PERFORMANCE ASSESSMENT OF PAKISTANI ISLAMIC MUTUAL FUNDS

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ABSTRACT:*This paper evaluates the performance of Pakistani Islamic mutual funds from January 2009 to December 2015 with the help of multiple tests for bringing reliable results. Applied techniques include ratio analyses such as Sharpe, Sortino, Treynor and Jenson Alpha. Augmented Dickey Fuller test is applied for finding stationarity of data and ultimately we apply Order of Preference by Similarity to Ideal Solution (**TOPSIS**) for ranking the funds according to their performance. These all tests give a clear image of Islamic mutual fund industry of Pakistan. Overall these tests points towards the fact that this sector is in good state in Pakistan.*

KEYWORDS: Islamic mutual funds, ratio analysis, TOPSIS technique, ADF unit root test.

1. INTRODUCTION:

Honohon [1] found that about 72% of the citizens living in Muslim countries do not exploit formal financial services. Acceptance of Islamic finance is increasing around the world and this is evident due to the switching from banking sector to Islamic insurance and Islamic mutual funds. Despite global crisis there is tremendous growth in last decade. A high level of interest in these funds stems from ethical considerations as described by Akhtar [2] fair distribution of risk and reward among its stakeholders and financial and economic considerations. Ernst and Young [3] found that on global level Islamic finance is getting more popularity due to Shariah compliance services and Islamic finance has its origin from Gulf States.

While Islamic finance is relative new term in today's economic system, we found its root in 1st July 1948 in the speech of Mr. Muhammad Ali Jinnah at the inauguration of the State Bank of Pakistan (SBP) **"I shall watch with keenness the work of your Organization in evolving banking practices compatible with Islamic ideas of social and economic life. We must work our destiny in our own way and present to the world an economic system based on true Islamic concept of equality of manhood and social justice."**

According to Shah & Hijazi [4] mutual funds in Pakistan were introduced by National Investment Unit Trust (NIT) for the first time in 1962 and after 70's nationalization government became more active in the management of funds. As per findings of Gohar, Ahmed and Niazi [5] private sector is the major player in mutual funds market. Mutual Funds Association of Pakistan is representative body for mutual funds whereas Securities exchange commission of Pakistan is functioning as regulatory authority. Literaure has cited many studies relateing to performance evaluation of Mutual Funds. Zafar [6] analyzed the performance of mutual funds in India and found that mutual funds are gaining popularity in India. Jank [7] analyzed the impact of news on market returns. He found that mutual funds flows predict real economy dynamics and further these flows can be explained with the help of T-Bill rate, default spread and consumption-wealth ratio.

Klapper [8] found significant growth of mutual funds showed mainly in Asia, during 1990's. Prince and Bacon [9] analyzed growth of mutual fund industry in comparison to risk free rate and market return. In their study they found that some funds had greater returns than expected. Kaminsky [10] found that main factor that effect on investment decision is not economic condition but liquidity. Walter and Sisli [11] examine the mutual funds market of Korea, Malaysia, China, Singapore, Indonesia, Philippines and Thailand. Their finding suggest that proper management of these assets will result in increasing growth rate of these fund. For the period of 1999-2005, Ferriera et.al [12] study the behavior of mutual fund around the globe. Results show that fund size is positively related with performance in domestic and international markets.

2. MATERIALS AND METHODS

In this study all Islamic mutual funds that were being offered in Pakistani market are part of study that exists in the market for period of January 2009 to December 2015. Secondary as well as tertiary sources are used for collecting data. Net asset value of mutual funds was collected from mutual fund association of Pakistan (MUFAP). In this study market proxy is Karachi Meezan Index (KMI)-30 and 12 month T-bill rates are taken as risk free rate. Data on market proxy and risk free rate is taken from statistical bulletin of State Bank of Pakistan.

2.1 Performance Valuation Techniques

In this study a diverse method is applied for increasing reliability of results. First of all ratio analysis is done. Employed ratios are as follows

- Sharpe ratio
- Treynor ratio
- Jenson alpha
- Sortino ratio

After the application of ratios a new method for the better choice of the funds is used. This technique is for order preference by similarity of ideal solution (TOPSIS). Before calculating TOPSIS, unit root test is employed for finding the stationarity of the data.

2.1.1 Sharpe measure:

This is used to measure the risk-adjusted performance. It measures performance of an investment by dividing excess return with amount of risk taken. It focuses on the use of the ratio for making decisions. The formula is:

$$\text{sharpe ratio} = r_{p-} r_f/ \sigma \qquad \text{(Eq. 1)}$$

Where,

r_p = portfolio return,

r_f = risk free rate,

σ = standard deviation.

2.1.2 Treynor Measure:

It is a composite measure of portfolio performance that comprises risk as well.

Treynor Measure $= r_{p-} r_f/ \beta$ (Eq. 2)

Where,

r_p = portfolio return,

r_f = risk free rate,

β = beta.

2.1.3 Jenson differential measure or Jensen Alpha:

This is a risk adjusted gauge of portfolio performance evaluation. This measure is based upon security market line and capital asset pricing theory. This ratio evaluates performance of security. The measure is as follows:

$$\alpha = r_p - \left[r_f + \beta_p(r_m - r_f)\right] \quad \text{(Eq. 3)}$$

Where,

r_p = expected total portfolio return,

r_f = risk free rate,

β_p = beta of the portfolio,

r_m = expected market return.

2.1.4 Sortino ratio:

A ratio similar to Sharpe ratio is used to measure risk adjusted return of investment or portfolio. This uses downside volatility in denominator for calculating negative volatility. This deviation helps to differentiate between negative and positive volatility. Mathematically it is written as follows:

Sortino ratio = R-MAR/DV (Eq. 4)

Where

R=fund return

MAR=minimum accepted rate

DV=downturn volatility

Higher Sortino ratio indicates lower risk so high value is favorable.

2.2 Test of Stationarity:

The unit root test is applied to find out whether time series are stationary or not. As stationary series has direct impact on the behavior of the funds. Shock will die away gradually after some time and series will return to its previous state. There are a number of tests used for this purpose but here in this study Dickey-Fuller and Augmented Dicey Fuller test is employed. It is calculated as follows:

$$\Delta y_t = \alpha y_{t-1} + x_t\delta + \beta_1\Delta y_{t-1} + \cdots \ldots\ldots + \beta_n\Delta y_{t-n} + \epsilon_t \quad \text{(Eq. 5)}$$

Where

x_t=regresses (constant)

δ= parameter

ϵ_t= white noise

β= coefficients of the study

2.3 TOPSIS Technique:

Technique for order preference by similarity of ideal solution is a useful multi-criteria decision making technique. PIS maximize benefit criteria and minimize cost criteria. Its steps are as follows:

TABLE 1. ADF-Unit Root Test

Fund Name	T- statistics	p value
ABL Islamic Income Fund (Formerly: ABL Islamic Cash Fund)	-2.227	0.201
ABL Islamic Stock Fund	-1.857	0.326
Al Meezan Mutual Fund	-2.628	0.093
KSE Meezan Index Fund	-2.532	0.125
Meezan Capital Protected Fund II	-2.486	0.129
Meezan Cash Fund	-6.686	0
Meezan Islamic Fund	-3.647	0.008
Meezan Islamic Income Fund	-4.657	0
Meezan Islamic Income Fund	-4.657	0
Meezan Sovereign Fund	-2.039	0.27
Meezan Balanced Fund	-2.61	0.097
Alfalah GHP Islamic Fund	-3.799	0.005
MCB Islamic Income Fund-A	-3.259	0.026
MCB Islamic Income Fund-B	-2.479	0.131
Pakistan Int'l Element Islamic Asset Allocation Fund	-2.685	0.083
Askari Islamic Asset Allocation Fund-B	-3.091	0.034
Askari Islamic Asset Allocation Fund-C	-2.905	0.052
Askari Islamic Income Fund-B	-1.099	0.708
Askari Islamic Income Fund-C	-1.121	0.7
Atlas Islamic Income Fund	-8.202	0
Atlas Islamic Stock Fund	-2.668	0.086
Faysal Islamic Savings Growth Fund	-4.598	0.001
HBL Islamic Money Market Fund	-0.439	0.889
First Habib Islamic Balanced Fund	-3.574	0.025
HBL Islamic Stock Fund	-1.192	0.665
IGI Islamic Income Fund	-4.729	0
JS Islamic Fund	-1.995	0.288
JS Islamic Government Securities Fund	-1.844	0.326
KASB Islamic Income Opportunity Fund	-2.5	0.121
NAFA Islamic Multi Asset Fund	-2.019	0.278
NAFA Islamic Aggressive Income Fund	-2.15	0.226
NAFA Riba Free Savings Fund	-4.702	0.001
Pak Oman Advantage Islamic Income Fund	-4.861	0
Pak Oman Islamic Asset Allocation Fund	-2.563	0.106

UBL Islamic Savings Fund	-2.889	0.056
UBL Shariah Stock Fund	-1.847	0.355
United Islamic Income Fund-INCOME	-1.071	0.722
United Islamic Income Fund-GROWTH	-1.56	0.497
UBL Islamic cash fund	-1.912	0.319
UBL Islamic Principal Preservation Fund I	-2.358	0.178

Step1: Normalize decision matrix

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}^2}}, i = 1, \ldots\ldots, m; j = 1, \ldots\ldots, n \quad \text{(Eq. 6)}$$

Step 2: weighted normalized decision matrix

$$v_{ij} = w_i * r_{ij} \quad \text{(Eq. 7)}$$

Step 3: calculate PIS and NIS

Positive Ideal Solution (PIS)

$$A^+ = \{(\max_i v_{ij} | j \in J), (\min_i v_{ij} | j \in J'), I = 1,2, \ldots\ldots, m\}$$

$$A^+ = V_1^+, V_2^+, \ldots\ldots, V_N^+ \quad \text{(Eq. 8)}$$

Where
J=benefit criteria
J'=cost criteria

Negative Ideal Solution

$$A^- = \{(\max_i v_{ij} | j \in J), (\min_i v_{ij} | j \in J'), I = 1,2, \ldots\ldots, m\}$$

$$A^- = V_1^-, V_2^-, \ldots\ldots, V_N^- \quad \text{(Eq. 9)}$$

Step 4: Calculate distance from PIS and NIS

Separation from PIS

$$S_i^+ = \sqrt{\sum_{j=1}^{n} (v_{ij} - v_j^+)^2} \quad \text{(Eq. 10)}$$

Separation from NIS

$$S_i^- = \sqrt{\sum_{j=1}^{n} (v_{ij} - v_j^-)^2} \quad \text{(Eq. 11)}$$

Step5:

Relative closeness to positive ideal solution

$$C_i = \frac{S_i^-}{S_i^+ + S_i^-} \quad \text{(Eq. 12)}$$

Step6:
Ranking of alternatives according to distance in descending order

3. RESULTS AND DISCUSSION

3.1 Unit Root Test:

At analysis phase first of all behavior of series is checked. For this purpose unit root test is applied. Unit root test is used to find out stationary behavior of the series. Results of ADF test indicate that all series are stationary. Results are given in table 1

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3.2 Ratio Analysis and TOPSIS Technique

In ratio analysis, four different ratios are employed namely Sharpe ratio, Sortino ratio, Treynor ratio and Jenson Alpha ratio. Sharpe ratio is used to find out risk return. It shows positive trend with few exceptions throughout the period, indicating that investors are getting return on their investment. After this ratio Sortino ratio is calculated which is based on Sharpe ratio and is used to find out lowest negative return. Like Sharpe ratio its results are also positive that indicate a good return over investment. Another ratio that is Treynor ratio is used to find out actual return is found to have variation in its results. In study period about more than half funds are having positive results while other have negative results indicating many investors were having actual return while other were having actual risk. Last employed ratio was Jensen alpha that is used to find out expected return. Like Treynor ratio its results are mixed as well, few funds are having positive results indicating investors were getting more than they expect while rest are having negative results.
Results of TOPSIS method are self-explanatory. This technique has prioritized the funds based upon their difference from negative ideal solution and positive ideal solution. In this method ratios are weighted subjectively, ratios are equally weighted and then on the basis of that rest of the results are produced. Its results are given in following table.

4. CONCLUSION

In this study the performance of Islamic mutual funds in Pakistan is examined. In order to fulfill this objective monthly data on fund's NAVs, KMI-30, and risk free T-bill rates is taken for the period January 2009 to December 2015. We apply ADF unit root test to find out whether the data is stationary or not. All series are found stationary. The performance of Islamic funds is evaluated with the help of Sharpe, Sortino, Treynor and Jensen alpha ratios. Our ratio analysis shows that Islamic funds perform very well even during the crisis period with few exceptions. Ratio analysis doesn't indicate a dominant alternative, for this purpose

TABLE 2. Ratio Analysis and TOPSIS Technique

Fund Name	Sharpe ratio	Sortino ratio	Treynor ratio	Jenson alpha	Cci	Ranking
NAFA Riba Free Savings Fund	0.874	0.411	0.003	0.068	0.965	1
MCB Islamic Income Fund-B	0.717	0.558	-0.036	0	0.783	2
MCB Islamic Income Fund-A	0.69	0.541	-0.032	0.001	0.779	3
HBL Islamic Stock Fund	0.187	0.299	0.028	0.044	0.773	4
KSE Meezan Index Fund	0.177	0.249	0.038	0.043	0.729	5
Meezan Balanced Fund	0.124	0.198	0.018	0.049	0.698	6
Faysal Islamic Savings Growth Fund	0.376	0.303	0.014	0.014	0.677	7
HBL Islamic Money Market Fund	1.051	0.642	-0.006	-0.041	0.664	8
NAFA Islamic Multi Asset Fund	0.117	0.167	0.019	0.045	0.653	9
Alfalah GHP Islamic Fund	0.111	0.166	0.013	0.044	0.647	10
ABL Islamic Income Fund (Formerly: ABL Islamic Cash Fund)	0.388	0.241	0.011	0.016	0.636	11
Pakistan Int'l Element Islamic Asset Allocation Fund	0.107	0.144	0.015	0.044	0.625	12
UBL Islamic Savings Fund	0.413	0.316	-0.029	0	0.619	13
Al Meezan Mutual Fund	0.09	0.138	0.025	0.045	0.618	14
KASB Islamic Income Opportunity Fund	0.32	0.194	0.021	0.014	0.57	15
Meezan Islamic Fund	0.083	0.111	0.026	0.036	0.55	16
Pak Oman Islamic Asset Allocation Fund (Formerly: Pak Oman Advantage Islamic Fund)	0.133	0.14	0.012	0.026	0.543	17
Meezan Capital Protected Fund II	0.377	0.413	-1.453	0.014	0.539	18
UBL Shariah Stock Fund (Formerly: United Composite Islamic Fund)	0.089	0.11	0.022	0.032	0.53	19
Meezan Sovereign Fund	0.34	0.243	-0.008	-0.009	0.512	20
Atlas Islamic Income Fund	0.387	0.179	-0.126	0.003	0.51	21
United Islamic Income Fund-GROWTH	0.177	0.155	0.032	0.012	0.498	22
Askari Islamic Asset Allocation Fund-C	0.112	0.132	0.01	0.02	0.497	23
Askari Islamic Income Fund-B	0.335	0.242	-0.005	-0.016	0.487	24
Atlas Islamic Stock Fund	0.068	0.084	0.029	0.028	0.48	25
Askari Islamic Asset Allocation Fund-B	0.109	0.123	0.013	0.017	0.475	26
Askari Islamic Income Fund-C	0.349	0.25	-0.004	-0.022	0.474	27
Meezan Cash Fund	0.52	0.24	-0.004	-0.028	0.473	28
JS Islamic Fund	0.065	0.075	0.028	0.026	0.462	29
United Islamic Income Fund-INCOME	0.142	0.126	0.03	0.008	0.448	30
Meezan Islamic Income Fund	0.3	0.187	-0.009	-0.014	0.445	31
Meezan Islamic Income Fund	0.3	0.187	-0.009	-0.014	0.445	31
Pak Oman Advantage Islamic Income Fund	0.2	0.184	-0.012	-0.009	0.444	33
IGI Islamic Income Fund	0.321	0.216	-0.003	-0.027	0.435	34

NAFA Islamic Aggressive Income Fund (Formerly: NAFA Islamic Income Fund)	0.095	0.117	-0.021	-0.001	0.395	35
UBL Islamic Principal Preservation Fund I	-0.128	-0.115	0.016	0.053	0.368	36
UBL Islamic cash fund	0.148	0.083	-0.001	-0.058	0.306	37
JS Islamic Government Securities Fund	-3.443	-0.621	-0.01	-0.003	0.26	38
First Habib Islamic Balanced Fund	-0.201	-0.219	0	0.028	0.165	39
ABL Islamic Stock Fund	-0.26	-0.373	0.004	0.013	0.048	40

TOPSIS technique is employed and with the help of this technique funds are ranked according to their performance.
This study is different from other performance measuring studies in terms of method. We have applied a different method of performance evaluation that enable us to priorities funds according to their performance. This study can be extended to other fund classes for evaluating their performance.

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