EFFECT OF MANAGEMENT FEE ON EFFICIENCY OF MONEY MARKET UNIT TRUST FUNDS IN KENYA

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Abstract
Management fee is a compensation to fund managers for their professional asset management services. However, there is an ongoing debate whether fund managers charge fees that are commensurate to the services they offer. Management fee is justified when fund managers earn high risk adjusted returns, outperform benchmarks and increase fund value because it would translate to efficiency. On the contrary, high compensation to fund managers that is not justified would be an evidence of agency problem where managers seek to pursue their self-serving interest instead of focusing on risk management, portfolio monitoring and cost management thereby resulting to fund inefficiency. Therefore, the main objective of this study was to determine the effect of management fee on fund efficiency. The study was guided by agency theory and X-efficiency theory. The study adopted a causal and longitudinal research design. Secondary data was collected from 25 money market unit trust funds (MMFs) over the period 2018 to 2024 yielding 122 fund year observations. Descriptive statistics provided simple summaries of the population. Inferential statistics and panel data regressions were utilized for testing of statistical hypotheses. A two-stage analysis was adopted whereby in the first stage, efficiency scores were computed using Data Envelopment Analysis and in the second stage, Generalized Method of Moment was used to determine the dynamic relationship among study variables. The findings revealed that, during the study period, MMFs were not 100% efficient. Further, management fee had no significant effect on fund efficiency (β=0.266, p-value>0.05). The lagged efficiency score was positive and statistically significant meaning there was persistence in fund efficiency (β=0.203, p-value<0.05). The results revealed that the rate of management fee to income charged by the fund does not influence its efficiency level. Further, a fund's past efficiency level has an influence on the current level of efficiency.

Key words: management fee, efficiency, agency problem, money market unit trust funds, asset management.

INTRODUCTION

In the past, studies on management fee have attracted research attention, most especially their effect on return, performance and efficiency of funds. Researchers have tried to establish whether the management fee levied by actively managed funds are justified and how they influence a fund's efficiency. Management fee, a compensation paid to fund managers for their asset management services, may either stimulate fund managers' performance thereby resulting to efficiency or result to inefficiency especially if managers adopt a rent-seeking behavior. Servaes and Sigursdon (2022) noted that management fees as a reward component, should control and stimulate managers' behavior towards maximizing investors return and increasing fund value. From the investors' perspective, management fee is a price paid for investment management while for the fund management company it is a source of revenue (Khorana *et al*. 2009). Therefore, fees paid should not be excessive rather should be justified by the results achieved by the fund.

Mutual fund investors pay fees mainly for quality portfolio management provided by the fund. Hence, higher fees should reflect better portfolio management and consequently, translate to better risk-adjusted performance. On the contrary, a negative relation between fees and risk-adjusted performance would be contradictory (Hue *et al*. 2016). Notably, Garcia *et al*. (2016) found a negative relationship where funds that charge high fees tend experience poor performance. Similarly, Newton (2015) found that high management fees decrease fund returns while growing the fund management company's profits. On the other hand, Kiymaz (2015) reported a positive effect where increase in fees leads to increased performance. Berk and Green (2004) noted that for a market that is consistent with efficient market hypothesis, the relation between fund fees and performance should be positive. Berk and Binsbergen (2012) noted that highly skilled managers are paid more and there is a strong correlation between managerial compensation and future performance.

According to Perez and Szymczyk (2022), management fee forms a major part of the fund's expenses representing around 90% of the total expenses. The amount of management fees charged significantly impact returns realized because it is treated as an expense and eventually a fund's efficiency (Wongsurawat, 2011). Therefore, while a 1.25% management fee is accepted very easily at a time when annual gross returns are, say, 7%, that same fee will attract a close scrutiny when the gross return is 2.5% (Ma *et al*., 2019). In the case of agency conflict managers may charge high fees disproportionate to the returns they have generated hence resulting to inefficiency (Mwangi, 2021). Moreso, a conflict can arise when managers focus on asset maximization strategies such as advertising for the purpose of increasing fees at the expense of lower returns for investors (Bednarczyk & Eichler, 2002; Davis *et al*., 2007). The assets under management in money market funds in Kenya have experienced a remarkable growth. For instance, growth by 383.9% from Ksh 51 billion in 2018 to Ksh 246.8 billion in 2024 (Capital market Authority [CMA] Report, 2024). Since the money market industry in Kenya is experiencing tremendous growth in assets under

management, probably agency problem may arise where fund managers charge excessive fees resulting to fund inefficiency.

Agency theory by Jensen and Meckling (1976) postulates that a conflict could arise between the principal and agent, whereby as investors seek to maximize their wealth, managers pursue their own interests. Agency theory suggests that a conflict can arise where managers may pursue personal interests through excessive fees, leading to inefficiency. Mendoza *et al*. (2014) argued that especially if management fee is fixed as a percentage of total assets under management, it implies that managers are compensated for asset growth instead of performance, hence managers may focus on advertising and attracting new investors to increase total assets instead of making quality investment decisions. X – efficiency theory proposed by Leibenstein (1966) argued that motivation of management is important in achieving efficiency. Management as a factor of production plays an important role in allocating resources and enhancing productivity. Fund managers who possess professional skills and knowledge would help in making quality investment decisions translating to fund efficiency. Therefore, X- efficiency theory relates efficiency to management effectiveness in minimizing costs and allocating the fund's monetary resources.

Empirical studies provide inconsistencies on the nature of relationship between management fee and efficiency. Sofi and Yahya (2019) found that funds that charge high fees are highly diversified and attain better performance. On the flip side, Fras (2018) found that higher management fee would result to lower rate of return. Similar to Garcia et al (2016) who found that funds that charge high fees tend to underperform. Perez and Szymczyk (2022) noted management fees had no significant effect on fund performance, implying that whether a fund charges a high or low fee it does not affect its performance. Overall, prior studies provide mixed evidence on whether management fees enhance or hinder fund efficiency. While some find a positive relationship, others report neutral or negative effects, with most of the studies conducted in developed markets. Limited empirical work has examined this relationship in emerging markets such as Kenya, where MMFs are growing rapidly. This gap underscores the need to analyze whether management fees influence the efficiency of MMFs in the Kenyan context. This study therefore sought to examine the effect of management fee on efficiency of money market unit trust funds in Kenya.

Methodology

Research Design

The study adopted a multi-dimensional research design that involved causal and longitudinal research designs. A causal design was used to infer the cause effect relationship between management fee and efficiency. A longitudinal design was adopted because it involved collecting data from all the money market unit trust funds across 7 years to capture the long-term effects and the dynamic relationship of management fee and efficiency.

Population of Study and Sampling Procedure

The target population for the study comprised of money market unit trust funds approved by the CMA. As at December 2024, there were 29 registered money market funds. Although filtering process was done to include only those funds that met the selection criteria in the sample. Consequently 4 funds were excluded due to missing data and lack of consistent reporting. Thus 25 MMFs were included in the study and a census approach was adopted. Money market unit trust funds were the preferred study population because they are the most popular funds in Kenya and have experienced remarkable growth since inception.

Research Instrument

A data collection sheet was used as the instrument for collecting data. The instrument was designed to capture relevant aspects of the variables of study such as return, unit holders' balances, operational expenses, amount of funds invested in each asset in the portfolio, total value of asset under management. Validity and reliability of data was ascertained by obtaining data from authentic sources such as CMA, CIS and MMFs website. Money Market funds are required to submit audited annual reports to the regulator (CMA) containing a summary of financial activities and performance of MMFs. This encourages accuracy and timeliness of the data presented in the financial reports.

Data Collection

The study relied on secondary data from audited financial reports of MMFs, CMA annual reports and CIS annual reports. A document analysis was done on the audited annual financial reports for a period of seven years from 2018 to 2024. The study period was selected because it captures a period of rapid growth for MMFs, regulatory changes and significant macroeconomic events that would affect the functioning of MMFs. Validity and reliability of data was ascertained by obtaining data from authentic sources such as Capital Market Authority, Collective Investment Scheme and money market unit trust fund website.

Data Analysis

Data analysis involved descriptive statistics and inferential statistics. A two-stage analysis was adopted whereby first, efficiency scores of the MMFs were computed using the DEA methodology. Secondly, panel data regression analysis was used to determine the effect of management fee on efficiency of MMFs. In the presence of endogeneity bias, a dynamic panel model- Generalized method of Moments (GMM) was used to estimate the parameter coefficients. The GMM model controls for endogeneity bias, serial correlation and heteroscedasticity through transformations and use of instrument variables. Specifically, system GMM model by Arellano and Bover (1995) and Blundell and Bond (1998) was used to analyze data and draw inferences about the relationship that exists among the variables.

The validity of system GMM model estimation was determined by Arellano and Bond (1991) test for second order serial correlation of the disturbances. Hansen and Sargan test for overidentifying restrictions checks for the validity of instrument variables at 5% level of significance. The research hypotheses were tested at 5% level of significance using t statistics and probability values in order to make inferences and conclusions.

Efficiency Estimation using Data Envelopment Analysis

Data Envelopment Analysis, a non-parametric linear programming model was used to compute the efficiency scores of money market funds. Specifically, the input-oriented Banker Charnes and Cooper (BCC) model that assumes variable returns to scale model was adopted. The input- oriented approach was suitable because it would indicate by how much funds should minimize inputs to achieve a given level of return. The DEA model is considered as a superior tool for evaluating efficiency because first, it does not require the assumption of an underlying functional form relating inputs to outputs. It constructs its own functional form thus avoiding the limitation caused by misspecification error (Charles & Kumar, 2012). Secondly, it incorporates multiple inputs and outputs that can be expressed in different units of measurement. The inputs selected for the study were risk as measured by standard deviation (volatility of returns), operational expenses and unit holders' balance (UHB) while output was annual return obtained by the fund. The efficiency score ranges from 0 to 1 whereby an efficiency score of 1 implies that the fund is 100% efficient while a score of less than 1 implies the fund is relatively inefficient.

After obtaining the efficiency scores, the second stage of analysis involved regressing the efficiency scores with the explanatory variables. However, directly regressing DEA efficiency scores on management fee can result to unreliable results and incorrect statistical inference. Bootstrapping, a powerful statistical tool was used to address the statistical aspects of DEA by correcting the inherent biasness in DEA procedure and estimating confidence intervals for the efficiency scores resulting to biased corrected efficiency scores. Fitting the biased corrected efficiency scores into the regression model led to the estimation of more accurate standard errors for the regression coefficient and reliable statistical inferences (Goldberger ,1991; Xue & Hacker, 1999).

Measure of Variables

The key variables used in this study, along with their respective measures and supporting literature, are summarized in Table 1.

Table 1: Measure of variables

Variable	Measure	Related Studies
Management fee	Management fee to income ratio	Malkiel (2013)
Efficiency	Efficiency score by DEA (weighted sum of output to weighted sum of input)	Abate (2021) Galagadera and Silvapulle (2002)
Output	Annual Return	Bodie *et al.* (2024)
Inputs	Risk as measured by standard deviation, operational expenses and unit holders' balances	Murthi *et al* (1997) Riley and Brown (2000) Baghdadabad *et al*. (2013)

Dynamic Panel Model Specification

Through dynamic regression models, it is possible to capture persistence in the behavior of outcome variable and the contemporaneous relationship of the explanatory variables (Piper, 2014). Past studies by Garcia and Vidal (2021), Cohen *et al.* (2019), Tripathy (2017) and Budiono (2009) contend that funds exhibit persistence in efficiency. The GMM model incorporated a lagged value of efficiency score as an explanatory variable to capture persistence. That is to account for the possibility that past efficiency can influence the current level of efficiency. The study adopted the two-step system GMM by for analysis. System GMM improves significantly the estimates' accuracy and enlarges efficiency when the lagged dependent variables are considered as poor instruments in the first-differenced regressors (Greene, 2003; Baltagi, 2002). Moreover, system GMM is more appropriate in the use of unbalanced panel data and gives more robust results than the first difference GMM (Bond *et al*., 2001).

The following regression model was adopted;

$$Vrs_{it} = \beta_o + \beta_1 Vrs_{it-1} + \beta_2 MFee_{it} + \mu_i + \varepsilon_{it}$$

…….1

Where;

Vrs_{it} = Efficiency of fund i at time t

Vrs_{it-1} = Lagged efficiency score (dependent variable)

$MFee_{it}$ = Size of fund i at time t

$\beta_1 \ldots . \beta_2$ = regression coefficients

Results and Discussions

Descriptive statistics provide basic features or predict the nature of data collected and provide simple summaries of the population (Saunders *et al*. 2009). Inferential statistics are mainly concerned with estimation of population parameters and testing of statistical hypotheses (Larson & Farber, 2012; Kothari, 2004). Inferential statistics involved correlation analysis, and linear regression analysis.

Descriptive Statistics

The main descriptive statistics used in this study included mean, standard deviation, skewness and kurtosis.

Table 2: Descriptive statistics for inputs and outputs used in DEA

Variable	N	Mean	Std. Dev	Min	Max	Skewness	Kurtosis
Annual Return	122	10.465	2.888	3.500	17.700	0.462	2.968
UHB	122	6,285	12,471	5.14	68,182	3.335	14.132
Operational expenses	122	20.668	39.095	0.045	204.912	3.329	14.573
Volatility of returns	122	0.687	0.571	0.01	2.494	0.880	2.910

As per the results in Table 2, the overall mean return was 10.465% with a standard deviation of 2.888 implying that the returns on investment portfolios were widely spread out from the mean. The overall mean for UHB was Ksh 6.285 billion with a standard deviation of Ksh 12.47 billion suggesting that funds manage diverse UHB due to new deposits and withdrawals by investors. For operational expenses, an overall mean of Ksh 20.7 million with a standard deviation of Ksh 39.1 million implied that the fund's operational expenses were widely spread out from the mean. The overall mean for risk measure was 0.687 with a standard deviation of 0.571 implying the level of risk was moderately low. The moderate risk could be as a result the investment strategy adopted by fund managers in an effort to reduce the possibility of loss due to variations in returns.

Biases Corrected Efficiency Scores

Bias corrected efficiency score obtained by bootstrapping pure technical efficiency scores are presented in Table 3.

Table 3: Bias corrected efficiency scores

Efficiency Score	Mean	Std. dev.	Minimum	Maximum
Pure technical efficiency Score	0.520	0.375	0.003	1
Bias corrected efficiency Score	0.468	0.336	0.039	1

Results in Table 3 show that, pure technical efficiency score mean score was 52% with a standard deviation of 37.5%. Upon estimating the bias corrected efficiency sores, the mean declined to 46.8% with a standard deviation of 33.6%. The 46.8% mean efficiency score suggest that for money market funds to achieve 100% efficiency they need to reduce their input utilization by 53.2%. In the second stage of analysis, the study adopted the bias corrected efficiency scores as the dependent variable in the regression analysis.

Management Fee

Management fee was proxied as a ratio of total fund's income. The descriptive statistics for management fee are presented in Table 4.

Table 4: Descriptive statistics for management fee

Variables	N	Mean	Std. Dev	Min	Max	Skewness	Kurtosis
Management Fees	122	0.166	0.079	0.002	0.509	1.010	5.447

Statistics in Table 4 show that the overall mean score of 0.166 with a standard deviation of 0.079 means that management fee constituted 16.6% of the total income obtained by funds and the ratios were concentrated around the mean. Notably, the maximum management fee to income ratio was 50.9% meaning that for some funds the management fee was slightly more than half the total fund's income.

Correlation analysis of Management Fee and Fund Efficiency

A correlation analysis was performed to determine the strength and direction of the linear relationship between the variables. The results are shown in Table 5.

Table 5: Pairwise Correlations

Variables	(1)	(2)	(3)
(1) VRS	1.0000		
(2) VRS (-1)	0.3857***	1.0000	
	(0.0001)		
(3) MF	-0.1283	-0.0752	1.0000
	(0.1592)	(0.4639)	

P-values in parenthesis, ***p < .01, **p<.05, *p<1
*MF- management fees

The findings in Table 5 show a negative but insignificant relationship between fund efficiency and management fee (r=-.0.1283, p- value >0.05). The relationship between management fee and lagged efficiency was negative and insignificant (r= -0.0752, p-value>0.05). Thus, there is no likelihood of multicollinearity between the explanatory variables.

Diagnostic Tests

Diagnostic tests were done to determine whether the assumptions of regression model had been met. They included omitted variable and model misspecification test, multicollinearity, heteroscedasticity, autocorrelation and stationarity tests. The diagnostic tests confirmed that the model was correctly specified, and there was absence of multicollinearity, heteroscedasticity and autocorrelation. Further all panels were stationarity at level. Hence, it was possible to obtain efficient and reliable results due to the robustness of the estimated model.

Endogeneity Test

Endogeneity problem occurs when one or more of the regressors correlate with the error term (Baltagi, 2005). Endogeneity test was done to determine if the residuals are significantly correlated with the explanatory variables. The test results are presented in Table 6.

Table 6: Endogeneity test

Variables	(1)	(2)	(3)	(4)
(1) Residual	1.000			
(2) Vrs(-1)	0.110***	1.000		
	(0.002)			
(3) Vrs(-2)	0.107**	0.748	1.000	
	(0.04)	(0.000)		
(4) Vrs(-3)	0.099***	0.4980***	0.790***	1.000
	(0.006)	(0.000)	(0.0000)	

According to the results in Table 6, significant correlation exists between the residuals and some of the variables at 5% level of significance. The existence of a significant correlation between the residuals and the regressors' means there is presence of endogeneity hence it was appropriate to fit a dynamic panel model- GMM that controls for endogeneity.

Dynamic Panel Model

Considering the dynamic nature of funds efficiency, a Generalized Method of Moment model was estimated and the results are shown in Table 7.

Table 7: Generalized Method of Moment Model

Efficiency	(GMM-sys)	(GMM-sys)
VRS (-1)	-0.155	0.2030**
	(0.444)	(0.041)
M Fee	0.8550	0.2660
	(0.1770	(0.609)
Constant		0.301***
		(0.001)
Observations	58	74
No. of instruments	3	6
AR1 (p-value)	0.083	0.0238
AR2 (p-value)	0.360	0.286
Hansen-J (p-value)	0.450	0.157
Sargan Test (P-value)	0.489	0.0584

p-values in parentheses *p <0.05, ***p< 0.01

The study determined the effect of management fee on fund efficiency using the results of system GMM model. The validity of the model was checked by the test for second order serial correlation AR (2), Sargan and Hansen test. The test for AR (2) yielded a p- value >0.05 implying no presence of autocorrelation in the disturbances of the first difference equation. Both Hansen and Sargan tests for overidentifying restrictions were not significant (p-values >0.05) hence the null hypothesis of no overidentifying restrictions was not rejected and a conclusion was made that the instruments used in the model are valid. According to the results, the lagged efficiency score was significant (β= 0.203, p-value=0.041 <0.05) meaning that over the sampled period, the past level of fund efficiency influenced the current level of fund efficiency. Management fee had no statistically significant effect on fund efficiency (β =0.266, p-value = 0.609> 0.05). The intercept term was significant (β =0.301, p-value = 0.001< 0.05) at 5% significance level.

Conclusion

The average for management fee to income ratio was 16.6%, such a ratio suggests that quality investment decisions are being made resulting to the generation of sufficient income to cover management fees and other operating costs. The persistence in efficiency signifies successful investment strategies and portfolio management techniques. This could attract even more investors in the fund due to investors' confidence in the money market unit trust funds thereby increasing assets under management of the fund. The increase in assets under management would mean also increase in management fee for fund managers. However, management fee has no significant effect on efficiency of money market unit trust funds implying that whether a fund charges high or low fee it does not affect its efficiency. Additionally, probably growth of the industry and competition has facilitated the fixing of fees that is not exploitative.

Recommendation

Based on the findings that management fee does not influence fund efficiency, it is recommended that probably to prevent agency conflict from arising in future. Fund managers' compensation structures should be reviewed to align incentives with performance outcomes, emphasizing sustained efficiency improvement rather than fee maximization.

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