MACROECONOMIC AGGREGATES AND RETENTION RATIO OF QUOTED FIRMS IN NIGERIA

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ABSTRACT: *This study examined the effects of macroeconomic aggregate on retention ratio of selected quoted manufacturing firms in Nigeria for the period 1981 to 2014. The study used secondary data. The techniques adopted is the Ordinary Least Squares, Error correction mechanism and Autoregressive Distributed Lag (ARDL) Bounds approach to cointegration. The dynamic short run estimate revealed that interest rate exerts a negative influence on retention ratio. The study also found that oil price exerts a positive and significant impact on retention ratio. Further, it revealed that capital market development exerts a positive influence on retention ratio, but financial sector's development showed a positive relationship with retention ratio, inflation rate appeared with expected negative sign. Foreign exchange rate showed a positive relationship with retention ratio; money supply exhibited a positive influence on retention ratio of quoted firms in Nigeria. The error correction coefficients were significant with the expected sign. Long run relationship among the variables were established. Thus, the study concludes that macroeconomic variables have significant influence on dividend policy. We recommend the need for firms to consider the operating macroeconomic framework in formulating dividend policy.*

KEYWORD: Macroeconomic Variables, Retention Ratio, Macro

INTRODUCTION

Dividend policy refers to the decision of management about the portion of income that is given to stakeholders in the form of dividend and this is an arguable issue for financial managers for decades (Toby, 2003). Dividend policy is also a critical finance management function that determines the proportion of corporate profit that is distributed to shareholders and the proportion that is retained. It is believed that dividends are highly sensitive to external events such as economic factors within the operating environment. A very important aspect of dividend policy is retention ratio. Retention ratio means the proportion of earnings kept back in the business as retained earnings. In other words, it is the percentage of net income that is retained to grow the business, rather than being paid out as dividends to shareholders.

Despite various reforms, policies, structural changes the performance of corporate organizations remains abysmal and affects the retention ratio of firms. Unfortunately, significant proportion of Nigerian firms has no consistent retention ratio policy over the past three decades, as they are largely influenced by unanticipated economic events with pervasive impact on dividend decisions of firms as it relate or affect return on ratio. Also, there is huge scarce literature that identified the macroeconomic determinants of dividend decisions of firms. It is believed that macroeconomic policy directly or indirectly determines the value of firm's retention ratio that shareholders desire to plough back.

In this case, behavioural finance plays an important role of explaining the dividend policy in any organization. Miller (1986) presents a traditional argument against behaviuoural finance by contending that behavioural theories may be able to explain the micro factors, but rational theories suffice to explain the macroeconomic aggregates that determine dividend policy. This suggests that the factor that determines corporate retention ratio remains a matter of debate among scholars.

Knowledge on the nexus between dividend and macroeconomic variables is crucial to the investors in the equity market as well as to the policy makers. Therefore, it is important to examine the relationship between macroeconomic aggregates and retention ratio of quoted firms in Nigeria. The relationship between macroeconomic aggregates and retention ratio can only work in the developed financial market where equity market and stock prices are well managed and its objectives on the financial market is achieved rather than when compared with financial market of the developing countries like Nigeria where the financial market is emerging and equity market and stock prices are characterized with ill timing and policy mismatch. Also, there are limited studies of citable significance on the effect of macroeconomic aggregates and retention ratio in Nigeria.

Despite many debates on the effect of macroeconomic variables, macroeconomic aggregates , dividend and retention ratio , extant studies show however, that there is still no consensus as to the exact effects of macroeconomic aggregates and retention ratio, (Akani and Yellowe, 2016) found that dividend policy affect the profitability of quoted manufacturing firms in Nigeria positively while other researchers such as Bhattacharya (1979), Basse (2009), Baker and Powell (2000), Dagogo and Obara (2015) and Collins,Saxena and Wansley (1989), found a controversial results, with diverging methodologies and period of study. However, there seems to be no conclusion on the types and direction of the relationship between macroeconomic aggregates and retention ratio. Therefore this study intends to examine the relationship between macroeconomic aggregates and retention ratio of quoted firms in Nigeria.

LITERATURE REVIEW

Dividend Policy refers to a company's policy which determines the amount of dividend payments and the amounts of retained earnings for reinvesting in new projects. Dividend policy has been of great interest for researchers and extensive empirical research has been carried out to identify the potential factors that influence the dividend decision of the firm. However, researchers are still unable to reach a consensus in this regards (Kim and Jang, 2010). It has remained a puzzle for financial economists (Black, 1976).

Duke, Nneji and Nkemare (2015) examined the impact of dividend policy on share price valuation in Nigerian Banks, based on data from two banks operating in Nigeria. They found that dividend yield had a significantly negative effect on share price

Spyrou (2001) studied the relationship between dividend policy and inflation for the emerging economy of Greece. Spyrou (2001) in consistent with Kaul's results, found that inflation and dividend policy are negatively related till the year 1995, after which the relationship became insignificant. Spyrou accredited the change in the relationship to the increased role of monetary fluctuations in line with Marshalls (1992) argument, which states

that the negative relationship between stock price returns will be less pronounced during the periods when inflation is generated by monetary fluctuations.

Ralph and Eriki (2001) conducted an empirical study on Nigerian stock market and found that a negative relationship exists between dividend policy and inflation. However, they also showed that the dividend policies are also strongly motivated by the level of economic activity measured by interest rate, money stock, GDP and financial deregulation.

Kalyanaraman and Al-Tuwajri (2014) examined the existence of long run relationship among five macroeconomic variables of CPI, industrial output, money supply, exchange rate, oil price along with proxy of S&P 500 and the TASI (Saudi All stock index). They used monthly data from 1994 to 2013 and applied the time series analysis. They found an existence of long run relationship among the five variables and all the five variables put an impact on stock price whereas S&P 500 index does not impact Saudi stock prices. They also found a two way causality between stock prices and oil prices they also found that the industrial production shocks pushes up the stock prices while consumer price index shocks pulls the stock price down.

Mwangi (2013) tries to determine the effect of macroeconomic variables such as real exchange rate, GDP growth rate, the change in money supply (M3), average annual lending interest rates and inflation rate measured by annual percentage changes in the consumer price index (CPI) on financial performance proxied by Return on Assets (ROA) of aviation industry in Kenya. The results reveal that ROA has weak positive insignificant correlation with gross domestic products growth rate and annual change in money supply while a weak negative insignificant correlation exist between ROA and exchange rate, annual average lending rate and annual average inflation.

Singh, Tripathi, and Parashar (2013) examined the primary factors those are responsible for affecting the index (NIFTY) in National Stock Index in India. They took Exchange rate, Insurance Intermediation Premium (IIP), WPI as the independent variable and applied regression analysis and found that IIP, exchange rate and WPI influences the stock prices.

Abedallat and Shabib (2012) examined the impact of macroeconomic indicators like change in investment and gross domestic product (GDP) as the independent variables and the movement of Amman Stock Exchange index as dependent variable for the data period of 1990- 2009. For the analysis of the above relationship they used the multiple regressions. They found a relationship between the two macroeconomic indicators (the investment and GDP) and the Amman Stock Exchange index, and also between each of them separately and the stock index, which means that the movement of prices in the Amman Stock Exchange affected by the movement of these two variables, and there is the effect of both variables on the movement of Amman Stock Exchange index. Further they found the impact of change in investments was greater than the impact of change in GDP on the Amman Stock Exchange index.

Basse and Reddemann (2011) examined inflation and dividend policy of US Firms and pointed that the neglecting of macroeconomic variables as the important reason why empirical tests often fail to support theories of dividend determination. He found a stable long run relationship between dividend payments and real economic activity and price level.

Model and Estimation Techniques

The Ordinary Least Squares (OLS) has been successfully used in studies (Abedallat and Shabib, 2012; Singh, Tripathi, and Parashar, 2013; and Amadi, Oneyema and Odubo, 2000), hence, this technique is employed in estimating the specified equations, while the EViews 9 as a computing platform in the analysis. The study utilized annual time series secondary data (1981 – 2014). All the data set are obtained from the Nigerian Stock Exchange fact book, Central Bank of Nigeria (CBN), and annual reports and statement of accounts.

In line with Olugbenga (2011), Osa and Ikaibo (2002), Amadi, Oneyema and Odubo (2000), the regression model takes the form:

$$RR = \beta_0 + \beta_1 INTR + \beta_2 OILP + \beta_3 FD + \beta_4 CD + \beta_5 M2 + \beta_6 INFR + \beta_7 RGDP + \beta_8 EXR + \varepsilon i \dots (1)$$

Where:

RR	=	Retention Rate
INTR	=	Interest Rate
OILP	=	Oil Price
FD	=	Financial Sector Deepening
CD	=	Capital Market
MOS	=	Broad Money Supply
INFR	=	Inflation Rate
RGDP	=	Real Gross Domestic Product
EXR	=	Exchange Rate
εi	=	Error Term
β_i - β_8 =		Coefficient of the Independent Variables
β_0	=	Regression Intercept

Empirical Results and Analyses

We present and analyze the estimated short-run model based on some goodness of-fit criterion, such as Akaike information criterion (AIC) and Schwartz information criterion (SIC) for selection of lag length in a model, hence; it is presented in the table below;

Table 1: Short-run Estimated Result showing the effects of Macroeconomic Variables on Dividend policy Indices in Nigeria

Variable	ΔRR	
C	-8.712443	(-0.340313)
$\Delta INTR$	-26.07145	(-5.129213)*
ΔINTR(-1)	-4.901002	(-1.338707)
ΔINTR(-2)	-7.099566	(-1.751070)
ΔOIP	1.378985	(3.242073)*
ΔOIP(-1)	1.424468	(3.075754)*
ΔOIP(-2)	2.485007	(4.534692)*
ΔCD	0.002173	(0.268275)
ΔCD(-1)	-0.026711	(-2.392656)
ΔCD(-2)	-0.011735	(-0.435949)
ΔFD	2.136948	(0.362346)
ΔFD(-1)	18.50266	(1.822995)
ΔFD(-2)	10.22963	(2.465365)*
ΔINFR	-0.005405	(-0.004556)
ΔINFR(-1)	-1.839189	(-1.030609)
ΔINFR(-2)	-0.697949	(-0.676941)
ΔRGDP	14.59239	(2.827198)*
ΔRGDP(-1)	18.72948	(2.626467)*
ΔRGDP(-2)	-37.52078	(-3.727010)*
ΔEXR	2.665646	(1.236714)
ΔEXR(-1)	-2.192780	(-1.236992)
ΔEXR(-2)	5.856717	(2.386177)*
ΔMOS	9.170141	(3.623753)*
ΔMOS(-1)	4.854979	(2.577289)*
ΔMOS(-2)	-0.041259	(-0.025766)
ECM(-1)	-1.540177	(-7.039320)*
R-squared	0.972314	
F-statistic	7.023826	(0.019475)*
Durbin-Watson stat	1.294621	
Breusch-Godfrey Test	0.398060	(0.7025)

Source*: Eviews 9 Computation*

Note: *t-statistic in parenthesis ( ),* *****indicates significance at 5%*

The above error correction model shows that the coefficient of determination (R^2) was significantly high. That is, the selected macroeconomic variables explained 97% changes in retention ratio. Also the overall regression was significant at 5%. The error correction coefficients have the expected sign and relatively high, though RR is significant.

The a priori of the signs of explanatory variables in the RR equation were correctly sign, except one and two-period lag capital market development, current period exchange rate, lag two exchange rate and money supply respectively. RR responds negatively and significantly to current-period interest rate; it also responds positively and significantly to changes in oil price, two-period lag financial deepening also showed a positive and significant influence on RR, real GDP growth appeared positive and significant, exchange rate appeared positive at current period and lag two-period, though significant only at lag two, while money supply

appeared with a positive and significant sign at current period and lag one period respectively, this confirms the economic believe that the dependence of a variable on another is rarely instantaneous, but responds with a lapse of time (Gujarati, 2004).

This is an indication that certain economic indices do not reflect in dividend policy, and economic policies are not satisfactorily used in the direction of increasing shareholders returns. This finding may not be unconnected with the lack of prudence in the utilization of dividends. In sum, the result reveals that dividend policy indices in the period under review in Nigeria, does adjust fairly to changes in macroeconomic variables.

Test for Serial Correlation

In essence, we employed the Durbin-Watson (DW) test for autocorrelation, it is based on the assumption underlying the Ordinary Least Squares (OLS), that the error term (μ) is assumed to be uncorrelated. The Breusch-Godfrey test shows evidence that the residuals are uncorrelated.

Test for Perfect Multicollinearity

Table 2: Test for Multicollinearity

	INTR	OIP	CD	FD	INFR	RGDP	EXR	MOS
INTR	1.000000							
OIP	-0.076909	1.000000						
CD	-0.018704	-0.389686	1.000000					
FD	0.042121	-0.356406	0.642279	1.000000				
INFR	0.026434	0.095067	-0.315252	-0.361966	1.000000			
RGDP	0.077516	0.115997	0.391266	0.349791	-0.206831	1.000000		
EXR	0.306915	-0.370523	0.753070	0.577952	-0.228009	0.421499	1.000000	
MOS	0.362128	0.113533	0.112204	-0.009332	-0.120845	-0.168355	0.018838	1.000000

Source: Author's Computation Using EViews 9 Software

From the above table 2, apart from the diagonal, the correlation between variables are not unity, this implies that the explanatory variables have no exact or perfect relationship.

Test for Model Stability

Figure 1: Model Stability Test for Retention Ratio Model
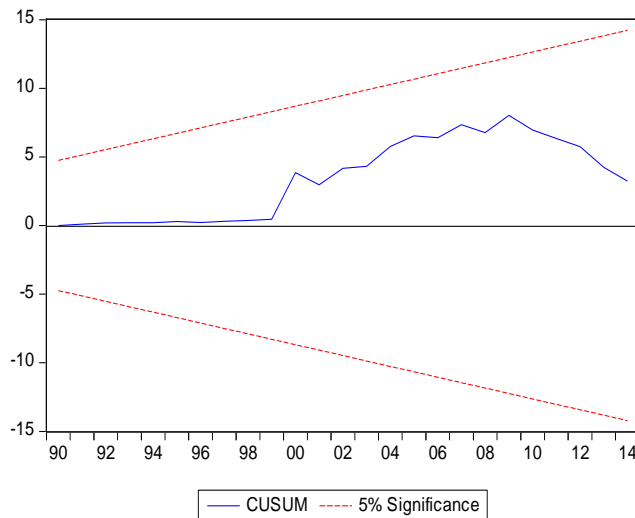
The CUSUM tests is used in this study to test for parameter stability, our graph shows that the plots of the residuals remain within the 5% critical bounds, therefore, we can accept that the parameters of the model are stable.

Test for Residual Normality

The Jarque-Bera (JB) test of normality is adopted in this study, purely to verify whether the residuals are normally distributed. It is conducted under the null hypothesis that the residuals are not normally distributed. From illustration below; the computed ρ value of the JB statistic (0.100786) under the normality assumption, we therefore reject the hypothesis that the error terms are not normally distributed. The diagram below shows that the residuals from the regression seem to be symmetrically distributed.

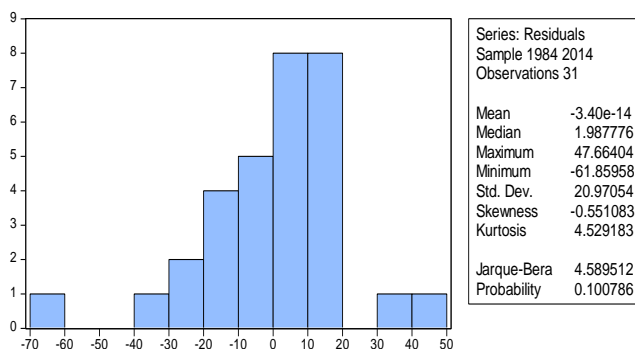**Figure 2:   Normality Test For Retention Ratio Model**

Table 3:   **Test for Heteroscedasticity**

Heteroscedasticity Test for Retention Ratio			
F-statistic	0.550246	Probability	0.8792
Obs*R-squared	12.81713	Probability	0.7483

Source: Author's Computation

This test is conducted using white's test, which involves either an auxiliary regression with no cross-terms or with cross terms. It also follows the F-distribution, from the table 3 shown above, since the ρrobability of F-value 0.8792 for retention ratio is not significant, we therefore conclude that there is homoscedasticity, that is to say, the variances are equal.

Table 4: Unit Root Stationarity Test

A Time Series Y_t is Integrated of Order D, Denoted I(D), If ΔDyt is Stationary. Then The Series Y_t Has D Unit Roots.To Further Ascertain The The Stationarity of the Data Series, Hence;

Table 4: Augmented Dickey- Fuller (ADF) Unit Root Test of Stationarity Results

Test	Variables	Levels		Differences		Order of Integration
		t- statistic	Critical	t- statistic	Critical	
ADF	RR			-8.904988	-3.653730	I(1)
	INTR			-6.384610	-3.661661	I(1)
	OIP	-5.877960	-3.646342			I(0)
	CD			-6.677589	-3.653730	I(1)
	FD			-5.726112	-3.661661	I(1)
	INF			-5.730629	-3.670170	I(1)
	RGDP	-4.369344	-3.646342			I(0)
	EXR			-6.006878	-3.653730	I(1)
	MOS			-7.185088	-3.653730	I(1)

*Note: * Implies significance at 1%*

Source: Author's Computation based on data from Central Bank of Nigeria Publications

According to Maddala (1992), testing for unit roots is a formalization of the Box- Jenkins approach of differencing the time series after a visual inspection of correlogram. The analyzing and testing for unit root naturally lead to the theory of cointegration (Iyoha and Ekanem, 2002).

The summarized result presented in table 4 above shows that at various levels of significance (1%, 5% and 10%), all the variables were stationary, specifically, OIP and RGDP are integrated of order zero, I(0), whereas RR, INTR, CD, FD, INF, EXR and MOS are integrated of order one, I(1). Hence, all the variable in this study are stationary.

ARDL Bounds Tests for Cointegration

Table 5a: Bounds Test for Cointegration Analysis

Critical value	Lower Bound Value	Upper Bound Value
1%	3.15	4.43
5%	2.55	3.68
10%	2.26	3.34

Source: Pesaran et al. (2001)

Table 5b: ARDL Results for Cointegration Analysis

ARDL Bounds Test Test:		
	Test Statistic	Value
RR EQUATION	F-statistic	5.466722

Source: Author's Computation Using EViews Software

Pesaran and Shin (2001) showed that cointegrating systems can be estimated as ARDL models; it has the advantage to estimate cointegrating relationship on variables that are either $I(0)$ or $I(1)$.

According to Pesaran *et al.* (2001), the asymptotic distribution of the F-statistic is non-standard regardless of whether the regressors are $I(0)$ or $I(1)$, and provide two adjusted critical values that establish lower and upper bounds of significance.

Interpretation:

Given a computed F statistics Value of 5.466722 for RR equations, the results of the bounds co-integration test therefore establish that the null hypothesis against its alternative is rejected at the various significance level. The computed *F*-statistic are greater than the lower and upper critical bound valuesat 1%, 5% and 10% respectively, thus indicating the existence of a steady-state long-run relationship among the variables. This suggest that the various selected macroeconomic variables have a long run relationship with dividend policy indices in Nigeria.

Concluding Remark

This study is an attempt to investigate macroeconomic variables and dividend policy of quoted firms in Nigeria. The overall results suggest that retention ratio responds to the dynamics of the macroeconomic environment; especially from interest rate, oil price, financial sector development, capital market development, foreign exchange rate, monetary policy instrument of money supply and the magnitude of growth in the economy, other check variables like inflation rate appeared with a slight stimulus on retention ratio.

Our result supports the outcry for firms to consider the existing macroeconomic environment, as essential to achieve quite good dividends policy. In this line, Chen, Roll and Ross (1986) showed that in the United States, dividends has a strong relationship with macroeconomic variables. This study also supports the scholarly work of Olugbenga (2011) that the impact of macroeconomic indicators such as money supply, interest rate, exchange rate, inflation rate, oil price and gross domestic product have varying impact on stock prices of firms in Nigeria.

This confirms that the dynamics in monetary policy and the oscillation in the external sector have unpredictable influence on dividends policy of quoted firms in Nigeria. Our long run estimate is similar to Basse and Reddemann (2011), based on the established long run relationship found between dividend policy indices and the macroeconomic variables.

Remarkably, this study concludes that a long run relationship exists between retention ratio and the macroeconomic variables. These conclusions also offer valuable indications to policy makers when determining retention ratios, by considering the macroeconomic environment where the firm exists. Therefore, the need for firms to consider the operating macroeconomic framework in formulating dividend policy is recommended from this study.

Policy Implications

The implication is that if those variables of macroeconomic aggregates are neglected by policy authorities in their quest to enhance equity market, increased stock prices and financial system stability, it might be difficult for the government through securities and exchange commission and other relevant authorities to achieve its major macroeconomic objectives of sound financial system stability, operational efficiency of the financial market and stock exchange market.

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