SSRG International Journal of Economics and Management Studies
ISSN: 2393 – 9125 / https://doi.org/10.14445/23939125/IJEMS-V7I1P108

Volume 7 Issue 1, 53-65, January 2020

Original Article

Irrational Investing in a Risky Nigerian Equity Market

Omokehinde[1], Joshua Odutola[2], Olurin, Enitan Rotimi[3]

[1,2,3] *Department of Accounting and Finance, Mountain Top University, Ibafo, Ogun State, Nigeria.*

Received Date: 23 December 2019
Revised Date: 17 January 2020
Accepted Date: 21 January 2020

Abstract **-** *The paper investigates the irrational behavior of investors in therisky Nigerian equity market from January 4, 2014, to September3, 2019, using: descriptive and diagnostic statistics to test the marketbehavior; Jensen ALPHA, CAPM, Sortino, Shapre, Treynor,and Fama'sreturn decomposition as standard tools to evaluate the irrational investing behavior of investors in the Nigerian equity market. The minimum acceptable return or risk-free rate stood at 12.76% during the period. The target market and portfolio returns were miscalebrated, which resulted in negative outcomes. The findings revealed that the excess of market and portfolio returns over risk-free were generally negative. The equity investment was risky as market and portfolio risks were grossly higher than their returns. The market return was volatile and did not behave normally as its kurtosis and skewness varied from the normal zero and 3.0 standards. The decomposition of the market and portfolio returns revealed that the systematic and unsystematic risks negatively influenced the risk-free to the extent that their total returns suffered losses that the selection opportunities could not remedy. The Treynor, Sharpe, and Jensen ratios were negative for the market and the portfolios. Jensen's Alpha is negative for both the market and the portfolios, which indicated that the risk-adjusted performance of the portfolios was not attractive. The CAPM indicates that the risk premium was negative for all the portfolios as the market return is lower than the risk-free rate. The Sortino ratio was also negative, and the average downside risk to total risk stood at 84.22%, indicating high downside volatility, meaning that for every N1.0 investment in the equity market, the probability of loss was lost 84.22kobo and 15.78kobo gain. It also attests that risk-averse investors were better than risk-seeking investors in the Nigerian equity market. The paper concluded that investors in the Nigerian equity marketbehaved irrationally and recommended that they avoid taking additional risksunless the risk premium is adequately compensatory for the degree of risk-taking.*

Keywords **-** *Irrational investing, risk premium, minimum acceptable Return, Systematic Risk, Unsystematic risk, Downside risk.*

I. INTRODUCTION

Equity investing is one of the riskiest investment decisions in the global financial markets. By implication, equity investors are risk lovers whose investment decision is based on the expected risk premium intended to compensate for the risk taken.Decision-making is a product of multiple influences like risk and returns resulting from macroeconomic, political, social, behavioral, mental, spiritual, etc. The mean-variance factor is the major driving force in investing. One of the basic assumptions of the capital market theory is that investors are assumed to be rational by investing in securities with higher returns at a minimum risk level.The common saying in finance that stocks with higher risk levels are associated with higher returns is completely rejected in an irrational investing manner. Irrational investing tends to be a product of many influences such as emotional biases (greed and fear), anchoring, intuitive thinking, risk perceptions, pride and regret, overconfidence, miscalibration,and ignorance of their choices familiarity biases with too much optimism. Investors can be categorized into three by their risk preferences. Tobin (1957) classified investors as; risk-averse, risk lover, and risk-neutral.

Equity investing is an additional risk to a given risk-free rate. A rational investor is expected to be compensated for taking additional risks and demand for risk premium adequate to compensate for the level of risk taken. In the financial market, investors contend with the choice of securities that satisfy their risk preferences. Most importantly, investors' emotional biases irrationally and aggressively moved the prices up without value-driven, hence, caused the beta of such stocks to be greater than one. Conversely, investors' fear moves the prices down, causing the beta of such stocks to be below market beta.

A risk-averse investor is expected to invest surplus funds in risk-free assets such as treasury bills and bonds. The beta of a risk-averse investor is zero, indicating that the return is divorced from the volatility in the market. This perception may be quite different for a risk seeker.The level of risk a stock bears is known as its "beta," which determines the return investors can expect (Bali, Brown, Murray, and Tang; 2017). Investing becomes irrational when the risk-adjusted return is negative,when the market andportfolio returnsare lower than the risk-free rate after considering the market risk as measured by beta, and when risk premium (risk-adjusted return) is negative to reduce risk-free return, and consequently, reduce portfolio expected return.

Therefore, in the equity market, investing is irrational when risk-averse investors are better than equity investors in the context of mean-variance. This is where the risk-free rate or minimum acceptable returnis related to the anchoring price or market and portfolio returns. Investing is irrational when: the risk premium is negative; the downside risk has a higher influence on the returns; Jensen alpha is negative; negative effect of systematic risk; portfolio exhibiting negative residual risk effect; and negative portfolio selection abilities; where high beta stocks are associated with higher losses.

A. Objectives of the study

The main objective of this paper is to examine the irrational behavior of Nigerian investors in the risky equity market. Specifically, it tests whether: (i) the risk premium has a significant negative effect on the minimum acceptable return (risk-free rate); (ii) the risk premium has no effect on the minimally acceptable return; (iii) systematic and non-systematic factors have a significant effect on total risk and returns of the indices (iv) the Jensen's Alpha risk-adjusted portfolio returns aresignificantly abovethat predicted by the CAPM; (v) the proportion of the risk-adjusted return per downside risk to the total risk of the portfolios; (vi) the risk-averse investors are more rational than risk lovers.

II. THEORETICAL LITERATURE

Investors' irrationality can be explained from the contexts of behavioral finance theory, capital market theory, adaptive market hypothesis, and post-modern portfolio theory. Behavioral scientists,cognitive and psychologists;Kahneman and Tversky (1986, 1992) propound the prospect theory and loss aversion, focusing on the cognitive biases and heuristics that cause people to engage in unanticipated irrational behavior. They identified three heuristics that affect probability assessments and the evaluation of sample outcomes: representativeness, availability, and anchoring. Other behavioral biases are mental accounting, gambler's fallacy, conservatism, disposition effect, and narrow framing.Also,Shiller (1981), Tversky (1982), Thaler (1985), Yaari (1987), Poterba and Summers (1988), and Shleifer and Summers (1990) carried out extensive research which influences investors' behavior on the formation of prices on the capital market. The development of behavioral finance in the early 1980s challenged the classical theory of market efficient hypothesis and concluded that humans are not only acting rational but that emotions influence them, knowledge as well as experiences, overreaction, overconfidence to make irrational and baseless decisions. This behavioral finance rests on investors' sentiments that deviate from the maxims of economic rationality. Loss aversion is, therefore, a psychological propensity that losses loom larger than equal-sized gains relative to a reference point and can occur in riskless and in risky choices.

Shleifer (2000) categorizes the deviations of investors' sentiments from the standard decision-making model in three broad classes: non-Bayesian expectation formation, attitude towards risk, and sensitivity of decision making to the framing of problems. The first class concentrates on beliefs or how people process information. By predicting uncertain outcomes, investors show behavior different from Bayesian rationality. Instead, investors rely on a limited number of heuristics to assess probabilities and evaluate sample outcomes. The heuristics may result in good decisions but sometimes lead to biased decisions caused by ignoring relevant information and irrelevant processing information.

The Modern Portfolio Theory by Markowitz (1952, 1959) is a theory on how risk-averse investors can construct portfolios to optimize expected returns based on a given level of risk. He applied statistical techniques of central tendency (expected returns) and dispersions (variance) to evaluate portfolio expected return, risk, and covariance. The theory also found a positive relationship between risk and Return. To reduce portfolio risk and maximize returns, Markowitz (1959) introduced the concept of diversification by increasing the number of assets in a portfolio. The assets in the portfolio were statistically selected using covariance and correlation coefficient and coefficient of determination or r-squared. The Markowitz Theory is also known as Portfolio Selection Theory, where investors focus on selecting portfolios based on those portfolios' overall risk-reward characteristics instead of merely compiling portfolios from securities that each individually has attractive risk-reward characteristics. He further proposed that the single-period return for various securities should be treated as random variables and assigns expected values, standard deviations, and correlations. The main outcome of the Portfolio Theory is that with optimum diversification, the risk weight of a portfolio shall be less than the average risk weights of the securities it contains.

James Tobin (1958) builds on Markowitz's Portfolio Theory by introducing the Efficient Frontier and adding a risk-free asset to the analysis. This makes it possible to leverage or deleverage portfolios on the efficient frontier.

This leads to the notion of a super-efficient portfolio and the Capital Market Line (CML). This line is termed the efficient frontier. The collection of Portfolios that fall on the efficient frontier is the efficient or optimum portfolios with the lowest amount of risk for a given amount of return.

However, Sharpe's (1964) paper "Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk" extended Markowitz's Portfolio Selection theory especially, his perception about the risk component of assets in a portfolio. Sharpe (1964) CAPM is the mean-variance equilibrium single-index factor model. The total risk has two components: systematic and unsystematic risks, which he termed "non-diversifiable" and "diversifiable" risks. Sharpe advocates for an efficient portfolio to eliminate company-specific or residual risk through diversification. Unsystematic risk is a variance of stock's movement that is not associated with the movement of the market index.

On the other hand, systematic riskarising from macroeconomic factors such as inflation, interest rate, exchange rate, Gross Domestic Product can affect investment performance and influence investors' behavior. Thus, Sharpe suggests beta measure systematic risk (market risk). Beta is the sensitivity of individual stock return to the market. Fama coined Sharpe's Capital Asset Prices as "Capital Asset Pricing Model" (CAPM). The key insight of the CAPM is the positive relationship between expected returns and portfolio risk. The market index's beta coefficient is 1.0, indicating the equivalence of its covariance and variance. However, a stock beta can be greater than or less than 1.0. A stock with a beta above 1.0 is aggressive and defensive when it is less than one. Securities with high betas tend to do worse in a contracting economy than those with low betas. All investors are single period risk-average utility of terminal wealth maximizers and can choose among portfolios solely based on mean and variance. The required rate of Return in CAPM equals the risk-free and risk premium. The investment behavior of investors becomes irrational when the risk premium is negative.

Jensen (1968) developed a measure to evaluate a portfolio known as Jensen's Alpha. Alpha is a coefficient proportional to the excess return over its benchmark return, or expected return, for its expected risk as measured by beta. Hence, Alpha is determined by the company's fundamental values in contrast to beta, which measures the return due to volatility. Jensen's Alpha can be positive, negative, or zero. Jensen's Index of the market is zero. If the Alpha is positive, it indicates outperformance of portfolio returns compared to market return and vice versa. A high alpha usually refers to a hedge fund manager who is good enough to outperform the market. Thus, Alpha investing allows the investor to statistically test whether the portfolio produced an abnormal return relative to the overall capital market, i.e., whether the manager's skill has added value to a fund on a risk-adjusted basis. Alpha investing tells you if investment decisions were rational or otherwise.

Fama (1970, 1972) developed another portfolio evaluation framework with a finer breakdown of the fund's performance. It segregates the total return into the risk-free rate of return; return due to systematic risk; return due to residual risk factors or compensation for improper diversification; and excess returns gained from the manager's stock selection ability (net Selectivity) at a given level of risk. As per Fama's, Selectivity, the stock selection ability of the fund managers can further be decomposed into two parts: compensation for diversification and net Selectivity. The greater the diversification achieved by the fund, the lesser the compensation for improper diversification and vice versa. This may be close to zero for a well-diversified fund and will always take a non-negative value otherwise (Kundu Abhijit, 2009).

Sharpe's(1966) ratio was developed to measure the excess return over the risk-free rate per portfolio risk defined by the standard deviation.

Sortino (1983) ratio was developed to measure the difference between the minimally acceptable return and the portfolio's actual return by the standard deviation of the negative asset returns or the downside deviation

A. Adaptive Market Hypothesis

However, Lo (2004, 2005) propounds the Adaptive Market Hypothesis theory to reconcile the traditional models of modern financial economics (efficient market hypothesis, capital asset pricing model and modern portfolio theory) to co-exist alongside behavioural finance models in an intellectually intellectual way consistent manner. Based on evolutionary principles, the Adaptive Markets Hypothesis implies that the degree of market efficiency is related to environmental factors characterizing market ecologies, such as the number of competitors in the market, the magnitude of profit opportunities available, and the adaptability of the market participants.Interestingly, this theory does not discard the theory of market efficiency in its entirety but only disagree with some of its assumptions such as (1) rationality of market participants, (2) no-arbitrage process, (3) passive investment opportunity, (4) full and quick adjustment of price to information.Lo (2004), therefore, cites irrational behavior of investors inconsistent with market efficiency as loss aversion, overconfidence, overreaction, mental accounting, and other behavioral biases that are consistent with an evolutionary model of individuals adapting to a changing environment via simple heuristics.

B. Post-Modern Portfolio Theory

Rom and Ferguson (1991) created post-modern portfolio theory (software entrepreneurs) to differentiate the portfolio-construction software developed by their company,

Investment Technologies, from those provided by the traditional Modern Portfolio Theory. On the perception of risk modern portfolio theory and post-modern portfolio theory, investors typically do not view as risky those returns *above* the minimum they must earn in order to achieve their investment objectives. They believe that risk has to do with the bad outcomes (i.e., returns below a required target), not the good outcomes (i.e., returns over the target) and that loss weighs more heavily than gains (Veronesi, 1999). This view has been noted by researchers in finance, economics, and psychology, including Sharpe (1964). "Under certain conditions, the mean-variance of modern portfolio theory can be shown to lead to unsatisfactory predictions of (investor) behavior.Fishburn (1977), Forsey and Sortino (1981) develop practical mathematical algorithms for calculating downside risk for *The Pension Research Institute*. Atchison and Brown (1987) also develop the three parameters lognormal distribution, a more roburst model of the pattern of returns than the bell-shaped distribution of Markowitz's modern portfolio theory. These developments provided a framework that recognizes investors' preferences for upside over downside volatility.

Bhosale and Adhikary (1994) evaluated the performance of growthschemes using Sharpe, Treynor, Jensen, and Fama's measures. The study used Fama'sreturns decomposition to identify returns due to diversification and systematic risk. They found that some of the sample schemes outperformed the relevant benchmark return. Jaideep and Sudip Majumdar (1994) examined the performance of five growth-oriented schemes from February 1991 to August 1993, using CAPM and Jensen measures to evaluate the performance. They conclude that the market return was superior to the returns of the selected mutual fund schemes. Kaura and Jaydev (1995) evaluated the performance of growth-oriented schemes by using Jensen, Treynor, and Sharpe measures and found that the schemes have not performed well. Tripathy (1996) also investigated the performance of growth-oriented schemes using the CAPM model and Jensen, Treynor, Sharpe measures and concluded that performance appraisal is not a difficult task. Rather return of the scheme will depend upon the performance of mutual funds. So the fund may produce returns either above or below average, but it may be superior over the long run. Phaniswara Raju B. (2008) evaluated the performance of 60 mutual fund schemes of 29 mutual fund companies operating during that time, analyzed using risk-adjusted performance measures, and found that many selected schemes failed to outperform the marketa mismatch of the risk-return relationship in some schemes. Sarita B. (2012) evaluated the performance of 25 equity diversified mutual funds using Jensen's and Fama's measure of net Selectivity and concluded that out of 25 funds, 24 funds have positive net Selectivity reflecting the superior performance of the fund managers.

However, evidence from the Nigerian equity market is scanty and also mixed. Ilo, Yinusa, and Elumah (2019) examine the performance of 37 mutual funds distributed across six broad portfolio classes traded on The NSE using monthly data from January 2012 to December 2015 employing Sharpe and Treynor ratios and Jensen's Alpha measure. They found that the market generally generated a negative risk premium, and the mutual fund portfolios similarly generated negative mean excess Return, failing to compensate investors for investing in risky assets. Hence, the fund managers cannot claim to have demonstrated any form of stock selection or portfolio diversification skill. Olakojo and Ajide (2010) examined the Capital Asset Pricing Model (CAPM) for the Nigerian stock market using monthly stock returns from the 10 most listed companies on the Nigeria stock exchange from January 2008 to December 2009. The findings of this study are not supportive of the theory's basic statement that higher risk (beta) is associated with higher levels of stock values or returns. Nwidobie (2013) tested Capital Asset Pricing Model and Variable Behaviour in the Nigerian Capital Market and established positive relationships between CAPM's expected return, risks (measured by β), and risk premium. In another development, Oke (2013) also tested Capital Asset Pricing Model from the Nigerian equity market using weekly returns from 110 companies listed on the Nigerian Stock Exchange from January 2007 to February 2010. His findings invalidated the CAPM's assumptions that higher risk (beta) is associated with a higher level of return and that the slope of the security market line should equal the excess return on the market portfolio.

III. DATA AND METHODOLOGY

This paper used *an ex-post-facto*research design of high-frequently tradedweekly closed data consisting of fifteenindices (including the market index or the NSE-ASI). The data were obtained from The Nigerian Stock Exchange (NSE) website www.nse.org. The paper also uses descriptive statistics design to test the statistical behavior of the historical weekly data sets such as mean, standard deviation, variance, covariance, beta, Alpha or intercept, correlation coefficient, coefficient of determination, skewed and kurtosis considered for first, second, to fourth moments; including residual diagnostic tests for normality.

The paper also considered the heuristic valuation process using Kahneman and Tverky (1979) prosperity theory process of the following psychological principles of (i) identifying the reference point; (ii) obtaining the loss aversion; (iii) comparing the (i) and (ii) above to determine the gain (rational) or loss (irrational) behavior of the investors. The reference point in this paper is the risk-free rate (minimum acceptable rate). Loss aversion is when the risk premium is zero (at a point where the investors are indifferent to the risk-free rate). Risk aversion is where the risk premium is negative, which depicts the irrationality in

the behavior of the investors. However, where the risk premium is greater than zero, the portfolio generates returns that compensate for the additional risk-taking by such investors. Also, the paper considered correlational research design applyingJensen (1968) Alpha index (ALPHA),Sortino (1981) and Sharpe (1964) Capital Asset Pricing Model, and Fama's return decomposition; coupled with the Sharpe and Sortino ratios as the best criteria to measure the risk-return behavior of the investors as well as the risk-adjusted returns of the market and portfolios. The risk-free return is used as the reference point

A. Data

Currently, there are 17 equity indexes listed on The NSE, including NSE-ASI. However, a sample of 15 consisting of thirteen NSE constructed indices and two by professional managers. The fifteen indexes areNSE-ASI, NSE Oil & Gas, NSE Premium, NSE Industrial, NSE Consumer Goods, NSE Banking, NSE 30, NSE 50, NSE Pension, NSE Mainboard, NSE Insurance, NSE ASEM, NSE Lotus, NSE Merigrow, and NSE Merival. The portfolios are patterned to proxy the behavior of investors. The dataset consists of 245weekly observations. The indices obtained from the NSE cover a period of 56 monthsfrom December 29, 2014, to September 3, 2019. The risk-free or minimum acceptable rate was used as the benchmarkrelative to the risk premium at the market and portfolio levels.The indices are generally broad-based, constructed to meet the diversities in the risk-return preference of the equity investors.

B. Model Specification

Having obtained the time series indices from the NSE, the next step is to take the natural log difference and obtain the stock returns to purge the series from the unit root and ensure stationarity. Next is applying the econometric packages using E-View 10.0 to estimate the mean and variance, kurtosis, skewness in a descriptive manner.

a) Estimating Weekly Market and Portfolio Returns

The weekly ex-post returns are calculated by taking the natural log difference for the market index, and theindices of the twelve portfolios as given by equations 3.1, and respectively

$$R_{mt} = \ln\left(\frac{P_{mt}}{P_{mt-1}}\right) * 100 \quad \ldots\ldots 3.1$$

$$R_{pt} = \ln\left(\frac{P_{pt}}{P_{pt-1}}\right) * 100 \quad \ldots\ldots 3.2$$

where R_{mt}, $and\ R_{pt}$Are the natural log historical weekly returns of market *m*, and portfolioat time *t*, respectively? The P_{mt-1}, P_{mt}; P_{pt-1}, andP_{pt}Represent the historical beginning and end weekly indices regarding the NSE-ASI and theportfolios. Assets *mand p* indicate market and portfolio, respectively, and *t* = 1, …, *N;N* is the sample size (245 weeks) from December 29, 2014, to September3,2019.

b)Estimating WeeklyMarket and Portfolio Variances

The variance of each company return is the squared differences of the actual and average returns as given by equation 3.4

$$\sigma_{mt}^2 = \sum_{i=1}^{N}(R_{mt} - \bar{R}_{mt})^2 \quad \ldots\ldots 3.3$$

$$\sigma_{pt}^2 = \sum_{i=1}^{N}\left(R_{pt} - \bar{R}_{pt}\right)^2 \quad \ldots\ldots 3.4$$

Where σ_{mt}^2, $\sigma_{pt}^2$are the variances of the benchmark *m* and each portfolioat time *t;* R_{mt}, andR_{pt} are market and portfolio *ex-post* returns while $\bar{R}_{mt} and \bar{R}_{pt}$Represent expected returns of the market and portfolios, respectively. However, the market risk is measured by beta (β_{mt}). Beta sensitizes the portfolios' returns to the market as indicated in equation 3.5. Beta as the market variance is obtained by dividing the covariance of the portfolio and the market returns $(COVR_pR_m)$per market variance (σ_m^2)as indicated in equation 3.5

$$\beta_{mt} = \frac{COVR_pR_m}{\sigma_m^2} \quad \ldots\ldots 3.5$$

Conversely, market variance is obtained from equation 3.5 by dividing the covariance of the market and portfolio by their respective betas, as given by equations 3.6

$$\sigma_{mt}^2 = \frac{COVR_pR_m}{\beta_{mt}} \quad \ldots\ldots 3.6$$

Similarly, the covariance of the market and portfolio was derived from both equations 3.5 and 3.6 by multiplying the portfolio beta by the market variance, as indicated in equations 3.7 and 3.8

$$COVR_pR_m = \sigma_{mt}^2\beta_{mt} \quad \ldots\ldots 3.7$$

Equation 3.8is equally written as:

$$COV_{pm} = \frac{1}{N}\sum_{i=1}^{N}[R_{mt} - \bar{R}_{mt}]\left[R_{pt} - \bar{R}_{pt}\right] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.8$$

Correlation coefficient shows the covariance of the market and portfolio per standard deviations of the market and each portfolio as defined below:

$$\rho_{pm} = \frac{COVR_pR_m}{\sigma_p\sigma_m} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.9$$

***c) portfolio Performance Measures**:*

Apart from the above measures of risk and return on market and portfolio, other performance evaluation measures are as stated below:

i. Sharpe CAPM
ii. Treynor measure
iii. Jensen Alpha
iv. Sharpe Ratio
v. Sortino Ratio
vi. Fama's decomposition measure

1) Sharpe CAPM

However, Sharpe-Lintner (1964) CAPM model of ex-post return is formally specified in equations 3.10

$$R_{it} = R_f + \beta_i\left((R_{mt}) - R_f\right) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.10$$

Equation 3.12 comprises of risk-free rate (R_f), and risk premium or Sharpe ratio ($R_{m,t} - R_f$). The risk-free rate was obtained from the CBN using the 364/365-day government Treasury Bills rate. The Sharpe postulation regarding equation 3.12 is that the residual value or unsystematic risk ($\varepsilon_{i,t}$) is completely diversified to zero. The total risk of an individual stock or a portfolio is called variance. This variance has two components: systematic and unsystematic risks. The distribution and behavior of the total risk relative to the Nigerian equity market are peculiar. The risk peculiarities are that the company-specific risk constitutes the larger proportion of the total risk. In other words, residual risk in the Nigerian stock market is too important to be ignored and virtually impossible to diversify to zero from the companies' descriptive and diagnostic characteristics behavior in (table 4.1), hence equation 3.11 applies.

$$R_{it} = R_f + \beta_i R_m + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.11$$

2) Jensen Alpha Measure

Jensen alpha measures the difference between the portfolio return and CAPM. The Jensen alpha is derived from the CAPM, as shown below

$$\alpha_{pt} = (R_{pt} - R_f) - \beta_i\left((R_{mt}) - R_f\right) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.12$$

or

$$\alpha_{pt} = R_{pt} - \left[R_f + \beta_i\left((R_{mt}) - R_f\right)\right] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.13$$

where:
α_{pt} = alpha return on portfolio at time *t*
R_{pt} =return on portfolio at time *t*
$\beta_{i,}R_{mt}, and\ R_f$ as previously defined

3) Estimate of Investors' Irrationality

i) Loss Aversion

This refers to a process where the risk premium is zero, or the risk-free rate is equivalent to theequity market and the portfolios' returns. The reference point is the risk-free rate. Other variables as previously defined

$$R_{lam} = \beta_m(R_m - R_f) = 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.14$$

$$R_{lap} = \beta_p(R_p - R_f)S = 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.15$$

ii) Irrational Investing

This refers to a process where the risk premium is negative (below zero), or the risk-free return is greater than the return on the market and portfolios.

$$R_{irm} = \beta_m(R_m - R_f) < 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.16$$

$$R_{irp} = \beta_p(R_p - R_f) < 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.17$$

iii) Rational investing

This is a process where the risk premium is positive (above zero) or where the risk-free rate is lower than the returns on the market and the portfolios

$$R_{rm} = \beta_m(R_m - R_f) > 0 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.18$$

$$R_{rp} = \beta_p(R_p - R_f) > 0 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.19$$

iv) Treynor Ratio

Treynor Measure,also known as the reward-to-volatility ratio, is defined as:

$$T = \frac{\left((R_{pt}) - R_f\right)}{\beta_p} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.20$$

v) Sharpe Ratio

Sharpe measure is known as a reward to variability ratio measure of the risk-adjusted performance per standard deviation of the portfolio is stated as:

$$S = \frac{\left((R_{pt}) - R_f\right)}{\sigma_p} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.21$$

$$TR_P = R_f + \beta_p(R_m - R_f) + [R_m - Rf\ ]\left[\frac{\sigma_p}{\sigma_m} - \beta\right] + (R_p - R_f) - (\sigma_p - \sigma_m)(R_m - R_f) \ldots 3.23$$

6) Omokehinde Ratio

$$\frac{(R_p - R_f) - (\sigma_p - \sigma_m)(R_m - R_f)}{[R_m - R_f]\left[{\sigma_p}/{\sigma_m} - \beta\right]} * -0.8 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.24$$

IV. EMPIRICAL RESULTS

Table 4.1 presents the descriptive statistics of the market and the indices concerning their means, variances, covariance, correlation coefficient, coefficient of determination, and beta. Both the market and the indices recorded negative returns during the period. Meanwhile, 9 of the 14 indices analyzed suffered losses above-market loss of (-4.85%) with the following indices mostly affected: NSE Consumer Goods (-10.45%), NSE Lotus (-13.85%, and NSE Oil & Gas (-14.92%). Three indices marginally recorded positive annual returns are: NSE Premium (5.05%), NSE Merigrow (6.07%), and NSE Merival (1.71%).

vi) Sortino Ratio

Sortino ratio is a portfolio's risk-adjusted return per downside standard deviation.It is the amount of loss that could be sustained due to the decline in prices. The downside risk explains a worst-case scenario for investment or indicates how much the investor stands to lose.

$$S_{tr} = \left[\frac{R_p - R_f}{\sigma_{-p}}\right] \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.22$$

Fama's Decomposition Measure

Risk-free return=R_f

Compensation for systematic risk = $\beta_i\left((R_{mt}) - R_f\right)$

Compensation for inadequate diversification =$[R_m - R_f]\left[{\sigma_p}/{\sigma_m} - \beta\right]$

Net Selectivity = $(R_p - R_f) - (\sigma_p - \sigma_m)(R_m - R_f)$

The negative returns by NSE-ASI and the 12 indices exhibited higher weekly risk as measured by variance. The weekly market risk stood at 8.0% compared to the 21.44% by NSE Industrial Goods and 16.81% by NSE Banking. Twelve of the 14 indices'returns were riskier than the market risk. These higher-than-return-risks recorded by the market and the portfolios are a testament that the Nigerian equity market is risky and suggests high volatilities and substantial uncertainties about the future returns of the portfolios, including the NSE-ASI.Meanwhile, the market skewed leftward at -0.29 with a kurtosis of 9.28. Both the kurtosis and skewness of the returns for the market and the indices varied from the normal 3.0 and zero standards, respectively. This implies that the market and the portfolio returns are asymptotic, leptokurtic, and heteroskedastic.

Table 4.1 Descriptive Statistics of NSE Indices

WEEKLY DECRPTIVE STATISTICS OF EQUITY INDICES IN NIGERIA FROM JANUARY 2015 - SEPTEMBER 2019															
INDICES	ASI	NSE_CMG	NSE_OILG	NSE_BKIN	NSE_30	NSEPREMI	NSEINDUS	NSE50	NSEPENSI	NSEINSUR	NSELOTUS	NSE_MAIN	NSE_ASEM	MERIGRO	MERIVAL
Weekly Mean	-0.30	-0.46	-0.38	-0.32	-0.37	-0.10	-0.38	-0.35	-0.28	-0.20	-0.42	-0.38	-0.16	-0.12	-0.28
Annual Return	-15.54	-23.76	-20.01	-16.56	-19.35	-5.06	-19.55	-18.20	-14.57	-10.19	-21.84	-19.68	-8.31	-6.10	-14.78
Median	-0.46	-0.57	-1.00	-0.62	-0.64	-0.35	-0.41	-0.57	-0.46	-0.18	-0.42	-0.29	0.00	-0.23	-0.51
Maximum	11.70	12.86	13.44	14.08	12.31	15.12	27.76	12.43	12.22	8.41	10.75	6.80	2.81	13.82	13.93
Minimum	-15.57	-12.93	-12.85	-21.70	-16.05	-22.80	-32.71	-16.35	-16.08	-8.52	-15.96	-11.41	-8.91	-11.96	-9.22
Std. Dev.	2.80	3.16	3.85	4.22	2.88	4.01	4.70	2.88	3.10	2.21	2.80	2.50	0.93	2.92	3.62
VARIANCE	8.00	9.99	14.85	17.77	8.32	16.09	22.06	8.28	9.60	4.90	7.83	6.25	0.87	8.54	13.12
COVAR	7.97	6.82	3.59	9.08	7.91	10.44	7.93	6.96	7.79		4.20		0.16	5.11	5.53
CORREL	1.00	0.75	0.34	0.79	0.97	0.90	0.61	0.60	0.87		0.47		0.06	0.62	0.51
BETA	1.00	0.85	0.45	1.13	0.99	1.30	0.99	0.87	0.97		0.52		0.02	0.64	0.69
R^2	1.00	0.56	0.11	0.62	0.94	0.81	0.37	0.36	0.76		0.22		0.00	0.39	0.26
Skewness	-0.29	-0.04	0.54	-0.04	-0.32	-0.33	-0.63	-0.24	0.01	0.09	-0.51	-0.17	-5.55	0.08	0.90
Kurtosis	9.28	5.99	4.31	7.23	9.76	9.34	19.37	9.89	8.43	4.47	9.23	5.60	45.78	7.37	5.30
Jarque-Bera	346.41	77.88	24.94	156.19	401.99	353.41	2348.73	414.79	256.80	19.10	346.69	59.84	17012.64	166.38	74.35
Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum	-62.46	-95.48	-80.43	-66.54	-77.77	-20.35	-78.56	-73.14	-58.54	-40.96	-87.77	-79.11	-33.38	-24.53	-59.39
RISK FREE	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76

Author's Computation

Diagnostically, the Jarque Berra for the market and the portfolio are significant at 1% suggesting, a rejection of the null hypothesis that the stock market returns for the respective series are normally distributed and accept the alternate hypothesis that the returns are not normally distributed.

The significant effect of systematic and non-systematic factors on total risk and returns of the indices

According to Sharpe (1964), the risk affecting portfolios' performance could be divided into systematic and unsystematic risk. Table 4.2 presents the distribution of the risk factors between systematic and unsystematic risks as they affect the total returns and risk of the portfolios. Factors such as inflation, exchange rate, interest rate, money supply, government expenditure, net export, and other macroeconomic factors affect the indices' returns and the NSE-ASI systematically. Inconsistent with Sharpe's CAPM tenet, the market's unsystematic risk is fully diversified to zero (0), as exhibited in table 4.2.Using Sharpe CAPM, the market return was influenced 100% by systematic risk while the portfolios were partially affected by both the systematic and unsystematic risk, which the management should have diversified. However, the behavior of the 14 indices to systematic and unsystematic factors is quite different from the NSE-ASI. Their risk factors were distributed between systematic and unsystematic. The only Index that almost perfectly mimics the NSE-ASI is NSE 30, with 94% and 6% influenced by systematic and unsystematic factors. Five indices' risk factors were more influenced by systematic factors: NSE CMG (56.23%, NSE Banking (61.85%), NSE 30 (94.08%), NSE Premium (80.75%), and NSE Pension (76.17%). The implication is that the vagaries of macroeconomic factors more influenced the performance of indices. The indices are expected to perform better than in a recessed period in terms of economic boom. A curious look at the betas and variance of the indices relating to the systematic influence indicates that virtually, all the five indices are aggressive with their beta above or equal to market beta.

Table 4.2.

EFFECT OF SYSTEMATIC AND NON-SYSTEMATIC FACTORS ON TOTAL RISK AND RETURNS OF THE INDICES																
		ASI	NSE_CMG	NSE_OILG	NSE_BKIN	NSE_30	NSEPREMI	NSEINDUS	NSE50	NSEPENSI	NSEINSUR	NSELOTUS	NSE_MAIN	NSE_ASEM	MERIGROW	MERIVAL
VAR	σ^2	8.00	9.99	14.85	17.77	8.32	16.09	22.06	8.28	9.60	4.90	7.83	6.25	0.87	8.54	13.12
R^2(VAR)	Systematic Factors	8.00	5.61	1.71	10.99	7.82	12.99	8.14	3.00	7.32	0.00	1.75	0.00	0.00	3.33	3.47
VAR-(R^2*VAR)	Non-Systematic	0.00	4.37	13.14	6.78	0.49	3.10	13.92	5.28	2.29	4.90	6.08	6.25	0.87	5.20	9.65
SYSMTC RISK (%)		100.00	56.23	11.48	61.85	94.08	80.75	36.91	36.19	76.17	0.00	22.38	0.00	0.35	39.05	26.44
UNSYSYMTC RISK (%)		0.00	43.77	88.52	38.15	5.92	19.25	63.09	63.81	23.83	100.00	77.62	100.00	99.65	60.95	73.56
FAMA'S RETRUN DECOMPOSITION																
Risk Free	Rf	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76
Rtn for systematic risk	Bi(Rm-Rf)	-28.18	-24.12	-12.68	-32.12	-27.97	-36.92	-28.02	-24.60	-27.55	0.00	-14.84	0.00	-0.56	-18.08	-19.55
Rtn for Residual risk	(δp/δm-βi)*(Rm-Rf)	0.00	-11.19	-39.82	-30.70	-1.43	-19.97	-49.98	-4.66	-6.41	-17.32	-12.85	-22.09	-2.53	-12.11	-26.82
Net Selectivity	Rp-(Rf+δp/δm)*(Rm-Rf)	0.00	-1.21	19.73	33.50	-2.71	39.07	45.69	-1.70	6.63	-5.63	-6.91	-10.35	-17.98	11.32	18.84
Total Returns		**-15.42**	**-23.76**	**-20.01**	**-16.56**	**-19.35**	**-5.06**	**-19.55**	**-18.20**	**-14.57**	**-10.19**	**-21.84**	**-19.68**	**-8.31**	**-6.10**	**-14.78**

The nine indices with their performance more influenced by diversifiable risk factors are NSE ASEM (99.65%), NSE Insurance (79.26%), NSE Oil & Gas (88.52%), NSE Lotus (77.62%), NSE Merival (73.56%), NSE 50 (63.81%), NSE Industrial Goods (63.09%), and NSE Merigrow (60.95%). These residual factors are diversifiable such as management inefficiencies. Tom Sharpe, these inefficiencies must be completely diversified.

Conversely, the effect of systematic and non-systematic factors on the total returns of the market and the portfoliosis also exhibited in table 4.2 using the FAMA decomposition of returns. These factors have negative effects on all the portfolios, including the NSE-ASI. The residual risk affects the NSE-ASIbecause it has been fully diversified. A fully diversified portfolio results in zero selectivity risk. Hence, only the market exhibits full diversification with zero selectivity risk. However, the less diversified indices had residual and Selectivity risks that influenced their returns. The following indices recorded positive

Selective abilities based on the performance of their respective components: NSE Industrial (45.69%), NSE Premium (39.07), NSE Banking (33.50%), NSE Oil & Gas (19.73%), NSE Merigrow (18.84%), NSE Merival (11.32%), and NSE Pension (6.63%). The indices with negative selection risk are: NSE ASEM (-17.98&), NSE Mainboard (-10.35%), NSE Lotus (-6.94%), NSE Insurance (-5.63%). The overall effect of both risks plummeted the market and portfolio returns into negative as decomposed by Fama in table 4.2, thereby making equity investing irrational.

The Jensen's Alpha risk-adjusted portfolio returns are significantly above that predicted by the CAPM

Table 4.3 presents Jensen's alpha measure. Jensen's Alpha measures the difference between the indices'and the CAPM returns. The CAPM return is divided into two: risk-free and risk premium. The risk-free is positive and given at 12.76%. However, all the indices, including the NSE-ASI risk premium, were negative. For indices with positive Jensen's Alpha, it was not as if they generated returns that outperformed the CAPM return. All the indices recorded negative returns. The positive Jensen's Alpha of NSE Banking (4.62%), NSE Premium (15.26%), and NSE Pension (2.752%) were puzzled. In the real sense, they are not positive and cannot be used to adjudge them as a good performer. Thus, using Jensen's alpha measure, virtually all the indices, including the NSE-ASI, had negative Alpha and by implications, investing in equity-based securities during the period is irrational.

The risk premium has no significant negativeeffect on minimally acceptable return

A test of whether the premium offered in the risky Nigerian equity market adequately compensates for the risk-taking by the investors indicates from our findings that the equity returns in respect of the market and the portfolios are not adequately compensatory for the level of risk taken. In Appendix 1.0, all the indices, including the NSE-ASI, recorded a negative risk premium. The negative risk premium is a disincentive to rational equity investors. It accounted for why investors are discouraged from investing in equity but preferred investing in fixed income securities such as Federal Government's Treasury Bills and bonds. The

negative risk premium reduces the risk-free return. A persistent negative premium can cause havoc to the equity market. The interpretation of the findings is that the returns on the Nigerian equity market during the period under review were grossly negative and inadequate to compensate for the risk-taking by the equity investors. Hence, equity investors are regarded as irrational.

Sortino Ratio and Irrational Investing

Table 4.3 presents the fifteen portfolios' risk-adjusted-performance measurements, including market return. The Sharpe, Treynor, Jensen, and Sortino ratios exhibited negative trends. The average downside risk to total risk stood at 84.22%, indicating high downside volatility, which portends that for every N1.0 investment in the equity market, the probability of loss is 84.22kobo and 15.78kobo gain. Thus, investing in the Nigerian equity market during the period under review is irrational.

Table 4.3 Risk-Adjusted Performance of the Market and Portfolios

RISK-ADJUSTED PERFORMANCE OF THE MARKET AND PORTFOLIOS								
PORTFOLIO	Total	downside	Portfolio	SHARPE RATIO	TREYNOR RATIO	JENSEN RATIO	Sortino Ratio	Downside
	Risk	Risk	risk Adjusted	Ratio	Ratio	Ratio	Ratio	Total Risk
	σ_p	$-\sigma_p$	(Rp - Rf)	(Rp-Rf)/δp	(Rp-Rf)/βp	(Rp-Rf)-Bi(Rm-Rf)	(Rp-Rf)/-αp	$-\sigma_p/\sigma_p$
ASI	2.80	**2.63**	-3.54	-10.10	-28.42	-0.12	**-10.76**	**93.83**
NSE CMG	3.16	**3.07**	-2.32	-13.03	-36.67	-12.40	**-11.89**	**97.15**
NSE OILG	3.85	**3.46**	-23.26	-11.69	-32.91	-20.09	**-9.47**	**89.79**
NSE BKING	4.22	**3.75**	-37.03	-10.46	-29.44	2.80	**-7.82**	**88.97**
NSE 30	2.88	**2.76**	-0.83	-11.46	-32.24	-4.14	**-11.63**	**95.71**
NSEPREMIUM	4.01	**3.61**	-42.61	-6.36	-17.89	19.10	**-4.94**	**89.99**
NSEINDUSTR	4.70	**4.51**	-49.23	-11.53	-32.44	-4.29	**-7.16**	**96.02**
NSE50	2.88	**1.97**	-1.83	-11.04	-31.08	-6.36	**-15.71**	**68.48**
NSEPENSION	3.10	**2.26**	-10.16	-9.75	-27.44	0.22	**-12.09**	**72.93**
NSEINSUR	2.21	**1.77**	2.09	-8.19	-23.05	-13.05	**-12.97**	**79.97**
NSELOTUS	2.80	**2.33**	3.37	-12.34	-34.74	-19.76	**-14.85**	**83.26**
NSE MAINBD	2.50	**2.01**	6.82	-11.57	-32.58	-12.36	**-16.14**	**80.41**
NSE ASEM	0.93	**0.75**	14.44	-7.52	-21.15	-20.51	**-28.09**	**80.24**
MERIGROWTH	2.92	**2.05**	-14.86	-6.73	-18.94	-0.78	**-9.20**	**70.16**
MERIVAL	3.62	**2.77**	-22.37	-9.82	-27.65	-7.98	**-9.94**	**76.48**
AVERAGE	3.11	2.65	-12.09	-10.11	-28.44	-6.65	-12.18	84.22

Source: Author's Computation

In this situation, only irrational investors will gamble with their money. A rational investor would rather prefer to invest only in fixed income securities such as treasury bills which is the common practice in Nigeria today.

The risk-averse investors are more rational than risk lovers

A risk-averse investor would not like to take an additional risk by investing in equities but would rather limit his investment only to risk-free investment like investing in government securities such as Treasury Bills and Bonds. Investing only in treasury bills will give the investor at least 12.76% rather than losses incurred by investing in equity. Thus, investing in equity during the period is tantamount to irrational investment. More importantly, since the effect of negative risk premium reduces the risk-free rate, a risk-averse investor will prefer a "loss aversion"technique to risk-aversion to protect the minimum acceptable return.Evaluating using Treynor and Sharpe ratios vividly attest to the irrationality in the investing behavior of investors in the market. The indicators gave negative outcomes for all the portfolios. The risk premium further backed this, with all the portfolios recording negative outcomes. The variation in risk premium outcomes is ascribed to the differences in market risk.

Fama's Decomposition Return

The distribution of the risk factors that influenced portfolios' total returns among the risk-free rate; systematic risk; unsystematic risk factors (compensation for inadequate diversification); and selection (netSelectivity) by Famaindicate that systematic risk factors mainly accounted for the poor performance of the portfolios' returns as presented in table 4.3 or Appendix 1.0 The negative returns recorded by the portfolios are majorly attributed to market risk. The 8 most-hit portfolios with negative systematic risk are: NSE-ASI (-17.54%), NSE Consumer Goods (-15.01%), NSE Banking (-19.98%), NSE 30 (-17.40%), NSE Premium (-22.97%), NSE Industrial (-17.43%), NSE 50 (-15.30%), and NSE Pension (-17.14%). This result is consistent with Sharpe's systematic risk factor having the greater influence on the total Return in Appendix 1.0. Next in effect to systematic risk factors is the residual risk (compensation for inadequate diversification) with greater depression on NSE Oilg (-23.15%), NSE Banking (-16.99), NSE Industrial (-29.72), NSE 50 (-21.75), and NSE Merival (-19.88). The negative effect of both systematic and unsystematic risk factors on the total portfolio returns waspartly attenuated by the selection ability of the NSE with NSE Banking (21.61%), NSE Premium (29.71%), NSE Industrial (20.55%), and Merival (20.99%) portfolios.The only portfolio with greater negative selection risk was NSE ASEM (-20.18%). Overall, the systematic, unsystematic exerted a strong negative influence on the total returns of the portfolios by negating the risk-free return and turning the total returns negative. Thus investing in the equity market with this level of risks is tantamount to irrational investing. Investors should be risk-averse than being a risk seeker.

CONCLUSION

From all indications, the findings revealed that the Nigerian equity market was risky during the period under review, with weekly returns of the market and the portfolios far below the risk measured by the variance/standard deviation. The kurtosis and the skewness that equally measured the volatility of returns also deviated from the normal standards of 3.0 and zero, respectively. The diagnostic revelation by Jacquard-Berra shows that the market and the portfolios' returns behaved abnormally. Investing in equity is risky by taking additional risks above the risk-free rate. It is expected that the risk-seeking investors should be rational and be compensated for the risk taken. However, the findings revealed that the equity investors were penalized for risk-taking, resulting in a negative risk premium. The returns were negative. The risk premium for both the market (-17.61%) and the portfolios was negative to such an extent that it reduced the risk-free rate to negative. The influence of systematic risk on the market (-17.54%) and the portfolios were negative.

Similarly, the effect of the unsystematic risk on the portfolios was devastated that the positive effect of portfolio selection benefits could not redeem; thereby, throwing the total returns for both the market and the portfolios into negative as revealed by the Fama decomposition of returns. The Sharpe and Treynor ratios exhibited negative results. The Sortino ratio was also negative, and the average downside risk to total risk stood at 84.22%, indicating high downside volatility, translating that for every N1.0 investment in the equity market, the probability of loss is 84.22kobo and 15.78kobo gain.

Because of the above, the Nigerian equity market was risky, equity-seeking investors behaved irrationally, and risk-averse investors were better than the risk seekers.

RECOMMENDATIONS

The correlation coefficients of the portfolios were less than perfectly positive; hence, the portfolios should be diversified to reduce the influence of residual risk on portfolio returns. Equity investors should invest rationally by daily monitoring the market's risk premium and the portfolios of interest to avert losses by exiting at a point where the risk-free rate equates risk premium. The paper also recommends that Nigerian equity investors should avoid taking additional risks unless the risk premium is adequate to compensate for the degree of risk-taking. Finally, the Nigerian equity market must be complemented with the issue of more preference shares to address the issue of no-fixed dividends or income from the equity side.Preference shares of vanilla or sweeteners should be introduced to guarantee a fixed income to the preferred shareholders to avert loss from equity investing. Similarly, instead of investing public lending to the government, new financing instruments such as structured finance (hybrid securities) through asset-backed- securities, mortgage-backedsecurities, collateralized debt obligations, and other derivates instruments to raise capital in financing corporate projects with competitive compensation of returns to investors must be introduced to the Nigerian equity market as equity alone has failed to compensate for the risk-taking by the risk seekers in the Nigerian equity market.The government should reduce the higher rates on treasury bills and bonds to stimulate demand for equity.

REFERENCES

[1] Black, F., Noise. Journal of Finance, 41(3) (1986) 529–543.

[2] Barberis, N.C., Shleifer, A., Vishny, R., A model of investsor sentiment. Journal of Financial Economics, 49(3) (1998)307–343.

[3] Daniel, K., Hirshleifer, D., Teoh, S.H., Investor psychology in capital markets, Evidence and policy implications. Journal of Monetary Economics, 49(1) (2002) 139–209.

[4] Elumah, L., Ilo, B., and Yinusa, O. Performance of Mutual Funds in Nigeria. The EIB International Journal of Finance, 17 (2018) 8-25

[5] Fama, E. F., & French, K. R., The Cross-Section of Expected Stock Returns. The Journal of Finance, 47 (2) (1992) 427-465

[6] Fama, E. F., & French, K. R., Common risk factors in the returns on stocks and bonds. Journal of Financial Economics, 33 (1993) 3-56.

[7] Fama, E. F., & French, K. R., Size, value, and momentum in international stock returns. Journal of Financial Economics. 105 (3) (2012) 457-472.

[8] Fama, E. F., & French, K. R., A Five-Factor Asset Pricing Model. Journal of Financial Economics. 116 (2015) 1–22.

[9] Fama, E. F., & French, K.R., Size and book-to-market factors in earnings and returns. The Journal of Finance, 50 (1) (1995) 131-155.
[10] Fama, E. F., & MacBeth, D. F., Risk, Return, and Equilibrium, Empirical Tests. Journal of Political Economy, 81(3) (1973) 607-636.
[11] Fama, E.F., Random Walks in Stock Market Prices. Financial Analyst Journal, 21(5) (1965) 55-59.
[12] Fama, E.F., Efficient Capital Markets, A Review of Theory and Empirical Work, Journal of Finance, 25(1970) 383-417.
[13] Gauss, C. F., Theoria Combinationis Observationum Erroribus Minimis Obnoxiae, Parts 1, 2, and Supplement, Werke, 4 (1821) 1-108.
[14] Jensen, M. C., Black, F., & Scholes, M. S. (1972). The Capital Asset Pricing Model, Some Empirical Tests. Retrieved from http,//papers.ssrn.com/abstract=908569.
[15] Kahneman, D. and Tversky, A., Prospect theory, an analysis of decision under risk. Econometrica 47 (1979) 263–91.
[16] Kahneman, D., & Tversky, A., Subjective probability, A judgment of representativeness. Cognitive Psychology, 3 (1972) 430–454.
[17] Kahneman, D., & Tversky, A., Prospect theory, An analysis of decision under risk. Econometrica, 47 (1979) 263–291.
[18] Kundu Abhijit., Stock Selection Performance of Mutual Fund Managers in India, An Empirical Study, Journal of Business and Economic Issues, 1(1) (2009)59-72.
[19] Le Mens, G., & Denrell, J., Rational learning and information sampling, On the 'naivety' assumption in sampling explanations of judgment biases. Psychological Review, 118 (2) (2011) 379–392.
[20] Li, Y., Yang, L., Prospect theory, the disposition effect, and asset prices. Journal of Financial Economics, 107(3) (2013) 715–739.
[21] Lintner, J., The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. Review of Economics and Statistics. 47 (1) (1965) 13–37.
[22] Lo, A., Long-term Memory in Stock Market Prices. Econometrica 59 (1991)1279–313.
[23] Lo, A.,Market Efficiency, Stock Market Behavior in Theory and Practice, 2 vols.Cheltenham, Edward Elgar Publishing Company(1997).
[24] Lo, A. W., The adaptive market hypothesis. Journal of Portfolio Management, 30(5) (2004)15–29.
Lo, A. W., Reconciling efficient market hypothesis with behavioral finance, The adaptive market hypothesis. Journal of Investment. 7(2) (2005) 21–44.
[25] Loewenstein, M., Willard, G.A., The limits of investor behavior. Journal of Finance, 61(1) (2006) 231–258.
[26] Jones, B.D., Bounded rationality. Annual Review of Political Science, 2(1) (1999) 297–321.
[27] Fama, E.F., Market efficiency, long-term returns, and behavioral finance. Journal of Financial Economics, 49(3) (1998) 283–306.
[28] De Bondt, W.F., Investor psychology and the dynamics of security prices. AIMR Conference Proceedings, 1995(7)(1995) 7–13.
[29] Lopes, L. L., & Oden, G. C. (1991). The rationality of intelligence. In E. Eells & T. Maruszewski (Eds.), Rationality and reasoning, Essays in honor of L. J. Cohen (pp. 199–223). Amsterdam, Rodopi.
[30] Madiha, L., Shanza, A., Marian, F., & Samia, F., Market efficiency, market anomalies, causes, evidence, and behavioral aspects. Research Journal of Finance and Accounting, 2(9) (2011) 1-13.
[31] Markowitz, H. M., Portfolio selection. Journal of Finance, 7(1) (1952) 77-91.
[32] Markowitz, H. M., Portfolio Selection, Efficient Diversification of Investments. Cowles Foundation Monograph N0.16, New York, John Wiley & Sons, Inc(1959).
[33] MSCI, BARRA., Long-Short BARRA Factor Indexes(2013). Retrieved from http,//www.msci.com/.../MSCI_Barra_Factor_%20indices_Methodology_NOV,13 pdf.
[34] Mussweiler, T., Comparison processes in social judgment, Mechanisms and consequences. Psychological Review, 110 (2003) 472–489.
[35] Nwidobie, B. M., Agency Conflict and Corporate Dividend Policy Decisions in Nigeria. Asian Economic and Financial Review, 3(8) (2013) 1096-1109.
[36] Oke, B. O., Capital Asset Pricing Model (CAPM), Evidence from Nigeria. Research Journal of Finance and Accounting, 4(9) (2013) 17-26.
[37] Olakojo, S.A., & Ajide, K. B., Testing the Capital Asset Pricing Model (CAPM), The Case of the Nigerian Securities Market. International Business Management, 4(2010) 239-242.
[38] Ritov, I., Anchoring in simulated competitive market negotiation. Organizational Behavior and Human Decision Processes, 67 (1) (1996) 16–25.
[39] Ross, S. A., The arbitrage theory of capital asset pricing. Journal of Economic Theory, 13(3) (1976) 341–360.
[40] Sayim, M., Rahman, H., The relationship between individual investor sentiment, stock return, and volatility, Evidence from the Turkish market. International Journal of Emerging Markets, 10(3) (2015) 504–520.
[41] Schlinger, J.H.D., Theory of mind, An overview and behavioral perspective. Psychological Record, 59(3), 435–448.
[42] Sharpe, W. F.,. Capital Asset Prices, A Theory of Market Equilibrium under Conditions of Risk. Journal of Finance, 19 (1964)(2009) 425-442.
[43] Sharpe, W. F., & Cooper, G. M., Risk-Return Classes of New York Stock Exchange Common Stocks, 1931-1967. Financial Analysts Journal, 28(2) (1972) 46-81.
[44] Shiller, R. J., The Volatility of Long-Term Interest Rates and Expectations Models of the Term Structure. The Journal of Political Economy, 87(6) (1979) 1190 1219.
[45] Shiller, R.J., Market Volatility. MIT Press, Turan G. Bali, Stephen J. Brown, Scott Murray, Yi Tang (2017) A Lottery-Demand-Based Explanation of the Beta Anomaly, Journal of Financial and Quantitative Analysis, 52(6) (1989) 2369-
[46] Shleifer, A., Summers, L.H., The noise trader approach to finance. Journal of Economic Perspectives, 4(2) (1990) 19–33.
[47] Summers, B., Duxbury, D., Decision-dependent emotions and behavioral anomalies. Organizational Behaviour and Human Decision Processes, 118(2) (2012) 226–238.
[48] Statman, M., Behavioral finance, Finance with normal people. Borsa Istanbul Review, 14(2) (2014)65–73.
[49] Thaler, R.H., Advances in Behavioral Finance. New York, Russell Sage Foundation(1993).
[50] Thaler, W., Does The Stock Market Overreact? Journal Of Finance 40 (1984) 793-805.
[51] Tobin, J., Liquidity Preference as Behaviour Towards Risk. The Review of Economic Studies, 25(2)(1958) 65-86.
[52] Treynor to the fall of. A final version was published in 1999 in Asset Pricing and Portfolio Performance. Robert A. Korajczyk (editor) London, Risk Books, (1962)15-22.
[53] Tversky, A., Kahneman, D., Advances in prospect theory, Cumulative representation of uncertainty. Journal of Risk and Uncertainty. 5 (4)(1992) 297–323.
[54] Tversky, A., Kahneman, D., The framing of decisions and the psychology of choice. Science, 211(4481) (1981) 453–458.
[55] Tversky, A., Kahneman, D., Judgment under uncertainty, Heuristics and biases. Science, 185(4157) (1974) 1124–1131.
[56] Tversky, Amos; Kahneman, Daniel., Rational Choice and the Framing of Decisions. The Journal of Business. 59 (4)(1986) 251–278.

APPENDIX 1.0

		ASI	NSE_CMG	NSE_OILG	NSE_BKING	NSE_30	NSEPREMI	NSEINDUST	NSE50	NSEPENSI	NSEINSUR	NSELOTUS	NSE_MAINB	NSE_ASEM	MERIGRO	MERIVAL
Mean		-0.09	-0.20	-0.29	-0.05	-0.15	0.10	-0.27	-0.12	-0.03	-0.12	-0.19	-0.16	-0.18	0.12	0.03
Annual Return		-4.85	-10.45	-14.92	-2.60	-7.65	5.05	-13.85	-6.09	-1.63	-6.01	-9.74	-8.51	-9.41	6.07	1.71
Median		-0.23	-0.43	-0.83	-0.35	-0.34	-0.12	-0.38	-0.52	-0.32	0.00	-0.37	-0.03	0.00	-0.01	-0.40
Maximum		11.70	12.86	13.44	14.08	12.31	20.19	27.76	44.86	12.22	12.63	20.19	39.03	2.81	13.82	15.38
Minimum		-15.57	-12.93	-12.85	-21.70	-16.05	-22.80	-32.71	-16.35	-16.08	-8.52	-15.96	-11.41	-8.91	-11.96	-9.22
Std. Dev.		2.83	3.23	3.76	4.10	2.89	4.12	4.63	4.10	3.17	2.20	3.15	3.42	0.95	2.90	3.82
VARIANCE		8.00	10.43	14.11	16.81	8.38	17.01	21.44	16.85	10.04	4.85	9.92	11.67	0.90	8.44	14.57
COVAR		7.97	6.82	3.59	9.08	7.91	10.44	7.93	6.96	7.79	2.49	4.20	5.08	0.16	5.11	5.53
CORREL		1.00	0.75	0.34	0.79	0.97	0.90	0.61	0.60	0.87	0.40	0.47	0.53	0.06	0.62	0.51
BETA		1.00	0.85	0.45	1.13	0.99	1.30	0.99	0.87	0.97	0.31	0.52	0.64	0.02	0.64	0.69
R^2		1.00	0.56	0.11	0.62	0.94	0.81	0.37	0.36	0.76	0.16	0.22	0.28	0.00	0.39	0.26
Skewness		-0.13	0.07	0.56	-0.10	-0.27	0.14	-0.46	5.17	0.02	0.78	0.73	6.06	-5.19	0.06	1.02
Kurtosis		8.74	5.41	4.46	7.14	8.83	9.66	18.14	61.74	7.29	8.50	12.62	72.77	39.75	6.88	5.35
Jarque-Bera		336.89	59.65	34.73	175.16	349.51	453.13	2348.96	36312.18	187.89	333.21	966.86	51187.33	14885.31	153.60	98.49
Probability		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum		-22.84	-49.22	-70.31	-12.26	-36.07	23.80	-65.24	-28.69	-7.67	-28.33	-45.90	-40.08	-44.32	28.58	8.06
Sum Sq. Dev.		1953.1	2543.8	3443.3	4101.2	2044.7	4150.3	5230.6	4110.6	2449.5	1183.3	2420.6	2846.5	220.5	2058.7	3554.4
Observations		245	245	245	245	245	245	245	245	245	245	245	245	245	245	245
RISK FREE		12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76
TOTAL RISK	VAR	8.00	10.43	14.11	16.81	8.38	17.01	21.44	16.85	10.04	4.85	9.92	11.67	0.90	8.44	14.57
SYSTEMATIC	R^2(VAR)	8.00	5.86	1.62	10.40	7.88	13.73	7.91	6.10	7.65	0.78	2.22	3.26	0.00	3.29	3.85
RESIDUAL RISK	VAR-(R^2*VAR	0.00	4.56	12.49	6.41	0.50	3.27	13.53	10.75	2.39	4.07	7.70	8.41	0.90	5.14	10.72
PROPORTION	SYSMTC RISK ('	100.00	56.23	11.48	61.85	94.08	80.75	36.91	36.19	76.17	16.09	22.38	27.91	0.35	39.05	26.44
	UNSYSYMTC RI	0.00	43.77	88.52	38.15	5.92	19.25	63.09	63.81	23.83	83.91	77.62	72.09	99.65	60.95	73.56
RISK PREMIUM	Bi(Rm-Rf)	-17.54	-15.01	-7.89	-19.98	-17.40	-22.97	-17.43	-15.30	-17.14	-5.47	-9.23	-11.18	-0.35	-11.25	-12.16
CAPM	Rf + Bi(Rm-Rf)	-4.78	-2.25	4.87	-7.22	-4.64	-10.21	-4.67	-2.54	-4.38	7.29	3.53	1.58	12.41	1.51	0.60
SHARPE RATIO	(Rp-Rf)/δp	-6.22	-8.20	-9.78	-5.43	-7.22	-2.72	-9.40	-6.66	-5.09	-6.63	-7.95	-7.52	-7.83	-2.37	-3.91
TREYNOR RATI	(Rp-Rf)/βp	-17.68	-23.30	-27.80	-15.42	-20.50	-7.74	-26.72	-18.93	-14.45	-18.85	-22.60	-21.35	-22.26	-6.72	-11.10
JENSEN RATIO	(Rp-Rf)-Bi(Rm-	-0.07	-8.20	-19.79	4.62	-3.01	15.26	-9.17	-3.55	2.75	-13.30	-13.27	-10.08	-21.82	4.56	1.11
SORTINO RATI	[(Rp-Rf)/-αp]/	-6.69	-7.56	-8.00	-4.10	-7.40	-2.14	-5.90	-9.57	-6.37	-10.61	-9.66	-10.58	-29.56	-3.26	-3.99
Mkt risk adj	(Rm - Rf)	-17.61	-17.61	-17.61	-17.61	-17.61	-17.61	-17.61	-17.61	-17.61	-17.61	-17.61	-17.61	-17.61	-17.61	-17.61
Portfolio risk	(Rp - Rf)	-17.61	-23.21	-27.68	-15.36	-20.41	-7.71	-26.61	-18.85	-14.39	-18.77	-22.50	-21.27	-22.17	-6.69	-11.05
Superiority c	Rm - Rp)	5.60	5.60	10.08	-2.24	2.81	-9.90	9.00	1.24	-3.22	1.17	4.90	3.66	4.56	-10.91	-6.56
Superiority c	(Rp - Rm)	0.00	-5.60	-10.08	2.24	-2.81	9.90	-9.00	-1.24	3.22	-1.17	-4.90	-3.66	-4.56	10.91	6.56
Alpha risk CM	Rf + [Rm-Rf)*	-6.22	-2.92	8.59	-15.17	-4.86	-21.69	-12.51	-5.35	-5.49	4.41	4.37	2.30	1.40	1.59	1.08
Fama's Dcompositn Rtn:																
Risk Free	Rf	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76	12.76
Rtn for syste	Bi(Rm-Rf)	-17.54	-15.01	-7.89	-19.98	-17.40	-22.97	-17.43	-15.30	-17.14	-5.47	-9.23	-11.18	-0.35	-11.25	-12.16
Rtn for Resid	(δp/δm-βi)*(	0.00	-7.93	-23.15	-16.99	-1.03	-14.44	-29.72	-21.75	-4.94	-5.19	-12.59	-14.48	-1.64	-7.31	-19.88
Net Selectivi	Rp-(Rf+δp/δi	0.00	-0.27	3.36	21.61	-1.98	29.71	20.55	18.21	7.69	-8.10	-0.68	4.39	-20.18	11.87	20.99
Total Returns		**-4.78**	**-10.45**	**-14.92**	**-2.60**	**-7.65**	**5.05**	**-13.85**	**-6.09**	**-1.63**	**-6.01**	**-9.74**	**-8.51**	**-9.41**	**6.07**	**1.71**
	Omokehinde Ratio ≥1.0	**-0.03**	**0.12**	**1.06**	**-1.60**	**1.71**	**0.58**	**0.70**	**1.30**	**-1.30**	**-0.05**	**0.25**	**-10.26**	**1.35**	**0.88**	

Source: Author's Computation