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EFFECT OF TACTICAL ASSET ALLOCATION ON RISK AND RETURN IN THE NIGERIAN STOCK MARKET

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Abstract

The study examines effect of tactical asset allocation on risk and return in the Nigerian stock market. The study covers the period of 2005 to 2020. Purposive sampling was employed. 90 regularly traded firms were considered as a filter on the sample size. The monthly stock prices, market index, risk-free rate ownership shareholdings, market capitalization, book value of equity, earnings before interest and taxes, total assets and tactical asset allocation were the data used in this study. The study gathered data from the CBN statistical bulletin, Nigeria of Exchange Website and Standard and Poor (S&P). The Fama-MacBeth two-step regression method was employed. The study found that tactical asset allocation shows that it insignificantly improves return and significantly reduces risk under the whole sample sub-period except for the sub-periods in the Nigerian stock market. Thus, tactical asset allocation is a short-term investment strategy that could be used in making optimal decisions in terms of maximizing return and minimizing risk in the Nigerian stock market. The study recommended that tactical asset allocation is a short-term market timing strategy which can be used in Nigerian stock market to *maximize return and minimize risk against buy and hold strategy which is passive and long-term in nature.*

Keywords: *tactical asset allocation, risk, return, Fama-Macbeth two-step regression*

JEL Classification : *G12, G15*

1. Introduction

Asset allocation establishes the framework of an investor's portfolio and sets forth a plan specifically identifying where to invest one's money. The general approach of an asset allocation strategy is to determine which asset classes to invest in based on your risk tolerance and return objectives. Asset allocation is the combining asset classes such as equities, bonds, and cash in varying proportions within one customized, diversified investment portfolio (Mirae Asset Knowledge Academy [MAKA], 2016). Izundu, Nwakoby, Adigwe, and Alajekwu (2017) opined that the creation of an investment portfolio can be seen as a top-down process which starts with the capital allocation that is, the decision how much should be invested in the risky portfolio and the risk-free assets with a view of how to the question how to compose the risky portfolio. Their study emphasized that the construction of the risky portfolio is the concern of asset allocation which is about making a choice between the asset classes like stocks, bonds, real estate, or commodities under the assumption of neutral capital market conditions which means that no asset class is underpriced or overpriced (proportional risk-return expectations). The study of Izundu et al. (2017) classified asset allocation into three categories which are: benchmark asset allocation, strategic asset allocation, and tactical asset allocation. The benchmark asset allocation is a program that exactly replicates the investment weights of the benchmark index. It could be referred to as indexing wherein no information is used other than the usual details of indexing: determining market weights, and managing delisting, new listing, buyback, secondary market offerings, dividends, and warrants. The strategic allocation is long-term in nature with at least a five-year horizon which relies on long-term economic data to make long-term predictions about the optimal portfolio. The asset allocation set bets on the performance of asset classes based on future forecasts within two to five year and longer period which allows investor to rebalance their investment plans. The deviations that arise from benchmarks introduce a tracking

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error. Tactical asset allocation, the investment managers will take short term bets usually monthly or quarterly and deviate from the strategic weights. The difference between the strategic and tactical weights induces a tactical tracking error. However, the difference between benchmark weights and tactical weights is the total tracking error.

Despite this importance, Markowitz established the mean-variance model, optimal portfolio allocation has been a hot topic in both practical portfolio management and academic research. This is consistent with the assertion of Yanga, Cao, Han, and Wang (2018), as well as Afzal, Haiying, Afzal, and Bhatti (2020). This is because most investors and portfolio managers strive to optimally develop their stock portfolio to meet their investing objectives. However, the question of which combination of portfolio sets he should choose to produce the maximum return given a given level of risk, or which portfolio sets would yield the lowest risk given a given level of return, remains. To answer this question, several authors have conducted empirical studies on how portfolio optimization is driven by asset allocation (Offiong, Riman & Eyo, 2016; Yanga, et al., 2018; Gathage, 2019; Shaukat & Shahzad, 2019; Afzal, et al., 2020; Vaskikari, 2020). Although most of these studies were conducted in developed economies and, to the best of the researcher's knowledge, studies on asset allocation are very scanty in Nigeria, which justifies the importance of this study. In line with this, the study examines the effect of tactical asset allocation on risk and return in the Nigerian stock market.

The contribution of this paper to the existing body of knowledge is three folds. First, an examination of the effect of tactical asset allocation on risk and return within the context of Nigerian stock market. Second, the estimation approach is conducted using Fama-MacBeth two step regression approach under the Fama and French Five factor model. Third, the study considered the effect of tactical asset allocation as a useful tool of investment performance strategy over the long and short period. In view of this, the remainder of this study proceeds as follow; section two documents the literature review, section three details the methodology, section four presents the results and section five proffers the conclusion

2. Literature review

This section covers the review of past studies which include but not limited to Lawal (2014) examined tactical asset allocation in Nigerian banking industry. Data from the Nigeria Stock Exchange on share prices of United Bank for Africa (UBA) and Union Bank of Nigeria (UBN) for the months of September and October 2013 were used. The study used a linear programming model to find tactical solutions to problems relating to portfolio risk minimization. It was documented that optimal allocations of investible funds could be made to each bank 's stock by minimizing the portfolio variance, thus by minimizing the total risk using graphical method of linear programming. Thus, it was concluded that practitioners as well as policy makers use this approach to obtain optimal solutions when faced with decision making given various investment alternatives. Offiong, Riman and Eyo (2016) aimed at determining the optimal portfolio in a three-asset portfolio mix in Nigeria. The data used for the study were daily stock prices for First Bank Nigeria Plc, Guinness Nigeria Plc and Cadbury Nigeria Plc obtained from the Nigerian Stock Exchange for the period of January 2010 to December 2013. The study employed majorly two empirical methodologies which were Matrix algebra and Lagrangian method of optimization. The study found that the assets of Guinness and First Bank are said to be efficient assets with high expected returns and low risk. The study therefore concluded that First Bank and Guinness were the only efficient optimal assets in the three asset-portfolio mix and therefore, the preferred choice for every investor since they yielded a high return with minimum variance. Ndung'u (2016) examined the effect of assets allocation on the financial performance of pension schemes. Data on different classes of assets and performance were collected from financial statements of fifty pension funds for three years. Regression analysis was used, and it was found out that asset allocation strongly explained the variability of fund performance. In addition, it was established that instruments such as treasury bills and commercial paper from cash and money market are the most liquid assets, and real estate is among the most illiquid. Thus, fund managers should strike a balance between liquidity and desired returns by establishing the minimum level of liquid assets they wish to hold in the investment portfolio.

Arbaa and Benzion (2016) analyzed and compared the contribution of asset allocation decisions to the performance of Israeli provident funds relative to passive market participation. The study used 15 years of monthly data for the Israeli provident funds and stock return from January 2000 to December 2014. Cross-sectional regression and time-series regression were used and it was found that, according to time-series analysis, total market movements which account for more than 70% of total returns, and the incremental contribution of policy above the market is only 17% while from the perspective of cross-sectional analysis, security selection dictates both the return level and the variation in returns from active management by 53% but the influence of timing is found negligible (below 10% on average). The study concluded that Policy did very little to improve performance and it was no better than active management in explaining excess return variations in the funds. Nystrup, Hansen, Madsen and Lindström (2016) examined whether dynamic asset allocation is most profitable when based on changes in the Chicago Board Options Exchange (CBOE) Volatility Index (VIX) or change points detected in daily returns of the S&P 500 index. The data analyzed is 6,485 daily log-returns of the VIX and the S&P 500 index covering the period from January 1990 through September 2015. Descriptive statistics and shape ratio were used as the estimation techniques. It is shown that a dynamic strategy based on detected change points significantly improves the Sharpe ratio and reduces the drawdown risk when compared to a static, fixed-weight benchmark. It concluded that it is not optimal to hold a static, fixed-weight portfolio even without any level of forecasting skill.

Wu, Ma and Yue (2017) examined a continuous-time dynamic optimal consumption and portfolio choice model that captures momentum over short horizon. Data on monthly basis were sourced on Shanghai-Shenzhen 300 Index from their website from 2006 to 2011. The study used Hamilton–Jacobi–Bellman (HJB) equation for the investor's dynamic optimization problem. The study found that intertemporal hedging demand motives greatly decrease the portfolio demand for stocks whose risk aversion coefficients exceed one. The study found that risk aversion is the main preference parameter in determining portfolio choice rather than the elasticity of intertemporal substitution. Namusonge, Sakwa and Gathogo (2017) assessed the impact of asset mix on the financial performance of the registered occupational Pension Schemes in Kenya. Systematic sampling technique was used to select a probability sample of 297 sample units from a population of 1232 registered pension schemes for the period 2006–2016 and data were gathered through a questionnaire. A panel regression analysis was used, and it was found that a positive correlation between a financial performance of occupational Pension schemes and asset mix. The study concluded that those schemes that are more conservative will always fetch moderate returns as opposed to those schemes that have aggressive investment policies and act within the regulatory requirements of the Retirement Benefits Authority. Zaremba (2018) examined whether the value spread is useful for forecasting returns on quantitative equity strategies for country selection. The study employed data sample of 120 country-level equity strategies replicated within 72 stock markets for the years 1996–2017. The study employed

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four factor model and weighted average valuations of the long and short sides of the portfolio as the estimation procedure. It was documented that value spread is a powerful and robust predictor of strategy returns in the cross-section, subsuming other methods based on momentum, reversal, or seasonality. In addition, going long (short) the strategies with the broadest (narrowest) value spread produces significant four-factor model alphas, markedly outperforming an equal-weighted benchmark of all the strategies. The study concluded that equity strategies with a wide value spread markedly outperform strategies with a narrow value spread. Yanga, Cao, Han, and Wang (2018) investigated the performance of tactical asset allocation on technical trading rules controlling for data snooping bias. Data on the following stock indices: Korean Stock Price Index (KOSPI), FTSE Straits Times Index (FTSE STI) for Singapore stock market, Stock Exchange Sensitive Index (SENSEX30) for Indian stock market, Nikkei225 for Japanese stock market and Shanghai Composite Index (SCI) for Chinese stock market, and 1-month Treasury bill rates of U.S. as returns were sourced d MSCI spanning from December 1990 to December 2017. The study used reality check (RC), superior predictive ability (SPA) test and their extensions, and false discovery rate (FDR). It was found that no tactical asset allocation strategies on technical trading rules outperform buy and hold benchmark. The study concluded that e that the outperformance of tactical asset allocation on technical trading rules is due to data mining bias. Arbaa and Varon (2018) examined the role of asset allocation policy and active management on equity mutual fund returns. The study employed dataset which consists of two portfolio peer groups of domestic bond funds that were active in Israel as of January 2006, 129 government bond funds and 79 corporate bond funds for the period 10 years from January 2006 until September 2015. The study employed regression analysis and it was confirmed that active management is far more important than policy for corporate bond fund returns, which is mainly attributable to managers' security selection skills while government bond funds and strategic long-term policies account for a larger part of excess market return variability. The study concluded that the greater heterogeneity of investments by corporate bond funds and possibilities for tactical bets can explain the differences in the results of corporate and government bond funds.

Shaukat and Shahzad (2019) assessed the effect of buy and hold strategy, dynamic asset allocation, strategic asset allocation and tactical asset allocation on portfolio risk and return. The study employed the purposive sampling and the non-probability sampling technique in sourcing the data. The data were collected on

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monthly basis for the period of 14 years which constituted the 166 for annual portfolios and 1560 for the monthly portfolio from January 2005 up to December 2017 and they were sourced from KSE 100 Index, including the three sectors viz automobiles, Pharmaceutical and Cement. The study employed One-way analysis of variance (ANOVA) as the estimation technique. The study found that dynamic asset allocation, tactical asset allocation and strategic asset allocation have positive impact on the portfolio risk and return. The study concluded that the Tukey's Post hoc test proves that these strategies are different from each other and will impact the portfolio return and risk differently as the mean difference between their means is not equal to zero. Gathage (2019) determined the relationship between asset allocation and financial performance. Primary data was collected by use of semi-structured questionnaires administered to investment managers and risk managers in the 55 insurance companies. Correlation analysis and multiple regression analysis were the estimation techniques. The study found that integrated asset allocation strategy, strategic asset allocation strategy, strategic asset allocation strategy positively and dynamic asset allocation strategy influences the Kenyan insurance companies‟ financial performance. It was concluded that insurance companies should only use integrated asset allocation strategy when they have enough resources, only use strategic allocation strategy in the achievement of long-term goals and tactical asset allocation strategy should be used in achieving the short-term goals is an organization.

Afzal, Haiying, Afzal and Bhatti (2020) investigated the effectiveness of different tactical asset allocation trading strategies on global stock market indices to better forecast the returns. Data on five global stock indices such as Dutch AEX, Dow Jones, S&P 500, FTSE 100, and NASDAQ have been gathered from CRSP from 1969 to 2018.The study employed Simulated moving Average and Buy and Hold strategy. Results showed that the simulated moving average is the best strategy to generate buy and sell signals to minimize the investor's risk and maximize the return of the portfolio. Thus, it can be concluded that investors who are looking to minimize the risk of their portfolio and decrease the drawdown should use simulated moving average to achieve a balanced portfolio in the future. Vaskikari (2020) re-evaluated the forecasting ability of the most potential stock market predictors found in the tactical asset allocation and equity market timing literature. Daily data on market indices for the US and European markets were collected from various sources which include financial databases of Bloomberg L.P., Thomson Reuters Corporation, Federal Reserve Economic Data (FRED) and

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Statistical Data Warehouse (SDW) for within the period of 1917 to 2019. The estimation technique is regression analysis. It was documented that the equity premium has not been predictable in real-time after the turn of the millennium. The study concluded that the passive buys and hold strategy has the highest forecasting ability as the stock market predictor. Thus, the study recommended it for both private and professional investors. In six locations, Umutlu and Bengitöz (2020) investigated the existence and importance of a cross-sectional relationship between several index features and expected country-industry returns. Global tactical asset allocation, ETFs, stock swap agreements, and mutual funds are among the characteristics of the index. Data on daily and monthly dollar returns, earnings-to-price ratios, dividend yields, ratios of EBITDA to enterprise value, market capitalization, operating profitability, and total assets were gathered for the time from January 1, 1973, through July 31, 2015. The model specification uses the enhanced five factor Fama and French with Carhart model, while the estimating method makes use of the Fam-MacBeth two step approach. The findings demonstrated that industry indexes with high earnings-to-price ratios across all market capitalizations produce greater projected returns in the US, Europe, and Asia-Pacific. Additionally, tiny European portfolios' dividend yield is favorably correlated with their future returns, as are small portfolios in Asia-Pacific with high idiosyncratic volatility. The study concluded that local industry index-based futures and/or equity swap contracts will make it easier to take advantage of profit opportunities than a worldwide tactical asset allocation approach.

Specifically, studies within and outside Nigeria (Offiong, et al., 2016; Yanga et al., 2018; Afzal, et al., 2020 among others) have examined the tactical asset allocation on portfolio performance. However, these past related studies have not considered the effect of tactical asset allocation on the risk and return relationship. In Nigeria, Lawal (2014), Offiong et al., (2016) are the few studies documented on asset allocation in the past, but these studies failed to examine the effect of the tactical asset allocation on risk and return in Nigerian stock market. Therefore, this present study fills the gap in knowledge and contributes to scanty literature within the context of Nigeria and particularly stock market. Therefore, this present study fills in the gap in in knowledge and contributes to scanty literature within the Nigerian context. Thus, the study formulates the null hypothesis as follow:

H0: Tactical asset allocation has no significant effect on risk and return in the Nigerian stock market.

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To test the formulated hypothesis, the study is anchored on modern portfolio theory. The theory emphasized that every investor seeks to maximize their utility (satisfaction) by maximizing expected return and minimizing risk (variance).

3. Methodology

Expo Facto research design was used, and the population of the study covers all the stock listed on the on the Nigerian Stock Exchange (NSE) as of December 2020 which were 161 in number. Purposive sampling was employed, and the sample size was filtered to 90 regularly traded stocks. The monthly stock prices, market index, risk-free rate (which was substituted with the treasury bill rate), ownership shareholdings, market capitalization, book value of equity, earnings before interest and tax, total assets and tactical asset allocation were the data used in this study. The sample period covered from 2005- 2020 which was grouped into sub-sample period; 2005–2008, 2009–2012, 2013–2016, and 2017–2020 in order to compare each short period of four years with the result of the whole market. The data was obtained from the websites of the Nigerian Group of Exchange (NGX), the Central Bank of Nigeria (CBN), and Standard and Poor. The study used ordinary least square through two-step Fama-MacBeth regression method. Consequently, the baseline model chosen for this investigation was Five-Factor Fama and French model and this is specified as follows:

$$R_{it} - Rf_t = a_i + b_i(Rm_t - Rf_t) + S_i(SMB_t) + h_i(HML_t) + u_i(RMW_t) + v_i(CMA_t) + \varepsilon_{it} \quad \text{.................3.1}$$

Where: R_{it} -Rf_t is the excess return of the individual assets. Rm_t - Rf_t is the excess market return, SMB_t is the size factor premium, HML_t is the value factor premium, RMW_t is the profitability factor premium, CMA_t is the investment factor premium, a_i is the intercept, b_i is the regression parameter, S_i is the loaded factor of the size, h_i is the loaded factor of the value, u_i is the loaded factor of the profitability, v_i is the loaded factor of the investment and ε_{it} is the residual term. This model is augmented by incorporating tactical asset allocation and that led to the equation 3.2

$$R_{it} - Rf_t = a_i + b_i(Rm_t - Rf_t) + S_i(SMB_t) + h_i(HML_t) + u_i(RMW_t) + v_i(CMA_t) + d_i(TAA_t) + \varepsilon_{it} \quad \text{..........3.2}$$

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Where: TAAt is the tactical asset allocation premium and di is the loaded factor of the tactical asset. These model specifications take a lead from Kim and Kang (2015). Tactical asset allocation is measured through investors' sentiment, and this is in line with the study of Kim and Kang (2016). To capture the effect of tactical asset allocation on risk in the Nigerian stock market, the tactical asset allocation incorporated in the Glosten, Jagannathan and Runkle Generaized Autorregressive Conditional Heteroscedaticity (GJR-GARCH). This showed the effect of tactical asset allocation on risk in the Nigerian stock market and influence of asymmetric information. The model is expressed in equation 3.3.

$$h_t = a_0 + \sum_{i=1}^{n} a_{1j} h_{t-j} + \sum_{i=1}^{m} a_{2i}\varepsilon_{t-i}^2 + a_{3i} M_{t-i}\varepsilon_{t-1}^2 + \theta_1 TAA_t + \varepsilon_t \qquad 3.3$$

Thus, the study used the investors' sentiment to capture the tactical asset allocation. The investor's sentiment is specified in equation 3.4.

$$EMSI = \frac{\sum (R_{ir} - \overline{R}_r)(R_{iv} - \overline{R}_v)}{[\sum (R_{ir} - \overline{R}_r)^2 \sum (R_{iv} - \overline{R}_v)^2]^{1/2}} * 100 \qquad 3.4$$

Where -100 ≤ EMSI ≤ 100

This method conforms to the approach used by Bandopadhyaya (2006) to estimate investors' sentiment. R_{ir} is the daily return for individual security, R_{iv} is the volatility of individual security and are the sample mean return and historical volatility respectively.

4. Results and Discussion

This section presents the result and discussion of the study. The result starts from the descriptive statistics present in Table 1 below.

Table 1: Descriptive Statistics

	AVR	B	S	H	R	C	TAA
Mean	0.014	0.717	-0.097	-0.358	0.130	0.180	0.688
Median	0.011	0.749	-0.122	-0.360	0.158	0.087	0.749
Max	0.092	2.013	2.078	9.281	8.121	8.69	0.908
Min.	-0.006	-0.199	-4.791	-12.71	-5.937	-3.340	-0.500
Std.Dev	0.016	0.407	0.807	1.830	1.248	1.27	0.213
Skew	2.741	0.500	-1.93	-1.859	1.376	4.119	-3.20
Kurtosis	12.24	3.590	14.3	32.63	26.53	28.9	15.5
J.B	433.3	5.067	541.3	3345.7	2105.8	2771.0	744.4
Prob.	0.000	0.079	0.000	0.000	0.000	0.000	0.000

Note: AVR, B, S, H, R, C and TAA represent average return, systematic risk, size risk premium, value risk premium, profitability risk premium, investment risk premium, and tactical asset allocation.
Source: Author's computation, (2022)

The result is depicted in Table 1, which reveals the average values of average return, estimated risk premia-market, size, value, profitability, investment, and tactical asset allocation. Market risk premium, profitability risk premium, investment risk premium and tactical asset allocation tend to increase average return. On the other hand, the size risk premium, and value risk premium tend to decrease during the sampling. The return values range from -0.006740 to 0.092572, which implies that there are tendencies to make losses and capital gains on the market's trading activities within the sample period. This indicates that there is a presence of active securities on the market. The values of the market risk premium range from -0.199242 to 2.013677, and this suggests that investors are not always rewarded. The values of the size risk premium range from 2.078426 to -4.791040, and this implies that investors are not always rewarded for the size of their portfolio. The value risk premium has a minimum value of -4.791040 and a maximum value of 2.078426. This implies that at some point in time, the co-

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skewness tends to be less volatile than the market, but at other times it tends to be more volatile than the market. The profitability risk premium value ranges from -5.937704 to 8.121966 and this implies that the investment risk premium values range from -3.340886 to 8.696328. Also, the tactical asset allocation has a maximum value of 0.908427 and a minimum value of -0.5, and this implies that the tactical asset allocation strategy tends to increase return and risk throughout the sample period.

The standard deviation in the Table indicates that the value risk premium is the most volatile among the variables, while the least volatile variable among the variables is the average return. Looking at the score of skewness, it reveals that the systematic risk, profitability risk premium, investment risk premium, and average return are positively skewed, while the size, value risk and tactical asset allocation. The scores of kurtoses show that the variables are platykurtic in nature and they are not normally distributed, as shown by the associated probability values of the Jarque-Bera being close to zero. Having described the characteristics of the variables both in their average return for each portfolio, estimated risk premia and tactical asset allocation, the study proceeds to conduct the correlation analysis to show whether the assumption of multicollinearity is refuted among the variables or not.

Table 2: Correlation Analysis

	B	S	H	R	C	TAA
B	1	-0.496	-0.275	0.090	0.421	-0.120
S	-0.496	1	0.836	-0.498	-0.236	0.095
H	-0.275	0.836	1	-0.834	-0.141	0.047
R	0.090	-0.498	-0.834	1	0.231	-0.002
C	0.421	-0.236	-0.141	0.231	1	0.032
TAA	-0.120	0.095	0.047	-0.002	0.032	1

Source: Author's Computation, (2022)

The result shows the correlation coefficients in-between each of the following: risk premia, and tactical asset allocation. The first column shows the correlation between market risk premium, size risk premium, value risk premium, profitability risk premium, investment risk premium and tactical asset allocation. The first pair has a correlation coefficient of -0.4964, the second pair has -0.2753, the third pair is 0.0907, the fourth pair is 0.4218, and the fifth pair has -0.1208. The implication

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of this is that the market risk premium moves in the same direction as the profitability risk premium and investment risk premium, but the market risk premium moves in the opposite direction with size risk premium, value risk premium and tactical asset allocation. The second column reveals that the size risk premium is linearly correlated with the value risk premium, and tactical asset allocation but the size risk premium moves in the opposite direction to the market risk premium, profitability risk premium, and investment risk premium.

The correlation coefficients in the third column show that the value risk premium has linear correlation with size risk premium and tactical asset allocation, but it has negative correlation with market risk premium, profitability, and investment risk premia. The fourth column shows the correlation coefficient with the following coefficient values; 0.0907, -0.4981, -0.8341, 0.2311, and -0.0027. This signifies that profitability risk premium moves in the same direction as market risk premium, and investment risk premium but it moves in the opposite direction with size risk premium, value risk premium and tactical asset allocation. The fifth column of the correlation matrix shows that the investment risk premium moves linearly with the market risk premium, profitability risk premium and tactical asset allocation.

More so, tactical asset allocation has a positive correlation with size risk premium, value risk premium and investment risk premium but it has an inverse correlation with market risk premium and profitability risk premium. The result shows that the coefficients of correlation among the variables are very low except in the cases of 0.8365 and -0.8341, and this implies that the assumption of multicollinearity can be refuted. This simply means the variable can be estimated in the specified models. Having conducted the analysis on the descriptive, the study proceeds to the estimation of the model under the whole samples and sub-periods samples.

The result of the estimation is done fold which are the effect of tactical asset allocation on return in the Nigerian stock market and the effect of tactical asset allocation on risk in the Nigerian stock market**.** Table 3 presents the effect of tactical asset allocation.

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Table 3: Tactical Asset Allocation and Expected Return

Variables	FF5F[1]	FF5F[2]	FF5F[3]	FF5F[4]	FF5F[5]
α	0.006	0.0349	-0.0240	-0.0082	-0.0101
	(0.947)	(3.4877)	(-2.7742)	(-1.2510)	(-1.8649)
	[0.346]	[0.0008]	[0.0068]	[0.2144]	[0.0658]
b	0.001	0.0224	0.0101	-0.0050	0.0074
	(-0.2408)	(3.7671)	(0.6452)	(-1.3085)	(1.2230)
	[0.8103]	[0.0003]	[0.5206]	[0.1943]	[0.2249]
s	-0.0013	0.0415	-0.0090	-0.0001	-0.0463
	(-0.2263)	(5.2782)	(-0.5081)	(-0.1149)	(-4.2158)
	[0.8215]	[0.0000]	[0.6127]	[0.9087]	[0.0001]
h	-0.0037	0.0020	-0.0072	-0.0031	0.0336
	(-0.9632)	(0.3668)	(-1.3090)	(-1.6491)	(3.2163)
	[0.3382]	[0.7147]	[0.1941]	[0.1029]	[0.0019]
r	0.0043	0.0052	0.0068	0.0036	0.0101
	(-1.1920)	(0.9323)	(1.1914)	(1.2494)	(4.1427)
	[0.2367]	[0.3538]	[0.2369]	[0.2150]	[0.0001]
c	0.0048	0.0326	0.0070	-0.0141	0.0071
	(2.9597)	(7.4609)	(1.3981)	(-4.8284)	(1.5660)
	[0.0040]	[0.0000]	[0.1658]	[0.0000]	[0.1212]
Taa	0.0095	0.0021	0.0070	0.0139	0.0004
	(1.2108)	(0.1231)	(1.3084)	(1.1845)	(0.0539)
	[0.2294]	[0.9023]	[0.1943]	[0.2396]	[0.9571]
R2	0.207684	0.6678	0.7059	0.7854	0.8233
Adj-R2	0.1504	0.6438	0.6846	0.7699	0.8102
P(F-Stat)	0.0030	0.0000	0.0000	0.0000	0.0000
Diagnostic Test					
LM Test	2.0814	0.1069	0.3938	1.0091	0.3266
	[0.0911]	[0.8987]	[0.6757]	[0.3691]	[0.7223]
BPG Test	2.2259	0.4690	1.3730	0.8819	1.6780
	[0.0522]	[0.8295]	[0.2351]	[0.5119]	[0.1369]
JB	609.020	0.7280`	0.0335	4.7138	0.0879
	[0.000]	[0.6948]	[0.9833]	[0.0947]	[0.9569]

Note: The figures in parentheses () are the standard error and the one in square brackets [] are the probability values. FF5F[1]-FF5F[5] represents the estimation of five-factor model under whole sample, 2005-2008, 2009-2012, 2013-2016 and 2017 -2020 sub-periods respectively.

Source Author's Computation, (2022)

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The result shows that tactical asset allocation has a positive and insignificant effect on return. This is because the coefficient values of tactical asset allocation 0.009507, which correspond with the probability value of 22 percent. The alpha value has coefficients of 0.006642 with corresponding probability value of 94 percent. This means the alpha value has a positive significant effect on return. Also, the coefficient of systematic risk is 0.001267, which correspond to probability value of 81 percent this signifies that systematic risk has positive but insignificant effect on return and this negates the assumption of the slope hypothesis but conforms to the positive risk-return trade-off. The coefficient of the size risk is -0.001350 with corresponding probability value of 82 percent and this implies that size risk has a negative and insignificant effect on return. However, the coefficient of value risk is -0.003789, which corresponds to the probability value of 32 percent, and this suggests that value risk has a negative and insignificant effect on return. Furthermore, the coefficients of profitability and investment risk are 0.004356 and 0.004851, which correspond with probability values of almost 0 percent, and this means that profitability reveals a positive but insignificant effect on return while investment risk shows a positive and significant effect on return. The model is significant at 0.05, indicating that the models are fit and the joint coefficient of the model influences return.

From the 2005 to 2008, the estimation reveals that tactical asset allocation has a positive but insignificant effect on return. This is because the coefficient value of tactical asset allocation is 0.002191, which corresponds with the probability value of 90 percent. Also, the coefficient of alpha is 0.034915, which corresponds with the probability value of almost 0 percent, and this signifies that the alpha value has a positive but insignificant effect on return. However, the coefficient of systematic risk is 0.022402, with associated probability value of almost 0 percent and this implies that systematic risk has a positive and significant effect on return, which is consistent with the a priori expectation. Also, the result shows that the coefficient values of size risk and investment risk are 0.041521 and 0.032600 with associated probability values of 0 percent, respectively, and this suggests that size and investment risks have a positive and significant effect on return. On the other hand, the coefficient values of value risk and profitability risk are 0.002000 and 0.005237, which correspond with the probability values of 71 and 35 percent, respectively, and this implies that value risk and profitability risk have a positive but insignificant effect on return. The model is significant at 0.05 because the

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probability value of the F-statistic is 0.000 which is less than 0.005. The models are further subjected to diagnostic tests.

Under the 2009 to 2012 sub-period, the report shows that the coefficient of tactical asset allocation is 0.007048, which corresponds with the probability value of 19 percent. This means that tactical asset allocation has a positive but insignificant effect on return under each model, and this suggests that the tactical asset allocation strategy is not significantly priced in the Nigerian stock market. The coefficients of alpha, systematic risk, size risk, value risk, profitability risk, and investment risk are -0.024017, 0.010196, 0.009041, 0.007296, 0.006879, and 0.007048, which are associated with the probability values of 0, 52, 61, 19, 23, and 16 percent, respectively. This suggests that alpha value has a negative but significant effect on return, while size and value risk have a negative and insignificant effect on return, and systematic, profitability and investment risk have a positive but insignificant effect on return. The probability value of F-statistic is 0.00 which is less than 0.05, and this suggests that the model is fit, but the study further subjects the models to diagnostic tests.

The results under 2013 to 2016 sub-period also report that the coefficient of 0.013959 is associated with probability value of 23 percent. This means that the tactical asset allocation has a positive but insignificant effect on return, and this suggests that investors are not rewarded for using such an investment strategy. The estimation of the model shows that the coefficients of alpha, systematic risk, size risk, value risk, profitability risk, and investment risk are -0.008223, -0.005059, -0.000183, -0.003124, 0.003691, and -0.014184, which correspond with the probability values of 21, 19, 90, 10, 21, and 1 percent respectively. This indicates that alpha value, systematic, size, and value risks have negative and insignificant effects on return, but investment risk has a negative but significant effect on return, and profitability risk has a positive but insignificant effect on return. The probability value of the F-statistics is 0.035362 which is less than 0.005. This shows that the models are fit but further subjected to diagnostic tests.

Under the 2017 to 2020 sub-period, the tactical asset allocation coefficient is 0.014735 with corresponding probability value of 95 percent. The evidence from this sub-period also supports that tactical asset allocation has a positive but insignificant effect on return, and this suggests that the introduction of tactical asset allocation does not command a premium. More so, the coefficients of alpha, systematic risk, size risk, value risk, profitability risk, and investment risk are -0.010167, 0.007454, -0.046331, 0.010128, and 0.007161, with corresponding probability values of 6, 22, 0, 0 and 12 percent, respectively. This means that the alpha value has a negative and insignificant effect on return, while value and profitability risks have a positive and significant effect on return. The result of the model also shows that systematic and investment risks have a positive but insignificant effect on return, while size risk has a negative but significant effect on return. The model is significant at 0.05 because the probability value of 0, which is less than 0.05.

It is very explicit from the result that the assumption of no autocorrelation cannot be refuted, and this suggests that the residuals of the models do not correlate over time. Also, the corresponding probability values of F-statistics are larger than 0.05 and this implies that the homoscedastic assumption holds. The normality test reveals the normality hypothesis is violated and this is because the probabilities value of Jarque bear is 0.0001 under the model. This shows the residuals of the models are not normally distributed to the FF5F model.

The study presents the effect of tactical asset allocation on risk, having studied the findings of the study on the estimation of tactical asset allocation on return. The study employs the GJR-GARCH model to estimate the effect of tactical asset allocation on risk in the Nigerian stock market. This method was chosen because it also reveals the effect of asymmetric information on the risk. Thus, for proper estimation, the study conducts some pre-estimation tests before fitting the data for estimation under the whole sample and sub-periods sample.

Table 4. Pre-estimation Test on GJR-GARCH Model

Statistics	**Whole Sample**	**2005-2008**	**2009-2012**	**2013-2016**	**2017-2020**
Normality	1375.299	442.1290	26.9199	0.47314	101.7025
	(0.0000)	(0.0000)	(0.0000)	(0.7893)	(0.0000)
Unit root	-13.647	-9.116133	-7.1348	-6.0483	-7.0179
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Q-Sat	20.130	16.193	16.964	8.8307	16.812
	(0.028)	(0.094)	(0.075)	(0.548)	(0.079)
Arch Effect	33.47632	15.0298	10.2113	1.4143	1.2455
	(0.0000)	(0.0001)	(0.0014)	(0.2343)	(0.2644)

Note: The figures in square brackets [] are the probability values.
Source: Author's Computation, (2022)

Table 4 reports that the normality assumption is rejected under the whole sample period and sub-periods as shown by the probability values of less than 0.05. However, the unit root tests show that the null hypothesis is rejected at the 0.05 level of significance since the P-value is less than 0.05. This implies the whole sample and sub-sample returns have no unit root, i.e., they are stationary. The study presents the autocorrelation using the Ljung-Box Q-Statistic test since it is assumed to be more powerful due to its consideration of the overall correlation coefficients from lags. The p-values from the Q-Statistics test are not significant for all lags under the sub-periods except for the whole sample. The results show persistence in return series and the presence of serial correlation over the whole period, which is an indication of non-random returns in the whole sample period.

The probability (chi-square) of the observed R-square in the table is base 5 percent significance level to reject or accept the null hypothesis of the ARCH effect. The p-value of the observed R-square is 0.0007 under the whole sample, which is less than 0.05, and this implies that the residuals of the Nigerian stock market return have an ARCH effect. This complies with the assumption of estimating the GJR-GARCH model. The result reveals that the p-value of the observed R-square is 0.0001, which is less than 0.05, and this means that the residuals of the stock market volatility have an arch effect in the sub-period 2005 to 2008. Similarly, the arch effect is also present under the 2009 to 2012 sub-period since the associated P-value of the observed R-square is less than 0.005. However, this contradicts the results under the periods of 2013 to 2016 and 2017 to 2020 because the associated P-values are larger than 0.05. The results indicate that the returns of the whole sample and sub-period of 2005 to 2008 violate the homoscedasticity assumption, which suggests that innovations in the returns are heteroscedastic, and these tests allow the returns to be modeled on the GJR-GARCH model, which assumes that the variance of the errors is not constant. However, the GJR-GARCH is not applicable to the sub-periods of 2013 to 2016 and 2017 to 2020. Thus, the study examines the effect of tactical asset allocation on risk in the Nigerian stock market using the GJR-GARCH model. The model incorporates tactical asset allocation and evaluates its e as well as the underlying asymmetric information. The estimation is performed for both the whole sample and sub-periods.

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Table 5: Tactical Asset Allocation and Risk

Variable	whole sample	2005-2008	2009-2012
Constant	-0.0001	0.0126	0.0012
	(0.0002)	(0.0052)	(0.0038)
	[0.4981]	[0.0170]	[0.7477]
Taa	0.0004	-0.0155	-0.0008
	(0.0003)	(0.0065)	(0.0044)
	[0.1996]	[0.0173]	[0.8413]
ARCH(Alpha1)	0.1465	0.4495	-0.2204
	(0.0434)	(0.1034)	(0.1326)
	[0.007]	[0.0520]	[0.0967]
GARCH(Beta1)	0.8891	0.5485	1.0405
	(0.0385)	(0.1496)	(2.99E-99)
	[0.0000]	[0.0002]	[0.0000]
GJR(Gamma1)	-0.2353	-0.3938	-0.2511
	(0.0515)	(0.2199)	(0.3614)
	[0.0000]	[0.0734]	[0.4871]
Diagnostic ARCH	2.8591	0.1147	0.1267
	[0.0909]	[0.7348]	[0.7218]
Q-Statistic	7.1621	12.770	9.4952
	[0.710]	[0.237]	[0.486]

Note: The figures in parentheses () are the standard error and the one in square brackets [] are the probability values.
Source: Author's Computation, (2022)

The result shows that tactical asset allocation has a positive but insignificant effect on risk under the whole sample and 2009 to 2012 sub-period. However, during the 2005–2008 sub-period, tactical asset allocation has a significant negative effect on risk. The result shows that there is a long-term memory as to the effect of the shock in the Nigerian stock market across the whole sample and the sub-periods. The leverage effect is negative and insignificant at 0.05 under the sub-periods but significant at 0.05 under the whole sample period, and this indicates the presence of an asymmetric effect under the whole sample period. Thus, the presence of a negative asymmetry effect reveals that a positive shock or good news associated with a tactical asset allocation strategy increases risk more than a negative shock under the whole sample. However, the result of the sub-periods reveals that tactical asset allocation has a negative symmetrical effect on risk, which means the stock market volatility's response to good or bad news associated with tactical asset allocation is the same. The study conducted the diagnostic tests, and it was found that the model was fit and meaningful, hence generalization can be drawn from it. The study examines whether the third objective of this study is achieved in the following sub-sections.

4.1. Discussion of Findings

The findings of the study reveal that tactical asset allocation has no significant effect on return in the Nigerian stock market. The findings show that tactical asset allocation has a positive but insignificant effect on the whole sample and the sub-periods. Contrary to this, it was found that tactical asset allocation has a significant effect on risk in the Nigerian stock market. Also, under the whole sample, it was found that tactical asset allocation has a positive and significant effect on volatility, but under the sub-periods, the result shows that tactical asset allocation has a negative but significant effect on volatility. The study discussed the findings with other previous studies, which included but not limited to Shaukat and Shahzad (2019), who found that portfolio strategies such as tactical asset allocation have a positive effect on the portfolio risk and return in the Pakistan stock market. This does not conform to the findings of this study but partially supports the a priori expectation because it has a positive and significant effect on return. However, the expectation of using tactical asset allocation is to improve performance through risk minimization, and this is in line with the findings of the study under the sub-periods. Also, Afzal et al. (2020) established that tactical asset allocation minimizes risk and maximizes return of a portfolio in five global stock markets, and this partially supports the findings of this study. The results of the whole sample and sub-period sample both establish that the short selling strategy is not significantly priced in the Nigerian stock market. The whole sample result and the 2005 to 2008 sub-period show a negative and insignificant effect on return, while the 2009 to 2012, 2013 to 2016, and 2017 to 2020 sub-periods show a positive but insignificant effect on return.

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5. Conclusion

The study found that drawdown has no significant effect on risk in the Nigerian stock market. More so, the findings revealed that the tactical asset allocation is not significantly priced in the Nigerian stock market. Contrary to this, it was found that tactical asset allocation has significant effect on risk in the Nigerian stock market. This means that tactical asset allocation shows that it insignificantly improves return and significantly reduces risk under the whole sample sub-period except for the sub-periods in the Nigerian stock market. Thus, tactical asset allocation is a short-term investment strategy that could be used in making optimal decisions in terms of maximizing return and minimizing risk in the Nigerian stock market. The study recommended that tactical asset allocation is a short-term market timing strategy which can be used in Nigerian stock market to maximize return and minimize risk against buy and hold strategy which is passive and long-term in nature. Further studies should be replicated by comparing Nigeria with other Sub-Saharan African countries to see whether the effect of tactical asset allocation on risk and return is replicated.

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