The Application of Arbitrage Pricing Theory (APT) in the Nigeria Capital Market

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ABSTRACT

This study attempts to capture the application of Arbitrage pricing theory in the Nigerian Capital Market using macroeconomic variables as the determinants of returns of the companies chosen. In pursuance of this objective, five companies were chosen which include Okitipupa oil palm, Mobil oil plc. , Forte oil plc. , Fidelity bank Plc. and aluminium extrusion industry plc. The data collected include, returns on security which constitutes the dependent variable, Interest rate, Exchange rate, and Inflation rate which constitute the independent variables for the period (1986-2014). The data collected were subjected to Ordinary Least Square (OLS) regression analysis, Arch and Garch model. The output of our findings shows that Interest, Inflation and Exchange rate were not statistically fit in explaining returns on investment in the Companies studied. This puts a question mark on the applicability of Ross theory (APT) in justifying returns on stocks in the Nigerian context of the capital market.

KEYWORDS: *APT, Capital Market, Garch, Arch Model*

1.0 INTRODUCTION

The general underpinning theory of asset pricing as the liner function of various macro-economic variables whose alertness to volatility in each factors is accountable by a factor specific beta coefficient in finance is the Ross model of APT. The rate of return acquired from the model will in turn be used as a yard stick in pricing the asset correctly. Stephen Ross who was an economist propounded this theory in about 1976. This pricing model originated from the empirical findings of shape, 1962, Trenor 1964, Lintner 1965 and Mossin 1966 model which was popularly known as CAPM. The CAPM is a single factor model whose empirical testability hinged on the portfolio in the market but the argument that a true portfolio in the market cannot be inspected poses serious limitation to the acceptability of the model.

Mine while, one of the most influential theories of asset pricing in market portfolio are Stephen Ross theory (APT) and Shape theory (CAPM). What differentiated the Ross theory (APT) from Shape theory (CAPM) was due to the fact that its assumption is less restrictive. Mine while, it gives room for the independent (as opposed to statistical) model of return on asset. According to Ross theory, he is of the opinion that each investor will hold a unique portfolio with its own particular array of betas, as contrary to the identical "market portfolio". To some reasonable extended, Sharpe model of (CAPM) can be regard as a "special case" of the APT in that the single-factor model of the asset price is represented by the securities market line, where beta is exposed to volatility in market value.

Consequently, Rose model (APT) is been viewed from the perspective of a "supply-side" model, since its beta coefficients shows the alertness of the underlying asset to economic factors. In the same vein, structural changes in assets' expected returns will be caused by factor shocks or in the case of stocks, in firms' profitability. On the other side, the sharpe model (CAPM) is viewed from the angle of "demand side" model. Its output is however relative to that of the Ross model (APT), emanating from an increasing problem of each investor's satisfaction function, and also from the resulting equilibrium in the market (investors are considered to be the "consumers" of the assets). Mine while, Ross (1976) argues persuasively that since the market portfolio is not identifiable the CAPM has never been tested and never will it be. Roll (1977) extended the criticisms up to the point of rejecting the CAPM completely and becomes the ardent supporter of the Ross model, (1976) Arbitrage Pricing Theory (APT). The APT is an elegant model plus two pricing identifications. The earlier one is called factor likelihood APT (FLAPT) while the later one is referred to pre-specified macroeconomic variables APT (PMVAPT). The PMVAPT shows a relationship between expected return and a set of randomly selected macroeconomic variables. In an equal token, the FLAPT provides intuitive linear relationship between expected return and asymptotically large existing factors.

With the globalization of the capital markets, various models have emanated, from a series of propositions concerning rational investor behaviour set forth by Markowitz to Sharpe model (CAPM) and then Ross model (APT) respectively among others. Risk assessment is an integral part of informed decision-taking, and is a key driver in shaping a revolutionary new business landscape. Of all the models that have tried to measure risk, Arbitrage Pricing Theory model has proved that there is more than one risk factor that affects expected return on assets. According to this model, it is assumed that returns are affected by systematic factors and the return on any asset over time is called the return generating process, (Bhalla). In view of the foregoing, therefore, this study investigates the Nigerian experience based on the fact that the Nigerian investing public often make decisions on which securities to hold based on the level of return without due consideration to common factors like macro-economic variables and associated risk that may influence returns from sure investment. The emerging facts from the international financial market have shown that Nigeria is losing huge investments to other developing nations of the world owing to the structural imbalances in the economy (Dada, 2003:18). For instance, available data from the Nigerian Stock Exchange (NSE) demonstrate that, out of about 2 billion dollars being invested every year in the emerging markets of the world, less than 0.01 percent of it comes into the Nigerian capital market. Empirical study has shown that inefficiency and instability of the macro-economic factors that characterized the Nigerian capital market accounted for this unpleasant state.

Emphatically, this research work is to empirically investigate the application of the Ross model (APT) on the efficacious of the Nigeria capital market

STUDY OBJECTIVES

The central intension of the empirical findings is to investigate the application of arbitrage pricing model on the Nigeria capital market.

The specific objectives however, include the following:

(i) To empirically determine the efficacious of inflation rate risk on returns on securities.

(ii) To assess how the interest rate risk stimulate the returns on securities.

(iii) To empirically review how exchange rate risk affect returns on securities.

(iv) To draw policy recommendations based on our findings.

RESEARCH QUESTIONS

The Underlying study is propelled by the following research questions, as it seeks to provide answers to;

(i) To what extent does the inflation rate risk influenced security returns?

(ii) To what extent does the interest rate risk affected the security returns?

(iii) To what extent does exchange rate risk affect security returns?

Research Hypotheses

To achieve the nominated objectives of this study and provide remedies to the research questions, The following Hypotheses were formulated in their respective null forms:

H_{01}: Inflation rate risk does not significantly affect security returns.

H_{02}: Interest rate risk does not significantly affect Security returns.

H_{03}: Exchange rate does not significantly affect security returns.

Significant of the study.

The findings of this research work will be of a great importance to policy maker, investors, regulators, researcher and financial analyst who have vested interest in understanding whether APM is applicable in the Nigeria capital market.

Organization of the study.

This research work is stratified into six different sections. Section one contained introduction of the study, section two consist of the theoretical and empirical review, section three discuss the method used in the process of research, section four present the empirical investigations while section five take care of discussion of findings and summary, while the last part anchors the concluding remark and recommendations.

2.0 LITERATURE REVIEW

APT AND ARBITRAGE.

According to Bodie et al (1998:219), there exist a pertinent different between arbitrage and CAPM risk-versus return dominance arguments in support of equilibrium price relationships. The bone of contention, as in the Sharpe theory (CAPM), state significantly that as the equilibrium price is not stable that is, violated, portfolio divergence will be implemented by series of investors. Each participant will make a restrictive divergence, though, depending on wealth and quantum of risk aversion. Totality of this restrictive portfolio divergence over many investors is demanded to construct or formulate great proportion of buying and selling, which will in turn fix equilibrium price. One of the two most prominent and popular theories on asset pricing are Ross model (APT) and sharpe model (CAPM) respectively among others. What differentiated the Ross theory (APT) from Shape theory (CAPM) was due to the fact

that its assumption is less restrictive. Mine while, it gives room for the independent (as opposed to statistical) model of return on asset. According to Ross theory, he is of the opinion that each investor will hold a unique portfolio with its own particular array of betas, as contrary to the identical "market portfolio". To some reasonable extended, Sharpe model of (CAPM) can be regard as a "special case" of the APT in that the single-factor model of the asset price is represented by the securities market line, where beta is exposed to volatility in market value. Considering the Ross model of APT context, arbitrage comprises of two asset trading – with at least one being mispriced that is either under-priced or overpriced. The arbitrageur may decide to take short position by selling the extremely expensive securities with an intension of using the returns to purchase cheap ones so as to maximizing profit. Under the APT, an asset is mispriced if its current price diverges from the price predicted by the model. The asset price today should equal the sum of all future cash flows discounted at the APT rate, where the expected return of the asset is a linear function of various factors, and sensitivity to changes in each factor is represented by a factor-specific beta coefficient. A correctly priced asset here may be in fact a synthetic asset - a portfolio consisting of other correctly priced assets. This portfolio has the same exposure to each of the macroeconomic factors as the mispriced asset. The arbitrageur creates the portfolio by identifying x correctly priced assets (one per factor plus one) and then weighting the assets such that portfolio beta per factor is the same as for the mispriced asset Ross' (1976, 1977).

When the investor is long the asset and short the portfolio (or vice versa) he has created a position which has a positive expected return (the difference between asset return and portfolio return) and which has a net-zero exposure to any macroeconomic factor and is therefore risk free (other than for firm specific risk). The arbitrageur is thus in a position to make a risk-free profit. Using the model derived rate of return will make the security to be correctly priced. the price of the asset is to equate the expected end of period price discounted at the rate implied by the model. In case the price changes, arbitrage should bring it back into its frontier.

Risky asset returns are said to follow a factor intensity structure if they can be expressed as:

rj = fj + bji G1 + Hj2 G2 + ….. + Hjn Gn + µj. .....(1)

Using

fj = is a constant for asset j

G1 = is the systematic factor

Hjn =is the sensitivity of the jth asset to factor loading

µj = is the risky asset idiosyncratic random shock with mean zero.

According to Ross model if returns on asset follows the factor platform then, it is assumes that the following underlying hold

$$E(r_j) = r_f + b_{j1}RP_1 + b_{j2}RP_2 + \cdots + b_{jn}RP_n \quad \text{.....(2)}$$

This implies that returns, that are expected on security j is a linear function of the asset's responsiveness to the n factors. According to (Ross, 1976, 1970), Derivation of the Ross model (APT) pricing equation above is rooted on two major assumptions: firstly, that there is perfect competition in the capital markets and secondly, that investors are rational economic

agents who in most time embraces large quantum of wealth to less wealth under the context of certainty.

Macroeconomic variables and stock returns

Altay, (2003) signals that empirical studies of the Arbitrage Pricing Theory have generally been done under two broad approaches. The first form is the factor loading or factor-analytic or statistical APT model derived by Roll and Ross (1980), which involve using factor analysis to isolate the examined factors out of share return using time series and test whether these factors are priced. Estimates of the factors are determined in accordance with arbitrage pricing theory, that is, factors are calculated from the features observed in the set of returns. The second form is an equilibrium model called macroeconomic variable model, which requires the arbitrary choice of a range of variables by economic intuition. Therefore, the method uses pre-specified factors to estimate factor loadings and then tests whether the loadings are correlated with significant risk premium. Having looked at the dynamics of methods applied in the reviewed literature, there has not really been a consensus as to which of the model is superior to another.

Empirical testing of APM

(Elton and Gruber,2002) emphasise that Testing of Ross model (APT) is specifically not simple to formulate because all the theory specifies is a structure for asset pricing of the economic or attribute of a firm that should affect expected return are not specified, meanwhile, The tenet of any economic theory is how effective it empirically explains reality as empirical study tries to mimic reality. Amanullah and Kamaiah,(1998) reveals that the Sharpe's model (CAPM) in Indian market may not be relevant. Some reasonable number of research with multi-factor models in India has been carried out applying various statistical tools. Engle and Rangel,(2005) examined the nexus between a number of macroeconomic variables and unconditional volatility. Bercker and Clement,(2005) extended the spline garch model proposed by Engle and Rangel,(2005) when they modelled stock market volatility conditional on macroeconomic conditions. They incorporated macroeconomic information directly into the estimation of such garch models. It was demonstrated that forecasts of macroeconomic variables can be easily incorporated into volatility forecasts for share index returns. Hence, their model lead to significantly different forecasts than traditional garch type volatility model. Wang et, al (2011) re-modify the classical FLAPT and provide overwhelming evidence in support of the model as a good benchmark for explaining stock return. Reinganum (1980) also uses alternative methodology to test the APT's validity over time. His test requires that the APT explains the size anomaly which arises from the market efficiency studies that use the equilibrium market model. However, it is noted that Reinganum could not resolve the problem of size anomaly using the APT methodological framework. Even, it is discovered that the use of more complex return generating do more halm than the parsimonious single model related to CAPM. Tursoy et, al (2008) empirically examine whether the sharpe model (APT) in the Istanbul stock market is valid or not applying monthly security returns data that ranged from Feb 2001 to Sep 2005 and found that returns on stock are stimulated by different systematic factors as opposed to the claims of the Sharpe (CAPM). Connor and Korajezyk (1986) provide a test of APT using the asymmetric principle components technique proposed by Chamberlin and Rothschild (1985). They discovered that they can explain the extra return on small forms and in January with five factors which is better than the sharpe model CAPM) based on a value – weighted index. The ability of an APT model employing a small number of factors to account for return patterns unexplained by the CAPM strongly suggests that the APT is a useful model for explaining relative prices. Amos(2010) studied the APT and empirical evidence in the Nigeria capital

market and find out that Amongst the five macroeconomic variables examined in the study as the factors that influence stock returns none of those variable is significant enough to stimulate the stock returns of companies studied. The non-significant influence of these variables is attributable to the inherent rigidity of the Nigerian capital market and the unstable macroeconomic policies over the years. Arewa, Ajibola and Nwakanma Prince C(2013) attempt to test the factor likelihood APT pricing model of (Ross, 1976) and (Ross & Roll, 1977) in Nigerian stock market. They employ research procedure similar to that of (Ross & Roll, 1980) which enables them to detect 17 uncorrelated latent factor. They subject these factors to the APT cross-sectional pricing implication and discover that 4 of the factors command risk premium. Hence, their findings have provided overwhelming evidence in support of the APT pricing model as a good description of expected return. Okorafor, (2008) investigate the nature and influence of the risks of the Ross model (APT) on the security returns of financial assets in the context of the Nigerian Stock Exchange for the period 1990-2006. A combination of stratified and simple random sampling methods was adopted. From the findings of the study, it was shown that the second-tier market has a very poor correlation among the various risk factors whereas all other sectors displayed add above average performance except the insurance sector with only 48.6% level of correlation. The study, therefore concludes that the Nigerian investing public does not necessarily base its investment decisions mainly on risk disposition, but rather on some other factors. Wycliffe and peter,(2014) *examine the impact of the macroeconomic variables on stock returns in Kenya spanning from the period of 2003- 2013, using the Ross and sharpe model. The econometrics tools used in its process of research includes Ordinary Least Square (OLS) to test for short run nexus among the variables and the relative importance of different variables which may have an impact on the stock returns. The empirical analysis found two interesting results. The First result shows stationality at I(0) level of integration. While other result reveals that, with the exception of interest rates, there exists a significant relation between macroeconomic variables and stock market returns. According to the findings of the study, Money Supply, exchange rates and inflation affect the stock market returns in Kenya. Money supply and inflation are found to be significant determinants of the returns at NSE. Exchange rates is however, found to have a negative impact on stock returns, while interest rates is not important in determining long rung run returns in the NSE.* Naik,(2013) examined the nexus that existed between the stock market index (BSE Sensex) in Indian and five macroeconomic variables, which includes, industrial production index, wholesale price index, money supply, treasury bills rates and exchange rates. The research applied monthly data for these variables under the study spanning from 1994:04–2011:06. Johansson's co-integration and vector error correction model (VECM) was employed by the author for their analysis. The result observed that in the long-run, the stock prices are positively related to money supply (M3). The study established that money supply causes stock prices only in the long-run but no causality from stock price to money supply as found either in the long run or in the short run. One possible explanation may be the fact that money supply changes have an indirect effect through their effect on real output which in turn impact the stock prices. Jamil and Ullah (2013) examined the impact of foreign exchange rates on stock prices for Pakistan by employing Co-integration Technique and Vector Error Correction Mechanism (VECM). Using monthly data from 1998 to 2009, they found that relationship exists between exchange rates and stock market returns, both in the short run and long run. The short run period was found to have a positive but significant relationship, while the long run relationship is not significant. The short run sensitivity of stock market returns to exchange rates indicates that the investments in the stock market are short term and most investors liquidate their stock within one year. Adaramola(2012) found a similar findings when the author studied the exchange rate volatility and stock market behaviour in Nigeria, applied Johansson's co-

Integration Technique and Error correction model using quarterly data for the period of 1985 to 2009 and found that Exchange rate exerts significant impact on Nigerian stock market both in the short and in the long run. The study showed that in the short run, exchange rate had a positive significant impact on stock market performance; however, the results also showed that in the long run, the relationship is significantly negative. Onasanya and Ayoola (2012) found that the stock macroeconomic variables do not significantly influence the return at the stock market. Interest rates, specifically was found to be negatively related and insignificant to stock market returns in Nigeria. From findings, it is observed that there is a strong empirical analysis for positive impact of APT in determining returns on security especially in the foreign reviewed studies. Meanwhile, the result on the empirical research in the Nigeria zone is cluster. Sequel to the above reviewed literature, there exist a lot of gap to be filled and to justify the above empirical underpinning, this study focused on the application of the APM on the Nigeria capital market.

3.0 METHODOLOGY

RESEARCH DESIGN

The multi-factor model of the APT adopted in this study take a lead from the work of okorafor,(2008) and Amos,(2012) which was modified to suit the purpose of this work using yearly security returns of five quoted companies listed in the NSE over the period of 1990 to 2014 while interest rate, inflation rate and exchange rate was proxy to capture macro-economic factors. The five sampled companies include okitipupa oil palm plc. , fidelity bank plc. , union bank plc. Aluminium extrusion plc. and Mobile plc. The variance of all the market was calculated and the total average was computed as proxy for SER. Same process was applicable to all other macro-economic factors. Hence, the model is specified in it multivariate functional form thus,

SER=F(INT, INF, EXCH)……(3)

The model is transform further into econometrics model thus

SER = ao +a1Int +a2Inf +a3Exch + ei……(4)

The model is transform into a dual log linear econometrics model in other to normalise the data, to avoid extrema and outlier in line with the assumption of the CLRM thus

LOG(SER) = ao+a1LOG(Int)+a2LOG(Inf)+a3LOG(Exc) +Ut……(5)

Where

ao = Constant

SER = return on security

INT = Interest rate

INF = Represent the inflation rate

EXC = is the exchange rate

E1 = error term

A-priori Expectation: α1, α2, and a3> 0

4.0 RESULTS AND DISCUSSION

Presentation of Data

Table 1

We start our analysis by testing for the short-run relationship using the ordinary least square regression model estimator.

Ordinary Least Squares method
Date: 03/09/16 Time: 07:40
Sample: 1990 2014

Included observations: 23				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.732102	1.108118	-7.880115	0.0000
LOG(INTR)	0.144053	0.218207	0.660165	0.5171
LOG(INLR)	-0.363408	0.213281	-1.703893	0.1047
LOG(EXCR)	-0.007734	0.086027	-0.089902	0.9293
R-squared	0.546626	Mean dependent var		-8.785792
Adjusted R-squared	0.511882	S.D. dependent var		1.502021
S.E. of regression	1.493070	Akaike info criterion		3.796317
Sum squared resid	42.35592	Schwarz criterion		3.993794
Log likelihood	-39.65765	Hannan-Quinn criter.		3.845982
F-statistic	1.088186	Durbin-Watson stat		1.321287
Prob(F-statistic)	0.378087			

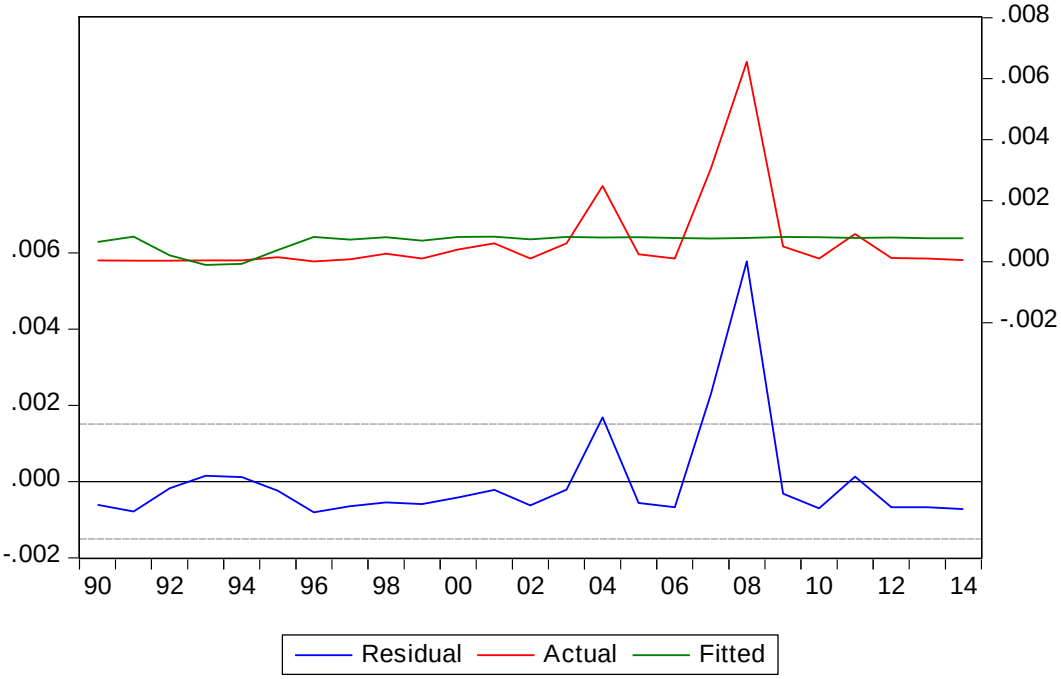
Source: E-view 8

The result of the OLS show that of all the macro-economic variable used in the process of research as proxy in capturing the multi factor as specified in the theory, none of this variable was prudent enough in explaining the expected returns in the Nigeria capital market judging by the probability value. The result shows that the value of interest rate (INTR) 0.5171> 0.05 is positive but not significant in explaining returns on investment in the Nigeria capital market. This could be due to the instability in the Nigeria economic and inconsistencies of policy making. Mine while, inflation rate has an inverse relationship toward investment returns in the capital market. (INLR) is negative and not significant to expected returns in the capital market. This is to the extent that 1% increase in inflation rate will bring about 36% decrease in the expected returns on investment in the Nigeria stock exchange market all thing been equal which suggested that once the interest rate increases, the expected returns on investment falls and these could have a contagious effect on the investor returns, capital market and the economy at large. The result of the (ECXR) also reflect none significant and inverse relationship toward investment returns suggesting that the More unstable the exchange rate is, the lower the returns on investment.
The adjusted R2 has an average predictive ability suggesting that 51% fluctuation in the regress and variable is capture and explained by the regressor variable while the Durbin Watson statistic shows presence of serial correlation judging by the rule of thumb. The F

statistic explains the overall significant of the variable. Security risks in most of the sectors showed no significant relationship with the security returns in the Nigeria capital market.

Table 2

The residual graph



From the output of the residual we can perceive that there exist a small volatility for a short period of time between 1990-1991 and begin to rise during 1992 to 1996.from 1997 to 2002, there also exist a small volatility for a long period of time. This means that small volatility is causing another small volatility for a long term. In the long-run however, there exist a prolong high volatility starting from 2003 to 2010 I.e. the volatility of the expected returns from the Nigerian stock exchange market by investors is very big. Between 2011 to 2014, the trend of shock begins to depreciate thereafter. When the residual are like this, then we can introduce Arch and Garch model i.e. when we have small volatility for a long period and also a big volatility for a long period then we can introduce Arch and Garch model. From the above residual, one can say that there is no consistency in the movement of stock expected returns in the Nigeria stock exchange market which could be harmful to the investors. Sequel to this, we proceed to t Arch and Garch model so as to get the trend of volatility.

Table 3

ARCH and GARCH model

Dependent Variable: SER
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 03/23/16 Time: 06:20
Sample: 1990 2014
Included observations: 25
Convergence achieved after 10 iterations
Presample variance: backcast (parameter = 0.7)
GARCH = C(5) + C(6)*RESID(-1)^2 + C(7)*GARCH(-1) +
C(8)*INTR + C(9)
*INLR + C(10)*EXCR

Variable	Coefficient	Std. Error	z-Statistic	Prob.

INTR	-0.001387	0.045445	-0.030522	0.9757
INLR	-0.000155	0.002600	-0.059464	0.9526
EXCR	-3.53E-05	0.002891	-0.012219	0.9903
C	0.000777	0.001443	0.538261	0.5904
Variance Equation				
C	1.62E-06	3.18E-06	0.509784	0.6102
RESID(-1)^2	0.150000	0.440108	0.340824	0.7332
GARCH(-1)	0.599998	0.779844	0.769383	0.4417
INTR	-7.78E-06	2.14E-05	-0.363361	0.7163
INLR	-2.31E-07	4.55E-06	-0.050806	0.9595
EXCR	-1.55E-07	5.45E-06	-0.028352	0.9774

R-squared	0.034138	Mean dependent var	0.000670
Adjusted R-squared	-0.103843	S.D. dependent var	0.001436
S.E. of regression	0.001508	Akaike info criterion	-9.845841
Sum squared resid	4.78E-05	Schwarz criterion	-9.358291
Log likelihood	133.0730	Hannan-Quinn criter.	-9.710615
Durbin-Watson stat	1.453806		

From the result of the output, the RESID(-1)^2 is the Arch term while the GARCH(-1) is the Garch term. Judging by 5% level of significant, the Arch term is 0.6102 meaning that the Arch term is not significant and hence could not be used in predicting the volatility in the expected returns on securities in the Nigeria stock exchange market. On the other hand, the Garch term with the probability value of 0.4417 greater than the 5% level of significant implies that the Garch term cannot predict the shock in the expected returns in the Nigeria stock exchange market. Mine while, both Arch and Garch are internal shock of the volatility of the dependent variable that is influencing SER. However, all the variable used in the process of research are also negative and not significant in explaining the volatility of expected return in the Nigeria stock exchange market. This suggest that all the variable used in the process of research are not sufficient in predicting the fluctuation or volatility in the expected return from stock market investment in Nigeria.

5.0 DISCUSSION OF FINDINGS AND CONCLUSIONS

This study empirically investigate the application of the arbitrage pricing model and the Nigeria capital market using macro-economic variable in capturing multi factor according to above reviewed literature while returns on security for five quoted firm in the Nigeria capital market was used as proxy for Nigeria capital market between the year of 1986 to 2014. From the result of the above findings, it was discovered that none of the macro-economic variable used during the process of study as the factors that influence security returns i.e. (interest rate, inflation rate, and exchange rate) was prudent enough in explaining the returns on security in the Nigeria capital market. The none-significant influence of these variables is attributable to the instability and inconsistencies of policy in the Nigeria capital market over the year. Intuitively, operational inefficiency in the Nigeria capital market could also contribute to these imbalances. The output of the Arch and Garch model also reveals the fact that none of the variable used in the process of research was capable enough in predicting the fluctuation

in the expected returns on securities in the Nigeria stock exchange market. Hence, we hereby recommend the following,

6.0 RECOMMENDATIONS

Based on the above findings in our result and considering the fact that all of the macroeconomic variables used in the process of research were negative and not significant enough in predicting the expected returns on investment in Nigeria stock exchange market, all things being equal, substantial improvements in these variables project the possibility of earning higher returns. Hence we advise that policy maker should be unsure stability in their policy as inconsistency of policy may have a ripple effect on the capital market and the general economic. Moreover optimal investment strategy could also be implemented to encourage investors. Secondly the exchange rates were found to be negatively correlated with stock market returns on the NSE. The economic implication is that these variables possess the potential of limiting stock market returns and growth. On the other hand interest rate were positively associated with stock returns and, as such, this indicate that they contribute to increases in returns and market growth hence, the government should set realistic macroeconomic targets to limit chronic deviations which normally render fundamental analysis almost impossible in order to improve public confidence in government decisions. Finally the above result suggested that and puts a question mark on the applicability of the Ross model (APT) in explaining stock returns in the Nigerian Capital Market. This result is in line with the work of Amos O. Arowoshegbe and Kennedy Imafidon(2010).

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Table 4 comprises of the cumulative variance of all the five companies and the macro-economic variable.

YEARS	SER	INTR	INLR	EXCR
1990	4.16E-05	0.0698	0.4312	0.185933
1991	3.38E-05	0.0013	0.0223	0.000497
1992	3.38E-05	0.1966	1.5036	2.260813
1993	0.000045	0.0012	3.0464	9.280553
1994	4.66E-05	0.0059	5.7173	0.000000
1995	0.000145	0.0018	1.8021	3.247564
1996	1.18E-05	0.0006	0.0444	0.001971
1997	8.08E-05	0.0548	0.1457	0.021228
1998	0.000259	0.0013	0.0966	0.009332
1999	0.000103	0.0081	0.6366	0.405260
2000	0.000398	0.0024	0.0408	0.001665
2001	0.000605	0.0013	0.0144	0.000207
2002	0.000106	0.0562	0.0901	0.008118
2003	0.000602	0.0042	0.0342	0.001170
2004	0.002485	0	0.1522	0.023165
2005	0.000246	0.0025	0.1058	0.011194
2006	0.000109	0.0063	0.2034	0.041372
2007	0.003053	0.0086	0.2848	0.081111
2008	0.006556	0.0281	0.0324	0.001050
2009	0.000503	0	0.0514	0.002642
2010	0.000102	0.0043	0.0996	0.009920
2011	0.00091	0.0171	0.1435	0.020592

2012	**0.000121**	**0.0097**	**0.0949**	**0.009006**
2013	**0.000101**	**0.0103**	**0.2263**	**0.051212**
2014	**4.98E-05**	**0.0092**	**0.2254**	**0.050805**

Source: CBN statistical Bulletin (2014)and authors computation.