays no role in a model of capital structure. Supporting the trade-off theory, the panel data regression results show that inflation is among the factors that exert a strong positive influence on capital structure such that a 5% decrease in the average firm's debt are due solely to a decrease in inflation.

Amjed & Shah (2016) empirically investigate the impact of macroeconomic conditions such as banking sector performance, economic growth, inflation rate, interest rates and market capitalization on the adjustment speed towards dynamic capital structure targets in Pakistan for the period 1999 to 2013. The study also assesses the effect of adjustment speed on the financial performance of the firm. The annual adjustment speed of five industrial sectors was estimated separately by using a modified partial adjustment approach. The direction of causality between financial

performance and annual capital structure adjustment speed was examined through the Granger causality test. The empirical results favor the presence of dynamic capital structure targets in Pakistan for all five industrial groups. They found that the capital structure adjustment speed significantly varies across industrial sectors and over time. The firms in Pakistan adjust their capital structure toward dynamic targets ranging from 23% to 46% annually depending on the country's macroeconomic conditions such as banking sector performance, economic growth, and interest rates. The deviation from the target capital structure also plays an important role in the capital structure adjustment speed. However, the empirical results fail to validate the effect of the inflation and market capitalization on the capital structure adjustment speed. The Granger causality test results show that a unidirectional causality runs from the capital structure adjustment speed to financial performance.

Ain, Jan & Rafiq (2017) investigate the effect of macroeconomic parameters on the capital structure of Pakistani firms. According to the best of their knowledge this is the first study of its kind in Pakistan and it will open new horizons of research in this area ultimately helping practitioners and academicians. Previous researches in the context of Pakistan have taken firm specific variables only while this study considers macroeconomic factors besides company specific variables. A panel data (for a period of 2003 to 2009) for KSE-100 (non-financial firms) has been analyzed by using SUR (Seemingly Unrelated Regression) model. The main findings of this study elucidate that macroeconomic variables have varying effects as far as capital structure's measurement is concerned. The market size (stock market development) has a positive effect on debt choice of Pakistani firms. Bank size is directly related with long term debt to equity of these firms. The correlation between inflation rate and financial leverage (long term debt to equity as well) is negative, whereas, it has a positive relation with external financing ratio. GDP per capita is inversely related with all debt ratios.

Belema & Odi (2019) empirically investigate the relationship between inflation and firm capital structure dynamics in Nigeria using firm-level panel data comprising 21 quoted companies over a period of 10 years from 2007 to 2016. The results show that the random effects model is the most plausible description of the relationship between inflation and firm capital

structure. The random effects results show that firm's financial leverage has a negative relationship with both core and food inflation rates but has a positive relationship with headline inflation rate. However, while none of the estimated coefficients is significant statistically, we argue that given the relatively large size of these coefficients, they are significant economically.

Maya, Sudjono & Ahmad (2020) analyze the effect of capital structure, company growth, and inflation on firm value with profitability as intervening variable. The population is the manufacturing companies listed on the Indonesia Stock Exchange in 2014 - 2018 totaling 174 companies. Determination of the sample is selected by purposive sampling. Out of 174 populations, only 27 samples were selected. The type of research data is panel data. Path analysis was chosen as the method of data analysis. The results shows that partially capital structure has a significant effect on firm value, company growth and inflation have no significant effect on firm value, capital structure has a significant effect on profitability, company growth and inflation have no significant effect on profitability, profitability has a significant effect on firm value. Profitability mediates the effect of capital structure on firm value; profitability does not mediate the effect of company growth and inflation on firm value.

Moradi, & Abad (2021) examine the effects of both firm specific risk and inflation rate risk of a firm on the capital structure and the distance between real leverage and target leverage (capital structure adjustment speed), from the viewpoint of the dynamic balance theory. The generalized method-of-moments (GMM) dynamic panel estimator is used to estimate the models and test the hypotheses. The research data is collected from 121 firms listed in Tehran Stock Exchange from 2011 to 2018. The results of the first model indicate that the effect of both inflation rate risk and firm specific risk on the financial leverage of the company is significant. This effect on the financial leverage is negative for both variables. Meanwhile, the results of the second model indicate that the effects of both firm specific risk and inflation risk on the target leverage adjustment speed is significant. In other words, the influence of these two variables on the capital structure adjustment speed of firms is negative. Results also show that the speed of capital structure adjustment is 29% for firms, which decreases to %28 when a firm inflation rate risk occurs. Moreover, it drops to %25 during the

periods a firm is exposed to a firm specific risk. Therefore; internal factors have a greater impact on the speed of capital structure adjustment of firms, as compared to external factors.

Suhono, Nugraha, Disman & Maya (2022) examine fundamental factors, namely debt of equity ratio (DER), net profit margin (NPM) and return on equity (ROE), macroeconomic factors, namely inflation and exchange rates on firm value on the Indonesia Stock Exchange and using capital structure as a moderating variable. This study uses a quantitative approach with an explanatory research method, data analysis uses the conditional process initiated by Hayes, the research data is used for 10 years, namely during the years 2008-2017. The results show that the capital structure can moderate the effect of DER on firm value. Comparison with other research results in Indonesia shows that there is an inconsistency in the influence of fundamental and macroeconomic factors on firm value

3. METHODOLOGY

This paper adopted the panel econometric methodology. The ordinary least square method (OLS) was employed for estimation of the relationships between the predictor variable and the criterion variables. Unit root test was conducted using the Augmented Dickey Fuller to ascertain the stationary property of the time series. This is done to avoid spurious regression. To further verify the relevance of the model, the co-integration test was performed to determine whether there exists long run equilibrium relationship among the variables and also OLS model was estimated to capture short run relationships.

3.1. Population and Sample Size

The population of interest in this study constitutes 15 industrial goods manufacturing firms quoted on the Nigeria Exchange Group for the period of ten years from 2012 to 2021. Due to the small nature of the population, the study adopted census sampling method; therefore the 15 quoted industrial goods manufacturing firms form the sample size.

Table 3.1: Sample Size

S/N	Name Manufacturing Firms	S/N	Name of Manufacturing Firms
1.	African Paints Nigeria Plc	8.	Cement Company of Northern Nigeria Plc
2.	AshaksCemPlc	9.	Cutix Plc
3.	Austin Laz and Company Plc	10.	Dangote Cement Plc
4.	Avon Crown Caps and Containers	11.	First Aluminum Nigeria Plc
5.	Berger Paints Plc	12.	Lafarage Africa Plc
6.	Beta Glass Company Plc	13.	Meyer plc
7.	Cap Plc	14.	Paints and Coatings Manufacturing Plc
		15.	Port Land Paints and Products Nig. Plc.

Source: Nigeria Exchange Group Report, 2021

3.3. Data

The data for the study is panel in nature. The secondary data were extracted from annual financial reports of the listed industrial goods manufacturing firms for the period of 2012 to 2021. The financial reports will be obtained from the Nigeria Exchange Group Reports firm’s publications and websites.

3.4. Model Specification

The regression models are presented as follows;

Pooled Regression Model Specification

$$DER = \beta_0 + \beta_1NIR_{it} + \beta_2CPI_{it} + \beta_3RIR_{it} + \mu_{it} \tag{3.1}$$

Fixed Effect Model Specification

$$DER = \alpha_0 + \alpha_1NIR + \alpha_2CPI + \alpha_3RIR + \Sigma_i^9 = 1\alpha idum\epsilon 1_{it} \tag{3.2}$$

Random Effect Model Specification

$$DER = \alpha_0 + \alpha_1NIR + \alpha_2CPI + \alpha_3RIR + \mu_i + \epsilon_{1_{it}} \tag{3.3}$$

Where

DER= Debt to equity ratio

NIR = Nominal interest rate

CPI = Consumer Price Index

RIR = Real Interest rate

α_0 = Constant or intercept

$\alpha_1 - \alpha_0$ Parameters

ϵ_1 = Stochastic or disturbance/error term

t = Time dimension of the variables

APrior Expectation of the Result

The a-priori expectation of the variables that an increase in the explanatory variables lead to decrease in the dependent variables capital structure, therefore it can be mathematical stated as follows:- $a_1, a_2, a_3 \leq 0$.

4. RESULTS AND INTERPRETATIONS

Table 4.1: Pre-Test of the Data

<i>Series: DER</i>						
<i>Method</i>	<i>Handri</i>	<i>Z test</i>	<i>Statistic</i>	<i>Prob.**</i>	<i>Cross-sections</i>	<i>Obs</i>
Pre-Test of the Data at Level						
RIR	25.187	0.000	15	10		
NIR	25.191	0.0000	15	10		
CPI	25.192	0.000	15	10		
DER	13.544	0.000	15	10		
Pre-Test of the Data at First Difference						
RIR	26.3401	0.0000	15	10		
NIR	26.3247	0.0000	15	10		
CPI	26.3427	0.0000	15	10		
DER	17.4614	0.0000	15	10		

Source: Extract from E-view

According to Table 4.1, a panel unit root test reveals that all variables are stationary at first difference and at level. This indicates that all variables are stationary at difference, suggesting a possibility of a long-term relationship and necessitating a cointegration test for further verification. Pesaran (2012) and Chakravarty & Mandal (2020), who carried out a panel unit root test, discovered that there is a significant correlation between time and an unequal cross sectional error term. Therefore, the cross sectional error term is not equal to the equation’s sum of the variances, as demonstrated by

the panel data unit root test. According to Peseran (2012), the panel unit root test revealed that the variables are stationary at difference and that the null hypothesis of no unit root cannot be refuted.

Table 4.2: Presentation of Pooled Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.728941	0.147479	4.942687	0.0000
NIR	-0.005957	0.017325	-0.343825	0.7315
CPI	-0.003889	0.008929	-0.435568	0.6638
RIR	-0.006954	0.007617	-0.912963	0.3628
R-squared	0.006209	Mean dependent var		0.611467
Adjusted R-squared	-0.014211	S.D. dependent var		0.200199
S.E. of regression	0.201617	Akaike info criterion		-0.338592
Sum squared resid	5.934796	Schwarz criterion		-0.258309
Log likelihood	29.39442	Hannan-Quinn criter.		-0.305976
F-statistic	0.304079	Durbin-Watson stat		2.098340
Prob(F-statistic)	0.822410			

Source: Extract from E-view

The pooled panel data regression analysis indicates that the independent variables were not statistically significant but have negative coefficients; this implies that there are negative relationships between debt to equity ratio and the independent variables which are nominal interest rate, consumer price index, and real exchange rate. This result implies a negative relationship between debt to equity ratio and nominal interest rate. Similarly, the relationship between debt to equity ratio and consumer price index is negative. Further, this relationship was found to be statistically insignificant. Finally, the relationship between debt to equity ratio and inflation was negative, but it was statistically insignificant. These results are consistent with the findings of previous studies that showed that lower debt to equity ratios are associated with lower interest rates and higher inflation (Egbunike et al., 2018). These results indicate that firms can borrow funds from banks at a lower cost by raising debt capital if they maintain lower debt to equity ratios. However, these results should be interpreted with caution because of the limitations of the regression method used.

Table 4.3: Presentation of Fixed Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.757003	0.193799	3.906118	0.0001
NIR	0.003415	0.059039	0.057845	0.9540
CPI	-0.008397	0.026345	-0.318733	0.7504
RIR	-0.007514	0.008863	-0.847791	0.3981

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.088423	Mean dependent var	0.611467
Adjusted R-squared	-0.028977	S.D. dependent var	0.200199
S.E. of regression	0.203079	Akaike info criterion	-0.238277
Sum squared resid	5.443823	Schwarz criterion	0.123000
Log likelihood	35.87074	Hannan-Quinn criter.	-0.091502
F-statistic	0.753181	Durbin-Watson stat	2.286847
Prob(F-statistic)	0.742747		

Source: Extract from E-view

The fixed effect model was not statistically significant based on the value of the F-statistics and the R-squared value of 8% indicates that the variation in the model were accounted for by the independent variables included in the model. In the fixed effect model (see Table 4.3) the independent variables were not significant.

Table 4.4: Presentation of Random Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.729176	0.148952	4.895369	0.0000
NIR	-0.005934	0.017563	-0.337899	0.7359
CPI	-0.003904	0.009044	-0.431686	0.6666
RIR	-0.006970	0.007685	-0.907005	0.3659

Effects Specification

	S.D.	Rho
Cross-section random	0.009170	0.0020
Idiosyncratic random	0.203079	0.9980

Weighted Statistics

R-squared	0.006207	Mean dependent var	0.605326
Adjusted R-squared	-0.014214	S.D. dependent var	0.200034
S.E. of regression	0.201451	Sum squared resid	5.925017
F-statistic	0.303941	Durbin-Watson stat	2.101783
Prob(F-statistic)	0.822510		

Unweighted Statistics

R-squared	0.006209	Mean dependent var	0.611467
Sum squared resid	5.934796	Durbin-Watson stat	2.098320

Source: Extract from E-view

The random effect model is presented in Table 4.4., the model is not statistically significant, the overall R² value of 0.006 implies that this model explains only about 6% of the variability in the market value of the companies. This can be explained by the presence of other unobserved factors that may affect the debt to equity ratio, hence explaining the low variance explained by the model. Thus, we can conclude that the “random effects model” has lower power than “fixed effect model” because of the lack of information on the source of variation.

Table 4.5: Presentation of Panel Cointegration Test Regression Results

ADF	t-Statistic	Prob.
	-1.616846	0.0530
Residual variance	0.083539	
HAC variance	0.023040	

Source: Extract from E-view

Table 4.6: Presentation of Causality Test Regression Results

Null Hypothesis:	Obs	F-Statistic	Prob.
CPI does not Granger Cause DER	120	0.08635	0.9173
DER does not Granger Cause CPI		-29.4512	1.0000
NIR does not Granger Cause DER	120	0.14954	0.8613
DER does not Granger Cause NIR		-52.3245	1.0000
RIR does not Granger Cause DER	120	0.04826	0.9529
DER does not Granger Cause RIR		0.24013	0.7869
NIR does not Granger Cause CPI	120	0.00000	1.0000
CPI does not Granger Cause NIR		-57.0272	1.0000
RIR does not Granger Cause CPI	120	0.00000	1.0000
CPI does not Granger Cause RIR		1.58554	0.2093
RIR does not Granger Cause NIR	120	0.00000	1.0000
NIR does not Granger Cause RIR		0.99835	0.3717

Source: Extract from E-view

The Panel co integration result shows that all the value are integrated and that longrun relationship exists between the debt-equity ratio, nominal

interest rate, real interest rate and inflation. Thus, it can be concluded that the debt-equity ratio of the firms are influenced by several other factors besides nominal interest rate, real interest rate and inflation. The Panel co integration result also shows that the market values of the firms are influenced by other unobserved factors besides cost of equity and weighted average cost of capital.

From Table 4.6 which presents the granger causality results, shows that there is no causation between debt-equity ratio, nominal interest rate, real interest rate and inflation.

5. CONCLUSION

In conclusion, we have established that there is no statistically significant relationship between inflation rates and debt equity ratios of the listed companies in Nigeria; there is no statistical evidence that there is an effect of the consumer price index on the debt equity ratio, and also no statistical evidence that there is a significant effect on the debt equity ratio from the nominal interest rate. However, the debt equity ratio increases with the changes in the nominal interest rate when the industry performance improves. Thus, we can conclude that it is advantageous for a company to reduce its debt portfolio and increase its equity holdings to improve its financial condition and its long-term growth when the economy is doing well. For this to happen, however, the company's management must recognize that there are risks when it decides to go the equity route, and therefore it requires them to take a disciplined approach to managing its balance sheet. Based on the findings and conclusion the following recommendations are made

Any company that has high debt levels should consider reducing its debt in order to reduce its borrowing costs and improve its financial strength.

It is in the best interest of a company to increase its level of equity financing in order to take advantage of the higher returns that an adequately funded balance sheet can offer.

The management of a listed company should monitor the financial conditions of all of its major suppliers in order to ensure that it has adequate cash flow to meet its expenses and provide working capital for its operations.

References

- Ain, Q, Jan, S.U & Rafiq, M, (2017) Effect of macroeconomic factors on capital structure decisions of firm-evidence from a developing country. *Journal of Business and Economic Review*, 3(1), 21- 32, Available at SSRN: <https://ssrn.com/abstract=2923752>
- Amjed, S & Shah, S. M. A (2016). The impact of volatile economic conditions on corporate capital structure adjustment towards dynamic target in Pakistan. *Pakistan Journal of Commerce and Social Sciences* 10(2), 296-315.
- Baker, M., & Wurgler J. (2002). Market timing and capital structure. *The Journal of Finance*, 45(1).
- Ball, L. (1992). Why does high inflation raise inflation uncertainty?. *Journal of Monetary Economics*, 29(3), 371-388.
- Bernanke, B., & Gertler, M. (1989). Agency costs, net worth, and business fluctuations. *The American Economic Review*, 79(1), 14-31.
- Bradley, M., Jarrell, G. & Kim, E. (1984). On the existence of an optimal capital structure: theory and evidence. *The Journal of Finance*, 39(3), 857-878.
- Carleton, W. T., & Silberman I. H. (1977). Joint determination of rate of return and capital structure: An econometric analysis. *The Journal of Finance*. 32(3), 811-821.
- Castanias, R. (1983). Bankruptcy risk and optimal capital structure. *The Journal of Finance*. 38(5), 1617-1635.
- Chen, A. H., & Boness A. J. (1975). Effects of uncertain inflation on the investment and financing decisions of a Firm. *The Journal of Finance*, 30(2), 469-483.
- Corcoran, P. Inflation, Taxes and Corporate Investment Incentives. Federal Reserve Bank of New York Quarterly Review, 2, pp. 1-9.
- Cukierman, A., & Meltzer A (1986). A theory of ambiguity, credibility, and inflation under discretion and asymmetric information. *Econometrica*, 54, 1099-1128.
- Dammon, Robert M. (1988). "A security market and capital structure equilibrium under uncertainty with progressive personal taxes." *Research in Finance*.
- DeAngelo, H. and R. Masulis (1980). Optimal capital structure under corporate and personal taxation. *Journal of Financial Economics* 8(3), 3-29.
- Dokko, Yoon (1989). "Are changes in inflation expectations capitalized into Stock Prices? A Micro-firm Test for the Nominal Contracting Hypothesis." *Review of Economics & Statistics*, 71(2), 309-17.
- Engle, R.F. (1983). Estimates of the variance of U.S. inflation based on the ARCH Model. *Journal of Money, Credit, and Banking*, 15(1), 286-301.

- Ferri, M., & Jones, W. (1979). Determinants of financial structure: A new methodological approach. *The Journal of Finance*, 34(2), 631-644.
- Flath, D., & Knoeber, C. (1980). Taxes, failure costs, and optimal industry capital structure: An empirical test. *The Journal of Finance*. 35(2), 99-117.
- Frank, M. Z. & Goyal, V. K. (2009). Capital structure decisions), which factors are reliably important? *Financial Management*, 38(1), 1-37.
- Franks, J. R and Eduardo S (1991). "The Stochastic behaviour of market variance implied in the Prices of Index Options." *Economic Journal*, Vol. 101, November, (409), pp. 1460-75.
- Friedman, M. (1977). Inflation and unemployment. *Journal of Political Economy*, 85(4), 451-472.
- Golob, J. E. (1994). Does inflation uncertainty increase with inflation? Federal Bank of Kansas City Economic Review.
- Harris, M., & Raviv, A. (1991). The theory of capital structure. *The Journal of Finance*, 50(1), 30-56.
- Hatzinikolaou, D., Katsimbris G. M., & Noulas A. G. (2002). Inflation uncertainty and capital structure: Evidence from a pooled sample of the Dow-Jones industrial firms. *International Review of Economics and Finance*, 11(3), 45-55.
- Hillier, D., Grinblatt, M., & Titman S. (2008). *Financial markets and corporate strategy: European Edition*.
- Hochman, S. and O. Palmon (1985). The impact of inflation on the aggregate debt asset Ratio. *Journal of Finance*, 40(9), 1115-1125.
- Hodder, James E. and Lemma W Senbet (1990). "International capital structure equilibrium." *Journal of Finance*, 45 (5), 1495-1516.
- Kelly, William and James Miles (1989). "Capital structure theory and the fisher effect." *Financial Review*, 24 (1), 53-73.
- Kim, Moon K. and Chunchi Wu (1988). Effects of inflation on capital structure. *The Financial Review*, 23(2), 183-200.
- Levy, A., & Hennessy C. (2007). Why does capital structure choice vary with macroeconomic conditions?. *Journal of Monetary Economics*, 54(2), 1545-1564.
- Levy, A., & Korajczyk R. A. (2003). Capital structure choice: macroeconomic conditions and financial constraints. *Journal of Financial Economics*, 68(5), 75-109.
- Li, C & Zhang, M. (2014). Insecure impact of inflation upon capital structure. *International Journal of Security and Its Applications* 8(5), 421-426 <http://dx.doi.org/10.14257/ijisia.2014.8.5.36>

- Long, M. S., & Malitz I. B. (1985). Investment patterns and financial leverage. National Bureau of Economic Research Volume Title: Corporate Capital Structures in the United States, pp. 325-352.
- Mahajan, A., & Tartaroglu S. (2007). Equity market timing and capital structure: *International Evidence. Social Science Research Network*, Accepted Paper Series.
- Maya, T.S., Sudjono, M. & Ahmad, B.S. (2020). The effect of capital structure, company growth, and inflation on firm value. *Dinasti international journal of economics, finance and accounting*. 1(1), 95-109.
- McGraw Hill. Jensen, M. C., & Meckling W. H. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
- Metel'skaya, V. V. (2021). Correlation and regression analysis of the influence of macroeconomic factors on capital structure of Russian corporations under crisis conditions. *Journal of Innovation Entrepreneurship* 10(20), 30-45. <https://doi.org/10.1186/s13731-021-00160-w>
- Miller, Merton H. (1977). "Debt and Taxes." *Journal of Finance* 32(2): 261-75. 11
- Modigliani, F. and M. H. Miller (1958). The Cost of Capital, Corporate Finance and the Theory of Investment. *American Economic Review* 48(3):261-297.
- Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American Economic Review*, 48(3), 261-297
- Moradi, M. & Abad, E.P.M (2021). Effects of inflation rate risk and firm-specific risk on a firm capital structure adjustment: GMM approach. *Journal of Empirical Research in Accounting*. 11(39), 23-52.
- Myers, S. C. (2001). Capital Structure. *The Journal of Economic Perspectives*, 15(2), 81- 102.
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187- 221.
- Nguyen, V. D & Duong, Q. N. (2022). The impact of foreign ownership on capital structure: empirical evidence from listed firms in Vietnam. *The Journal of Asian Finance, Economics and Business*, 9(2); 363-370. <https://doi.org/10.13106/JAFEB.2022.VOL9.NO2.0363>
- Platt, Harlan D. Marjorie B. Platt, and Guangli Chen (1995). "Sustainable growth rate of firms in financial distress." *Journal of Economics & Finance*, 19(2), 147-51.
- Rajan, R. G. & Zingales, L (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance*, 50, (5), 1421-1460.

- Schall, L. D. (1984). Taxes, inflation and corporate financial policy. *Journal of Finance* 39(3), 105-126.
- Shivdasani, A., & Zenner, M. (2005). How to choose a capital structure: Navigating the Debt Equity Decision. *Journal of Applied Corporate Finance*, 17(1), 12-28.
- Shleifer, A., & Vishny, R. W. (1989). Management entrenchment: The case of manager-specific investments. *Journal of Financial Economics*, 25(5), 123-139.
- Suhono, S, Nugraha, N, Disman, D, & Maya, S. (2022). The influence of fundamental and macroeconomic factors on firm value with capital structure as a moderating variable. *Budapest International Research and Critics Institute (BIRCI-Journal)*. 5(1) 32-43.
- Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of Finance*, 30(1), 12 - 45.
- Tupe, S. (2022). The determinants of capital structure of Indian power generation and supply firms: panel data analysis. *Asian Journal of Economics, Finance and Management*, 6(1), 46-56. Retrieved from <https://globalpresshub.com/index.php/AJEFM/article/view/1441>
- Zwick, B (1977). The market for corporate bonds. Federal Reserve Bank of New York Quarterly Review, 2(2), 27-36.
- Chakravarty, D., & Mandal, S. K. (2020). Is economic growth a cause or cure for environmental degradation? Empirical evidences from selected developing economies. *Environmental and Sustainability Indicators*, 7, 100045.
- Pesaran, M. H. (2012). On the interpretation of panel unit root tests. *Economics Letters*, 116(3), 545-546.
- Egbunike, C. F., & Okerekeoti, C. U. (2018). Macroeconomic factors, firm characteristics and financial performance: A study of selected quoted manufacturing firms in Nigeria. *Asian Journal of Accounting Research*.