

Macroeconomic Variables and Retained Earnings of Quoted Manufacturing Firms in Nigeria: A Time Variant Study

Ngozi G. Iheduru¹ & Charles U. Okoro²

¹Department of Accountancy, Faculty of Business Administration, Imo State University, Owerri, Nigeria

²M. Sc., Department of Accountancy, School of Management Sciences, Ken Saro-Wiwa Polytechnic, Bori, Rivers State, Nigeria

Correspondence: Associate Professor, Ngozi G. Iheduru, FCA, Department of Accountancy, Faculty of Business Administration, Imo State University, Owerri, Nigeria. Tel: 08037163444, 08153171772, Email: ngoziiheduru@imsu.edu.ng

To cite this article: Iheduru, N. G., & Okoro, C. U. (2018). Macroeconomic Variables and Retained Earnings of Quoted Manufacturing Firms in Nigeria: A Time Variant Study. *International Journal of Accounting & Finance Review*, 3(1), 33-47. Retrieved from <http://www.cribfb.com/journal/index.php/ijaftr/article/view/29>

Received: September 21, 2018

Accepted: September 25, 2018

Online Published: October 10, 2018

Abstract

This study examined external factors that determine retained earnings of quoted manufacturing firms in Nigeria. Annual time series data were sourced from Central Bank of Nigerian Statistical Bulletin, and Annual Reports of the selected manufacturing firms, the study modeled retained earnings the function of money supply, exchange rate, oil price, inflation rate and interest rate. The ordinary Least Square method was employed with multiple regression model based on Statistical Package for Social Sciences version (22.0). The Durbin-Watson statistics show the presence of multiple serial autocorrelation. The result shows collinearity that corresponds with the Eigen value condition index and variance constants are less than the required number, while the variance inflation factors indicate the absence of auto-correlation. It was found that Oil price have positive impact on retention rate of the selected manufacturing firms while exchange rate and interest rate have negative impact on the dependent variable. It was also found that money supply have negative effect on dividend payout rate while inflation rate have positive impact on retention rate. From the findings we conclude that oil price, interest rate, exchange rate and money supply have no significant relationship with dividend policy while inflation rate have significant relationship with dividend policy of the selected quoted manufacturing firms. We recommend the need for the manufacturing firms to formulate policies that leverage the negative effect of macroeconomic variables on retained earnings of the manufacturing firms and interest rate should properly be defined in the Nigerian financial market that is either full deregulated or regulated to determine the market rate of return, investment and the profitability of manufacturing firms. The operational efficiency of Nigerian capital market and the financial environment should be deepened, existing laws that does not encourage profitable investment should be changed and new laws enacted to enhance investment that will affect the profitability of manufacturing firms positively.

Keywords: Macroeconomic Variables, Retained Earnings, Quoted Manufacturing Firms, Money Supply

1. Introduction

The traditional finance paradigm, theory and teaching put the shareholders wealth maximization as the primary goal of corporate management. As in Davis and Lucky(2018)The shareholders wealth maximization as function of management is a critical function that requires tactical and strategic measures to achieve. The management of any given firm is always faced with a problem of making the financing decision that will maximize the firm's value. Brigham(2016) opined that the decision about allocation of net income after tax between dividends and retained earnings can have a critical influence on the value of the company. The management is torn between paying out to shareholders large, small and zero percentage of earnings in form of dividends or to retain them for investment operations. Retained profit is part of equity capital, and second, retention is a deprivation of shareholders' dividend. In other words, the retention-dividend dilemma affects the firm either as part of financing decision or as part of dividend decision.

In a deregulated financial market like Nigeria, retained earnings depends on both internal and external operating environment of corporate organizations. From the internal operating environment retained earnings is the function of profitability, liquidity, investment policy, capital structure and management quality while from the external environment retained earnings is the function of macroeconomic factors such as, money supply, interest rate, oil price and exchange rate. Unstable macroeconomic environment does not only threaten the profitability of a firm but threatened the survival of business organizations. Managers engage in earnings management for many reasons and probably exercise their accounting discretion to influence reported earnings. According to Zimmerman and Subramanyam (1986) management manipulate earnings largely to;

Firstly, they manipulate earnings because of capital market incentives, including implementing management buyouts plan; Initial public offers seasoned equity offering and mergers plans, income. Secondly, they implement earnings management because of contracts motivation. Thirdly, they conduct earnings management due to regulation and antitrust law, etc. regardless of whichever cause managers to manipulate earnings, the behavior of earnings management implies conflict of interest between managers, owners, and majority shareholders.

Retained earnings and dividend represent two sides of a coin that may just be a conceptual misfit as it is assumed that both sides of the coin must be equal for each to be on one side of the coin. In reality and indeed what had been the puzzle in finance is the rare equality between retained earnings and dividend, and the overarching implication of the foregoing. As in Dagogo and Obara (2015), even if there is a coincidental equality in the nominal sense, there is never going to be any equality in the implicit sense of it.

There are two way effects of macroeconomic variables and retained earnings and retained earnings and macroeconomic variables. The level of money supply available in an economy can contrast, due to inflation. When this happens, the value of dividend policies is negatively affected. On the other hand, a steady rate of expansion in money supply with low inflation has a tendency to boosts dividend policy. Fluctuations in the price of the crude oil in the international market have an over-bearing influence on the Nigerian economy. Interest rate fluctuations are widely acknowledged as an important source of uncertainty for firms. However households own funds in two different ways. First, they hold funds directly in their own checking and savings accounts. Second, households hold funds indirectly through the firms in the economy, which they own. It is through these indirect holdings that retained earnings matter,when a monetary shock hits, initially only the asset holdings of firms are affected. An expansionary monetary shock increases the amount of funds held by the business sector. Since funds held by the business sector are not used for consumption, the economy wide ratio of funds used for consumption and savings changes after such a shock. Without adjustment costs, households would then lower their own savings to re-establish the preferred ratio of consumption to savings. With adjustment costs, consumers adjust their asset holdings to a lesser degree, and the resulting imbalance affects real variables such as output and

employment. If earnings in the business sector are retained, the imbalance and therefore the real effects of the monetary shock will persist. Retained earnings matter for the transmission of monetary policy because they affect the overall balance between different uses of funds in the economy (Doepke, 2004). While factors that determine dividend policy has well been documented in literature, the effect of macroeconomic variables on corporate retained earnings is lacking in literature apart from the study of Akani and Sweneme (2017, therefore this study examined macrocosmic factors that determine retained earnings of quoted manufacturing firms in Nigeria.

2. Literature Review

Retained Earnings are the earnings ploughed back into the company for the purpose of expansion programme. The price at which equity shares are traded in the stock market is their market value. Generally the earnings and their distribution have positive reflection on the share prices. Every year a company retains a part of its earnings. The level of earnings before interest and tax, the rate of tax payable and the volume of dividend distributed influence the amount of retained earnings. This amount of retained earnings gets accumulated to form a significant source of internal finance. The amount of earnings retained represents a source of fund, which is relatively cheaper. Whenever there is requirement for fund, the company can safely bank upon the retained earnings.

The amount retained by the company acts as a cushion that absorbs the adverse effects of the business. It also enables a company to maintain a stable dividend policy. Profit refers to the earnings of a company. The amount of earnings a company can generate depends not only on its efficient use of funds but also on factors like market for the product manufactured, state of competition, its quality, company's after sales service, government regulations. The earning capacity of a company is an indicator of its continuity of existence. Higher the level of earnings, higher would be the value that the market attaches to the company. As in **Odiero (2013)** sufficient amount of earnings enable a company to tide over adverse business conditions. A company that earns more can maintain a dividend policy that can satisfy the shareholders. Further, by capitalizing the earnings, expansion programme may also be taken up.

The earnings of a company are distributed among dividends and retained earnings. The nature of distribution of earnings is influenced by the dividend policy followed by the company. If it follows a principle of paying dividends continuously, then retained earnings becomes only residual. Contrary to this, a few of the companies attach primary importance to retained earnings. Retained earnings, though it involves opportunity cost, is an easy source of financing as far as the company is concerned. The opportunity cost is the return foregone from the next best alternative activity. Had the earnings retained in the business were distributed to the shareholders, they would have got some earnings by investing these funds outside. The earnings generated by the company by the use of retained earnings should be at least equal to the opportunity cost of the earnings retained (Pandey, 2015).

Retained earnings, as a source of finance for investment proposals, differ from other sources like debt, preference shares and equities. The use of debt is associated with a contractual obligation to pay a fixed rate of interest to the suppliers of funds. The principal amount also should be repaid at some pre-determined date. An almost similar kind of stipulation applies to the use of preference shares also. In the case of ordinary shares, although there is no provision for any pre determined dividend payment, yet a certain rate of dividend will be expected by the shareholders. Legally there is no obligation on a firm to pay a return on retained earnings. The contention that retained earnings are free of cost, however, is not correct. Retention of earnings does have implications for the shareholders of the firm. If the Earnings were not retained they would have been paid out to the shareholders as dividends. The dividends foregone by the shareholders involve opportunity cost. Thus the firm is implicitly required to earn on the retained earnings at least equal to the rate that would have been earned

by the shareholders if they were distributed to them. As a source of funds, retained earnings have some commendable features. They are readily available to the firm.

2.1 Macroeconomic Determinants of Retained Earnings

Crude oil Price: On July 11th 2008, the crude oil price reached its highest price ever (Hamilton, 2009; World Bank, 2015a) and in the second half of 2008 there was a sharp decrease in oil prices. The increasing OPEC supply, political issues between Iran and the United States and the financial crisis exacerbated this decrease (Hamilton, 2009). Other determinants of the oil prices are the structure of the oil market and speculation (Fattouh, 2007). In May 2010 prices fell more than 10 Dollar per barrel in less than a fortnight (OPEC, 2014; World Bank, 2014a). The prices have recovered since then and are currently hovering around 100 Dollar per barrel for the main crude oil benchmarks (OPEC, 2014; World Bank 2014a). Fluctuations in the price of the crude oil in the international market have an over-bearing influence on the Nigerian economy. This is because most organizations (including the government) rely greatly on the petroleum product for their energy generation especially and or are directly or indirectly linked to the Nigerian Oil Industry. The Crude Oil and the Petroleum Industry has become a web in Nigeria almost touching every area (if not all) of our national life.

An increase in the price of the crude oil leads to an increase in petroleum and its allied products. This increases are also transferred to every other commodity or services rendered within the Nigerian state, all things being equal. The reason for this is quite obvious as an increase in petroleum and its allied products would ordinarily lead to an increase in the cost of operations vis-à-vis increase in cost of production. These increases may not necessarily translate to increase in profits in all cases. This situation then calls for a proactive corporate manager to take adequate steps in deciding on the dividend policy that would maximize the entity's opportunities. However, if an increase in oil prices influences economic output negatively, this results in diminished expected earnings and should influence corporate performance.

Interest Rate: Governments and or monetary authorities have several tools designed to regulate the flow of money in any economy. The interest rate is one of them and is used in order to influence the economy. A high interest rate is an indication of a tight monetary policy. In times with high interest rates, it is more costly for firms to borrow and this all things being equal will result in low investment. This is because the cost of capital will be high which makes it more unattractive to invest. This is not applicable to firms alone, but individuals also are affected by high interest rates, as the repayments of these loans and mortgages will be more expensive. Lipsey and Chrystal (2007) postulated that high interest rates tend to decrease demand, while low interest rates stimulate demand in an economy.

Interest rate fluctuations are widely acknowledged as an important source of uncertainty for firms. Graham and Harvey (2001) provide evidence that fluctuations in the interest rate are the second most significant risk factor for companies. They mentioned the maturity match between assets and liabilities as 'important or very important'. The influence of the interest rate on the stock performance of firms has received great attention in empirical studies, yet a lot of these studies focused on financial institutions due to the interest rate sensitivity of these sector (Mommel, 2011). However, interest rate fluctuations may also affect nonfinancial companies through their influence on the financing costs and the value of the assets and liabilities held by these companies. The opportunity cost for investing in a stock is represented by the interest rate. Interest rate is known as one of the most important factor moving the attitude of investors in the stock market that affect dividend policy. As interests rises bonds turn out to be more attractive given their risk-return features; this encourages investors to switch from the stock market to the money market by buying bonds and selling stocks, hence depressing stock prices. The relationship between short-term and long-term interest rates or rates of return particularly in the stock market in the efficiency of pricing of company securities shows how we can rely on the monetary policy being

able to correctly value a company's shares. When interest rate is reduced, this encourages demand for cash for tentative purpose which may improve the stock market activities. Furthermore, the rise in interest rates raises equity capitalization rates, which also leads to lowering stock prices. Accordingly, interest rate is expected to have an inverse effect on dividend policy. The relationship between stock prices and interest rates has received considerable attention in the literature.

Money Supply: The Money supply variable used in this thesis is M2 which will capture the percentage rate of changes in Nigerian money. M² is the broadest form of money supply currently reported by the Central Banks and it was found that large changes in it (which is regarded as M² Volatility) coincide with stock market volatility. The level of money supply available in an economy can contract, due to inflation. When this happens, the value of dividend policies is negatively affected. On the other hand, a steady rate of expansion in money supply with low inflation has a tendency to boost dividend policy. For this reason, easing the level of Federal Reserve requirements in banks and that of stock market prices can be driven to heights. The tightening of short-term interest rates such as the rediscount rate or treasury rates can hurt the stock market and the economy. The impact of money supply can be explained in two hypotheses namely Monetary Portfolio Hypothesis (MPH) and Efficient Market Hypothesis (EMH). The MPH expects that an increase in money supply will result in an increase in almost all-economic activities including the stock market (Friedman, 1988). While EMH assumes that the impact of the change of money supply on share price reaction is limited and the speed of adjustment does not leave a room for traders to obtain abnormal returns because dividend policy incorporates all relevant information.

Exchange Rate: According to Shapiro (2013) the important determinants of the exchange rate are the demand and supply for the currency, inflation, interest rate, the economic and political risk. Due to the wide worldwide usage the United States Dollar (USD) and the Euro as the most important exchange currencies, many academics examine the relationship between exchange rate and stock performance for both theoretical and empirical reasons using these currencies. The exchange rate variable in this thesis will capture the changes in the value of the Nigerian Naira against the US Dollar. The theory of Purchasing Power Parity (PPP) involves the relationship between inflation and exchange rates. It suggests that the exchange rate will, on average, change by a percentage that reflects the inflation differential between the two countries concerned. Consequently, the purchasing power of customers when purchasing goods in their country will be similar to their purchasing power when importing goods from a foreign country.

Accordingly, in a perfect purchasing power parity conditions, exchange rates will adjust to reflect relative inflation levels between the economies of the transacting currencies and since there has been a considerable increase in economic globalization, all businesses are now affected directly or indirectly from international activities. As a result, changes in exchange rates affect both multinational firms and domestic firms. However, the effects on multinational firms are more direct, as a change in exchange rates will be reflected in foreign operations resulting in a loss or a profit if the firm does not hedge. Besides this, the value of the monetary assets of these firms may be affected indirectly by the exchange rate movements through the changes on aggregate demand or the changes on relative competitiveness of their products with imported goods. All these effects will change the value of the firm, hence the dividend policy.

Inflation: During inflationary periods, companies usually retain huge part of their earnings so as to avoid a reduction in their scale of operation and to compensate for the fall in purchasing power, hence, would not be able to pay much dividend. If this occurs, the relationship between inflation rate and dividend payout would be negative. On the other hand, shareholders on their part would advocate for higher dividend due to the fall in purchasing power. The rate of inflation in an economy has a great impact on investors; the investors are faced

with the decision as to whether to make investments or not. Increase in inflation rate can cause the real income to decline, and when this happens, the investor may end up selling their assets, including stocks to improve their buying power. When the inflation rate is low, the reverse is the case; investors would like to purchase more assets with stocks not exclusive. However, it is observed that the negative relationship between stock returns will be less pronounced during the periods when inflation is generated by monetary fluctuations. Also Ralph and Eriki (2001) postulated that a negative relationship exists between dividend policy and inflation. They stated however, that the dividend policies are also strongly motivated by the level of economic activity measured by interest rate, money stock, GDP and financial deregulation.

2.2 Theoretical Framework

Dividend Relevance Theory: Gordon (1962) stated that investors may prefer present dividend instead of future capital gains because the future situation is uncertain even if in perfect capital market. This theory further postulates that many investors may prefer dividend in hand in order to avoid risk related to future capital gain. Also in his work, he opined that there is a direct relationship between dividend policy and market value of share even if the internal rate of return and the required rate of return will be the same and that the share price of a firm is subordinate of discounted flow of future dividends.

Relevance of Dividend Policy Based on Clientele Effects: Pettit (2004) investigated on what extent transaction costs and taxes can affect the investor's portfolios in the United States of America. His findings provided empirical proof supporting the clientele effect theory. He studied 914 investors' portfolios and reported that investors' ages and their portfolios' dividend yield are positively related. He also reported that investors' incomes and dividend yield are negatively related. Pettit proposed that aged investors with low-income are more dependent to their portfolios for financing their current consumption. Therefore, they prefer investing in stock with high-payout for avoiding the transaction costs of selling stock. He also demonstrated that investors who have portfolios with low undiversifiable risk prefer high-dividend stocks. His findings also supported the tax-induced clientele effect. Schlarbaum, (2006) used a sample derived from identical database applied by (Pettit, 2004) and evaluated clientele effect hypothesis. But their findings provide very weak proof for supporting the dividend clientele effect theory.

Relevance of Dividend Policy Based on Information Content of Dividend: Miller and Modigliani (1961) suggested that in imperfect market, dividend may affect the share price. So dividend announcements can be interpreted as a signal of future profitability of firm. Asquith and Mullins Jr, (1983) used a sample of 168 companies paying dividend for the first time or paying dividend after at least 10 -year interruption and studied the relationship between market reaction and dividend announcement. They analyzed the daily abnormal stock returns for the ten-day period prior and ten-day period following the dividend announcement. Their findings implied an approximate abnormal return of +3.7 percent for a period of two days after announcement. Furthermore, they used cross-sectional regression and reported that first dividends' amount has significant positive impact on the excess returns on the day of dividend announcement. They concluded that the magnitude of changes in dividends can be also important. Amihud and Murgia (1997) used 200 German firms as sample and studied the stock price response to dividend announcement for the period of 1988 to 1992.

Relevance of Dividend Policy Based on Agency Cost: Studies has shown that high insider ownership companies adopt lower dividend payment and proposed that insider ownership and dividend payment have negative association. This position has been found to be true as the study of many scholars even in recent times show. The most recent is the work of Chen and Dhiensiri (2009). They used 75 Zelanian companies as sample and studied the factors influencing dividend policy through 1991 to 1999. They concluded that insider ownership has negative impact on dividend payout. This finding is consistent with agency cost hypothesis.

Dividend Irrelevance Theory: The Modigliani and Miller (1961) dividend-irrelevance theory says that investors can affect their return on a stock regardless of the stock's dividend. Investor could then buy more stock with the dividend that is over the investor's expectations. As such, the dividend is irrelevant to investors, and it can be further interpreted that investors care little about a company's dividend policy since they can simulate their own. Their theory was built on a range of key assumptions, similar to those on which they based their theory of capital structure irrelevancy. Modigliani and Miller (1961) argue that the value of the firm in a perfect capital market depends only on the income produced by its assets not on how this income is split between dividends and the retained earnings. It is worthy of note here that in a perfect Capital markets, there are no taxes both corporate and personal taxes; no transaction costs on securities; investors are rational; information is symmetrical hence all investors have access to the same information and share the same expectations about the firm's future as its managers. According to M&M's irrelevancy theory, it therefore does not matter how a firm divides its earnings between dividend payments to shareholders and internal retentions and that a firm's dividend policy has no effect on its market value or its cost of capital.

2.3 Empirical Review

Akani and Sweneme (2017) 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 are 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 was 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.

Sifunjo (1999) studied the relationship between exchange rates and dividend policy in Kenya for a period of six years (November 1993 to May 1999). The study employed co integration and error-correction approach using Dicker- Fuller (DF) and Augmented Dickey Fuller ADF) tests. The study provided evidence that there exist a unidirectional causality from exchange rates to dividend policy. Hence the movement of exchange rates exerts significant influence on dividend policy determination in Kenya. However, his study cannot be relied to give conclusive results because he considered only one variable, but offered suggestion that more macroeconomic variables can be tested to determine their relationship on dividend policy.

Mohiuddinet *al*, (2008) carried out an empirical study of the relationship between macroeconomic variables and dividend policy. The study aimed at investigating the explanatory power of various macro factors such as inflation rate, exchange rate, interest rate, money supply and production index on the variability of the dividend policy in Bangladesh. Multiple regressions were used in the analysis and the results were that no significant relationship exists between the dividend policy and any of the macro economic factors. However after remedial measures of heteroscedasticity were taken care of, Interest rates were found to have a negative and significant relationship with dividend policy. Ndungu (2009) recommends in her the study of determinant of dividend policy that there exists a need both theoretical and empirical to test the effects of macroeconomic variables as a determinant of dividend policy. This study recognized the gap in the numerous attempts on the subject even

when it could not fill it.

Kiptoo (2010) carried out an empirical investigation on selected macroeconomic variables and dividend policy a study of the Nairobi Stock exchange for a period of ten year (1978-2008). The macro economic variables used were inflation rate, money supply, interest rate, exchange rate and Gross domestic product. The study used Augmented Dickey-Fuller, multicollinearity, residual and stability tests. The study revealed that exchange rates and inflation were found to have a significant impact on dividend policy determination at the NSE. On the other hand, interest rates, money supply and gross domestic product were insignificant. Basse and Reddemann (2011) studied the inflation and dividend policy of US Firms which consisted of 500 leading companies in the US and established a stable long run relationship between dividend payments and real economic activity and price level. Ochieng&Kinyua (2013) examined Relationship between Inflation and Dividend Payout for Companies Listed at the Nairobi Securities Exchange. Due to the nominal increase in the volumes of money, which result from the increase in inflation, at least for a short run, some studies have concluded that inflation has a positive effect on dividend payout. However, in the long run, studies in general seem to show that the inflation rate and stock returns are negatively related. The study showed that, inflation rate has no impact on the dividend payout. However, other variables considered, that is, the spot Dollar exchange rate to Kenya Shillings, the Volumes of Money Supply and the T-Bill rate (91 day rate) show mixed results. The study reveals that, the exchange rate and the T-Bill rate have a positive correlation with dividend payout, while volume of money supplied has no impact on the dividend payout. This study considered macroeconomic factors itself but was a study conducted in Nairobi in Kenya. It however places a foundation on the assumption that macroeconomic variables could determine the dividend policy pursued by a body corporate.

3. Research Methodology

This study used quasi experimental research design approach for the data analysis and descriptive survey. Survey allows the collection of large amount of data from a sizable population in a highly economical way. It allows one to collect quantitative data which can be analyzed quantitatively using descriptive and inferential statistics. It enables us therefore to observe the effects of explanatory variables on the dependent variables. However, for the purpose of this study, the secondary data collection method was used and the multiple regressions with the use of software package were used. The time series data was used to examine the effect of the independent variables on the dependent variables within the specified time period. The population is the manufacturing concerns quoted in the Nigerian Stock Exchange. The study made use of 20 manufacturing firms selected using random sampling technique. The required data were collected from the stock exchange fact-book, the Central Bank of Nigeria statistical bulletin and financial statement of the quoted firms.

The technique that will be used to examine the external factors is the Ordinary Least Square (OLS) estimation technique. The test instruments in the OLS are the T-statistics and F-test which will be used to test the significance of variables and the overall significance of the regression respectively. Other test instruments also employed were the Durbin Watson test which was used to test the presence or absence of auto correlation between and among the explanatory variables and the adjusted R-square used to test the percentage variation of the dependent and the independent variables.

The dependent variables in the study were retention ratio while the independent variables were Exchange Rates, Inflation Rate, Interest Rate, Money Supply and Financial Sector Development. Statistical package for social Sciences (SPSS) was used as an aid in the analysis. Because the study was aimed at quantifying the relationship between the dependent variables and independent variables, effect statistics was used. Multiple linear regression technique was employed to give the magnitude and direction of the two variables within a period of 10 years.

3.1 Model Specification

The theoretical assumption of dividend policy has been that it is irrelevant in a perfect market condition. The models below assume that dividend policy is a linear function of the operating environment of the quoted firms. The Retention Ratio is a component of dividend policy that determines proportion of the firm's profit that is retained for further investment. Note that $1 - \text{payout Ratio}$ gives Retention Ratio. Based on the objectives of the study, the functional model is specified as follows:

$$RR = f(\text{OILP}, \text{INTR}, \text{EXR}) \quad 1$$

Transforming equation 3.8 to econometrics form:

$$RR = \beta_0 + \beta_1 \text{OILP} + \beta_2 \text{INTR} + \beta_3 \text{EXR} + \varepsilon_i \quad 2$$

Where:

RR = Retention Rate

OILP = Oil Price

INTR = Interest Rate

EXR = Exchange Rate

ε_i = Error Term

$\beta_1 - \beta_3$ = Coefficient of the Independent Variables

β_0 = Regression Intercept

Transforming equation 3.8 to econometrics form:

$$RR = \beta_0 + \beta_1 \text{MS} + \beta_2 \text{INFR} + \varepsilon_i \quad 3$$

Where:

RR = Retention Rate

MS = Money Supply

INFR = Inflation Rate

ε_i = Error Term

$\beta_1 - \beta_2$ = Coefficient of the Independent Variables

β_0 = Regression Intercept

Table 1: Proxy Variable Definition and Expected Sign

Proxy Variable	Definition	Expected Sign
Retention Ratio	RR	Dependent Variable
Interest Rate		+
Oil Price		+
Money Supply		+
Inflation Rate		-
Exchange Rate		+

3.2 Estimation Techniques

The regression analysis is used to identify the direction and significance of relations between dividend policy and the macroeconomic variables. The regressions are performed by utilizing the Ordinary Least Square (OLS) and to estimate the regression coefficients. Each regression coefficient estimated by OLS coincides with the true value on the average and they have the least possible variance such that they are efficient so that regression

analysis can produce best linear unbiased estimates.

The reported results from the estimated model will be explained using the followings: Estimated coefficients (s), t-ratios, R^2 , F-statistic. Beta coefficients corresponding to the external factors variables are estimated for the dependent variable.

The reasoning for doing so is to investigate the effects of different variables in combination with other variables. To test the significance of the individual coefficients, a t-test is performed. If the computed t values are larger than the critical value at a given level of significance, then the null hypothesis that the given regression coefficient (risk premium) is not significantly different from zero is rejected such as individual risk premium is significant. The R^2 will be used to get the percentage of total variations in General share index returns explained by the external factors variables in the multiple regression equation. Finally, F-test is used to test the overall significance of the model, that is, whether dividend policies are linearly related to external factor variables.

3.3 Multicollinearity

Multicollinearity refers to the situation where there is either an exact or approximately an exact linear relationship among the independent variables. So, in order to identify whether multicollinearity exist among the variables used for this study, the study estimated a correlation matrix for dividend policy which is dividend payout ratio and retention ratio. Here It expect to get a low correlation among macroeconomic variables, whilst, a high correlation between dependent and the independent variables.

3.4 Autocorrelation

The problem of autocorrelation stems from among the residuals when they are not independent of each other. The OLS estimators are efficient (i.e. they have minimum variance) and unbiased only when there is no correlation between error terms. The most popular test for discovering autocorrelation is developed by Durbin Watson, known as the Durbin-Watson d statistic. It is performed by the first-order autocorrelation by testing the following null hypothesis.

$$H_0 = \text{No autocorrelation; if } d_U < d < 4 - d_U \quad 4$$

$$H_A = \text{Positive autocorrelation; if } d < d_L \quad 5$$

$$\text{Negative autocorrelation; if } 4 - d_L < d < 4 \quad 6$$

Although it is popularly used, one of the disadvantages of the d test is that if it falls in region of ignorance where results are inconclusive, we cannot conclude whether or not autocorrelation does exist.

$$d_L \leq d \leq d_U \text{ and } 4 - d_U < d < 4 - d_L \text{ are regions of ignorance} \quad 7$$

The critical values used in testing the hypothesis are as follows:

	d_L	d_U
%5	1.37	1.81

Source:Gujurati(2004).

Here we compare the computed D-W d statistics with the tabular values presented above. At 1% significance level all computed DW d statistics of our model are in the $d_U < d < 4 - d_U$ form, $1.81 < d < 4 - 1.81$, which

indicates no autocorrelation between residuals. Therefore we accept the null hypothesis of H_0 that there is no first-order autocorrelation.

At 5% significance level, the results show no autocorrelation among the successive residuals taking the form $1.81 < d < 4-1.81$. The computed d statistics of the equation is 1.84. In general, the computed results exhibit that there is no first-order autocorrelation among residuals.

The empirical test results will be carried out by using SPSS 20.0. Having analyzed the misspecification test results for the serial correlation, autocorrelation, normality and heteroscedasticity, the study will evaluate the results estimated from the regression equations using:

- t -test (individual significance test of the estimated coefficients)
- F-test (overall significance test of the coefficients)
- R^2 (goodness of fit) values.

The regression results for the relationship between the chosen macroeconomic variables and dividend policy. The t -values that used to test the null hypothesis of no significance of the estimated coefficients associated to the macroeconomic variables.

We hypothesize that

$H_0: \beta_s = 0$ (Not significant)

$H_a: \beta_s \neq 0$ (Significant)

The other important issue is to test the overall significance in which the study utilized F-test. It will test the null hypotheses that employed macroeconomic variables; together they have an influence on dependent variables as follows:

$H_0: R^2 = 0$ (Not significant)

$H_a: R^2 \neq 0$ (Significant)

R^2 gives the percentage of the total variation in the dependent variable explained by the explanatory variables in the regression models.

4. Presentation of Results and Discussion of Findings

Table 2: Test of Colinearity and Autocorrelation

Variable	Tolerance	VIF
OILQ	.831	1.2
INTR	.929	1.0
EXR	.144	6.9

Source: SPSS 22.0

The tolerance level is the amount of variability of the selected independent variable not explained by the other independent variable while the variance inflation factor indicates how the variance is inflated. A large VIF value, threshold of 10.0 corresponds with .10 of tolerance. Conventionally, VIF is not expected to be less than 4 and more than 10 (Gujurati and Deporta, 2005). From the above table, the tolerance level of 0.831 indicates that about 8.3% of the variance in Oil price is not predicted by other predictors' variable while the VIF ratio are below 4, except exchange rate this shows the presence of perfect autocorrelation among the variables.

Table 3: Colinearity Diagnostic and Durbin Watson Test

Model	Variable	Eigen Value	Condition Index	Constant	OILP	INTR	EXR
I	1	3.140	1.000	.00	.01	.01	.00
	2	.840	1.933	.00	.14	.59	.00
	3	.013	15.275	.00	.61	.10	.00
	4	.006	22.814	.99	.03	.01	.00

Durbin Watson Statistics	$\alpha = 0.05$
Model I	2.756 > du 1.82 = Reject H_0 : Positive autocorrelation
Model II	2.362 < du 1.82 = Reject H_0 : Positive autocorrelation

Source: SPSS 22.0

The Eigen value provides an indication of how many distinct dimensions they are among the independent variables, when several Eigen value are close to 0, the variables are highly inter-correlated and the variables are said to be unconditioned; which means small changes in data values will lead changes in the estimates of the coefficients. From the table above, the Eigen values are greater than 0, this proves that the variables are not highly correlated, this means the absence of multicollinearity.

A condition index greater than 15 indicates a possible problem and an index greater than 30 suggests a serious problem. From the table above, the condition index are less than 15 and 30 that means the absence of serial autocorrelation among the variables. The coefficient of the variance proportion are less than the condition index of 30%, therefore there is an absence of multicollinearity. The Durbin Watson statistics for the models are less than 3.00 which mean the absence of positive autocorrelation among the variables.

Table 4: Effect of Oil Price, Interest Rate and Exchange Rate on Retained Earnings

Variable	OILP	INTR	EXR
UN β	.543	-7.561	-.68
ST β	.323	-.395	-.065
STD Error	.600	6.698	.922
T-Test	.905	-4.129	.183
T-Significant	.400	.002	.861

Constant 1204.444, T-test 6.611, T-Sig .001

R = .847(84.7%), $R^2 = .799$ (79.9%), $AdjR^2 = .551$ (55.1%), F-Ratio = 4.853, F-Sig = .014

Source: SPSS 22.0

Analysis of the effect of the independent variables on the dependent variables as formulated in found that Oil price have positive impact on retention rate of the selected manufacturing firms while exchange rate and interest rate have negative impact on the dependent variable. The coefficient of the Oil price indicates that a unit increase will lead to increase on retention rate while the coefficient on interest rate and exchange rate found that a unit increase will lead to decrease on retention rate. The correlation coefficient (R) implies that the strong correlation exist between the independent variable and the dependent variable. The coefficient of determination (R^2) proved that 79.9% variation on retention rate of the manufacturing firms can be explained by the independent variables while the F-statistics shows that the model is statistically not significant at 5% level of significance.

Table 5: Test of Colinearity and Autocorrelation

Variable	Tolerance	VIF
MS	.957	1.045
INFR	.957	1.045

Source: SPSS 22.0

The tolerance level is the amount of variability of the selected independent variable not explained by the other independent variable while the variance inflation factor indicates how the variance is inflated. A large VIF value,

threshold of 10.0 corresponds with .10 of tolerance.

Table 6: Colinearity Diagnostic and Durbin Watson Test

Variable	Eigen Value	Condition Index	Constant	MS	INFR
1	2.841	1.000	.01	.01	.01
2	.132	4.644	.01	.57	.23
3	.028	10.157	.99	.41	.76

Durbin Watson Statistics $\alpha = 0.05$

Model I 3.143 > du 1.82 = Reject H_0 : Positive autocorrelation

Model II .3.028 > du 1.82 = Reject H_0 : Positive autocorrelation

Source: SPSS 22.0

The Eigen value provides an indication of how many distinct dimensions they are among the independent variables, when several Eigen value are close to 0, the variables are highly intercorrelated and the market is said to be unconditioned; which means small changes in data values will lead changes in the estimates of the coefficients. From the table above, the Eigen values are greater than 0, this proves that the variables are not highly correlated, this means the absence of multicollinearity. A condition index greater than 15 indicates a possible problem and an index greater than 30 suggests a serious problem (Lucky, 2017). From the table above, the condition index are less than 15 and 30 that means the absence of serial autocorrelation among the variables. The coefficient of the variance proportion are less than the condition index of 30%, therefore there is an absence of multicollinearity. The Durbin Watson statistics for the models are less than 1.00 which means the presence of positive autocorrelation among the variables.

Table 7: Effect of money supply and inflation rate on Retained Earnings Retention Ratio

Variable	MS	INFR
UN β	-.004	1.472
ST β	-.344	.106
STD Error	.004	4.973
T-Test	-.961	.296
T-Significant	.369	.776

Constant 1036.744, T-test 12.052, T-Sig .000

$R = .680(68.0\%)$, $R^2 = .544(54.4\%)$, $AdjR^2 = .300(30.0\%)$, F-Ratio = 5.590, F-Sig = .000

Source: SPSS 22.0

The impact of inflation factors on retention rate of the selected manufacturing firms found that money supply have negative effect on dividend payout rate while inflation rate have positive impact on retention rate. The R shows a strong correlation relationship between the dependent and the independent variable. The coefficient of determination found that the independent variables can explain 55.4% variation on the dependent variable which is retention rate. The coefficient of the regression constant found that if the independent variables are increased by 1% money supply will reduce dividend payout rate while inflation rate will add 6.2% to the dependent variable. The F-statistics and the F-probability justifies that the model is significant.

5. Discussion of Findings

From the external environment model oil price have positive but insignificant impact on retention rate while interest rate and exchange rate have positive impact on retention rate. The model found that money supply has

negative effect and significant effect on retention rate. A well structured macroeconomic policy is expected to have a positive impact on corporate performance such that it will enhance dividend policy of operating firms. Therefore, the negative effect of the variables contradicts the expectation of the results, while the positive effect confirms the a-priori expectation of the results, the positive findings of Sifunjo (1999); Mohiuddin et al., (2008); Kiptoo (2010); Basse and Reddemann (2011); Ochieng and Kinyua (2013). It could be recalled that one of the policy thrust of the civilian administration was to overhaul the macroeconomic environment that will enhance operational efficiency of quoted firms. The positive finding validates these reforms while the negative effect could be traced to macroeconomic shocks over the period such as the global financial crises in 2007/2008 and Nigerian economic recession in 2016 as well as volatility of oil price and depreciating naira exchange rate that results in macroeconomic instability such as high rate of inflation.

6. Conclusion

This study examined external factors that determine dividend policy of selected manufacturing firms. Both ordinary least squares were run on a sample of 20 quoted manufacturing firms for the period of ten years (2007-2016). It was found that money supply have no significant impact on dividend payout rate but found significant impact of interest rate on the dependent variable. The study found that inflation rate and money supply are not the major determinant of retention rate. From the external factors, the study conclude that oil price, interest rate, exchange rate and money supply have no significant relationship with dividend policy while inflation rate have significant relationship with dividend policy of the selected quoted manufacturing firms.

7. Recommendation

In view of the findings of this research, the following recommendations are advanced.

- There is need for the manufacturing firms to formulate policies that leverage the negative effect of macroeconomic variables on dividend policy of the manufacturing firms and interest rate should properly be defined in the Nigerian financial market that is either full deregulated or regulated to determine the market rate of return, investment and the profitability of manufacturing firms.
- The operational efficiency of Nigerian capital market and the financial environment should be deepened, existing laws that does not encourage profitable investment should be changed and new laws enacted to enhance investment that will affect positively the profitability of corporate firms and the dividend policy and dividend policy should be integrated with the macroeconomic and monetary policy objectives to leverage the corporate organization.
- There is need to diversify Nigerian economy from the mono-cultural oil economy to leverage the negative effect of oil price decrease on the economy and the dividend policy of listed firms and monetary authorities should formulated policies to manage naira exchange rate against key currencies to attract domestic investment, reduce inflation and enhance dividend policy and there is need to overhaul Nigerian investment climate to enhance operating efficiency of Nigerian quoted firms that will effectively impact on the dividend policy.

References

- Akani, H. W &Sweneme, Y. (2017). Macroeconomic aggregates and retention ratio of quoted firms in Nigeria. *European Journal of Accounting Auditing and Finance Research*, 5(10),1-11
- Amihud, Y., and Murgia, M., (1997). Dividends, Taxes, and Signaling: Evidence from Germany. *Journal of Finance*, 5 (8), 397-408.
- Asquith, P., and Mullins, D.W., (1983). The Impact of Initiating Dividend Payments on Share Holder's Wealth. *Journal of Business*, 56 (1), 77-96.
- Basse, T., &Reddemann, S. (2011). Inflation and the dividend policy of US firms. *Economics Watch*, 6 (4)

333-64.

- Brigham, E. F. (2016). *Financial Management: Theory and Practice with Thompson ONE*; Canada, Dryden Press
- Dagogo, D. W., & Obara, L. C. (2015). Comparative analysis of earnings rate, retention rate, and dividend yield as determinants of capital growth. *International Journal of Economics and Finance* 7(2), 214-224.
- Davies, S. D., & Lucky, A. L., (2018). Corporate Characteristics and Influence on Share Based Payment of Financial Service Firms in Nigeria. *Asian Finance & Banking Review*, 2 (1), 18-29.
- Fattouh, F. (2007). The Relationship between dividends and earnings. *Journal for Economic Educators*, 4(4), 1 – 5.
- Hamilton, A., (2009). The impact of initiating dividend payments on shareholders' wealth. *Journal of Business* 12(8), 77-96.
- Kiptoo S. C. (2010). An empirical investigation of the relationship between selected macroeconomic variables and stock prices: Evidence from the Nairobi Stock Exchange, Unpublished MBA Project, University of Nairobi.
- Lucky, A.L (2017). Prudential determinants of commercial banks soundness in Nigeria. M.Sc thesis submitted to postgraduate school Rivers State University.
- Miller, M. H., & Modigliani, F. (1961). Dividend policy growth and the valuation of shares. *The Journal of Business*, 34, (4), 411-433.
- Ndungu, A. (2009). Determinants of dividend policy: Evidence from the Nairobi Stock Exchange, Unpublished MBA Project, University of Nairobi.
- Ngunjiri (2013). Comparative Analysis of Earnings Rate, Retention Rate, and Dividend Yield as Determinants of Capital Growth. *International Journal of Economics and Finance*; 12(3),604-627.
- Ochieng, D. E., & Kinyua, W. H., (2013). Relationship between Inflation and Dividend Payout for Companies Listed At the Nairobi Securities Exchange. *International Journal of Education and Research* 1 (6), 78 - 102.
- Odiro (2013). The effect of retained earnings on the returns of firms listed at the Nairobi securities exchange companies. The retention ratio is also known as the retention rate of an organization. *Journal of Accounting and Taxation*, 2(4), 189-209.
- Pettit, R., (2004). Taxes, Transactions Costs and the Clientele Effect of Dividends. *Journal of Financial Economics*, 5(3), 419-436.
- Sifunjo, K. (1999). The causal relationship between exchange rates and stock prices in Kenya. *Unpublished MBA Project, University of Nairobi*.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal. This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).