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An Examination of The Impacts of Macroeconomic Indicators on Conventional and Islamic Equity Fund Returns: Perspectives From The Mena Region

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An Examination of the Impacts of Macroeconomic Indicators on Conventional and Islamic Equity Fund Returns: perspectives from the MENA region

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Abstract

This study examines the performance of conventional and Islamic equity mutual funds in the MENA region, and the influence of major macroeconomic determinants on the two types, by analyzing 503 conventional and 128 Shariah-compliant funds. It incorporates three major macroeconomic variables using Generalized Linear Models (GLM). The findings indicate no significant superiority of Islamic funds over conventional ones. The study also notes that while market performance and foreign exchange rates positively affect both fund types, GDP growth and inflation have a negative impact. Islamic funds are less influenced by excess market returns, GDP growth, and inflation compared to conventional funds, showing a distinct response to economic variables.

Chapter One

Introduction

1.1 Overview

This study provides a thorough analysis of the performance of Shariah and conventional equity mutual funds across seven MENA countries, namely, Saudi Arabia, United Arab Emirates, Egypt, Kuwait, Qatar, Oman, and Bahrain. The study analyzes the historical performance of 503 conventional equity funds and 128 shariah compliant equity funds. It employs both descriptive statistics and standard financial performance measures like Jensen's alpha, Jensen, M.C. (1969), as well as the most agreed upon macroeconomic determinants of mutual funds performances.

The objective is to establish whether there is a favored or unfavored relationship between conventional and shariah compliant equity mutual funds in MENA region.

1.2 Significance of the Study

Although there are significant differences between Islamic investment instruments and conventional investment instruments, there are fundamentals that apply to both types of instruments. Considering the growing Muslim population, and the rise in financial awareness and literacy, which is, in its turn, driven by globalization and availability of knowledge and data, it would be remiss to disregard the emerging segment of Muslim investors who are looking for investment opportunities that cater for their investment appetite, and at the same time their core beliefs.

It is of no doubt that, in developing economies particularly, trading volumes is an issue that impact the efficiency of financial markets on many levels. One of the key solutions to this chronic dilemma is to introduce instruments that are appealing for a segment of investors, that have been for a long time, keeping away from investment markets, for the sole reason that they do not fit

shariah compliance measures. Whereas in many of the developing economies, there is still no clear, and agreed upon, scheme of shariah compliance measures in place. And in many cases, there is still a remarkable shortage in the supply of shariah compliant instruments, markets are still found to be missing tremendous trading volumes of those who do not find the available instruments satisfactory to their traditions. This is where this paper, and the like of it, comes to play. It paves the road for a better understanding of the implications of shariah compliant equity investing in stock markets and hence, the availability of more investment opportunities in that regard.

1.3 Contribution

The study explores the performance of conventional and Islamic equity mutual funds in the MENA region, focusing on the influence of macroeconomic factors. It provides insights on how these funds respond to variables like GDP growth, inflation, market performance, and foreign exchange rates. The findings indicate that Islamic funds are less impacted by these macroeconomic factors compared to conventional funds, demonstrating a distinct response to economic variables.

In terms of practical implications for the investment profession, this study enriches asset management strategies by highlighting the different sensitivities of Islamic and conventional funds to macroeconomic changes. Asset managers can leverage this knowledge for more informed decision-making and risk assessment in portfolio management. Additionally, the study's insights could guide investment product development and marketing, particularly in Islamic finance markets, enhancing investment opportunities and catering to diverse investor needs.

Chapter Two

Determinants of Conventional and Islamic Investment Funds: A Review of Relevant Literature

2.1 *Shariah-compliance screening measures*

There have been several studies published with regards to evaluating investment instruments, asset classes, and portfolios generally, in terms of their compliance to Islamic Shariah. In this research, we aim at identifying the most common shariah screening criteria of investment instruments, and consequently, investment portfolios, according to the most famous Shariah legislation bodies across the world.

According to Derigs, U., & Marzban, S. (2008) findings, "asset universes are significantly different in size as well as constituents, i.e., for every index there is a substantial number of assets which are specified as halal or haram but classified the opposite way for other indexes. This indicates that, so far, there is no universal or generally accepted understanding of how to transform the descriptive Shariah rules into a system of checkable investment guidelines".

The difference in judgement between different Islamic institutions and scholars, with regards to shariah compliance, Stems from two sets of screening paradigms. The first of which is business screening and the second is financial screening. Generally, most practitioners incorporate two tiers of screening in their judgement, one is qualitative, and the other is quantitative. It is in the quantitative screening threshold where allowance and permissibility slightly differ, Ho, C. S. (2015).

Another reason for variation in judgement is that dynamicity of shariah compliance in general, so that the availability of new information/studies, might cause a shift in the compliance paradigm, and consequently turn a non-compliant investment to a compliant one or vice-versa. Accordingly, an investment fund that is managed according to shariah compliance measures incurs a

contractual obligation to continuously check and validate the compliance of all underlying assets, Marzban, S. (2012).

Like-for-Like, management bodies of businesses change, and as they change, there might occur a change in practice, business morale, or business values. As mentioned above, two sets of screening are used in concluding whether a given investment is compliant or not, one of which is business screening. Hence, a change of management within an organization might cause the issued security of that organization to turn from compliant to non-compliant or vice-versa, Marzban, S. (2012).

It is not only the selection of investment instruments that plays a role in composing a shariah compliant investment portfolio. According to Boudt, K., Raza, M. W., & Wauters, M. (2019), the balancing of objectives and constraints that is usually conducted to optimize a portfolio composition, not only affects the financial performance of a portfolio, but also its shariah compliance.

Upon all the above mentioned, it can be clearly concluded that there is a margin of variation when it comes to Shariah screening criteria, across different times, regions, and legislators. Hence, in this research, we aim at covering as much markets as can be within the MENA region. To provide a conclusion which significance holds under the variations in Shariah screening measures.

2.2 *Effects of Shariah-compliant practice on asset management performance*

This research aims at concluding whether there is a statistically significant performance advantage to conventional mutual funds over Shariah compliant mutual funds, or vice versa. Many studies have been conducted in the same regard across previous years, and authors do not share the same

conclusions when it comes to the impact of applying shariah compliant measures on asset management practice. Since this study is concerned with the comparison of conventional and Shariah compliant mutual fund performances, it sheds the light on many similar literatures in the same regard.

A study has been conducted on Emerging markets by Abdul-Rahim, R., Abdul-Rahman, A., & Ling, P. S. (2019), which focus was to compare between the performance of conventional mutual funds and shariah compliant mutual fund, concluded that Shariah funds slightly outperformed conventional funds in Malaysia, Pakistan and South Africa, while in Egypt, Conventional funds' performance showed a significant supremacy over the market, while Shariah compliant funds Alpha was insignificant.. This study used Jensen's Alpha, Jensen, M.C. (1969), to determine whether each of the two fund types outperformed or underperformed the market and used no macroeconomic determinants in its regression analysis.

Similar research has been conducted in Saudi Arabia by Ashraf, D. (2013). Dawood studied The Saudi Arabian stock market from 2007 to 2011 to determine whether a statistical supremacy can be proven for any of the two fund types under study. Dawood reached a conclusion that conventional funds presented better performance over shariah compliant funds during times of crisis. However, in stable environments, no Statistically significant superiority was recognized for any of the two types.

A very similar study has been executed in the Saudi Arabian market as well, but this time focusing on equity mutual funds only. The study was conducted by Al Rahahleh, N., & Bhatti, M. I. (2022). The author used the developments of Fama, E.F. and French, K.R. (1992) and Carhart, M.M. (1997), i.e., the three-factor model and the four-factor model respectively, which are both

considered as extensions to Jensen, M.C. (1969). According to Al Rahahleh, N., & Bhatti, M. I. (2022) findings, “The results show that the locally focused equity mutual funds (LFEFs) significantly outperformed their benchmark, i.e., the Tadawul All Share Index (TASI), during the full sample period and the low-volatility period. According to the empirical comparison, the CMFs also outperformed their TASI benchmark for the full sample period and the low-volatility period. However, the SMFs neither outperformed nor underperformed their S&P Saudi Arabia Domestic Shariah Index benchmark. That is, for each of the SMFs included in the sample, the Jensen’s alpha was insignificant”.

Another study was conducted by Arif, U., & Majeed, M. I. (2023). The study focused on comparing the performance of conventional and Shariah-compliant mutual funds in Pakistan from 2013 to 2021. The objective was to analyze and contrast these funds in terms of risk and return. The financial instruments under examination are various categories of both conventional and Shariah-compliant mutual funds. Key findings indicate that Shariah-compliant mutual funds generally outperform conventional funds in absolute risk measures, achieving a higher Sharpe ratio and lower coefficient of variation. However, the results for the funds' exposure to systematic risk showed mixed outcomes for both types of funds.

Hilman, I. (2017) investigated the performance of Sharia equity funds compared to conventional equity funds. The study focused on the Indonesian Stock Exchange (IDX). Using the Sharpe method and the average difference test of independent sample t-tests, the study aimed to determine which type of equity fund performs better. The results indicate that, according to the Sharpe method, Sharia equity funds outperform conventional equity funds, suggesting Sharia funds may offer a better investment option in this context.

The abovementioned 5 studies, although they cover different countries/regions, they all share the following points:

- They all compare the performance of Shariah compliant mutual funds against the performance of conventional mutual funds.

- They all share the primary concept of performance comparison/evaluation, while one or more of them incorporated additional comparison techniques. In additional to descriptive statistics, the primary comparison approach was conducting a regressive analysis on conventional funds performance on corresponding market performance separately, and then repeating the process with shariah compliant funds performance. The conclusion then is reached by analyzing the regressions intercept (alpha).

- They all do not use macroeconomic determinants as independent variables. However, they might include other asset/stock classification techniques in their regression models.

- They all use excess returns, i.e., average returns minus corresponding risk-free rate, instead of absolute returns.

The authors of the five studies were all concerned to analyze and compare conventional and shariah compliant mutual funds performances but without particular focus on a certain asset type. While Al Rahahleh, N., & Bhatti, M. I. (2022), and Hilman, I. (2017) focused on equity funds particularly, Abdul-Rahim, R., Abdul-Rahman, A., & Ling, P. S. (2019), Ashraf, D. (2013), and Arif, U., & Majeed, M. I. (2023), all widened the scope of their studies to include various asset categories/classes, and consequently different fund types, including fixed income funds, money markets funds, multi-asset funds, and funds of funds.

In a nearby realm, other studies attempted to answer the same questions using data of stocks and indices and not mutual funds, with the same objective of defining superiority of conventional investing vs. shariah compliant investing, or vice versa.

A study has been conducted on the Australian markets that investigates whether shariah compliant stocks perform better than the conventional stocks. Authors, Krishna Reddy & Mingli Fu, 2014, found that “there is a statistically significant difference in performance of the Islamic and conventional stocks listed on the ASX in terms of risk, otherwise the performance of the Islamic stocks tends to be similar to the conventional stocks”. Most importantly, but beyond the concern of this research, the authors found a statistically significant relationship between the returns of shariah compliant stocks and conventional stocks. Kr, K. R., & Fu, M. (2014).

Similarly, the study "Performance Measurement Analysis: Shariah-compliant vs. Non Shariah-compliant Securities" by Bakar and Ali (2014), aimed to analyze the performance of Shariah-compliant and non-Shariah compliant securities in Malaysia. Covering the period from January 1990 to December 2011, the study divides the sample period into four segments: pre-Asian Financial Crisis (AFC), during AFC, post-AFC, and the Subprime Mortgage Crisis. It focuses on 107 securities and applies performance measures like Jensen Alpha Index and Treynor Index. The main findings suggest that the performance of Shariah-compliant securities tends to be similar to non-Shariah compliant securities. However, significant differences were observed between these portfolios across the four economic periods studied.

This study, following Al Rahahleh, N., & Bhatti, M. I. (2022), and Hilman, I. (2017), will focus its analysis on equity mutual funds particularly and not all mutual funds. Moreover, and unlike any of the studies that are tapped on in the above literature review, this study focuses on MENA

region, conducting the analysis on seven countries with active equity stock markets. The objective of including seven MENA countries in the study, and consequently reflecting the performance of the maximum number of Shariah compliant fund managers across the region, is to incorporate and reflect different practices and measures of shariah compliant investment, which is extremely difficult to standardize across one country, not to mention, an entire region.

The approach that is going to be used in this study is the most used approach in literature, which is using Jensen's Alpha, Jensen, M.C. (1969), to determine whether the excess returns of conventional funds exceed, subceed, or does not have a statistically significant relationship with excess market returns, and the same goes for shariah compliant mutual funds, which eventually caters as a conclusive comparison between conventional and shariah compliant practice.

2.3 *Macroeconomic determinants of mutual funds' performance*

In order to facilitate a comprehensive comparison between conventional and Shariah-compliant funds and arrive at a meaningful conclusion, an extensive review of literature on the macroeconomic determinants influencing mutual fund performance was crucial to incorporate in this study. While traditional assessments of mutual fund performance, such as alpha, predominantly rely on the Capital Assets Pricing Model, which assumes a fixed sensitivity of a fund's risk exposure to its market proxy (beta), it is crucial to recognize that this relationship can be affected by evolving economic conditions. In the realm of conditional performance evaluation, both betas and alphas are permitted to fluctuate in response to changing economic conditions over time. Agarwal, P. K., & Pradhan, H. K. (2019).

A study by Panigrahi, Karwa, and Joshi (2019) aimed to examine the impact of macroeconomic variables on the performance of mutual funds in India, focusing on Assets Under Management (AUM) as a proxy for investor preference. The study covers data from January 2012 to December 2022/ The study included multiple macroeconomic including Consumer Price Index, Industrial Production Index, inflation, Sensex, money supply, and exchange rate. The methodology includes Augmented Dickey Fuller and Phillip Peron tests for stationarity, Johansen Co-integration test, Vector Error Correction Model (VECM), and E-GARCH model to capture leverage effects. The key findings indicate significant relationships between these macroeconomic variables and AUM, showing that changes in these variables significantly influence mutual fund performance in India.

Another study with the same objective, which is defining the most influencing macroeconomic variables on mutual funds performance was carried out in Ghana by Gyamfi Gyimah, Addai, and Asamoah (2021). The research was conducted for the period 2007–2016 and utilized the Pooled Mean Group (PMG) estimation of the Autoregressive Distributed Lag (ARDL) model. The primary objective of the study was to ascertain how key macroeconomic factors, such as exchange rates, inflation, Treasury Bill (T-Bill) rates, and GDP growth, influence mutual funds' performance in the Ghanaian context. Additionally, the study examined the monetary policy rate's impact, which has often been overlooked in similar studies according to the author.

The data used for the study primarily consisted of accounting data of mutual funds, unlike many previous studies that relied on stock market data. This approach allowed for a more accurate assessment of the mutual funds' performance, which are often largely unlisted and not reflected in stock market data. The main findings of the study revealed homogenous long-run significant positive impacts of exchange rate, inflation, T-Bill, and GDP growth on mutual funds' financial

performance. Interestingly, the study also found a homogeneous long-run negative significant impact of the monetary policy rate on mutual funds' performance. In the short-run, the study established heterogeneous impacts, with significant negative and positive impacts of T-Bill and monetary policy, respectively, on mutual funds' financial performance. These results contribute to a deeper understanding of the influence of macroeconomic variables on mutual funds in a developing country context, distinguishing between short-run and long-run effects.

Li, Atampokah, Akolpoka, Avonie, and Kwame (2021) published a similar study, again in a Ghanian context. The study examined the impact of macroeconomic variables on mutual funds, covering the period from 2008 to 2016. The study focused on inflation, exchange rate, and interest rates, among other macroeconomic factors, and it found that macroeconomic factors, especially exchange rates, significantly influence mutual funds' returns. A key finding was that lower exchange rates lead to higher real-term returns. The study underscores the need for fund managers to adapt their strategies to macroeconomic changes. It also highlights a gap in research, suggesting future studies should explore the relationship between Ghana Stock Exchange returns and mutual fund performance. which makes scientific sense, particularly in the context of generic mutual funds, including every asset categorization there is.

Since this study, as elaborated above, is going to focus on equity mutual funds rather than all kinds of mutual funds, it is reasonable to extend the scope of this part of the literature review, which objective is defining the top macroeconomic determinants of equity mutual funds performance, by incorporating articles and research papers that investigate the most influencing macroeconomic determinants on stock market performance in different regions. Since there is undoubtedly an extremely high correlation between the performance of equity mutual funds

particularly, not all mutual fuds, and stock markets performance. Such literature is going to serve the same purpose of this section of the literature review.

According to Rahman, A. A., Sidek, N. Z. M., & Tafri, F. H. (2009), Malaysian Malaysian stock market index shows a co-integrating relationship with changes in several macroeconomic factors. It is specifically sensitive to changes in reserves and the industrial production index. These two macroeconomic variables have a stronger interaction with the stock market compared to other factors like money supply, interest rate, and exchange rate.

In 2014, a very significant study has been published on two emerging markets, namely, Egypt and Tunisia. Barakat, M. R., Elgazzar, S. H., & Hanafy, K. M. (2016), attempted to explore the relationship between stock markets and macroeconomic factors in the two regions. This study was conducted over the period from January 1998 to January 2014. In Egypt, the researchers found a causal relationship between the market index and several macroeconomic variables: the consumer price index (CPI), exchange rate, money supply, and interest rate. For Tunisia, the study observed similar causal relationships except for CPI, which did not show a significant connection with the market index. Furthermore, the study revealed that these four macroeconomic factors are co-integrated with the stock market in both countries, implying a long-term equilibrium relationship between them. The study's findings contribute to the broader understanding of how macroeconomic variables impact stock markets in emerging economies.

The study "Stock Market Performance and Macroeconomic Factors: The Study of Indian Equity Market" Tripathi, V., & Seth, R. (2014), investigates the relationship between the Indian stock market performance and macroeconomic variables using data from July 1997 to June 2011. It

employs various analytical techniques. The study identifies three primary factors affecting the stock market: inflation, interest rate, and exchange rate. It finds significant correlations between these macroeconomic factors and key stock market indicators, such as the Sensex, market capitalization, and market turnover.

Upon the above, this study shall select the most agreed upon macroeconomic variables as per the above literature, which are believed to have significant influence on the performance of equity mutual funds. These variables are GDP growth, FX rate, inflation rate, as well as risk free rate. The four variables are going to be tested for multicollinearity to make sure the results of Jensen's alpha are solid.

2.4 *Hypotheses development*

Based on the above literature, the thesis examines the following testable hypotheses:

H1: "There is no statistically significance between the returns of conventional and Islamic equity mutual funds."

H2: "There is a statistically significant relationship between conventional and Islamic equity mutual fund performances and GDP growth, foreign exchange rate, inflation rate and stock market excess returns."

Chapter Three

Data and Methodology

3.1 *Data*

The Data for this research has been obtained from multiple resources. All conventional and shariah compliant fund performance data has been obtained from Refinitiv data base in USD, this is to overcome the effect of value of difference currencies in MENA region. Afterwards, fund data has been filtered to so that only equity mutual funds data is included to enhance analysis consistency. Table 1 presents a full summary of fund data.

Different market indices have been used as a proxy for market returns. Table 2 below provide a dictionary for every country in the study and the corresponding index used to reflect the market performance in such country. All country indices performance data has been obtained from Refinitiv data base as well.

As for the macroeconomic determinants, i.e., GDP growth, FX rate, inflation rate, as well as risk free rate, different resources have been used to obtain the data. GDP growth figures has been extracted from the world bank data base for the seven countries under study. Inflation rates have also been extracted from the world bank data base. FX CHG % data has been obtained from Refinitiv data base.

Overnight mid-corridor rates have been used as a proxy for the Risk-free rates in the countries under study. The rates of Saudi Arabia and United Arab Emirates has been obtained from "Trading Economics Online Data base". While the data for the remaining five countries has been extracted from the world bank data base.

The annual rates of GDP growth, inflation, and risk-free rates have been sourced as annual figures. To maintain data uniformity, these annual rates have been transformed into monthly rates.

The employed conversion formula incorporates the principle of compound interest. Consequently, the resultant compounded monthly rate accurately aggregates to the corresponding annual rate as initially derived from the data source. Detailed statistical descriptive of the data is reported in the Appendix.

Table 1: Summary of Funds data

No.	Country	Conventional equity funds	Shariah equity funds	Total
1	Kuwait	17	11	28
2	Egypt	27	9	36
3	Bahrain	102	4	106
4	Oman	81	3	84
5	KSA	42	91	133
6	UAE	184	7	191
7	Qatar	50	3	53
	Total	503	128	631

As can be concluded from table 1, There is a varied distribution between conventional and Shariah equity funds across these countries. Some countries like Bahrain and Oman have a strong inclination towards conventional equity funds, whereas KSA shows a significant leaning towards Shariah equity funds.

In Middle Eastern countries, the choice of mutual funds is significantly influenced by cultural, religious, and economic aspects, particularly Islamic finance principles. Muslims traditionally avoided stock markets due to religious constraints, but this changed after a mid-1990s fatwa in Saudi Arabia allowed Sharia-compliant equity investments. This led to the rise of Islamic mutual funds that strictly adhere to Islamic laws, avoiding sectors like conventional finance, alcohol, gambling, and non-halal products.

Table 2: Summary of Rm proxies

No.	Country	Market index proxy
1	Kuwait	KPRI
2	Egypt	EGX 30
3	Bahrain	BASI
4	Oman	MSX 30
5	KSA	TASI
6	UAE	DFMGI
7	Qatar	QEGI

In some countries like Egypt and Oman, the study adopted specific concentration indices that leverage the performance of the most influential stocks in the market as a gauge for overall market performance. However, this approach posed challenges when applied to other countries, as analogous concentrated indices were not readily available until recent years. This lack of comparable indices necessitated the use of more general market indices that encompass all stocks in the market for those countries. These general indices were chosen due to their provision of historical data that aligns with the timeframe of the study. Using such indices ensures data consistency across different markets by providing a more uniform basis for comparison, despite the inherent differences in market structure and dominant stocks in each country.

3.2 Methodology

The approach that is going to be used in this study is the most used approach in conventional vs shariah compliant fund performance literature, which is using Jensen's Alpha, Jensen, M.C. (1969), to determine whether the excess returns of conventional funds exceed, subceed, or does not have a statistically significant relationship with excess market returns, and the same for shariah compliant mutual funds.

Jensen's *alpha* Index $(R_p - R_{FR}) = \alpha + \beta_p(R_M - R_{FR}) + \epsilon_p$

To reinforce the significance of the study, it was important to include the macroeconomic factors that influence fund performance. Using alpha and assuming a constant risk sensitivity (beta) based on the Capital Assets Pricing Model, may not fully capture the dynamics, as these relationships can vary with changing economic conditions. Upon the literature review conducted above, GDP%, inflation%, FX CHG% and Rfr% are added as independent variables.

Since Risk free rate is a component of the only dependent variable and the first independent variable, hence, it makes sense that it gets excluded from the model. Thus, the model that is going to be used includes one independent variable, which is excess fund return (fund return-RFR), and independent variables will be excess market return (RM-RFR), GDP growth %, FX CHG % and Inflation %.

$(R_p - R_{FR}) = \alpha + \beta_p(R_M - R_{FR}) + \beta_{\text{gdp (GDPg \%) + }} \beta_{\text{inf (inf \%) + + }} \beta_{\text{fx (FX CHG \%) + }} \epsilon_p$

3.3 Statistical testing

- *Testing for Random vs. Fixed Effects (Hausman Test)*

Table 3 below reports the results of testing whether the data includes fixed or random effects. Hausman test is performed on conventional and Islamic fund returns (Hausman, 1978; Hausman and Taylor, 1981).

$$H_0: \text{cov}(x_{it}, \lambda_k) = 0$$

$$H_1: \text{cov}(x_{it}, \lambda_k) \neq 0$$

Where x_{it}= regressors, and λ_k=error term.

Table 3: Hausman Test Results

Conventional Funds	**Islamic Funds**
χ^2 (4) = 0.000 Prob > χ^2 = 1.00	χ^2 (4) = 0.000 Prob > χ^2 = 1.00

The Hausman test runs under the hypotheses that follow:

H0: differences in coefficients are not systematic, meaning that the individual variable effects are uncorrelated with the independent variable (random-effects model is more suitable).

H1: differences in coefficients are systematic, meaning that the individual variable effects are correlated with the independent variable (fixed-effects model is more suitable).

The above results show that a fixed-effect estimation fits the data due to no significant difference between estimates being statistically significant. Therefore, the null hypothesis is not rejected.

- *Linearity vs. Non-linearity Test (RESET)*

A linearity assumption indicates that the dependent variable is directly related to the independent variables and error term (Hilmer and Hilmer, 2014). Due to there being a set of independent variables, the relationship has to be linear in parameters. Nonetheless, variables may not be in a linear relationship with the dependent variables (Gujarati and Porter, 2009). The Regression Equation Specification Error Test, or RESET, (Ramsey, 1969; Thursby and Schmidt, 1977;

Thursby, 1979; Sapra, 2005; Wooldridge, 2006) is employed to test the two hypotheses that follow.

$$H_0: \hat{\gamma}^2, \hat{\gamma}^3 = 0$$

$$H_1: \hat{\gamma}^2, \hat{\gamma}^3 \neq 0$$

The null hypothesis, **H0**, refers to linearity and the alternative hypothesis, **H1**, refers to non-linearity.

Table 4: Ramsey RESET test using powers of the fitted values.

Conventional Funds	**Islamic Funds**
F (1, 16376) = 355.2276 Prob > F = 0.00	F (1, 16376) = 388.6106 Prob > F = 0.00

The results in Table 3 show that non-linearity assumption fits that data. Therefore, a robust test is used to address the non-linearity in the data by correcting misspecifications in the model. Thus, the Generalized Linear Model (GLM) estimator is utilized, since it conveys a valuable advantage in its adaptability. The GLM estimator accommodates a diverse array of probability distributions beyond the Gaussian distribution, encompassing Poisson, binomial, or gamma distributions, among others. This allows for a more precise alignment with the inherent characteristics of the data (Faraway, 2016). In addition to the preceding robust test, a heteroscedasticity test may ensure that the appropriate regression model is specified.

- *Homoscedasticity Test*

Homoscedasticity pertains to the assumption that the relationship being studied remains uniform across the entire span of independent variables. Specifically, homoscedasticity denotes the constancy of variability in errors within a regression model across all levels of independent variables. When homoscedasticity is not satisfied, discrepancies in errors (residuals) may be more evident in certain segments of the variable range than in others. This discrepancy signifies the existence of heteroscedasticity in the data, wherein error terms lack constancy (Garson, 2012; Hilmer and Hilmer, 2014).

The Breusch–Pagan test, developed by Trevor Breusch and Adrian Pagan in 1979 (Breusch and Pagan, 1979), is a widely used method for detecting heteroscedasticity. Serving as a diagnostic tool, the Breusch–Pagan test evaluates the presence of heteroscedasticity in regression errors. Consequently, the hypotheses guiding the application of this test are detailed as follows.

H0: The variance of error terms is constant (Homoscedasticity)

H1: The variance of error terms is not constant (Heteroscedasticity)

If the test statistic yields a low p-value (i.e. $p < 0.05$), it implies rejecting the null hypothesis and asserting homoscedasticity. If the p-value is high (i.e. $p > 0.05$), then heteroscedasticity is inferred by testing the null hypothesis, H0, against the alternative hypothesis, H1. The summary of p-values resulting from the Breusch-Pagan Test is presented in Table 4 below. These p-values play a crucial role in deciding whether to reject or retain H0.

Table 5: The Results for the Breusch-Pagan Test

Conventional Funds	**Islamic Funds**
χ^2 (4) = 25.62191 Prob > χ^2 = 0.0000	χ^2 (4) = 213.9077 Prob > χ^2 = 0. 0000

The results in Table 4 show that the null-hypothesis of the Breusch-Pagan Test for heteroscedasticity is rejected at 1% significance level. Thus, the variances of residuals are not constant, which requires the use of robust estimation to estimate the parameters of the models under consideration, reiterating the aforementioned model estimator required.

Chapter Four

Results and Discussion

4.1 Regression results

Table 6: Results of GLM Method of Regression

The dependent variable is fund excess returns. The Independent variables include respective country index excess returns, exchange rate of the currency of a respective country, the inflation rates, and GDP growth rates. The estimation process uses the GLM estimator. The data includes 16382 monthly return observations for Conventional funds and 16382 for Islamic funds covering the years 1998-2023. The cross-sections included is 503 conventional funds and 128 Islamic funds. The z-statistics are reported between round brackets. The Variance Inflation Factor (VIF) scores are reported in square brackets. Variables associated with a VIF score >= 10 to avoid the problem of multicollinearity.

Variable	Conventional Funds	Islamic Funds
C	0.0018 (0.1645)	0.00275 (0.920)
Market excess Return	0.3142 [1.009] (45.186)***	0.2613 [1.004] (40.223)***
Currency Exchange Rate (per USD)	0.0009 [2.103] (4.379)***	0.0008 [1.747] (3.983)***
GDP growth Rate	-0.772 [1.066] (-4.49)***	-0.5143 [1.051] (-3.70)***
Inflation Rate	-1.559 [2.196] (-7.61)***	-1.071 [1.811] (-5.706)***
Country Effect (Dummy = 1 for respective country, otherwise = 0)	Yes	Yes

Mean dependent var	0.003094	0.002545
Sum squared resid	55.47317	46.80751
Akaike info criterion	-2.84882	-3.01868
Hannan-Quinn criter.	-2.84711	-3.01697
Deviance statistic	0.003389	0.002859
LR statistic	2361.823	1832.957
Pearson SSR	55.47317	46.80751
Dispersion	0.003389	0.002859
S.D. dependent var	0.062249	0.056368
Log likelihood	23345.67	24736.96
Schwarz criterion	-2.84365	-3.0135
Deviance	55.47317	46.80751
Restr. deviance	63.47621	52.04824
Prob (LR statistic)	0.000000	0.00000
Pearson statistic	0.003389	0.002859

*** Significant at 1%

4.2 Discussion of the results

- Hypothesis 1

The results show that there is a statistically insignificant predominance of Islamic equity mutual funds over conventional equity mutual funds, represented in the supremacy of the Islamic funds excess return to market excess return relationship intercept over the conventional funds excess return to market excess return relationship intercept.

This generally aligns with the findings of relevant literature conducted on emerging markets by Abdul-Rahim, R., Abdul-Rahman, A., & Ling, P. S. (2019). As per their study, Shariah funds slightly outperformed conventional funds in Malaysia, Pakistan and South Africa. However, the results of this study were statistically insignificant in that regard as well.

Two studies from the literature have been conducted on the Saudi Arabian market, which is a significant market in the MENA region for which this study is constructed. As per the first study, the author, Ashraf, D. (2013), stated that his model failed to present a statistically significant result in a steady economic environment. The other study, which was executed by Al Rahahleh, N., & Bhatti, M. I. (2022), reached a result that is statistically significant only at $p<0.10$ for Conventional funds Alpha, showing clear superiority over local market performance, while it could not reach a significant study for shariah compliant funds Alpha.

Arif, U., & Majeed, M. I. (2023), a study a similar study on the Pakistani market reached supporting results to our study, concluding that Shariah compliant funds significantly outperformed conventional funds in absolute risk measures. Hilman, I. (2017) applied the same study to the Indonesian stock market and concluded the same results. Table 4 below summarizes the findings of this study to the literature regarding Hypotheses 1.

	Superiority	significance	Region	incorporating macro det.
This study	Islamic	NS	MENA	Yes
Abdul-Rahim et al. (2019)	Islamic	NS	Emerging markets	No
Ashraf, D. (2013)	Islamic	NS	KSA	No
Al Rahahleh, N., & Bhatti, M. I. (2022	Conventional	S (conv only)	KSA	No
Arif, U., & Majeed, M. I. (2023),	Islamic	S	Pakistan	No
Hilman, I. (2017)	Islamic	S	Indonesia	No

Table 7: Summary of Hypotheses 1 results compared to literature

- Hypothesis 2

The results show undoubtedly significant results regarding the influence of Macroeconomic determinants of both conventional and shariah equity mutual fund performances. The influence of all the macroeconomic variables tested in this study is significant at $p<0.01$ for both conventional and shariah compliant funds.

While the effect of market performance and FX rate is positive on both conventional and shariah compliant equity funds, the effect of GDP growth % and inflation % on both conventional and shariah compliant funds is negative. Results also show with great significance that Islamic equity funds are less influenced by Excess market returns, GDP growth %, and inflation % than their conventional counterparts.

This generally aligns with the findings of relevant literature conducted in terms of significant influence of the Macroeconomic factors on mutual funds in general, while there are some differences in the sign of this

influence. In their study on the Indian market, Panigrahi, Karwa, and Joshi (2019), found positive influence of inflation rate on mutual fund performance.

A from Ghana supports the significance of the influence of Macroeconomic determinants on mutual fund performances but have different conclusions on the sign of influence. Gyamfi Gyimah, Addai, and Asamoah (2021), concluded a positive influence of the 3 macroeconomic determinants on mutual funds' performance.

4.3 Conclusion

For the sake of establishing whether there is a statistically significant performance superiority of one type of equity mutual funds over the other, between conventional and Islamic, and for the purpose of studying the impact of the macroeconomic variables on both types of equity mutual funds, this study analyzes 503 conventional equity funds and 128 Shariah-compliant equity funds from seven countries in the MENA regions and incorporate 3 major macroeconomic variables into the analysis using GLM.

the results revealed that there is no significant supremacy of Islamic equity mutual funds over conventional ones. This aligns with other studies that found Shariah funds slightly outperforming conventional funds in certain markets but not in others. The study also highlights the significant influence of macroeconomic determinants on both conventional and Shariah equity mutual fund performances, noting the varied impacts of these variables across different contexts. While the effect of market performance and FX rate is positive on both conventional and shariah compliant equity funds, the effect of GDP growth % and inflation % on both conventional and shariah compliant funds is negative. Results also show with great significance that Islamic equity funds are less influenced by Excess market returns, GDP growth %, and inflation % than their conventional counterparts.

Chapter Five

References and Appendix

5.1 References

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5.2 Appendix

Descriptive Statistics for the Conventional Funds

	Excess Fund Return	Market excess Return	fx	gdp	inf	Kuwait	Egypt	Bahrain	Oman	KSA	UAE	Qatar	shariah
Mean	0.00309	0.00195	3.06406	0.00287	0.00243	0.06019	0.12782	0.33134	0.08985	0.08003	0.30906	0.00171	0
Standard Error	0.00049	0.00051	0.03385	2.2E-05	2.9E-05	0.00186	0.00261	0.00368	0.00223	0.00212	0.00361	0.00032	0
Median	0.00529	-0.0009	3.6725	0.00327	0.00173	0	0	0	0	0	0	0	0
Mode	-0.0044	0	3.6725	0.00327	0	0	0	0	0	0	0	0	0
Standard Deviation	0.06225	0.0657	4.33311	0.00276	0.00375	0.23784	0.3339	0.47071	0.28598	0.27134	0.46212	0.04131	0
Sample Variance	0.00387	0.00432	18.7759	7.6E-06	1.4E-05	0.05657	0.11149	0.22157	0.08179	0.07363	0.21355	0.00171	0
Kurtosis	4.6972	6.47318	14.034	1.90882	12.9119	11.6826	2.97113	-1.4865	6.23007	7.58547	-1.3171	580.251	230.45
Skewness	-0.5202	0.16388	3.31672	-0.7534	3.02417	3.6988	2.22952	0.71671	2.86868	3.09589	0.82647	24.1284	15.99
Range	1.06654	0.75496	30.6312	0.0211	0.02729	1	1	1	1	1	1	1	0
Minimum	-0.5705	-0.3416	0.26883	-0.0077	-0.0022	0	0	0	0	0	0	0	0
Maximum	0.49604	0.41334	30.9	0.0134	0.02507	1	1	1	1	1	1	1	0
Sum	50.6892	31.9729	50195.5	46.9456	39.772	986	2094	5428	1472	1311	5063	28	0
Count	16382	16382	16382	16382	16382	16382	16382	16382	16382	16382	16382	16382	16382

Descriptive Statistics for the Islamic Funds

	Excess Fund Return	*Market excess Return*	*fx*	*gdp*	*inf*	*Kuwait*	*Egypt*	*Bahrain*	*Oman*	*KSA*	*UAE*	*Qatar*	*shariah*
Mean	0.00255	0.00216	3.99893	0.0026	0.00272	0.10536	0.09529	0.03736	0.00726	0.68764	0.04542	0.02167	1
Standard Error	0.00044	0.0005	0.02772	2.5E-05	2.7E-05	0.0024	0.00229	0.00148	0.00066	0.00362	0.00163	0.00114	0
Median	0.00495	0	3.75	0.0029	0.00204	0	0	0	0	1	0	0	1
Mode	-0.0008	-0.0017	3.75	0.00327	0.00204	0	0	0	0	1	0	0	1
Standard Deviation	0.05637	0.06443	3.54786	0.00315	0.00341	0.30703	0.29362	0.18964	0.08492	0.46347	0.20822	0.14561	0
Sample Variance	0.00318	0.00415	12.5873	9.9E-06	1.2E-05	0.09426	0.08621	0.03596	0.00721	0.2148	0.04336	0.0212	0
Kurtosis	4.41056	3.19962	21.9929	1.51027	14.4437	4.61085	5.60195	21.8138	132.712	-1.3443	17.072	41.1816	20.5908
Skewness	-0.658	-0.1932	4.05799	-0.204	2.95645	2.57105	2.75704	4.87967	11.6059	-0.8098	4.36691	6.57089	3.28544
Range	0.77977	0.75496	30.6312	0.02726	0.02922	1	1	1	1	1	1	1	0
Minimum	-0.3974	-0.3416	0.26883	-0.0077	-0.0041	0	0	0	0	0	0	0	1
Maximum	0.38235	0.41334	30.9	0.01956	0.02507	1	1	1	1	1	1	1	1
Sum	41.6978	35.4124	65510.4	42.5452	44.5656	1726	1561	612	119	11265	744	355	16382
Count	16382	16382	16382	16382	16382	16382	16382	16382	16382	16382	16382	16382	16382