

PERFORMANCE EVALUATION OF PAKISTANI MUTUAL FUNDS

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Abstract. Extensive research has evaluated mutual fund performance in different financial markets which led to mixed results (Soderlind *et al.*, 2000; Korkeamaki and Smythe, 2004), however, limited work has been done to evaluate Pakistani mutual funds. The purpose of this study is to provide guidelines to the managers of open-ended Pakistani mutual funds and benefit small investors by pointing out the significant variables influencing the fund performance. An effort has been made to measure the fund performance by using Sharpe ratio with the help of pooled time-series and cross-sectional data and focusing on different fund attributes such as fund size, expenses, age, turnover, loads and liquidity. The quarterly sample data are collected for all the open-ended mutual funds listed on Mutual Fund Association of Pakistan (MUFAP), for the years 1999-2006. The results indicate that among various funds attributes lagged return, liquidity and 12B-1 had significant impact on fund performance.

I. INTRODUCTION

Increasing number of mutual funds in the developed financial markets indicate investor's preference for this mode of investment (Huhmann, 2005). Over the years mutual fund industry has experienced tremendous growth, whereas, mutual fund is still a recent phenomenon in some of the developing countries. The growth has been robust which in turn has led to the creation of various types of mutual funds. Broadly speaking, these funds can be categorized as open-ended and close-ended funds. Closed ended funds are those whose shares are initially offered to public and then traded in the secondary market between different investors whereas open-ended funds are

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those whose subscription and redemption of shares are allowed on continual basis. Zera (2001) pointed out the most unusual characteristic of open-ended funds by defining these as having no customers but only shareholders. In essence, mutual funds are institutions established for the purpose of benefiting small investors who cannot invest directly in various types of securities. For this purpose an asset management company is considered to be effective as it provides professional management by experts in the stock market.

Mutual Funds were introduced in Pakistan in 1962, with the public offering of NIT (National Investment Trust). Currently, this is the only open-ended mutual fund operating in public sector. The formation of the ICP (Investment Corporation of Pakistan) in 1966 offered a series of close-ended mutual funds which was afterwards divided into two lots in June 2000 and was then privatized. In the private sector, there are forty-three open-ended and twenty two closed-ended mutual funds. Although Pakistani mutual funds have experienced a phenomenal growth during the period under study (1999-2005) with net asset value grown from Rs. 16 billion to Rs. 137 billion till June 30, 2005, which also necessitates to ascertain whether the growth in this sector is a real one or is just a bubble. However, comparing Pakistani mutual fund industry internationally it is of a tiny size. According to Khorana *et al.* (2005) Pakistan holds only 1.33% mutual fund assets to primary securities, in contrast to India with 3.7%, Malaysia 4.0%, Hong Kong 20.3%, and South Korea 16.5%. These facts indicate that mutual fund industry in Pakistan has significant room to grow. Paid-up capital may look substantial but the size is still too small as compared to international standards.

The claim of management effectiveness by asset management companies has been a long-standing issue in finance literature and researchers have repeatedly evaluated management effectiveness of mutual funds. Earlier studies (Jensen, 1964; Shawky, 1982; Bogle, 1991; Pushner *et al.*, 1999; George, 2001) have examined management effectiveness by comparing risk-adjusted returns of mutual funds with those of unmanaged indexes. The results of these studies indicate that in general mutual funds have not been able to outperform the market. Management effectiveness has been also evaluated by many studies through examining relationship of fund returns with its selected attributes (Ippolito, 1992; Tan *et al.*, 1997; Gallagher, 2003; Joseph, 2004). These studies have generally taken attributes like fund size, fund expenses and turnover ratio in order to show their strong influence over open-ended fund returns.

Hence, management effectiveness of open-ended mutual funds should be evaluated as Pakistan's fund industry has a significant room to grow

further, which currently is smaller in size compared to other developing countries. Therefore, looking at the potential of the industry and the need of the small investors, it is important to assess the relationship of fund returns with its selected attributes in Pakistan.

II. LITERATURE REVIEW

A number of researchers have empirically evaluated the relationship of open-ended fund's performance with its attributes in different time periods for the developed economies (Soderlind *et al.*, 2000; Korkeamaki and Smythe, 2004). The effect of fund size on its return can be evaluated by measuring the relationship of fund's net asset with its return. Prior studies have indicated that smaller the size of fund, the higher is its operating efficiency. Robert (1988) concluded that the smallest quartile of US funds size achieved superior performance in comparison to other quartiles. The conclusion specifically indicated that the smallest quartile had significant positive risk adjusted returns as measured by Jensen Abnormal Performance Index at 90% level of significance. Gorman (1991) also found that small mutual funds, as measured by net assets, perform slightly better than large mutual funds. These results indicate that mutual funds quickly exhaust economies of scale and experience decreased returns (Becker and Vaughan, 2001; Chen *et al.*, 2004). Consistent with these researches, Soderlind *et al.* (2000) evaluated the relationship between fund performance and fund size in the Swedish market and concluded that better performance is achieved by the equity funds that are smaller in size.

The consistency of management effectiveness has been the focus of interest for many researchers. The theory of efficient market also suggests that fund managers should not be able to generate positive fund returns consistently over a period of time. In this context, Brown (1995) analyzed annual fund returns of US funds and found that returns are serially correlated over time thus negating the efficient market hypothesis. This study also confirms that past performance of mutual fund can be an important attribute in determining future fund returns.

Most of the studies on mutual fund performance conclude that actively managed funds fail to boost returns sufficiently so as to recover their expenses back. Hence, one of the most evident findings among the previous studies is the negative relationship between fund return and fund expenses. Livingston and O'Neal (1998) have also particularly stressed the significance of expenses in open-ended funds. In this context, Elton *et al.* (1993) examined the returns of US mutual funds and found that equity fund

performance is negatively related to the magnitude of expense ratios. Load, another form of expense was analyzed by Droms and Walker (1995) through examining international mutual funds and using a pooled cross-sectional/time series regression model to determine whether load/no-load status, asset size, expense ratios, and turnover rate were related to unadjusted and risk-adjusted returns. Results indicated no performance difference between no-load and load funds when using unadjusted and risk-adjusted returns. McLeod and Mathotra (1995) analyzed 12B-1, yet another form of mutual fund expense and confirmed that the fund managers justify these expenses in the form of higher returns. Consistent with above-mentioned studies a recent study by Korkeamaki and Smythe (2004) examined this relationship in Finnish market and reported that bank-managed and older funds charge higher expenses but investors were not compensated for paying higher expenses with higher risk-adjusted returns.

The level of fund turnover represents active or passive management strategy chosen by the fund managers in order to achieve their goals, where higher turnover reflects active management and *vice versa*. Various researchers have assessed the relationship of fund performance with the level of turnover showing varied evidences regarding its effect. Carhart (1997) empirically investigated US fund market and found a negative relationship between fund turnover and fund returns. In contrast, Soderlind *et al.* (2000) and Wermers *et al.* (2000) reported that turnover is positively associated with fund returns. Glenn (2004) argues that since open-ended funds face the possibility of redemptions it has to keep more of its assets in the form of cash. Therefore, an open-ended fund will have relatively less money invested than a close-ended fund, which may result in lower returns for the open-ended mutual funds.

Various studies have also used fund's age as a determinant to estimate different variables of mutual funds such as fund-flows, expenses, returns, and size. The study by Rao (1996) with a sample size of 964 funds found an insignificant relationship of age with expenses for US mutual fund industry. Another study by Sawicki and Finn (2002) with a sample size of 55 Australian funds confirmed the age-effect on fund-flows to performance of young funds.

A large number of researches have examined US mutual funds Karlsson *et al.* (2005), whereas, mutual fund industry of other emerging markets have attracted researchers' attention fairly recently. Ramasamy *et al.* (2003) surveyed the relative importance of various factors in the selection of mutual funds by financial advisors in Malaysia and concluded that consistent past

performance, size of the fund and cost of transaction were the three important factors influencing the fund performance. India's fund industry is also of considerable importance because of its recent rapid growth. Narayan (2003) evaluated the performance of Indian mutual funds and reported that over all, funds were able to satisfy investor's expectations by giving, excess returns over expected returns based on both premium for systematic risk and total risk. Moreover, the analysis of the Indian pension fund industry by Mukul and Amarendu (2006) suggested the need for greater professionalism and more superior system-wide perspective by India's provident and pension funds.

Despite the growing interest of researchers in mutual funds world wide, Pakistan's fund industry has not been able to attract the attention of researchers resulting in very limited research for Pakistan's fund industry. Cheema and Shah (2006) in their study of Pakistani fund industry using the annual data for 1994-2004 period concluded that the sufficient protection of minority investors can only be possible if institutional investors in general and mutual funds in particular play a significant role in corporate governance. Another study by Sipra (2006), evaluated the performance of close-ended mutual funds in Pakistan based on the data for the period 1995-2004 and reported that according to Jensen and Treynor measures almost half of the funds outperformed the market portfolio over the last five years. However, when the risk measure was adjusted for Fama's net selectivity measure the market portfolio outperformed all the funds except one.

The present study attempts to evaluate the management effectiveness of open-ended mutual funds in Pakistan for the purpose of benefiting the fund managers and the small investors. There are certain reasons to accept that management effectiveness for open-ended mutual funds would be different from close-ended due to size effect, pricing structures and fund flows. Management effectiveness would be evaluated by examining the relationship of mutual fund return with fund size, fund expenses, fund's age, portfolio turnover, loads and level of cash.

III. DATA AND METHODOLOGY

The quarterly sample data is collected for all forty-three open-ended mutual funds listed on MUFAP,¹ from the years 1999-2006 with the average number of observations for each variable being Two hundred and fifty

¹MUFAP is the official website which gives the direct facility of further web linkages to every mutual fund in Pakistan.

seven.² The study uses the regression model of Philpot *et al.* (1998), which was particularly used for evaluating management effectiveness of US bond mutual funds. Korkeamaki and Smythe (2004) also used a similar regression model to explain the returns over time for Finnish mutual funds for the period 1993-2000. Moreover, funds Age and liquidity are used as added variables to explain its relationship with fund returns. The inclusion of age variable may be justified by the logic that as the fund's age increases it would have more standardized procedures, in other words, greater operating efficiency would lead to have positive relationship with fund return. Glenn (2004) has discussed the negative effect of liquidity on open-ended funds as they have to maintain more cash compared to close-ended funds in order to meet the chance of redemption. Therefore, the liquidity is also included as an additional explanatory variable of the estimated model.

Model 1 (Philpot Model)

$$\begin{aligned} \text{Return}_{it} = & \alpha + \beta_1 (\text{Assets}_{it}) + \beta_2 (\text{Expense}_{it}) + \beta_3 (\text{Turnover}_{it}) \\ & + \beta_7 (12B-1_{it}) + \beta_4 (\text{Load}_{it}) + \beta_8 (\text{Return}_{t-1,i}) + \varepsilon_{it} \end{aligned} \quad (1)$$

Model 2 (Modified Model)

$$\begin{aligned} \text{Return}_{it} = & \alpha + \beta_1 (\text{Assets}_{it}) + \beta_2 (\text{Expense}_{it}) + \beta_3 (\text{Turnover}_{it}) \\ & + \beta_4 (\text{Load}_{it}) + \beta_5 (\text{Age}_{it}) + \beta_6 (\text{Liquidity}_{it}) + \\ & \beta_7 (12B-1_{it}) + \beta_8 (\text{Return}_{t-1,i}) + \varepsilon_{it} \end{aligned} \quad (2)$$

Where

i , represents the fund

t , represents the time period

The eight experimental variables used in present study represent the funds attributes with their expected outcomes where:

Return = The fund quarterly Sharpe ratio

Assets = Asset has been measured as the natural logarithm of fund's total net assets of each quarter. The asset variable should have a positive relationship with fund's return if they realize economies of scale.

²Some of the mutual funds were in operation for the entire time period under study whereas, the others came into existence later on, therefore, the average numbers of observations for each variable were 257.

- Expense = Expense ratio has been measured by mutual fund's quarterly operating expenses (including management fees, distribution fees, and other expenses) as a percentage of the fund's average net assets. If by spending more resources on active management, managers increase the return then expenses regression coefficient should be positive.
- Turnover = Turnover ratio reflects the total trading activity undertaken by the fund during the quarter. Hence, if active management increases return the turnover variable will have a positive relationship with fund's return.
- Load = A dummy variable coded one if the fund charges any load and coded zero otherwise. Thus, if load fund managers are more skilled then it should have a direct relationship with returns.
- 12B-1 = A dummy variable coded one if the fund charges a distribution fee, and coded zero otherwise. 12B-1 should have a positive relationship if it increases the fund size by promoting the share sales which in turn increases the fund return.
- Age = Age will be measured by number of quarters the fund is operational. As age increases it is deemed that efficiency increases therefore, returns are also supposed to increase resulting in a positive relationship.
- Liquidity = Liquidity will be measured by the fund's total cash on quarterly basis. If increase in cash balance prevents quick sales of assets then relationship of liquidity with fund return is expected to be positive.
- Return_{t-1} = Mutual fund Sharpe ratio lagged one holding period. If fund managers are consistent in their performance, the expected relationship is positive.

IV. RESULTS

The descriptive statistics of forty-three open-ended mutual funds in Pakistan are presented in Table 1. On average, the mean net assets of Equity fund are 4.052 billion rupees while the median net assets figure stands at only 1.372 billion rupees, this clearly shows that some of the extraordinary large funds as National Investment Trust, to some extent have skewed the mean

upwards. Moreover, the largest funds have lower expense ratios but surprisingly the fund size is not helping them to excavate higher returns. In addition, the Islamic funds seem to be the most expensive in terms of total expense ratio but are also earning the highest mean returns. However, Hybrid funds on the other hand have lowest expense ratio and turnover with the highest amount of liquidity. The mean values of Sharpe ratio for all the fund categories during the sample period are negative and they are highest for fund of funds category while lowest for the Income and money market funds. Moreover, the fact that funds of funds being lowest in terms of raw return but highest for Sharpe ratio demonstrates its ability to reward the premium return relative to its variability.

Almost all of the funds in the categories of Islamic funds, balanced funds, hybrid funds, and funds of funds are charging load fee, with the exception of equity funds and income funds where 72% and 90.9% of the funds are charging this fee.

In comparison to the load fee, 12B-1 is charged by all the funds in the categories of hybrid funds and funds of funds only. With the balanced funds category having the lowest number of funds with (50%) charging the fee.

The relationship between fund attributes and fund performance are hypothesized on the basis of three financial theories namely, Efficient market theory, Agency theory and Trade-off theory. Efficient market theory deals broadly with two issues, whether mutual fund managers are consistent in their performance or not and whether active portfolio management increases portfolio returns. The agency theory discussed in this study is related with certain fund characteristics which might be manipulated by the management in order to maximize their own benefits rather than maximizing shareholders wealth. Finally, the trade-off theory addressed by this study is concerned with the optimal holding of cash, which suggests that firms set the amount of cash holding by weighing their marginal cost and marginal benefits.

The hypotheses indicated by the theories are tested in this study as H_1 : The Mutual Fund return is negatively related to fund size. H_2 : Mutual Fund returns have negative relationship with expenses. H_3 : The mutual fund return is negatively related to turnover ratio. H_4 : Mutual Fund charging loads provide lower returns as compared to funds not charging loads. H_5 : 12B-1 has a positive relationship, if it increases the fund size. H_6 : The Mutual Fund return has a positive relationship with fund's age. H_7 : Mutual Funds holding more cash are expected to provide lower risk-adjusted return. H_8 : A mutual fund return is un-related to its quarterly lagged return.

TABLE 1
Descriptive Statistics (1999-2006)

	Equity	Income/ Money market fund	Islamic funds	Balanced funds	Hybrid Funds	Funds of funds
Assets (Billions Rs.)						
Mean	4.052	4.041	1.582	1.692	1.189	0.183
Median	1.372	1.377	1.205	1.372	1.106	0.184
SD	11.47	11.44	12.82	1.240	0.209	0.013
Expense ratios						
Mean	1.194%	1.184%	1.297%	1.256%	0.403%	1.168%
Median	0.846%	0.832%	.907%	0.878%	0.289%	1.082%
SD	1.284%	1.285%	1.413%	1.349%	0.248%	0.575%
Turnover						
Mean	57.290%	57.63%	74.69%	70.47%	14.132%	91.08%
Median	19.86%	19.86%	23.65%	24.81%	17.81%	39.17%
SD	1.818%	1.814%	2.335%	2.085%	8.82%	1.19%
Liquidity (Billions Rs.)						
Mean	0.315	0.324	0.231	0.275	0.982	0.021
Median	0.127	0.131	0.104	0.115	0.855	0.023
SD	0.442	0.449	0.406	0.429	0.207	0.014
Return						
Mean	4.14%	4.17%	4.56%	4.46%	3.28%	-0.43%
SD	8.18%	8.10%	8.92%	8.29%	0.97%	5.99%
Sharpe ratio						
Mean	-0.423	-0.430	-0.322	-0.274	-0.544	-0.120
SD	1.191	1.192	1.245	1.031	0.724	0.100
Fund's Age Mean (quarters)	23	24	7	7	4	4
Funds Charg- ing Load	72%	90.9%	100%	100%	100%	100%
Funds Charg- ing 12B-1	90.9%	54.5%	66%	50%	100%	100%

The empirical evaluation of above eight hypotheses consists of regressions with Sharpe ratio as dependent variable and lagged Sharpe ratio, log of fund assets, quarterly expense ratio, portfolio turnover rate, load, 12B-1, cash and age of the fund as independent variables. The first model in Table 2 represents the results of independent variables included by Philpot (1998) while, in the second model two new variables cash and age of the mutual fund were added to be estimated. The first two regression models are run under ordinary least square and the third regression model is run under IGLS. This study uses a pooled-time series cross-sectional data to estimate the mutual fund returns relationship with independent variables. In doing so, IGLS is used to take care of the possible contemporaneous correlation and heteroskedasticity. Therefore, the conclusion should be drawn from the IGLS model.

TABLE 2

Results of Regression Analysis (Dependent Variable Sharpe Ratio)

Variable	Model 1 OLS	Model 2 OLS	Model 2 IGLS
Assets	3.04 (0.363)	4.35 (0.328)	4.73 (0.34)
Expense ratio	1118.7 (1.634)	980.04 (1.42)	980.08 (1.47)
Turnover	3.072 (0.675)	2.84 (0.625)	2.84 (0.65)
Load	-15.11 (0.528)	-15.61 (-0.652)	-15.61 (-0.67)
12B-1	24.21 (1.413)	36.64** (2.016)	35.78** (2.08)
Return _{t-1}	0.153** (2.513)	0.124** (1.996)	0.1235** (2.06)
Age		0.584 (1.11)	0.583 (1.15)
Liquidity		-4.0e-008* (-1.794)	-4.03e-08* (-1.85)
F-value	2.803**	2.873**	5.24***
Model R ²	0.122	0.153	0.218

*Significant at 0.1 level, **Significant at 0.05 level, *t* statistics in parenthesis

If the mutual fund data supports the theory of efficient markets then the outcome should match the theory's prediction also. Hence, the estimated coefficients should be negative or unrelated for the variables of lagged Sharpe ratio, expense ratio and turnover. If the predictions of agency theory are supported then the estimated coefficients for assets, load and 12B-1 must be negative. Finally, if the prediction of Yan (2006) made under static model of optimal cash holding holds true then the coefficient for liquidity variable will be negative.

The results of IGLS regression in the Table 2 shows that quarterly Sharpe ratio is positively and significantly related to its lagged Sharpe ratio. This means that fund performance in a quarter is directly related to its performance in the prior quarter. This result is of particular importance to financial planners and investment advisors who spend a lot of time studying the past fund performance as they regard it a key component of selection process (Droms, 2006). The result of this study provides the evidence that the mutual funds are consistent in their performance and also conforms that the fund managers have difference in their skills which persists over time. Hence, difference in fund performance is also expected to be proportional to differences in prior periods. However, the insignificant variables expense ratio ($t = 1.47$) and turnover ratio ($t = 0.65$) somehow support the efficient market theory. This means that funds' incurring of higher expenses and turnover ratio do not put any significant effect on the Sharpe ratio. However, these results are consistent with Lin (2004) who also confirmed that expense ratio and turnover ratio were unrelated to risk-adjusted return.

The funds charging 12B-1 has a significant ($t = 2.08$) positive relationship with the Sharpe ratio. In general, a 12B-1 fee is justified on the basis that it helps the fund to pay for its advertising, which over time builds the asset base of a fund and hence raises the performance due to growth and possible economies of scale. Thus, this result does not support agency theory which predicts that investors lose value when their funds are used to promote mutual fund share sales. The result is consistent with study of Griffith *et al.* (1998) which concluded that these costs do add to the fund's performance.

Relation between Asset and Sharpe ratio is insignificant ($t = 0.34$) which shows that large fund size neither benefits the shareholders through increased economies of scale nor does it costs them due to increased agency problems. Although, the large fund size certainly benefits the management because their management fee is a fixed percentage of fund assets.

The result suggests that load is not a distinctive factor for the recognition of superior or inferior funds but normally this expense should be avoided by

the investors. The load coefficient is negative which indicates that no-load funds outperform load funds marginally. This result may have supported the agency theory prediction that investors lose value when such fees are charged but the result however, is not significant.

The funds have an option of meeting investors redemption either by liquidating securities or holding cash. The fund manager has to maintain a balance between the options of holding cash or liquidating securities because holding more cash would decrease the expected return while liquidating securities requires transaction cost and also is not favorable to sell when the markets are down. The result in Table 2 indicates the effect of fund cash holding on performance is negative and significant which also supports the prediction of Yan (2006). However, this outcome is also consistent with the findings of (Glenn, 2004), that only those mutual funds are able to survive better which maintain lower level of cash holdings. The older funds are thought to exhibit superior performance due to more experience but somehow, the Age variable is positive and not significant indicating that old funds on average perform the same or slightly better.

The liquidity coefficient is significant ($t = -1.74$) and negative. This outcome appears to support (Glenn, 2004; Dukes and Davis, 2006) finding, that only those mutual funds are able to survive better which maintain lower level of cash holdings.

V. CONCLUSION

Existing literature has focused on the management effectiveness of Pakistan's close-ended funds and has concluded the performance of these funds as poor. However, the present study's primary contribution is in providing conclusive evidence on the important characteristics of open-ended mutual funds. The study investigates the impact of asset size, 12B-1, load, expense ratios, turnover, lagged return, liquidity and age on mutual fund performance. Mutual fund risk-adjusted return is positively related to expenses, turnover and Age however, they are statistically insignificant. In fact, this result points towards the opportunity for mutual fund industry to make themselves better informed and operationally efficient for the reason, that as the age increases it enables fund to achieve greater operating efficiency and decrease their expenses (Dellva and Olson, 1998).

The 12B-1 fees has a significant positive relationship with the Sharpe ratio in the second model signifying that this has become important due to the addition of other two factors. 12B-1 allows the fund for the payment of distribution fees to selling agents which in turn helps fund to increase its

performance due to growth and possible economies of scale. This result is also consistent with Griffith *et al.* (1998) study which concluded that these costs do add to the fund's performance. On the other hand, the regression results did not make any significant difference between funds charging load and no-load funds. The results of both the models suggest that asset size is not a distinctive factor for the recognition of superior or inferior funds conforming the results of Dellva and Olson (1998).

Thus, the conclusion of this study in addition to focusing on the relationship between funds attributes and performance for better funds management also implies that investors while making decisions should see the past performance of the fund, level of fund cash holdings and prefer a fund with 12B-1 plan.

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