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FACTORS AFFECTING PERFORMANCE OF MUTUAL FUNDS IN KENYA

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Abstract: *Although weak legal structures and the underdeveloped capital markets in developing nations may undesirably impact the performance of mutual funds, market inefficiency in these countries may facilitate fund managers to successfully apply security selection and market timing techniques to beat the market.*

Significance: *The study will be useful to investors as they identify firms that will give them better returns based on their stock selection skills, market timing ability, size, and expense ratio. It will also enlighten investors on whether they can profit by investing in mutual funds or they can simply track benchmark indices and make equal returns.*

Objectives: *This study investigated the performance of mutual funds in Kenya and evaluated the effect of four fund characteristics (stock selection, market timing, fund size, and expense ratio) on the performance. First, the study employed Treynor and Mazuy (1966) model for market timing and stock selection to investigate whether Kenyan mutual funds possess market timing and stock selection skills. Then, the study employed the single-index asset pricing model to estimate the performance (Jensen's alpha) of each selected mutual fund. The study then linked performance to the identified factors (stock selection, market timing, fund size, and expense ratio) through a cross-sectional multiple regression model.*

Findings: *The study found that stock selection and market timing are the only factors that affect the performance of mutual funds in Kenya. Stock selection was found to be a significantly positive determinant of mutual fund performance in all three fund categories; equity, balanced and money market mutual funds. Market timing was, however, a significant determinant of the performance of balanced funds only. Fund size and expense ratio were found to not affect mutual fund performance. According to the values of adjusted R-squared, stock selection, market timing, fund size, and expense ratio explain 70.8197%, 93.4125%, and 45.7923% of changes in performance of equity, balanced, and money market funds respectively.*

Recommendations: *Based on the findings, this study recommends that equity fund and money market fund managers should endeavour to have superior stock selection skills as this is the most significant driver of mutual fund performance. Balanced fund managers, on the other hand, should balance between stock selection and market timing as both factors have a strong effect on fund performance.*

Keywords*: expense ratio, fund size, mutual funds, market timing, stock selection*

INTRODUCTION

1. Background of the Study

Mutual funds, also known as unit trusts, may be defined as investment vehicles that pool funds from several investors and channel it into diversified investment portfolios with the aim of lowering risk through lower average cost per investor and professional management (Ombogi, 2014). The funds collected are jointly invested in a portfolio of either stock, money market instruments, bonds, and other authorized securities with the aim of achieving the goals of the investors. Based on the type of fund, mutual funds generate income through dividends, capital gains and interest received.

The fast-growing status of unit trusts as investment vehicles has attracted significant attention to their past and present performance. Using decades of mutual fund performance data, there is a near consensus that they are unable to beat the market even after all relevant expenses and fees have been deducted. Particularly, the studies have found that the funds have a significantly negative alpha, almost by the amount of fees they charge. Most of the research, however, has occurred in the United States mainly because the country's industry is far much ahead of the rest of the world in terms of assets under management.

In recent years, mutual fund studies have shifted focus to the European market. These studies have, however, focused on particular countries thus making it difficult to arrive at comprehensive conclusions across countries. An exception to this scenario is a study by Otten & Bams (2002) that involved 506 mutual funds from the U.K., Italy, and the Netherlands. The study finds that, on average, European mutual funds produce alphas that are not significantly different from zero excluding expenses. Adding back expenses, 4 out of 5 countries show outperformance, on average. An even more comprehensive study was carried out by Cuthertson, Nitzsche & O'Sullivan (2008) in the UK. The study consisting of a sample from 1976 to 2002 found that significance over-performance of UK mutual funds. However, they attributed this to managers' luck as opposed to skill.

Evidence on the performance of mutual funds in developing countries, most of which are in Asia and Africa, is scarce. Ferraira et al. (2006) and Khorana et al. (2005) find that there is a positive correlation between mutual fund performance and country-specific qualities such as the strength of legal institutions and the development of capital markets, factors that differentiate between developing and developed countries. Despite the differences in these markets, the few studies that have been conducted in emerging markets show underperformance of mutual funds. For instance, a study conducted by Kumar (2012) in on the performance of equity and hybrid mutual funds in India established that, on the basis of Sharpe and Trenor measures, most of the funds underperformed the market benchmark. Suppa-aim (2010), also finds that mutual fund managers in Thailand lack selectivity and market timing ability and therefore no value added for investors. Similarly, Tan (2015) while studying the performance of mutual funds in South Africa, established that only one of the 10 mutual funds studied could outperform the market benchmark index. Similar conclusions were arrived at by Oduwole (2015) in his study on the performance of Nigerian mutual funds. He finds that, on average, the 31 mutual funds reviewed were unable to predict price stock prices well enough to outperform benchmarks.

Studies done in Kenya relating to the performance of unit trusts have largely relied on the traditional methods of investigating the ability of fund managers to beat benchmark market indices. For instance, Kagunds (2011) studied the concept of asset allocation by fund managers and how it affects the financial performance of unit trusts in Kenya. She established that asset allocation explained a significant amount of the difference in returns across time among equity-based funds. Similarly, Jerop (2007) while studying the performance of equity and money market funds in Kenya, found that both equity mutual funds failed to outperform the NSE 20 index

while the money market funds beat the 91-day treasury bill. Likewise, Koyengo (2008), in his evaluation of returns under active vs passive portfolio management, found that market indices generated higher returns than fund managers in Kenya and therefore it would better for investors to invest passively managed funds.

2. Statement of the Problem

The Kenyan mutual fund industry has grown remarkably fast during the past two decades (Ombogi, 2014). Over the years, the value of assets under management in the mutual funds has grown from a meagre Sh 500 million in 2001 to Sh 55 billion by mid-2017 (Kenyan WallStreet, 2017). The industry grew by an impressive average of Sh 1.9 billion annually since 2001 to reach Sh 17.6 billion by 2009 (Ombogi, 2014). The growth has been largely motivated by facets such as the growing middle class, privatization of pension systems and improved market penetration of the insurance sector (Ombogi, 2014). Despite the growth in the industry, the performance of Kenyan mutual funds has been less than impressive. This, coupled with the improved fundamentals in the emerging market economies, provides sufficient background for research to be carried out on the factors driving performance of mutual funds.

Despite the growth in the industry, studies conducted generally find Kenyan mutual funds to underperform benchmarks. Furthermore, data extracted from individual funds' financial reports have found negative to mixed performance. For instance, Britam equity fund had underperformed the benchmarks for the years 2015, 2016 and 2017 (Britam, 2017). CIC equity fund, on the other hand, failed to outperform the market for a similar period (CIC Asset Management, 2018). Old Mutual equity fund recorded a mixed performance, with the fund recording higher returns against the market on some occasions while losing to the market on others (Old Mutual Investment Services, 2016). African Alliance consistently lost to the market for 3 years consecutively (African Alliance Asset Management, 2018).

Although efforts have been made to examine the performance of mutual funds in Kenya, most of the studies have employed traditional methodologies such as testing for the outperformance of mutual funds relative to market benchmarks. These studies have failed to capture the drivers of the observed over- or underperformance. Part of the reason why in-depth analysis of factors driving performance of mutual funds has been ignored is lack of sufficient and reliable data from the Kenyan mutual fund industry.

However, at this moment, sufficient data is available to perform an in-depth analysis of the relationship between performance and the various fund characteristics (Huij & Lansdorp, 2012). Therefore, this study has contributed to the body of research in financial economics by evaluating mutual fund performance in Kenya in relation to fund and manager characteristics such as market timing ability, stock selection skills, fund size, and expense ratio. As a result, various stakeholders can determine whether investing in mutual funds adds value.

3. Study Objectives

The study sought to investigate the factors that affect the performance of mutual funds in Kenya through the following objectives;

i. To investigate the effect of stock selection skills on the performance of mutual funds.
ii. To evaluate the effect of market timing abilities on the performance of mutual funds.
iii. To investigate the effect of fund size on the performance of mutual funds.

iv. To investigate the effect of expense ratio on the performance of mutual funds

4. Research Hypotheses

From the above objectives, the following hypotheses were tested;

i. **Null Hypothesis**: Stock selection has no effect on the performance of mutual funds.

ii. **Null Hypothesis**: market timing has no effect on the performance of mutual funds.

iii. **Null Hypothesis:** Fund size has no effect on the performance of mutual funds.

iv. **Null Hypothesis:** Expense ratio has no effect on the performance of mutual funds

5. Conceptual Framework

The figure below demonstrates the relationship between the independent variables and the dependent variable. The independent variables in this study were: market timing, stock selection, fund size, and expense ratio while the dependent variable was performance (measured by Jensen's alpha).

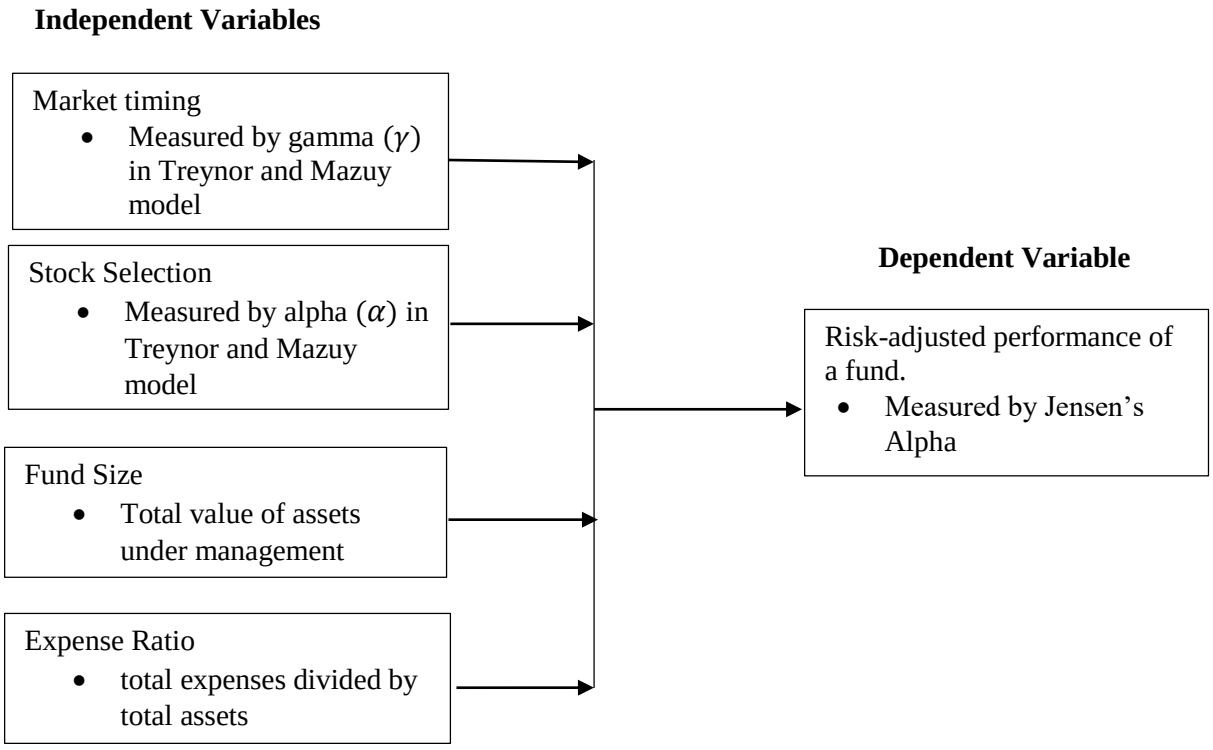

Figure 1: conceptual framework

6. Scope of the study

This study covered all mutual funds in Kenya. Estimates of performance, stock selection, and market timing were estimated using price data ranging from 2009 to 2018. Only funds that have been in operation within this period and are licensed as collective investment schemes by the Capital Markets Authority were considered. Fund size and expense ratio data was gathered from 2017 financial statements of respective fund managers.

LITERATURE REVIEW

7. Theoretical Framework

This study was guided by the following theories;

Modern Portfolio Theory: The basic portfolio theory was developed by Harry Markowitz (1952, 1959), in which he advanced a mathematical framework for creating a portfolio of assets that maximizes expected return for a given level of risk. The theory opines that it is possible to construct an efficient frontier of optimal portfolios that offer the maximum expected return at a particular level of risk. This process involves four basic steps: security valuation, asset allocation, portfolio optimization, and performance measurement.

The capital asset pricing model: The CAPM, as put forward by forward by financial economist and Nobel Prize winner William Sharpe in 1970, describes the relationship between expected return of a particular stock and systematic risk. The model describes two types of risk faced by an investor: Systematic and unsystematic risk. Systematic risk refers to risk in the market that an individual firm has no control over hence cannot diversify it away. It encompasses interest rate, inflation, recession, and wars. Unsystematic risk is the risk that is specific to a stock and can, therefore, be diversified away as an investor increases the number of stock in his/her portfolio. The CAPM, therefore, measures the volatility of a stock relative to the market. It takes the following mathematical form:

$$E(R_i) = R_f + \beta_i \left(\left(E(R_m) - R_f \right) \right) \quad \text{.....(1)}$$

Where,

$E(R_i)$=Expected return on a portfolio at a specific period

$E(R_m)$= Expected return on the market

R_f=risk free rate of return

The CAPM breaks down return on an asset into two components; the rate on a risk-free security and a risk premium. The risk-free rate represents the time value of money and rewards the investor for foregoing present gratification and investing over a period of time. Customarily, the risk-free rate is the rate on government securities. The risk premium gives the amount of compensation that an investor requires in order to accept additional risk. This is obtained by multiplying the stock's risk measure (beta) with the market premium (Rm-Rf).

Arbitrage Pricing Theory: In an attempt to mitigate the shortcomings of previous asset pricing methodologies, Ross (1976, 1977) introduced a new approach which came to be known as the Arbitrage Pricing Theory (APT). The theory was characterized by less restrictions whereby investors were assumed to each hold a unique portfolio and, therefore, the expected return on a financial asset depended on various macroeconomic variables.

Risk-Adjusted Measures of Performance: The development of the asset pricing theories formed the background upon which traditional risk-adjusted measures of portfolio performance emerged. The Treynor (1965) measure, also referred to as reward-to-volatility ratio, was the first measure that incorporated risk in portfolio performance analysis. Treynor's (1965) aim was to establish a measure of performance that was applicable to all investors regardless of their risk preferences. The measure is a representation of the portfolio's

return on each unit of systematic risk assuming that the investor holds a diversified portfolio. Sharpe (1966) developed a measure similar to Treynor's. The Sharpe (1966) measure applies the standard deviation as a risk measure representing the return on a portfolio per unit of total risk.

Similarly, to the above-mentioned portfolio performance measures, Jensen's (1968) measure also applies the CAPM to capture the ability of a fund manager to make extra returns by predicting asset prices while minimizing risk. In other words, Jensen's measure isolates the specific part of a portfolio's return that is attributable to the manager's ability to outperform the market. This measure is also known as Alpha and is computed as follows.

$$R_{p.t} - R_{f.t} = \alpha_p + \beta_{I.p}\left(R_{m.t} - R_{f.t}\right) + e_{p.t} \quad \text{.....(2)}$$

Where,

$R_{pt.}$=Return on the fund portfolio at a specific period

$R_{m.t}$= Return on the market

$R_{f.t}$=risk free rate of return

α_p = Jensen's measure of performance

$\beta_{I.p}$ =Systematic risk of the portfolio

e_p= error term

The alpha coefficient measures the return on an actively managed portfolio. In other words, it measures the performance of a security or portfolio compared to a suitable market index. Under market efficiency assumptions, alpha is expected to be zero. Therefore, the alpha coefficient measures the performance of a portfolio after accounting for risk. A negative alpha indicates that the investment has earned too little compared to the risk taken. A positive alpha, on the other hand, shows that the investment has returned more than the assumed risk (Reilly and Brown 2009).

Selectivity and Market Timing Measures: The most common measure of market timing and stock selectivity was developed by Treynor and Mazuy (1966). Their model advanced on Jensen's measure by adding a quadratic term on the regression model developed by Jensen (1968)

$$R_{p.t} - R_{f.t} = \alpha_p + \beta_{I.p}\left(R_{m.t} - R_{f.t}\right) + \gamma_{I.p}\left(R_{m.t} - R_{f.t}\right)^2 + e_{p.t} \quad \text{.....(3)}$$

Where,

$R_{pt.}$=Return on the fund portfolio at a specific period

$R_{m.t}$= Return on the market

$R_{f.t}$=risk-free rate of return

α_p = measure of sock selectivity

$\beta_{I.p}$ =Systematic risk of the portfolio

$\gamma_{I.p}$=measure of market timing

e_p= error term

The intuition behind the model was that, if a fund manager predicts that the market will rise in the future, then he will switch from less risky to more risky assets, and vice versa. That is to say, if a fund manager increases the portfolio's exposure to the market before the rise of the market, then there will be a convex relationship between market and fund returns. This relationship is captured by the quadratic term in the model and is expected to be positive when fund managers can accurately predict the direction of the market.

METHODOLOGY

8. Research Design

This study employed a descriptive research design. According to Burns and Grove (2003), a descriptive research is intended to paint a picture of a situation as it naturally occurs. Thus, this study employed descriptive research techniques to capture the relationship between fund characteristics and mutual fund performance as it naturally occurs. The target population for this study was the 22 collective investment schemes approved to conduct business in Kenya by the capital markets authority as of June 30, 2017.

Data relevant to this study included: the NSE 20 share index returns, the Central Bank of Kenya (CBK) 91-day treasury bill rates, the interbank rate, the net asset value (NAV) or sell prices for the selected equity funds, the value of assets under management, and the ratio of expenses to total assets. Data on NSE 20 index, treasury bill rate and interbank lending rates was obtained from the NSE and CBK websites respectively, while data on unit prices, fund size, and expense ratio was obtained from the respective mutual funds.

This study applied a three-pronged approach to data analysis. First, a model to test market timing and stock selection abilities of fund managers was estimated. Next, the CAPM model was used to estimate the risk-adjusted measure of performance (alpha). Lastly, the study linked market timing abilities, stock selection skills, fund size, and expense ratio with the performance of mutual funds through a cross-sectional regression model.

RESEARCH FINDINGS AND DISCUSSION

9. Summary Statistics

This section presents a summary of the descriptive statistics for the variables used in this study. The financial information information was gathered from ten equity mutual funds, fourteen balanced mutual funds, and sixteen money market mutual funds. Benchmark variables data (NSE 20, T-bill rate, interbank lending rate) was obtained from the NSE and the Central Bank of Kenya websites, respectively. Data analyzed included fund excess returns and how that varies with factors such as stock selection skills, market timing abilities, fund size, and expense ratio.

Table 1. Summary Statistics for Equity Funds

Descriptive Statistics							
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Jensen's alpha	10	-1.3679	.4058	.058485	.5417373	-2.445	6.286
Stock Selection	10	-1.3400	.8601	.214281	.5950430	-2.278	6.162
Market Timing	10	-.0347	.0237	-.003973	.0147907	-.260	2.598
size	10	.0086	2.4900	.601659	.8198611	1.718	2.419
Expense ratio	10	.0200	.1257	.042490	.0340225	2.005	3.821

The above table presents the descriptive statistics for the variables Jensen's alpha, stock selection, market timing, fund size, expense ratio for equity funds in Kenya. The statistics include mean, standard deviation, minimum, maximum, skewness, and kurtosis

Table 2. Summary Statistics for Balanced funds

Descriptive Statistics							
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Jensen's alpha	14	-1.1833	.5917	-.12507	.398740	-1.121	3.648
Stock Selection	14	-.8910	.8623	-.08061	.383925	.430	3.207
Market Timing	14	-.0683	.0663	-.00919	.030648	.594	2.610
size	14	.0130	1.1540	.29742	.377466	1.573	1.616
Expense ratio	14	.0246	.1418	.06626	.043519	1.000	-.846

Table 2 above shows the summary statistics (mean, standard deviation, minimum, maximum, skewness, and kurtosis) for balanced funds.

Table 3. Summary Statistics for Money Market Funds

Descriptive Statistics							
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Jensen's alpha	16	-.01147	.00837	-.000987	.0051633	-.116	.143
Stock Selection	16	-.01289	.02942	.005074	.0125298	.099	-.600
Market Timing	16	-2.60331	.09956	-.34181	.6294962	-3.454	12.948
Size	16	.0290	15.2310	2.87670	3.849795	2.411	7.054
Expense ratio	16	.0076	.0526	.024101	.010967	1.095	2.177

Table 3. above presents the descriptive statistics (mean, standard deviation, minimum, maximum, skewness, and kurtosis) for money market funds.

According to tables 1, 2, and 3., the mean alpha for equity funds was .058485, that of balanced funds was -.125072, and for money market funds was -.000987. Thus, equity funds, on average, performed the best followed by money market funds, and lastly, balanced funds. Only equity funds appear to generate positive excess returns based on the descriptive statistics. The mean stock selection skills of equity funds is .214281, for balanced funds is -.080616, and for money market funds it is .005074. This means that, on average, only equity funds and money market funds exhibited positive stock selection skills, with equity funds having the largest value. In terms of market timing skills, all funds and equity funds posted negative average market timing skills given by -.003973 for equity funds, -.009193 balanced funds, and -.34181 for money market funds.

The descriptive statistics further show that the money market funds represent the largest fraction of the Kenyan mutual fund industry with Ksh 2.8767b worth of assets under management, followed by balanced funds with Ksh 1.154b, and then equity funds with Ksh 0.601659b worth of assets. In terms of expense ratio, money market funds had the least ratio at 0.0241010 followed by equity funds at 0.04249, and balanced funds had the highest expense ratio at 0.0662692.

10. Diagnostics

Before running the regression models, diagnostic tests were conducted to verify that the models adhered to the OLS assumptions of Linearity, normality of residuals, homoscedasticity, and no multicollinearity. The findings of these tests are as shown below:

Table 4. Diagnostic tests

Test	Equity		Balanced		Money Market	
	Statistic	P-value	Statistic	P-value	Statistic	P-value
Heteroskedasticity	LM= 8.32	0.403	8.65	0.37	15.99	0.31
Normality	$\chi 2$=5.01	0.08	4.20	0.12	4.30	0.12
Linearity	LM = 0.39	0.82	0.82	0.37	2.32	0.13
Multicollinearity (Mean VIF)	1.367		1.08		1.34	

From the above diagnostic tests results, the classical assumptions of ordinary least squares (OLS) have been met for all fund categories. The assumption of homoskedasticity has been met. Using the White's test criterion, we find that heteroskedasticity is absent in all models as the p-values for equity funds (0.403291), balanced funds (0.37234), and money market funds (0.116377) are greater than 0.05.

Using the 5% level of significance, the assumption of normality of residuals has been met since the p values of the test statistics for equity funds (0.0818428), balanced funds (0.122305), and money market funds (0.116377) are greater than 0.05. As such, we fail to reject the null hypothesis that the errors are normally distributed.

Similarly, the assumption of linearity has also been met. At 5% level of significant, we fail to reject the null hypothesis that all the three models are linear since their p values are greater than 0.05.

The problem of multicollinearity is also absent as the mean variance inflation factors in all models are less than 10.

11. Correlation Analysis

Table 5. Correlation analysis results for equity funds

	Jensen's alpha	Stock Selection	Market Timing	size	Expense ratio
Jensen's alpha	1.0000	0.8920	-0.1635	0.1654	0.1624
Stock Selection		1.0000	-0.3747	0.1530	0.0725
Market Timing			1.0000	-0.1597	0.0074
size				1.0000	0.2903
Expense ratio					1.0000

The above correlation matrix shows the correlation Pearson correlation coefficients among Jensen's alpha, stock selection, market timing, fund size, expense ratio for equity funds in Kenya.

Table 6. Correlation analysis results for balanced funds

	Jensen's alpha	Stock Selection	Market Timing	size	Expense ratio
Jensen's alpha	1.0000	0.8732	0.4102	0.0052	-0.0773
Stock Selection		1.0000	-0.0131	0.1111	-0.0317
Market Timing			1.0000	-0.1917	0.1514
size				1.0000	-0.2541
Expense ratio					1.0000

The above table presents the correlation coefficients between Jensen's alpha, stock selection, market timing, fund size, and expense ratio for balanced funds in Kenya.

Table 7. Correlation analysis results for money market funds

	Jensen's alpha	Stock Selection	Market Timing	Size	Expense ratio
Jensen's alpha	1.0000	0.7631	0.1773	0.4060	0.2472
Stock Selection		1.0000	0.2519	0.3868	0.1409
Market Timing			1.0000	-0.0438	-0.1603
Size				1.0000	0.1490
Expense ratio					1.0000

The above table shows the correlation coefficients among Jensen's alpha, stock selection, market timing, fund size, and expense ratio for money market funds in Kenya.

The correlation matrices presented above show a strong positive correlation between Jensen's alpha and stock selection skills for all the types of funds. This is consistent with the hypothesis that positive stock selection skills increase the performance of mutual funds. Equity funds have the strongest correlation coefficient between alpha and stock selection with 0.8920, followed by balanced funds with 0.8732, and the weakest correlation is in money market funds at 0.6729.

As hypothesized, there is a positive correlation between performance (alpha) and market timing skills in money market funds and balanced funds, with 0.1773 and 0.4102 respectively. However, there appears to an inverse relationship between performance and market timing abilities for equity funds, with a correlation coefficient of -0.1635.

From the correlation analysis, fund size is positively correlated with fund performance for all funds. The relationship is strongest in money market funds at 0.4060, followed by equity funds at 0.1654, and weakest in balanced funds at 0.0052. These results are consistent with the findings of some studies, which found fund size to be positively related to fund performance.

The analyses further show a negative relationship between fund performance and expense ratios for balanced funds, as was hypothesized by this study. However, the relationship is positive for equity funds and money market funds. The correlations is strongest for money market funds (0.2472) and weakest in balanced funds (-0.0773).

12. Regression Analysis

This section presents the analysis of the data collected using the OLS approach. The independent variable Jensen's alpha (Y) is regressed against the independent variables stock selection (X1), market timing (X2), log of fund size (X3), and expense ratio (X4). The model therefore takes the form

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e_i$$

13. Estimating Jensen's measure of performance

Before the final regression was performed, Jensen's measure of performance, derived from the standard CAPM security market line, was estimated for each fund. This was done for the 10 equity funds, 14 balanced funds, and 16 money market funds. The CAPM model takes the form: $R_t - R_{ft} = \alpha + \beta(R_{mt} - R_{ft}) + e_t$. Where R_t, R_{ft} and R_{mt} are monthly returns of the funds, the risk-free return, and the benchmark return respectively. Further, α is the Jensen's alpha, β is the systematic risk of the fund, and e_t is the error term.

For equity funds and balanced funds, 91-day treasury bill rate was used as the risk-free rate proxy. The NSE 20 index was used as the benchmark rate for equity funds, while for the balanced funds, a composite index comprising of 60% NSE 20 and 40% 91-day T-bill rate was used as the benchmark rate. For the money market funds, the 91-day treasury bill rate was applied as the market benchmark while the interbank lending rate was used as the risk-free rate proxy. Each series was first tested for stationarity using augmented Dickey-Fuller test at 5% alpha. While most of the series were stationary at levels, some had unit roots and therefore first differences were taken before performing the regression. The regression equation was then estimated using OLS. To account for potential serial correlation and heteroskedasticity, Newey-West corrected standard errors were used.

The output from this estimation, as in appendix 1, shows that 80% of equity funds could generate positive alphas (6 out of 10) implying they could outperform their passive benchmarks. However, only ICEA equity fund generated a statistically significant positive alpha. Similar findings were replicated in 5 out 14 balanced funds, with none having a statistically significant positive alpha. In money market funds, 50% (8 out of 16) of the funds generated positive alphas, but none was statistically significant.

14. Estimating Selectivity and Market Timing

Next, the Treynor and Mazuy model of market timing for the Kenyan mutual funds was estimated in order to gather data on stock selection and market timing. To run this analysis, data on fund returns, market return and risk-free return was used. The regression equation that was estimated took the form: $R_{pt} - R_{ft} = \alpha + \beta(R_{mt} - R_{ft}) + \gamma(R_{mt} - R_{ft})^2 + e_p$, where α measures a fund manager's stock selection skills and γ measures the fund manager's market timing skills. Before estimating the regression equations for various funds in the three fund categories, stationarity tests were conducted using the ADF technique for each individual fund returns series. Series found to contain unit roots were differenced until they became stationary. Although, in the few instances that unit roots were found, the series became stationary after the first difference. Further, while estimating the models, heteroscedasticity and autocorrelation consistent standard errors were used.

Finally, the model that examines the effect of stock selection skills, market timing abilities, fund size, and expense skills on fund performance is estimated. The findings are presented along with the respective regression models.

According to the results of the Treynor and Mazuy model results, as shown in appendix 2, 80% (8 out of 10) of equity funds managers displayed positive stock selection skills. However, none of these skills were statistically significant. Similarly, 28.57% (4 out 14) of balanced fund managers exhibited positive stock selection skills, but only Zimele displayed statistically significant selection skills. Further, four out of eleven (68%) of money market fund managers displayed positive stock selection skills. It is notable, however, that none of these managers had statistically significant selection skills.

The results also show that none of the equity fund managers had positive market timing skills. On the other hand, positive market timing abilities were reported in 35.7% of balanced funds and in one money market fund. However, only one of these funds, Amana balanced funds, recorded statistically significant positive market timing skills.

15. Estimating the Effect of Fund Characteristics on Mutual Fund Performance

Lastly, a cross-sectional regression model was estimated to determine the effect of stock selection skills, market timing abilities, fund size, and expense ratio on the performance of Kenyan mutual funds.

Table 8. Regression results for equity funds

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.158	0.224		-0.706	0.512
	Stock Selection	0.870	0.211	0.955	4.131	0.009
	Market Timing	7.114	7.208	0.194	.987	0.369
	Expense ratio	1.439	2.983	0.090	.482	0.650
	Log Size	0.002	0.066	0.005	.023	0.982
a. Dependent Variable: Risk-adjusted performance b. N= 10, R-square=0.838, Adj. R-square=0.708, Prob F=0.000						

The final estimated model becomes

$$Y = -0.158 + 0.870X_1 + 7.11X_2 + 1.44X_3 + 0.002X_4 \quad \text{.....(5)}$$

$$(0.224) \quad (0.211) \quad (7.21) \quad (2.98) \quad (0.0661)$$

n = 10, R-squared = 0.838

(standard errors in parentheses)

According to the above results, only stock selection is a statistically significant determinant of mutual fund performance. However, all the coefficients, except for expense ratio, have positive signs as was hypothesized. Based on the adjusted R^2, the independent variables explain 70.8% of all changes in the performance of equity funds. Overall, based on the F statistic, the model was significant in predicting the performance of equity funds since the P-value of F (0.000) was less than 0.05.

Table 9. Regression results for balanced funds

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.089	.067		1.323	.219
	Stock Selection	.898	.078	.865	11.508	.000
	Market Timing	5.783	.950	.444	6.087	.000
	Expense Ratio	-1.065	.660	-.116	-1.613	.141
	Log Size	.008	.018	.033	.434	.675
a. Dependent Variable: Risk-adjusted performance b. n = 14, R-squared = 0.954, Adj R-Squared=0.934, Prob F=0.000						

$$Y = 0.089 + 0.898X_1 + 5.783X_2 + 0.008X_3 - 1.06X_4 \quad \text{.....(6)}$$

$$(0.067) \quad (0.078) \quad (0.950) \quad (0.018) \quad (0660)$$

n = 14, R-squared = 0.954

(standard errors in parentheses

Based on the above regression output, only market timings and stock selectivity significantly determine the performance of balanced funds in Kenya. Overall, the independent variables explain 93.4% of all changes in performance, according to the adjusted R^2. Further, based on the statistic, the model was statistically significant in predicting the performance of balanced funds since the P-value (0,000) was less than 0.05.

Table 10: Regression results for money market funds

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.004	0.003		-1.533	0.153
	Stock Selection	0.304	0.091	0.738	3.356	0.006
	Market Timing	0.00012	0.002	0.015	0.072	0.944

	Expense ratio	0.068	0.101	0.144	0.675	0.513
	Log Size	7.799E-6	0.001	0.003	0.011	0.991
a. Dependent Variable: Risk-Adjusted Performance b. n = 16, R-squared = 0.602, Adj. R-squared =0.458, Prob F=0.0269						

The estimated model therefore becomes:

$$Y = -0.004 + 0.304X_1 + 0.00012X_2 + 7.80e-6X_3 + 0.0680 * X_4 \quad \ldots\ldots\ldots\ldots\ldots\ldots (7)$$

$$(0.003) \quad (0.091) \quad (0.002) \quad (0.001) \quad (0.101)$$

n = 16, R-squared = 0.602 (standard errors in parentheses)

The above output shows that only stock selection is a statistically significant determinant of the money market funds performance. Based on the adjusted R^2, the independent variables explain 45.8% of all changes in the performance of money market funds. The F test results (0.0269) for money market funds show that the model is statistically significant at 5%.

16. Discussion

The first objective of this study was to establish how stock selection skills affect mutual fund performance. Reviewed studies found a positive relationship between fund managers' selection skills and fund performance. This study makes similar findings as the coefficients of stock selection skills for equity funds, balanced funds, and money market funds are positive and statistically significant at 5%. Therefore, the findings suggest that fund managers' ability to select the right stock to include in their portfolio increases fund performance. These findings are similar to the findings by Alexandri (2013), Naveen and Mallikarjunappa (2016) who found stock selection skills to have a positive effect on mutual fund performance but contrary to the findings by Cuthbertson and Nitzsche (2013) who found stock selection skills to negatively affect mutual fund performance. Sehgal and Jhanwar (2008) and Chang and Lewellen (1985) found weak to no effect of stock selection on mutual fund performance.

The second objective was to investigate the effect of market timing skills on the performance of mutual funds in Kenya. Reviewed literature identified market timing skills as one of the two aspects that explain the ability of a fund manager to generate excess returns. As such, market timing skills should have a positive effect on mutual fund performance. The regression results presented above are consistent with this hypothesis as the coefficients of market timing skills are positive for equity funds, balanced funds, and money market funds. However, the effect of market timing skills is only statistically significant for balanced funds. In the case of equity funds and money market funds, the findings of this study are consistent with those arrived at by Naveen and Mallikarjunappa (2016), Chen et al. (2013), Chang and Lewellen (1984) who found that market timing skills had no effect on mutual fund performance, but inconsistent in the case of balanced funds. The findings of this study, in the case of equity funds and money market funds, are, however, contrary to the findings by Treynor and Mazuy (1966), Henriksson and Merton (1981), Cuthbertson and Nitzsche (2013), Sehgal and Jhanwar (2008) who found market timing skills positively affected mutual fund performance. They are, however, consistent in the case of balanced funds.

The third objective of this study was to establish the relationship between mutual fund performance and fund size. Prior studies are divided on how fund size affects performance with some finding a positive relationship and others a negative relationship. This study finds fund size to be positively related to mutual fund

performance and the coefficients of *log size* are positive in all fund categories. These coefficients are, however, not statistically significant in all cases. These findings are consistent with the findings of Droms and Walker (1994), Ciccotello (1996), wo found no significant relationship between fund size and mutual fund performance. They are, however, contrary to the findings by Indro et al., (1999) Berk and Green (2004), and Gruber (1996) who found fund size to be negatively related to fund performance. They are also contrary to the findings by Grinblatt and Titmann (1989), Payne et al., (1999), Otten and Bams (2002), Annaert et al. (2003), Bauer et al., (2006) who found a positive relationship between size and mutual fund performance.

Lastly, this study sought to determine how expense ratio affects the performance of mutual funds in Kenya. Intuitively, there should be a negative relationship between expense ratio and fund performance as expenses would eat into the returns. This hypothesis is violated in the cases of equity funds and money market fund where the coefficients of expense ratio are positive, but upheld in the case of balanced funds which has a negative coefficient. However, none of these coefficients are statistically significant. The findings are similar to the findings by Ippolito (1989) who found no relationship between expense ratio and fund performance. The findings are however contrary to those by Geranio and Zanotti (2005), and Korkeamäki and Smythe (2004), Babalos, Kostakis, & Philippas, (2009), and Haslem et al., (2008) who found expense ratio to have a significant inverse relationship with fund performance.

17. Summary

This study sought to establish the factors driving the performance of mutual funds in Kenya. The study focused of the three main fund categories available in Kenya; equity funds, balanced funds, and money market funds. Unit price data was provided by the various fund managers and was used to compute the monthly returns of the funds. The NSE 20-share index was used as a benchmark for equity funds and the data for this index was obtained from the NSE website. A composite index comprising 60% NSE 20 share index and 40% 91-day Treasury Bill rates was used as the benchmark index for balanced funds. The 91-day Treasury Bill rate was used as the risk-free rate proxy for the equity and balanced funds analysis, and as the benchmark index for the money market fund. The interbank lending rate was used as the risk-free rate in the case of money market funds. Both 91-day Treasury Bill rate data and the interbank lending rate were obtained from the CBK website. Data on fund size and expense ratio was obtained from the annual financial statements.

The CAPM single-factor model was used to compute the Jensen's alpha, which was used as the measure of fund performance. Similarly, the Treynor and Mazuy model was applied to estimate the stock selection and market timing skills of a fund manager. The Jensen's alpha was then regressed against stock selection skills, market timing skills, fund size, and expense ratio.

18. Effect of Stock Selection Skills on Mutual Fund Performance

The study found that stock selection skills was a statistically significant determinant of mutual fund performance in all fund categories. That is, the higher a fund manager's stock selection skills the higher the excess return derived.

19. Effect of market timing skills on mutual fund performance

The study also found that market timing skills significantly determined the performance of balanced funds, but had no significant effect on the performance of equity and money market funds. Thus, balanced fund managers with superior market timing skills are likely to achieve higher excess returns.

20. Effect of fund size on mutual fund performance

Fund size was found not to significantly affect the performance of mutual funds, although it had a positive coefficient. This implies that larger funds do not have an advantage over small funds, and neither do small funds have an advantage over large funds.

21. Effect of expense ratio on mutual fund performance

Lastly, the study finds no significant relationship between expense ratio and fund performance. This implies that funds that drastically reduce their expenses with the goal of boosting the fund performance are likely not to achieve this outcome.

22. Conclusion

The study found that most of the funds could not outperform their benchmarks, with only ICEA equity fund significantly outperforming the market benchmark. Similar findings were reported for stock selection and market timing skills, with only one fund displaying significant selectivity skills and only one displaying significant timing skills. These funds are Zimele balanced fund and Amana balanced funds respectively. However, the study finds that stock selection skills are essential drivers of fund performance in all categories, whereas market timing skills are only significant determinants of balanced funds' performance. Fund size and expense ratio were found to be insignificant determinants of fund performance in all fund categories studied.

This study is therefore in agreement with many past studies that found mutual funds to underperform their benchmarks and lack stock selection and market timing abilities. It also finds that stock section and market timing are the key drivers of fund performance with other factors such as expense ratio and fund size having minimal to no effect.

23. Policy Recommendations

There is a need for players and regulators in the mutual fund industry to develop universal, objective and reliable benchmarks for measuring fund performance against a uniform index. As it is at the moment, funds establish their own benchmarks that guide their management decisions. This has led to unreliable and incomparable results.

According to the findings of this study, mutual funds lack superior selectivity and market timing skills requisite for the outperformance of benchmarks. As such, the government, through the CMA, should create a framework for the establishment of index-tracking funds. These are funds that are designed to match and track certain market benchmarks. Low management fees characterize these funds since they do not hire as many managers as active mutual funds.

This study also finds that stock selection skills is that most significant determinant of fund performance. Therefore, fund managers should put more effort into selecting the right stock to put in their portfolios. This is likely to generate higher returns that attempting to time the market. Part of the reason market timing is not as significant is because of the efficient market hypothesis which holds that stock prices are unpredictable since current prices reflect all available information.

This study does not find expense ratio and fund size to significantly affect performance. Therefore, for mutual funds pursuing a benchmark outperformance objective only, these factors should not be of concern as they

have no bearing on performance. However, funds that are seeking both profitability and outperformance objective, reducing expense ratio and increasing fund size should be pursued.

24. Recommendations for Further Research

This study evaluated the effect of four factors (stock selection, market timing, fund size, and expense ratio) on the performance of Kenyan mutual funds. This leaves room for other researchers to include potential determinants such as fund age, portfolio turnover rate, fund flow, and minimum investment amount.

In this study, only equity funds, balanced funds, and money market funds were considered. This is because other fund categories such as pension funds, fixed income, and bond funds are very few and cannot, therefore, be analyzed at the moment. However, in future, more such funds may establish these fund categories thus enabling researchers to study how they perform relative to the more established equity, balanced, and money market funds

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