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INVESTIGATING MOMENTUM RETURNS AND NON-FACTOR EXCESS PROFITS IN NIGERIA'S EQUITY MARKET

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ABSTRACT

This research looks into trends in the four-factor model in Nigeria's stock market. It specifically checks if market factors do better than non-market ones and digs into size and value effects across different portfolios. The study used monthly average returns from 59 stocks between January 2012 and June 2017 to see how well the four-factor model stacks up against single-factor and three-factor models. They used basic statistics and Ordinary Least Squares (OLS) to analyze the different forms of the models. The results show that size is beneficial in high-beta portfolios and low-return market settings, while value effects stand out only in low-beta portfolios. Momentum effects are stronger in high-beta portfolios during low-return conditions. The study also finds consistent momentum profits over 1% during the period, along with signs of mean reversion and market underreaction to news. It suggests that investors consider the four-factor model for estimating expected returns and required rates of return, as single-factor models don't explain things well enough. Finally, it

recommends that the government support market liquidity and make listing rules easier to boost market activity.
Keywords: Momentum; Momentum; Risk Premium; Value Premium; Size Premium; Four-factor model
JEL. Classification: C58; E44; G11; G12

INTRODUCTION

The Nigerian capital market is known for being a place where you can invest profitably, and it's been tested in many ways, similar to other developed markets. Some researchers, like Adedokun and Olajoko in 2012, have looked into the Capital Asset Pricing Model (CAPM) to see if it's a good way to measure risk and return. There are still mixed opinions on whether CAPM does a good job of explaining that relationship. Because of this uncertainty, many investors aren't stepping in, which slows down the market's growth. There have also been problems like insider trading, theft, and unauthorized share sales. On the flip side, the market did see a big surge during the banking and insurance sector's consolidation and recapitalization. But trading has been slow in some areas, showing that there just aren't enough options available for real economic growth.

Some studies worth checking out include Oke (2013), Adedokun and Olakojo (2012), Osamwonyi and Asien (2012), Abdullahi, Lawal, and Ibrahim (2011), and Olakojo and Ajide (2010). They all looked at how a single factor falls short in explaining the ups and downs in market risk and return. Oke (2013) used the single-factor model known as CAPM for the Nigerian Stock Market, but found that it didn't hold up. On the other hand, Osamwonyi and Asien (2012) used the Sharpe-Lintner version from Campbell, Lo, and Mackinlay (1997), which showed a solid link between security return and market betas. Their findings

suggested that CAPM's approach might not work well in Nigeria, likely due to their focus on just one factor. Given these findings, it's important to properly investigate CAPM to give investors a clearer picture that the capital market can be profitable and not as risky as it seems, highlighting potential gains from different market strategies.

This study aims to clarify the role of the Capital Asset Pricing Model (CAPM) in the Nigerian stock market, as previous findings have been mixed. Some researchers support CAPM's validity while others challenge it. One reason for these differing views might be that they used a single factor with limited ability to explain stock risk and returns in Nigeria. The main goal here is to determine if CAPM holds up in the Nigerian market. We want to answer some specific questions about how asset pricing models work there. First, is the four-factor model, which includes a momentum factor, valid in the Nigerian capital market? Second, does the market factor perform better than the non-market factors?

This study aims to fill a gap in the research by looking at the validity of the CAPM model suggested by French-Fama-Cahart (1997) in the Nigerian stock market. There's been a lack of thorough investigation around the relationship between risk and return in a way that applies to asset pricing in Nigeria. So, we need to analyze time-series data to identify factors like momentum, size, and value across different stocks. This research will help us understand how risk and return behave for various portfolios investors hold. By validating and challenging previous research findings, this study adds to what we know. It uses multifactor models, which are practical for real-world investing, while noting that the CAPM model hasn't been fully proven in the Nigerian Stock Exchange. We'll test

single, three-factor, and four-factor models using the same measures and a solid data set to find the best fit for Nigeria. This could be really helpful for investors because the Fama-French-Carhart Multifactor Model can provide clearer insights into how factors like company size, book-to-market ratios, and momentum can affect stock returns.

The Nigerian capital market has been tested as a good spot for investment, much like markets in developed countries, but the results have been mixed. Earlier researchers, including Adedokun and Olajoko (2012), Osamwonyi and Asien (2012), and Nwude and Eyisi (2013), looked into how the Capital Asset Pricing Model (CAPM) works in Nigeria. Yet, there's still no agreement on whether it's valid. Investor confidence is low, which is partly due to insider trading and poor corporate governance, and this is slowing down market growth. Even though there was a surge during the banking and insurance mergers, trading is still limited in some areas, pointing to deeper issues. Many previous studies mostly used the single-factor CAPM, which didn't always do a good job of showing the differences in risk and returns. Newer research shows that adding more factors may better reflect how asset prices behave in emerging markets. This study plans to look at the validity of CAPM by using a four-factor model that includes the momentum factor and check if market factors do better than non-market factors in Nigeria's capital market.

LITERATURE

Oke (2013) looked into the Capital Asset Pricing Model (CAPM) on the Nigerian stock market, using weekly data from 110 companies listed on the Nigerian stock exchange (NSE) between January 2007 and February 2010. The study found that the CAPM's claim that higher returns come with higher

risk (beta) doesn't hold true. They also challenged the idea that the intercept should be zero when measuring the Security Market Line (SML). The results even went against the notion that the slope of the SML must match the return of the excess market portfolio. Overall, this study questioned the CAPM's validity in the Nigerian capital market. Notably, they didn't create a Momentum portfolio, which could have impacted the results, and only looked at a single-factor model.

Adedokun and Olakojo (2012) tested the CAPM's validity using a method inspired by Sharpe and Linter. They analyzed monthly stock data from 16 companies between January 2000 and December 2009 and found that CAPM fell short in explaining the relationship between asset risk and return. Their work built on findings from Osamwonyi and Asien (2012) and highlighted issues noted by Jensen regarding possible errors from using proxies for different variables.

The five-factor model from Fama and French (2015) adds investment and profitability elements to the earlier three-factor model, and also modifies Cahart's four-factor model by including market and industry-adjusted value, profitability, and momentum. This has led to a lot of discussions in the asset pricing field. The main idea behind these extra variables is that companies with better working profits and a steady growth rate in assets tend to have above-average returns. When looking at the results from the five-factor model, split by size and book-to-market ratios, we see that the alphas for small-growth portfolios remain the same and are often negative compared to the standard three-factor model. But for small-value and large-growth portfolios, the alphas are usually strong and positive.

The work of Harvey, Liu, and Zhu (2016) and Hou, Xue, and Zhang (2017) is really important in discussing other factor models. It's clear that no single model can cover all the anomalies that exist. In this conclusion, the ideas from Fama and French (2018) point out that having too many priced factors can make comparisons tricky, while Hou et al. (2015) and Blitz et al. (2018) warn that data mining might just create more noise without any solid theoretical backing.

McLean and Pontiff (2016) pointed out that some trials might not be statistically sound and believe the criticisms mentioned will lead to future research suggesting better models to figure out real return factors. Feng, Giglio, and Xiu (2017) introduced a model-selection technique that aims for clarity on the variables commonly found in recent studies. On the other hand, Harvey, Liu, and Zhu (2016) proposed a structure to carry out various tests and suggest levels of statistical significance for asset pricing research. Fama and French (2018) recommend ranking asset pricing models based on the highest squared Sharpe ratio in a model.

Recent work by Sun et al. (2022) shows how strong multifactor models can be in emerging markets, noting that momentum and profitability are still crucial for returns. Hou, Xue, and Zhang (2015) also focused on investment and profitability in their q-factor model, questioning whether the CAPM holds up on its own. Harvey, Liu, and Zhu (2016) acknowledged that while using multiple factors can lead to overfitting, no single model can explain asset prices perfectly. McLean and Pontiff (2016) also warned about lower returns when anomalies are taken advantage of, stressing the need for ongoing testing in markets like Nigeria.

Recently, Olowookere and Akinleye (2022) looked into momentum effects in African stock markets and found that momentum sticks around even when taking into account factors like liquidity and company size. They point out that places like Nigeria need asset-pricing models that are designed specifically for their unique market issues. Aregbeyen and Olowe (2023) backed this up with recent evidence from the Nigerian stock market, showing that multi-factor models, especially those that consider momentum and profitability, do a better job of explaining returns than single-factor models.

METHODOLOGY

The research will use the Ordinary Least Squares (OLS) regression to calculate the factors of the single-factor Capital Asset Pricing Model (CAPM) and reproduce the outcomes of the three-factor Fama & French as well as the four-factor Carhart specifications. The two-pass regression method outlined by Fama & Macbeth (1973) is applied to both conditional and nonconditional equations of the models. The estimates of stock specific betas are obtained through the calculation of simple OLS regressions of the monthly average returns of each asset and the returns of the market index during the period between January 2012 and June 2017. These calculations produce SMB, HML, and WMLO parameters, as of June 2022, and as such, they permit calculation of long-run and averaged values (long-run, average values) of these parameters.

The extension to the original three-factor model introduced by Fama and French (1992) is Carhart (1997) four-factor model that adds a momentum factor. The difference between the value-weighted average of best-performing and worst-performing stocks the previous month is determined as momentum in the present study. A given security has

momentum when the average twelve-month returns have been positive. Four-factor model hence, provides the investors with a new measure of portfolio construction and forms a yardstick of measuring active management and mutual funds. This approach to modeling is based on the One-Pass regression approach developed by Carhart (1997).

$$R_p - R_{ft} = \beta_0 + \beta_{im} R_{mt} - R_{ft} + \beta_{is} SMB + \beta_{ih} HML + \beta_{imt} WMLO + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots$$

(3.1)

The intercept in this model is been called "four-factor alpha"
Where

$R_p - R_{ft}$ - is the monthly excess returns of the portfolio,

$R_{mt} - R_{ft}$ - this is the premium of the market, representing market excess return and the risk-free interest rate.

SMB - we compare the equal-monthly-weighted average returns of small-cap mimicking portfolios, relative to the large-cap mimicking portfolios, to evaluate the size premium.

HML - On the same note, we perform the same estimates above this time comparing the equal weighted mean returns on high book-to-market ratio mimicking portfolios and the low book-to-market ratio mimicking portfolios as a measure of the value premium.

$WMLO$ - momentum can be evidenced by comparing the equally weighted average returns of the Winner mimicking portfolio, which consists of the highest past-performing stocks, with that of Loser mimicking portfolio, which comprises of lowest past-performing stocks. It indicates a momentum factor or earning premium.

β_{im}, β_{is}, β_{ih} and β_{imt} are the slopes of the one pass regression which is the risk-factor sensitivities. β_0 is the intercept of the model and ε_{it} is the stochastic error term.

Data Analysis and Interpretation of Results

This table **4.1** is on the descriptive statistical values computed on the four-factor model which comprises of factor portfolios (Momentum, Size and Value) and the market portfolio. The research describes these variables based on their mean, standard deviation, minimum/maximum, the skewness and as well as kurtosis value of their distributions. The summary is given in as follows;

Table 4.1- Descriptive Statistic Results for the Four Factor Model

Statistic	RM	SMB	WMLO	HML
Mean	0.002567	0.202893	0.56947	0.225363
Maximum	0.329621	3.088508	6.392367	3.565022
Minimum	-0.53682	-0.43528	-0.20545	-0.78547
Std. Dev.	0.132281	0.610178	1.373813	0.691657
Skewness	-1.08817	3.151203	2.798125	2.766434
Kurtosis	6.929238	13.24671	10.11164	11.89829
Jarque-Bera	50.43846	361.7885	204.7336	274.4805
Probability	0	0	0	0

As stated in Table 4.1, the study shows that all the portfolios do not indicate negative minimum returns. The portfolio value portfolio has the lowest minimal return, this is followed by the market portfolio and then the winner portfolio although it is slightly above zero. Remarkably, the portfolio of the winner reaches the peak in August 2016. Market portfolio has an

almost zero mean of 0.0029 percent in relation to its mean performance. The portfolio of the winner on the other hand has an average value of 57.39 percent and the average of the value portfolio is 21.18 percent. In regard to risk, market portfolio has the smallest standard deviation of 0.132281 and it is therefore the least risky portfolio. In contrast, the largest standard deviation present in the portfolio of the winner was 1.3738, which is an indication of the largest variability. This property positions the winner and value portfolios at the level of most risky options, but are providing the most returns as well. The result of the empirical investigations thus substantiates the hypothesis that non-market portfolios perform better than the market portfolio and that they involve greater risk levels than the market portfolio. Another examination will show that the other portfolios are positive skewed, with high kurtosis and, consequently, tend toward higher variance. In addition, JB statistics of all the variables are also significant, thus implying that portfolio returns are not normally distributed.

Testing the CAPM: Four-Factor Models

The empirical study makes an analysis of the four-factor model of the CAPM in the context of stock market. Both average constant and its statistical significance, probability distribution of coefficient estimates as well as average coefficient of determination are analysed in the time series version of the model. Simultaneously, a cross-sectional adaptation of the model is also tested by carrying out statistical tests including the Ramsey Reset test, tests on serial correlation and heteroskedasticity, and the significance attached to the constant and slope coefficients.

Table 4.2-Validation of Time Series

Pricing Identification of CAPM with 4 Factors

Average Constant	Average Probability	Average R-squared
-0.00608	0.531268	0.5121

Table 4.3-Validation of Cross-sectional Pricing Identification of CAPM with 4 Factors

PANEL-A

Ramsey RESET Test	Value	P-value	LM Test	Value	P-value	BPG Test	Value	P-value
t-statistic	3.205	0.0023	F-statistic	0.2829	0.7548	F-statistic	0.624	0.6474
F-statistic	10.27	0.0023	Chi-squared	0.6349	0.728	Chi-squared	2.607	0.6256

PANEL-B

Variable	Coefficient	Std. Error	t-Statistic	Prob.
B1	-0.00271	0.009424	-0.28703	0.7752
B2	0.187471	0.006631	28.27231	0
B3	0.133903	0.015264	8.772362	0
B4	0.487564	0.019828	24.58974	0
C	0.018463	0.013999	1.31889	0.1928
JB	1081.89			0

Validity Tests for the Capital Asset Pricing Model (CAPM)

In our discussion, we have used a procedural procedure of experimental investigation to make the points proven. The first question that we investigated was whether or not the Capital Asset Pricing Model (CAPM) will stand up as it is tested by the four basic propositions: (1) linearity of the risk-return relationship, (2) slope of the risk-return relationship, (3) systematic risk, and (4) idiosyncratic risk. These hypotheses

were tested on four different samples all of them were covering all the years expertly 2012, 2013, 2014, 2015 and 2016 but there were also three overlapping years, namely: 2012, 2013, 2014, 2013, 2015 and 2014, 2015, 2016. The intervals were selected in order to cover the initially mentioned periods of the original sample found in the previous works associated with the CAPM.

Overall Period (2012 to 2017) Tests:

In this period, the study investigates whether the four hypotheses mentioned above are empirically fair in the context of the Nigerian equity market. The test results are reported as follows:

Table 4.4 Test of Positive Risk Hypothesis and Slope Hypothesis 2012 to 2017

Regressor	Coeff	Sdt-Error	T-stat	P-value
BETA1	-0.354734	0.040433	-8.773425	0.0000
C	0.470749	0.089385	5.266541	0.0000

The regression result in the Table 4.4 shows that the beta (as an approximation of systematic risk) of the full year 2012 to 2016 is about -0.35. The p-value and T-statistic of this would be 0.000 and -8.04 respectively. These findings imply that there was a strong negative correlation between systemic risk and average return in the cited 5-year period. Therefore, the hypothesis of theoretical capital asset pricing model (CAPM) indicating that the greater the risk, the higher the returns are not true of the sample being considered. However, the results of the regression analysis verify the slope hypothesis, as the beta coefficient is different than null-value; this means that investors were getting better returns by bearing less

systematic risk and this phenomenon is against the popular belief that higher risks bring higher returns.

Table 4.5 – Test of Linearity Hypothesis 2012 to 2016

Regressor	Coeff	Sdt-Error	T-stat	P-value
BETA1	-0.0135	0.0168	-0.8023	0.4258
BETA1^2	0.0487	0.0018	26.7735	0.0000
C	0.0176	0.0296	0.5936	0.5552

The table 4.5 indicates, the beta and beta-squared values are -0.013 and 0.049. Beta's P-values are 0.43 and 0 for beta-squared. This implies that the beta value really isn't any different from zero, but beta-squared is. It appears like the CAPM model changes when you add a nonlinear term like, Beta squared. Therefore, in such a period we cannot infer a linear relationship between risk and return.

Table 4.6-Test of Systematic Risk Hypothesis 2012 to 2016

Regressor	Coeff	Sdt-Error	T-stat	P-value
BETA1	-0.081961	0.029026	-2.823710	0.0066
SD1	0.216331	0.016509	13.10417	0.0000
C	0.006305	0.057062	0.110488	0.9124

Table 4.6 results reveal that the beta (systematic risk) observed is -0.08 whereas the standard deviation (unsystematic risk) is 0.22 hence resulting in corresponding P-values of 0.01 and 0 respectively. As a result, the two sources of risk are significant. This finding is a challenge to the CAPM hypothesis which notes that systematic risk is the only predictor of risk premium within the stock market,

unsystematic risk also has its calculable hand. The study of the years 2012-2016 goes further to explain that alone diversification is not enough to mitigate unsystematic risk, and therefore a portfolio manager would have to achieve the intended amount of returns by having an abnormally high number of investments.

First Sub-Period (2012 to 2014) Tests:

The first sub-period of the research spans three years, from 2012 to 2014. The tests outlined earlier were repeated, and the results are presented in Table 4.17.

Table 4.7-Test of Positive Risk Hypothesis and Slope Hypothesis 2012 to 2014

Regressor	Coeff	Sdt-Error	T-stat	P-value
BETA2	-0.099854	0.025456	-3.922525	0.0002
C	0.123106	0.024180	5.091296	0.0000

The coefficient of the systematic risk is of negative sign (-0.10) and a significant statistical level (p = 0). This finding indicates that increase of systematic risks is accompanied by decrease in mean returns. The regression does not show a positive direct co- relationships between systematic risk and average return but the negative sloping which does happen to be significant does support the stand taken by the Capital Asset Pricing Model.

Table 4.8-Test of Linearity Hypothesis 2012 to 2014

Regressor	Coeff	Sdt-Error	T-stat	P-value
BETA2	-0.217151	0.029358	-7.396741	0.0000
BETA2^2	0.130964	0.023393	5.598502	0.0000
C	0.103849	0.019834	5.235976	0.0000

Table 4.8 demonstrates that nonlinear risk component is identified and it is significant at a time, whilst the linear risk component has a negative and significant effect. These results refute the expectation of a strict linear connection because the positive correlation between risk and returns can be traced all through the period of 2012 to the year 2014.

Table 4.9-Test of Systematic Risk Hypothesis 2012 to 2014

Regressor	Coeff	Sdt-Error	T-stat	P-value
BETA2	-0.003321	0.005210	-0.637403	0.5265
SD2	0.166071	0.004076	40.74034	0.0000
C	-0.001160	0.005360	-0.216417	0.8294

The coefficient of the slope in Table 4.9 is against the expected value. Precisely, the value of unsystematic risk has a positive coefficient of equal to 0.17 and is significant at 1 % level (p = 0.01). This revelation points to the fact that the unsystematic risk has significant implication on average returns and therefore questions the argument by CAPM that only systemic risk alone has implication on returns differentials.

The Second Sub-Period (2013 to 2015) Tests:

The second sub period in question is a period going between the years 2013 and 2015 which can be reckoned as a three year period. This period came just before the most recent economic woes to have hit Nigeria- with instances of Shoe-Leather Inflation- and hence provides a means to test the strength of principles governing CAPM. The related findings are reported in Table 4.20.

Table 4.10-Test of Positive Risk Hypothesis and Slope Hypothesis 2013 to 2015

Regressor	Coeff	Sdt-Error	T-stat	P-value
BETA3	0.351969	0.070741	4.975467	0.0000
C	-0.203116	0.108999	-1.863464	0.0676

The beta coefficient, as it is commonly viewed as a proxy of the systematic risk, or market risk, is positively signed 0.35, and significant at the 1 percent level (p = 0). This result complies with the what the capital-asset-pricing model (CAPM) would have led one to expect, i.e., that larger risks shall be linked with larger average returns. This is established in the relationship in equity returns analyzed by the author in the duration 2013 to 2015 whereby every unit of risks is related to an increment in the expected returns measuring to be about 0.35 units. Systematic risk is, therefore, revealed to have a positive effect on returns.

Table 4.11-Test of Linearity Hypothesis 2013 to 2015

Regressor	Coeff	Sdt-Error	T-stat	P-value
BETA3	-0.341225	0.212989	-1.602076	0.1148
BETA3_2	0.123606	0.036171	3.417211	0.0012
C	0.280885	0.173399	1.619877	0.1109

When the nonlinear component is included in the equation the beta coefficient changes very significantly: the linear part of beta increases in being negative related with risk, and the squared part turns out to be significant and positive correlated. This observation means that empirical relation between risk and returns is fundamentally not linear and, hence, violates the linear assumption behind the CAPM.

Table 4.12-Test of Systematic Risk Hypothesis 2013 to 2015

Regressor	Coeff	Sdt-Error	T-stat	P-value
BETA3	0.100571	0.018927	5.313607	0.0000
SD3	0.192297	0.006315	30.45196	0.0000
C	-0.111092	0.026416	-4.205437	0.0001

This means that there is an insignificant correlation between beta and the unsystematic risk coefficient (r = 0.092, p = 0.209) that shows that the market rewards investors on the grounds of bearing both the systematic and idiosyncratic risk. This evidence is bad news because of what the CAPM implies, and, therefore, confirms the earlier empirical results, which under-support the hypothesis of systematic risk in the course of this specific sub-period.

The Third Sub-Period (2014 to 2017) Tests:

Under third sub period, there have been the new economic crises which swept through various markets such as the equity market of the Nigerian economy. This emergence leads to the question on whether assumptions of Capital Asset Pricing Model (CAPM) remained steady even in the face of such troubled weather. The results are shown in table 4.23:

Table 4.13-Test of Positive Risk Hypothesis and Slope Hypothesis 2014 to 2017

Regressor	Coeff	Sdt-Error	T-stat	P-value
BETA4	-0.300510	0.118910	-2.527205	0.0143
C	0.666559	0.234157	2.846636	0.0061

The beta coefficient (-0.30) is found to be statistically significant at the level of 1 per cent; hence, the slope

coefficient is significant, but it shows negative value. In this sub-period it is midway in this sub-period overlapping the economic crisis and the positive risk hypothesis is not confirmed. This situation could be the reason why equity investments in the stock market have been experiencing unforeseen shrinks even when their risk ratings are high due to the recent economic meltdown which has hit Nigeria.

Table 4.14-Test of Linearity Hypothesis 2014 to 2017

Regressor	Coeff	Sdt-Error	T-stat	P-value
BETA4	-0.599105	0.151548	-3.953243	0.0002
BETA4^2	0.045218	0.015498	2.917644	0.0051
C	0.784430	0.223778	3.505400	0.0009

Empirical findings show that between 2014 and 2017, there was no linear relation between systematic risk and returns and it is supported by the negative coefficient used in explaining the level of systematic risk and the positive and significant coefficient used in explaining the squared term of systematic risk. This result is therefore seen not to hold true to the linear representation supposed of capital-asset pricing model (CAPM) and here displays a model of failing to represent the dynamics of systematic risk during this time interval.

Table 4.15-Test of Systematic Risk Hypothesis 2014 to 2017

Regressor	Coeff	Sdt-Error	T-stat	P-value
BETA4	0.086021	0.048711	1.765942	0.0829
SD4	0.335496	0.017768	18.88185	0.0000
C	-0.260996	0.099946	-2.611377	0.0116

As shown by the findings, in odd contrast to the theoretical premise set out by CAPM, both systematic and unsystematic risks have positive significance where systematic risk is

statistically significant at the 10 % level. Therefore such results contradict the argument that systematic risk is the only risk factor that is priced in the Nigerian market and bears out the larger claim that all risk types are relevantly productive of returns.

SUMMARY AND FINDINGS

The current study reveals that multifactor model explains the risk-return relationship in the Nigerian capital market in different market circumstances and portfolio diversifications. Empirical evidence on time- series demonstrates that four-factor model is plausible since the coefficient on the mean constant is statistically in- differentiable to zero. In the entire sample, CAPM four-factor model reveals that 51 percent of the risk premium is predicted averagely which is in harmony with the constant aspect of the framework. Using the cross-section dimension, three out of the four factors namely the SMB, HML and WML prove to be statistically significant, the overall market return is not significantly different than zero. Since three of the factors exhibit explanatory factors, the four factor model qualifies as acceptable within the Nigerian setting under the guidance of the rules set out by Cahart (1997). The founder model of capital markets, CAPM, assumes that there exists a positive correlation between systematic risk exposure and the expected portfolio return, although, the recent time analysis of Nigerian capital market was not empirically supportive of an analogy concerning linear correlation. However, the null hypothesis of the equality of the beta coefficient and zero was rejected and hence the slope of the regression was significantly different to zero though not constant. Based on this finding, the researcher assessed the above relationship in the context of the Nigerian market and

concluded that in the Nigerian market, prompting conditions of strong positive market actions, portfolios with high momentum characteristics produced lower returns, hence giving a countercyclical relationship. Collectively, this evidence makes the argument that the equilibrium portfolio therefore implicitly presupposes the direct proportionality in the risk exposure and the expected payment unrealistic.

Markowitz and Sharpe have provided us with the tool on how we evaluate portfolio risk but based on the results presented hereay it can be implied that their premise especially on the idea that through diversification it is possible to remove unsystematic risk may not hold across the board. Its empirical study reveals that investors who have to face the Nigerian market ecosystem, have to deal not just with the systematic risk but also with idiosyncratic risk that does not disappear as holding periods increase and portfolios diversify. Therefore, we may have a situation where the minimum required degree of diversification in the feasible set of a certain investor is larger than the least diversification suggested by the traditional objective models.

Other empirical works on the Nigerian market are close to zero on other aspects of equities except on its size and value. The proposed study builds on these previous studies and incorporates the evidence of momentum, a factor that was under-studied in the past in this body of literature. In addition, the results support earlier conclusions indicating that portfolios that have firms of high-market-capitalization and large lead to high returns as opposed to merely using a value or size criteria in making portfolios, but also they discard expectations that the returns made through exclusively using

size or value portfolios may be adequate to capture performance dispersion.

Overall, the study supports the hypothesis advanced by Oke that the higher systematic risk, the more the expected returns as well as proving that indeed momentum is an extra variable in explaining the Nigerian equity market. To this end, the analysis further enhances our knowledge of the risk-reward relations within the said environment since it determines the presence of a strong slope as well as a systematic departure of those amounting to the load-and-return line.

Theoretical Implications

The traditional CAPM framework in examining risk-return relationship in the Nigerian market is not adequate. A more holistic model that takes into consideration factors like the size and value of a firm and the short term momentum is thus required. Moreover, every empirical study carried out on developing markets is showing that asset returns to risk are nonlinear and thus require the adoption of nonparametric methods (Feng, Giglio & Xiu, 2020). More so, the existence of large and unsystematic risk in these environments shows that optimal diversification is not achievable (Harvey et al., 2016).

Practical Implications

Other aspects that investors should consider in creating portfolios are the momentum and the size of firms. Large experiment goes to show that these variables tend to generate better returns, albeit at a higher level of risks. Regulators should thus focus on interventions that would strengthen market depth and liquidity, and thus mitigate the unsystematic risk and, in general, improve the performance of the market (Olowookere & Akinleye, 2022). One such strongly promoted

intervention is that of easing listing rules which would promote a high rate of trading and which would curb the existence of thin markets and the lack of liquidity that propagates latent unsystematic risk.

Future research agendas can also explore how the use of machine-learning techniques should be adopted to detect anomalous market behaviour in the Nigerian equity market (Feng, Giglio, & Xiu, 2020). The actual causes of momentum formations might also be explained through empirical investigation of behavioral deviations (over- or under-reaction to information).

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