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An Empirical Study on Selecting Partially Equivalent (PE) Benchmarks for Mutual Funds Categories in Pakistan: ANOVA Approach

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ABSTRACT

In this study, we propose a new concept of partially equivalent (PE) benchmarks for evaluation of different mutual funds categories in Pakistan. We constructed separate benchmarks for all major categories of funds after carefully considering the asset composites of classes. For the validity of proposed benchmarks, we conducted unit root test, kernel density distribution and ANOVA analysis. Our results prove that money market and aggressive income non-sharia benchmarks and most of Sharia benchmarks indices have shown indifference of distribution against the conventional benchmark i.e., KSE 100 and KMI 30. This encourages the fund managers and scholars alike to use the proposed benchmark indices against the conventional ones to analyze the management style, market variations, market timing and behavioral aspects with some precision and accuracy.

1. Introduction

Benchmark portfolios are those portfolios that are equivalent to the degree of all returns-related components, known as essential composites. Let this portfolio be called "Partially Equivalent" (PE) benchmark portfolio. A PE benchmark portfolio requires that likeness exists in components of the managed fund portfolios, which create distinctive returns against the benchmark portfolio. In any case, issue exists with regards to the operationalized definition of the idea. This can be determined if the performances of these proposed benchmark indices can be comprehended under the impression of their particular meaning of (PE) benchmark portfolio.

The general understanding of assessing the performance of the assets fund is done by simply analyzing the generated returns of the benchmark portfolio and the funds over the holding time. This comprehension of assessing the performance of the assets fund is done on the straightforward activity of counting the generated returns of the benchmark portfolio and the managed funds over the holding time. In any case, the consideration ought to be taken that the benchmark portfolios do not convey the substance of trough's capacity of contributing the funds' portfolios to create attractive results. The (PE) benchmark portfolio is expected to distinguish the issues of high-low expected returns from the managed portfolios entirely based on the asset composites of schemes of mutual funds given in Table 1. This produces space for optional proposed benchmarks as proxies that contribute toward the parallel improvement procedure of gauging the portfolio performance of funds.

This research introduces a concept of separate benchmark keeping in view the respective riskier classes of mutual funds in the context of Pakistan. This study investigates the validation of proposed benchmarks against the standardized conventional and Sharia compliant benchmarks on the basis of their respective standardized criteria. The main focus of the research underpins two main facts; i.e., first relates to the lack of research on mutual funds industry of Pakistan and the second one is to address the issue of choosing appropriate benchmarks in conjunction to the respective riskier categories of mutual funds in Pakistan.

In the light of this argument this study suggests that each category of mutual funds should be evaluated against a separate set of benchmark. This benchmark should be in conformance with the benchmark used by the industry in practice. The main reason for the change in benchmark as opposed to the conventional benchmark is the gap which is ignored in the recent past. Moreover, once the benchmark is set for the main categories of mutual funds it becomes easier to perform further analysis that can be se to compute the sensitivities of fund's performances with some precision and accuracy.

The main objective of this paper is to propagate the concepts of use of separate benchmarks for the evaluation of non-Sharia and Sharia compliant mutual funds. The benchmarks presented in this study relate to all categories of mutual funds available for investment in Pakistan. These bench marks have been formulated after rigorous study. This paper consist of the following sections, i.e., section 2–focuses on the literature discussion; section 3–discusses the dataset and the methodology of the study; section 4–described the study results and their analysis; section 5–provides practical implications and finally section 6–gives the conclusions.

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2. Literature Review

The (PE) benchmark portfolio for assessing a business sector clock is amix of three-risk free assets, an alternative to business sector portfolio and the business sector portfolio itself. In the mid-70's exploration work focused more on the multi market risk variables contrasted with the 'Capital Asset Pricing Model' (CAPM), which proposed just a single business sector component clarified the normal returns. The macro-factors like interest rates, inflation, etc., influenced market forces to response in the relation to distribution of fund's returns. For that, Merton [1] and Long [2] investigated in their proposed model the effect of risk factors on fund's returns. However, there is still an ambiguity regarding to the choice of the risk factors that might play vital role in describing the possible outcomes. In opposition to that, financial managers who longed for the unfaltering development out of their venture funds most likely kept away from these portfolios which offered low returns because of swelling support.

As indicated by Wermers [3] the past performance of mutual funds can predict their future performance. This contention is likewise supported by Coval and Moskowitz [4] and Jan and Hung [5]. The advocates of this measure hold that if the past performance is negative then this will have negative effect on future performance and the other way around [6]. One of the studies was conducted by Sharpe [7] which upheld this thought. In the meanwhile, these findings were further supplemented by Gruber [8], Droms and Walker [9] in which they presumed that this persistence in performance is just kept going up to three years and a short time later this persistence neglected to exist. It is also important to mention that the performance disappears in post-incubation period [10]. However, Kothari and Warner [11] inferred that precipitance of performance exists in the short run as well as in the long run. Their findings were based upon the idea that funds would continue their current performance trend a year from now and this procedure would carry on. These findings were further supplemented by Grinblatt and Titman [12]. In 1994, Grinblatt and Titman [13] discovered positive performance persistence as well as negative performance persistence for mutual funds. The mutual funds outperform during contractions phase in business cycle and underperform during expansion in business cycle. Evans [14], Badrinath and Gubellini [15] used the 'active peer benchmark'(APB) approach in a single-factor model to judge (relative) fund manager's ability to outperform the market or at least earn the returns which are equal to market returns.

Ross [16] has proposed the model which determines the components in free factual terms known as Asset evaluating hypothesis. This hypothesis loses the contingent meaning of elements and incorporates few risk elements which are needed for normal returns. This inferred (PE) benchmark portfolio has the same exposure to the greater part of the pervasive risk components and these elements rely on the dimensionality of the pervasive risks existing in the business sector. The studies by Merton [1] and Long [2] shed light on the risk variables like financing costs and the swelling impact on the general expected returns. The advantage of estimating hypothesis is that it left it to the scientists to pick between the risks figures that best clarify the support portfolios returns. For instance, Chen et al [17] recognized comparative financial variables as well as assessed the value mutual funds' performance on the premise of these components presented to the business sector risk. Another study has been conducted to investigate the sensitivity of choice of the benchmark through introducing a replica of risk factors pattern approach and found that there exist a significant statistical evidence related to the choice of appropriate benchmark selection, e.g., see [18-20].

The general understanding regarding the (PE) benchmark portfolio is that it supposed to address the fundamental behavior of fund managers with regards to investment 'style'. By style one implies that it is confinements that have been enforced by the firm on to managers like "Big Caps versus Small Caps"; or "Value versus Growth" stocks. This style-based methodology introduces "style exposures" which is like the different beta resource evaluating model. It is suggested that (PE) benchmark portfolio have comparable risk (style) presentation to that of the managed portfolio to be assessed. In the study conducted by Fama and French [21] four variables were removed from the past stocks patterns and afterward utilized to assess the performance of mutual funds.

Comparable work done by Carhart [22] shed light on the most proficient method to concentrate elements from stock examples and apply the style construct performance measures in light of mutual funds. This methodology has been further refined by changing the style-based performance measure through evaluating the attributes of the stocks held by the funds. These qualities are characterized by the business sector capitalization or size of the firm; estimation of firm-book to showcase and past return [23]. Under this approach the (PE) benchmark portfolio has been organized by including the similar characteristics of the "passive fund" portfolio held by the manager. On some occasions the style exposure has been coordinated through portfolios with the same features in similar markets known as "peer benchmark portfolios". This further made the average performances of fund portfolios as a 'zero-sum game', i.e., to extent where peer groups got similar dimensions to benchmark portfolios.

Table 1: Partially equivalent (PE) non-Sharia benchmarks with appropriate composites

Schemes	Composites	Benchmark selection
Equity	Stocks	KSE 100
Income	T-bills/PIBs, TFCs, preference shares	6M Kibor
Money Market	T-bills and deposit funds of the banks	50% 6MKibor + 50% 3M TDR (AA Bank)
Aggressive Income	Fixed income securities, mediocre asset classes, etc	6M Kibor
Asset Allocation	Diversified investments in any asset class	70% 6M Kibor + 30% KSE 100
Balanced	Stocks and Bonds	50% KSE 100 + 50% 6M Kibor
Capital Protected	Tailored made for emerging market conditions	85% 3M TDR + 15% KSE 100 Index
Commodity	Gold, etc	80% GP + 20% 3M TDR
Fund of Funds	Fixed income, balanced, equity and money market funds.	20% 6M Kibor + 30% KSE 100 + 50% 3M TDR

On the basis of persistency attribution of the mutual fund performance outcomes over the past few decades, the most distinct criticism is on the presence of error in selecting an appropriate benchmarks out of many (e.g. [3, 22, 24] and so on). This would lead to ask one of the most fundamental questions regarding choice of a benchmark which relates to the particular risk classes of mutual funds. Unlike the past researches on the mutual funds performances based upon the returns statistics which were resulted out after holding the investments for respective years, one of the studies has proposed that one should also examine the performance of individual stocks held by the funds [13, 25]. This has suggested that one ought to likewise inspect the performance of individual stocks held by the funds. The work carried out by Nouman and Shah [26] can be classified as the only research which genuinely tried to incorporate some concept of separate benchmarks as they are used in the KSE-100 index for evaluation of conventional mutual funds and KMI-30 index for evaluation of Sharia complaint funds and held that KMI-30 index was a more appropriate benchmark for evaluation of Sharia complaint funds as compared to KSE-100 index.

3. Methodology and DataSet

3.1 Methodology

In this segment of the study the benchmark chosen, keeping in perspective the relative risk classes of the mutual funds in Pakistan, is described. For example, the primary more extensive category can be the Equity funds itself, whose risk is connected with riskier securities like stocks, shares and so on. So with such a composite a fitting benchmark which has been proposed here is the KSE-100 index. Secondly, more extensive category can be the Income funds, whose risk is connected with the obligation instruments of the business like securities based upon the time skyline of the speculation. Under this plan subsequent to the fundamental composites are T-charges/PIBs, TFCs, Preference offers and so forth a suitable benchmark has been proposed as 6-Month KIBOR rate. Comparable benchmark has additionally been proposed for the Aggressive income funds having the same class risk.

The Money market fund is a category which comprises of money market instruments like T-bills and deposit funds of the banks with maturity less than a year. Under this plan the proposed benchmark is amix of 6-Month KIBOR and 3-Month TDR of AA rated banks in Pakistan. Similarly the scheme like Mixed funds, which entirely depends on the manager's decision and his approach towards bearing the risk in the investment of the fund classes (e.g., balanced funds, asset allocation funds), an appropriate benchmark has been selected on the basis of composite. Also, the other funds which constitute the rest of the classes of mutual funds i.e. capital protected funds, index tracker funds, commodity funds, fund of funds etc, it has been proposed that the selection process of benchmarking should be done with respective risk classes of mutual funds. This information is given in Table 1.

For the last major category of funds, i.e., Sharia Compliant (Islamic) funds, which incorporate all the Sharia compliant funds traded in the mutual fund industry of Pakistan is given in Table 2. The benchmark selection is exceptionally delicate to the relative performance of mutual funds when past studies were analyzed (see e.g. [11, 13]). The particular risk classes of the Sharia funds have been nearly observed with their individual asset composites and afterward a fitting benchmark allotted to them. On the general comprehension the value of Sharia based fund's risk class has been connected with the KMI-30 index, and the currency market Sharia based funds risk class has been connected with the 3 Months Placement rates of A-rated bank for the individual years.

Table 2: Partially Equivalent (PE) Non-Sharia Benchmarks with appropriate composites

Schemes	Composites	Benchmark selection
Equity	Sharia compliant equities	KMI 30
Income	Sharia compliant income instruments	3M PR (A rated Bank)
Money market	Sharia compliant money market instruments	50% 3M PKRV + 50% 3M PR (A rated Bank)
Aggressive income	Sharia compliant Fixed income securities, mediocre asset classes etc	3M PR (A rated Bank)
Asset allocation	Diversified investment in any Sharia asset class	70% 3M PR + 30% KMI 30
Balanced	Sukuk bonds, Ijarasukuksetc	50% KMI 30 + 50% 6M PR(A rated Bank)
Capital protected	Tailored made for emerging market conditions	85% 3M TDR + 15% KMI 30 Index
Fund of funds	Shariah compliant fixed income, balanced, equity and money market funds.	50% 6M PR + 50% KMI 30

3.2 Data Sample

Monthly return data of all the proposed benchmarks has been taken from various database sources from January 2004 to December 2014. For the purpose of the study we classified these proposed benchmarks into 9 major categories based upon non-sharia schemes and 8 major Sharia based categories. In order to collect the data we have used annual reports of A rated financial institutions, prime rates, deposit rates and the gold prices rates as per announce for the period mentioned above. We also contacted major Asset Management Companies of the asset funds, Stock exchanges, Security Exchange Commission of Pakistan (SECP) and internet data bases. The sample taken for purpose of this research comprises of monthly returns of proposed benchmarks keeping in view the different categories.

4. Results and Findings

4.1 Descriptive Analysis of Partially Equivalent (PE) Benchmark Indices

4.1.1 Non-sharia benchmarks

Description: Table 3 reports the monthly returns of benchmark indices from January 2004 through December 2014. Calculation has been made on the basis of equally weighted average method. The different statistical values has been given in the table with their respective indications of the proposed benchmark indices, i.e. SD stands for standard deviation which measures the dispersion of returns from the respective calculated mean values.

The proposed benchmark for Equity funds was KSE-100 index.The comparision of X-bar or standard mean gives a value of 1.434% and the value of standard deviation is 7.57% while the Skewness value is (1.945) with value of Kurtosis being 12.70. For Second category of funds i.e. Income funds which is usually composed of T-bills/PIBs, TFCs, preference shares etc., bench mark of 6-Month KIBOR rate was proposed. The results have shown reasonable standard deviation with respective return, while the distribution pattern of returns is abnormal. These patterns are indicated by the value of Skewness which came to be -1.11567. The same is evident for Aggressive income funds which are considered as having same risk class.

The proposed benchmark for Money market funds was composed of 6-Month KIBOR and the 3-Month TDR of AA rated bank operating in Pakistan, which had lowest mean-variance tradeoff among other benchmarks indices. The Mixed funds which had benchmark composed of composite and asset allocation benchmark respectively. Benchmark in question (both of them), when applied Jarque-Bera (J-B) test statistics, at confidence interval of 1% and with *p*-value = 0, there is an evidence of non-normal distribution of return (details are given in Table 3).

Table 3: Descriptive statistics of monthly returns of Benchmark indices

INDICES	AGG_INC_BM	ASST_ALLOC_BM	BAL_BM	CAP_PROT_BM	COM_BM	EQTY_BM	FOF_BM	INC_BM	MM_BM
Mean	0.866%	1.037%	1.15%	0.654%	0.776%	1.434%	0.86%	0.86%	0.69%
Maximum	0.0125	0.0630	0.101	0.0329	0.0992	0.1978	0.061	0.012	0.009
Minimum	0.0017	-0.1258	-0.218	-0.0624	-0.1161	-0.4488	-0.129	0.001	0.002
Std. Dev.	0.242%	2.255%	3.77%	1.142%	3.849%	7.574%	2.26%	0.24%	0.21%
Skewness	-1.115	-1.865	-1.917	-1.9030	-0.0797	-1.9458	-1.923	-1.115	-1.017
Kurtosis	4.253	12.181	12.51	12.084	3.6633	12.707	12.45	4.253	3.396
Jarque-Bera	36.029	540.51	578.3	533.528	2.5599	601.59	572.8	36.02	23.63
P-value	0	0	0	0	0.2780	0	0	0	0

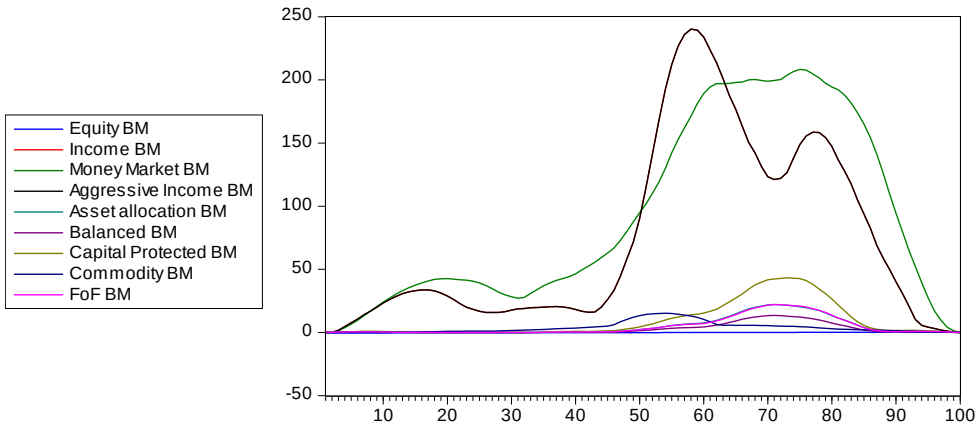

Fig. 1: Kernel density distribution plotting of Partially Equivalent (PE) Non-sharia Benchmarks indices against the conventional KSE-100 index benchmark

Table 4: Descriptive statistics of monthly returns of sharia benchmark indices

Schemes	Sharia_ AGG_ INC_BM	Sharia_ Asst_Alloc_ BM	Sharia_Bal_ BM	SHARIA_ CAP_PRO_ BM	SHARIA_ EQUITY_ BM	SHARIA_ FOF_ BM	SHARIA_ INC_ BM	SHARIA_ MM_ BM
Mean	0.00486	0.00422	0.00502	0.00219	0.01314	0.00545	0.00798	0.00476
Max	0.0065	0.04398	0.06934	0.02497	0.19785	0.04437	0.01166	0.00794
Min	0.0042	-0.0176	-0.03308	-0.00599	-0.4488	-0.0172	0.00095	0.00048
SD	0.00088	0.00736	0.01150	0.00481	0.07563	0.00709	0.00246	0.0018
Skewness	0.70386	2.23861	2.27736	2.16527	-1.89927	2.20930	-1.0533	-0.2868
Kurtosis	1.65441	11.7093	13.4561	7.8364	12.6784	12.5323	3.9544	2.51310
J-B	15.1691	527.444	715.419	231.794	594.557	607.141	29.417	3.11450
p-value	0	0	0	0	0	0	0	0.21071

Kernel Density Estimation was used in order to estimate the probability density function of respective benchmark indices of non-sharia based funds given in Fig. 1.

The interpretation of the plots provides interesting reading as the kernel density of returns was taken on y-axis and usual normal distribution on the x-axis. The results shown in Fig. 1 indicate that the most of the benchmark indices have shown low density distribution and confirmed the non-normal behavior earlier from the Jarque-Bera (J-B) test statistics with respective p-values. Contrary to this, the money market and aggressive income benchmark indices have shown strong density distribution against the conventional benchmark of KSE-100 index. This further suggests that the proposed benchmarks have weak tendency to absorb variations in the riskier categories of funds. At the same point we found no evidence of outlier leading us to further establish our earlier findings.

4.1.2 Sharia benchmarks

Table 4 reports the monthly returns of Sharia benchmark indices from January 2004 through December 2014. Calculation has been made on the basis of equally weighted average method. The different statistical values has been given in the table with their respective indications of the proposed Sharia based benchmarks indices, i.e., SD stands for standard deviation which measures the dispersion of returns from the respective mean.

The respective risk classes of the Sharia funds have been closely monitored with their respective asset composites and then an appropriate benchmark assigned to them. For instance, on the general understanding the equity Sharia based fund's risk class has been associated with the KMI-30 index, and the money market Sharia based funds risk class has been linked with the 3 months placement rates of A-rated bank for the respective years etc.

The descriptive statistics represents in Table 4 of Sharia benchmarks indices have shown in difference of results in terms of skewness of results. For instance, 3 out of 8 indices have shown the negatively skewed returns i.e. Sharia equity, Sharia income and Sharia money market benchmarks indices. The resulted negatively skewed distribution confirmed the recent introduction of asset allocation composition represented by Sharia compliance funds and showed the immaturity of this industry alike.

In order to complete and comprehend earlier analysis, the kernel density estimation was used as non-parametric method for estimating the probability density function. This analysis for Sharia complaint benchmarks provides

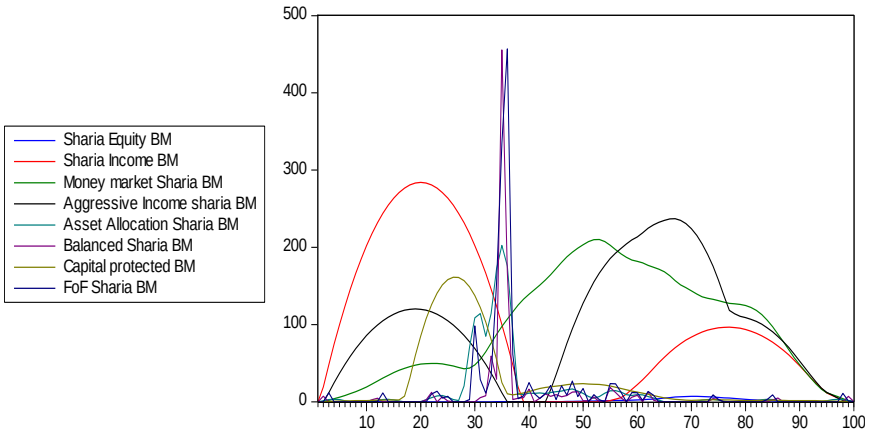

Fig. 2: Kernel density distribution plotting of Partially Equivalent (PE) Sharia Benchmarks indices against the conventional KMI-30 index benchmark

different picture as compared to the conventional benchmark given in Fig. 2. The results supported the normal distribution pattern in money market benchmark index and generally half of the indices were in support of normal distributed pattern with ability to absorb resulted variations. In addition, further results show that in the data two benchmarks have shown slight variation which can be attributed to small sample size available as KMI 30 index is newly formed benchmark. This further validates our earlier findings in relation to the non-Sharia benchmarks indices as shown in Fig. 2.

These results further need investigation to confirm the credibility of formation process of respective benchmark indices under consideration. In this process we proposed the application of stationarity test statistics to gauge down the effect of distribution pattern of monthly returns of chosen benchmark indices. Moreover, there is also a need to confirm the amount of variations that might exist in the proposed benchmark indices. For that test statistics ANOVA was proposed to justify the difference among conventional and proposed benchmarks. The respective results have been given below on the basis of Non-Sharia benchmark indices and Sharia benchmark indices.

4.2 Stationarity Test Analysis of Partially Equivalent (PE) Benchmark indices

4.2.1 Non-sharia benchmarks

In order to verify the stationary of data proposed bench marks of the conventional mutual funds bench mark of KSE 100 Index and the proposed benchmarks the group unit root test was applied. The test statistics to conclude the stationarity of the data (which are given in Table 5) include Levin, Lin & Chu test, Pesaran and Shin W-stats, Fisher Chi-square**.** The test statistics show that all of the mutual fund categories showed significant results at 99% confidence interval led us to conclude that the proposed benchmarks are statically valid as there is strong evidence to support our finding details of which are provided in the Table 5.

Table 5: Group unit root test statistics of non-sharia proposed benchmarks of respective riskier classes of mutual funds in Pakistan and KSE-100 index benchmark: Summary

Series: EQUITY_BM, INCOME_BM, MONEY_MARKET_BM, ASSET_ALLOCATION_BM, AGGRESSIVE_INCOME_BM, BALANCED_BM, CAPITAL_PROTECTED_BM, COMMODITY_BM, FOF_BM

Sample: 2004M01 2014M12

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.10761	0.0000	9	1179
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-22.2771	0.0000	9	1179
ADF - Fisher Chi-square	415.055	0.0000	9	1179
PP - Fisher Chi-square	401.155	0.0000	9	1179

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

4.2.2 Sharia benchmarks

In order to ratify the stationarity of data proposed bench marks the group unit root test was applied against the KMI-30 index and rest of the bench mark indices, in order to formalize the benchmark against the riskier fund classes. The various test statistics to conclude the stationarity of the data which include Levin, Lin & Chu test, Pesaran and Shin W-stat, Fisher Chi-square test statistics were performed. The test statistics show that except for sharia complaint Aggressive income and income funds all of the mutual fund categories showed significant results, leading us to conclude the validity of the proposed benchmarks.

4.3 ANOVA Test Analysis of Partially Equivalent (PE) Benchmark Indices

4.3.1 Non-sharia benchmarks

Analysis of Variance (ANOVA) tests was also performed to measure the impact of change of benchmarks against the conventional benchmark of KSE 100 Index. F-test, Siegel-Tukey, Bartlett, Levene and Brown-Forsythe test statistics were applied on all the proposed benchmarks against the conventional benchmark. The strong evidence of dissimilarity amongst the variances of the proposed benchmarks against the conventional benchmark of KSE 100 Index suggest that one should consider the alternative benchmarks to assess the riskier classes of Pakistani Mutual funds. The details of which can be found in Table 6.

4.3.2 Sharia benchmarks

In order to further verify our findings the Analysis of Variance (ANOVA) tests were performed to assess the impact of change of benchmark; the F-test, Siegel-Tukey, Bartlett, Levene and Brown-Forsythe test statistics were applied on various proposed benchmarks against the KMI-30 Index. These test statistics confirmed that there exists a significant evidence of difference amongst the proposed and standard Sharia benchmark of KMI 30 Index. The details of statistical validation can be found in Table 7.

5. Practical Implication

The assessment of performance of mutual funds is one of the most important for investors and policy makers as their performance is indicative of the performance of the financial markets in general. Historically, the main issue with the performance assessment of the mutual funds was the use and choice of benchmarks. In the settings like Pakistan, where there are the religious preference, have deterred many investors from investing in the mutual funds. Due to main concerning issue related with the use of Riba (interest) and as the result of introduction of Sharia complaint mutual funds, it has become very important for investors to have clear understanding of the performance of the mutual funds.

Table 6: ANOVA test statistics for proposed non-sharia benchmarks against the KSE-100 index benchmark: Summary

Test for Equality of variances between series				
Sample: 2004M01 2014M12				
Method		df	Value	Probability
Bartlett		8	2269.715	0.0000
Levene		(8, 1179)	68.43460	0.0000
Brown-Forsythe		(8, 1179)	61.96590	0.0000
Category Statistics				
			Mean Abs.	Mean Abs.
Variable	Count	Std. Dev.	Mean Diff.	Median Diff.
EQUITY_BM	132	0.075736	0.052593	0.051949
INCOME_BM	132	0.002422	0.001729	0.001724
MONEY_MARKET_BM	132	0.002086	0.001601	0.001571
ASSET_ALLOCATION_BM	132	0.022550	0.015841	0.015640
AGGRESSIVE_INCOME_BM	132	0.002422	0.001729	0.001724
BALANCED_BM	132	0.037721	0.026312	0.025979
CAPITAL_PROTECTED_BM	132	0.011420	0.008088	0.007945
COMMODITY_BM	132	0.038486	0.028456	0.027069
FOF_BM	132	0.022663	0.015881	0.015643
All	1188	0.032983	0.016914	0.016583
Bartlett weighted standard deviation: 0.033013				

Table 7: ANOVA test statistics for proposed sharia benchmarks against the KMI-30 index benchmark: Summary

Test for Equality of Variances Between Series				
Sample: 2004M01 2014M12				
Method		Df	Value	Probability
Bartlett		7	3067.783	0.0000
Levene		(7, 1048)	97.47374	0.0000
Brown-Forsythe		(7, 1048)	93.62003	0.0000
Category Statistics				
			Mean Abs.	Mean Abs.
Variable	Count	Std. Dev.	Mean Diff.	Median Diff.
SHARIA_EQUITY_BM	132	0.075637	0.051799	0.051350
SHARIA_INCOME_BM	132	0.002648	0.002304	0.001551
MONEY_MARKET_SHARIA_BM	132	0.001883	0.001513	0.001506
AGGRESSIVE_INCOME_SHARIA	132	0.002300	0.001930	0.001628
ASSET_ALLOCATION_SHARIA_	132	0.007367	0.004543	0.003802
BALANCED_SHARIA_BM	132	0.011507	0.006751	0.005030
CAPITAL_PROTECTED_BM	132	0.004813	0.003525	0.002321
FOF_SHARIA_BM	132	0.007091	0.004224	0.003490
All	1056	0.027492	0.009573	0.008835
Bartlett weighted standard deviation: 0.027379				

There is a need for a separate regulated benchmark for Sharia compliant mutual funds as well as non-sharia mutual funds existed in the mutual funds industry of Pakistan. In this study we tried to resolve these issues and proposed the separate benchmarks for assessment of mutual fund categories. To validate the need of the proposed benchmarks for categories of mutual funds, they have been statically tested. The significance results from the study implies that these benchmarks can be applied in practice and provide more accurate picture of funds' performances.

6. Conclusion

The benchmarks proposed where constructed keeping in view the potential query of practitioners and after going through rigorous literature available for this study. These benchmarks, so called partially equivalent (PE) benchmarks have been constructed after carefully considering the asset composites of classes. The findings of our study showed that the money market and aggressive income benchmarks indices in particular, where most of Sharia benchmarks indices have shown indifference of distribution against the conventional benchmarks previously in use. We strongly recommend on the basis of this study findings that the fund managers should incorporate these partially equivalent (PE) benchmarks to evaluate the performances of mutual funds categories with some accuracy and precision.

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