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Higher Order Moments Timing Abilities of Islamic Fund Managers

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ABSTRACT
This study scrutinises the performance of Shariah compliant funds in Saudi Arabia, Pakistan, and Malaysia based on fund managers' market and higher-order moments timing abilities from Jan 2010 to June 2022. The study explicitly introduces higher-order moments as a potential risk factor, which is reflected in the specification of the study model and also represents the non-normality distribution of the market's return. On average, the Islamic funds produced positive alpha compared to conventional funds in all selected Islamic countries after incorporating the higher-order moment's factor in the famous four-factor model. The study offers novel findings that Islamic fund managers have better market timing abilities than conventional fund managers. Additionally, the higher-order moments timing abilities are also better for Islamic funds than conventional funds. These results conclude that Islamic fund managers have superior timing abilities and could generate higher returns for their investors than conventional funds. The study found that both types of funds preferred positive skewness. Thus, they pay overpriced hedges against negative skewness securities to avoid the skewness risk. In negative risk, the premium is associated with higher-order moments risk in Islamic and conventional funds.

Keywords: *Islamic Funds, Conventional Funds, Timing Abilities, Higher-Order Moments, Islamic Countries, Performance*

1. Introduction

Investment in mutual funds has become increasingly popular among investment channels in recent decades. It is important to evaluate the fund manager's skills in fund management since the manager is in charge of considerable investment. Thus, their investment decision can increase or decrease the investors' wealth. It is, therefore, crucial to look at the performance factors through the lens of the mutual fund manager (Jiang et al., 2021). If fund managers have a competitive advantage, they could extract value from the capital market for their investors (Berk & Binsbergen, 2015; Feldman, Saxena & Xu, 2020). In finance, "timing" is a strategy used to modify a portfolio's exposure to the market by using

fund managers' market forecast ability (Zheng & Zheng, 2021). The fund manager raises(lower) funds' exposure before the market increases(falls) (Cagnazzo, 2022). If a fund manager could time the market, they can adjust their exposure to produce a good return and decrease losses. Fund managers who can time the market may earn additional profits, particularly during market instability (Zouaoui, 2019; Busse et al., 2020; Chen, Liu & Li, 2021). According to Liao et al. (2017), top-timer fund managers can produce abnormal returns compared to non-timer fund managers. They further elaborated that investment decisions must take timing measures into account.

The normality of stock returns is a basic principle of empirical asset pricing. Using a quadratic utility function or a normal distribution of stock returns enables the mean-variance frontier to produce the traditional utility theory (Joro & Na, 2006). Skewed returns violate both assumptions, the quadratic nature of the utility function and the normality of the returns, so the only requirement is the normality of returns. In the case of highly traded assets, this may be a reasonable requirement, such as those in developed funds markets. However, the constraints funds market does not satisfy this condition (Hassan et al., 2017). A normal distribution of fund returns is not necessarily followed by fund returns (Gray & French, 1990). Investing in higher potential moments requires paying off investors (Kraus & Litzenberger, 1976). A review of the risk-return paradigm in equity and mutual fund pricing by Ang et al. (2006) argues that it should be reassessed in light of the high-order moments: positive skewness should be viewed as a riskier asset, therefore requiring higher returns.

Any investment portfolio that uses Shariah-Compliant Funds (hereafter, SCF) relies on 'purging' non-accepted stocks (Hassan et al., 2017). Different reasons may be behind this purging, depending on whether it is secular or non-secular (Grira & Labidi, 2021). Shariah law prohibits SCF from consuming alcohol, pork, and gambling-related activities, thus excluding firms that earn income from these activities (Al Rahahleh & Bhatti, 2022). Funds perform differently because of other characteristics, fees, operations, and restrictions. Such as, hedge fund managers have to face no limits; they can quickly adapt various strategies to time the market, such as short selling and avail the derivatives opportunities (Alaabed, Chowdhury & Masih, 2019). There may be a difference in performance between mutual and hedge funds because they have highly skilled managers, which increases their attraction compared to mutual funds (Feldman, Saxena & Xu, 2020). In addition, more restricted funds may exhibit different performance than less restricted funds (Hassan, Chachi & Munshi, 2019). Experienced managers may exploit such conditions and produce better results for the funds (Osinga et al., 2021). According to Shariah rules, SCF invests in restricted sectors, such as small-cap, technology, etc., leaving them with less diversified and volatile portfolios than conventional funds (Mirza et al.,2022). Muslim investors must follow Shariah and cannot invest in Conventional Funds (hereafter, CF) (Azmi et al., 2020). Hence, it is interesting to investigate whether the SCF managers have the timing abilities to produce a good return for their investors. This study will compare these managers' timing skills with their conventional counterparts to analyze whether SCF investors get any economic value by investing in SCF by considering higher-order moments risk factors.

It has been documented that most research on mutual fund managers timing ability involves conventional funds, with mixed results (Ferson & Schadt, 1996; Treynor & Mazuy, 1966; Henriksson, 1984; Jiang, 2003; Cuthbertson, Nitzsche & O'Sullivan, 2010; Andreu et al., 2018; Mascio, Fabozzi & Zumwalt, 2020). The major topics of these studies were market timing, selectivity, and cash flow timing. On the other hand, market volatility, liquidity timing, style timing, and higher-order co-moments have received little attention (Busse, 1999; Giambona & Golec, 2007; Cao, Simin, & Wang, 2013; Wattanatorn & Nathaphan,2020; Wattanatorn et al., 2020). Further, there is little literature on SCF manger' timing abilities, especially on higher-order moments.

In capital markets worldwide, higher-order moments (extreme risk) are common, where investors tend to keep a safe distance from financial catastrophes (Andersen et al., 2021). Extreme events can significantly disrupt the market despite their rarity, reducing portfolio values (Ni et al., 2021). In 2015, Shanghai's Composite Index lost more than 18 trillion yuan ($18 trillion) to the crash of the Shanghai Stock Exchange Composite Index (SSECI). More than 1300 stocks fell below limits at closing, and over 1400 equity assets were suspended. Many mutual funds also suffered losses (Karagiannis and Tolikas, 2019). The coronavirus disease (COVID-19) caused a tail event that ultimately crashed the fund markets (Andersen et al., 2019; Mirza et al., 2022). The tail risk, in this case, is undeniable (Mensi et al., 2020). Using an innovative approach, the author explores the traditional timing issue by examining SCF managers' abilities to time market-implied tail risks (higher-order moments).

A study focusing on SCF was conducted by Mirza et al. (2022). As far as performance, abnormal returns, and volatility timing are concerned, SCF outperformed CF. This pattern is consistent despite the outbreak of COVID-19 being the primary cause of these findings. There are several reasons for the dominance of Islamic funds. According to (Lesser & Walkshausl 2018), an essential factor affecting superior performance is the fund managers' expertise in SCF investments in stable Islamic financial environments. Several studies have linked fund performance and screening mechanisms (Reddy et al., 2017). SCF undergoes a thorough compliance screening process (Alda, 2019; Peillex et al., 2019). The asset distribution of SCF has been attributed to the performance of SCF. Based on their style analysis results, they observe a proactive shift across sectors across the sample period (Boo et al., 2017; Otero-Gonz ález & Durán-Santomil, 2021).

This study has several reasons for focusing on higher-order moment timing. Firstly, Fund performance and tail risk are interconnected. Cross-sectional data shows a correlation between tail risk and fund returns (Karagiogiannis & Tolikas, 2019). It would be more likely to have a low valuation and a higher expected return if the fund had high tail risk loading. Approximately half of the mutual funds in the study of Chen and Dai (2020) sampled had negative beta tails. There may be less vulnerability to market left-tail events for some

actively managed funds (Shaikh, 2020). Therefore, it is crucial to consider whether SCF can time tail risks (higher-order moments).

Another interesting aspect of the SCF market is that it has grown rapidly recently, with fund managers being the most sophisticated investors. By strategically timing market movements, professional asset managers may be able to detect risks associated with market tails. The third point is that mutual funds trade dynamically and have time-variating exposures to systemic risks. The mutual fund industry needs to investigate tail risk timing capabilities since downside tail risk will influence market exposure. Lastly, Black-Scholes assumes a total market, which means funds prices depend only on stock price behaviour. For informed investors, funds appear more attractive than stocks despite not meeting all conditions for market completeness. A recent study has shown that the stock market first reflects market information before the fund market (Huang & Li, 2019). The study investigates the higher-order moment's risk in this study using SCF data and its comparison with CF data.

A greater change in optimal portfolio allocation increased the utility of the asset returns when more moments were included in the decision process (Harvey et al., 2010). Several empirical studies support this finding. In their research, You and Daigler (2010) explore whether diversifying across international equity markets can reduce diversification benefits if higher moments are included. By ignoring higher-order moments, the authors of this study suggest that you are underestimating your portfolio risk. An analysis of diversified portfolio performance may be significantly inaccurate if higher moments of statistical significance are ignored (Shaikh, 2020). The author demonstrated that ignoring higher moments leads to nontrivial underestimating portfolio risk in extreme market conditions. Additionally, their findings highlight the importance of asset class diversification for Sharia-compliant practitioners and the advantages of higher moments.

This study will discuss fund managers' higher-order timing abilities regarding constrained investment assets such as SCF. SCF is the leading constrained group in the study. The study includes CF based on traditional principles for comparison and control.

Theoretical Background

Investors' utility functions (Arrow, 1971) should possess the following qualities: (1) A rise in wealth always increases utility, i.e., a lack of satiety regarding wealth (the first derivative of its utility function must be positive). (2) For wealth to be marginally beneficial, its second derivative should be negative. It is important to note that speculators do not gamble, as they always value certain gains more than random outcomes with similar returns. They invest despite the risks and require compensation. (3) The absolute risk aversion of an individual does not increase, meaning the risky assets do not have inferior properties. According to the mean-variance preference, the first two conditions are met.

The utility function U(W) first derivative possibilities are $\dot{U}$ (W) > 0 , $\dot{U}$ (W) = 0 or $\dot{U}$ (W) < 0. For positive marginal utilities, the first derivatives of the utility function should be greater than zero i.e. $\dot{U}$ (W) > 0. The utility function's second derivatives possibilities are $\ddot{U}$ (W) > 0 , $\ddot{U}$ (W) = 0 or $\ddot{U}$ (W) < 0. The decreasing and positive marginal utility is $\ddot{U}$ (W) < 0 called hyper-absolute risk aversion and the absolute risk aversion coefficients of Arrow-Pratt's (1964) $R_A(W) = -\frac{\ddot{U}\,(\mathrm{W})}{\dot{U}\,(\mathrm{W})}$, based on a specified wealth level W, this metric measures how much an individual holds in risky assets. An investor's absolute risk aversion can be classified into three types (a) R_A(W) > 0: increasing absolute risk aversion (IR)– With growing wealth, wealthier people hold fewer risky assets (b) R_A(W) = 0: constant absolute risk aversion (CR)- With increasing wealth, wealthier people hold stable risky assets, and (c) R_A(W) < 0 decreasing absolute risk aversion (DR)- Wealthier people increase risky assets with growing wealth.

A measure of relative risk aversion based on Arrow-Pratt theory$R_{R\,(W)} = -\frac{w\ddot{U}\,(\mathrm{W})}{\dot{U}\,(\mathrm{W})} = R_A(\mathrm{W})$, this Equation measures an individual's wealth level W; they decide how much wealth they choose to invest in risky assets. An investor's relative risk aversion can be classified into three types (a) R_R(W) > 0: increasing relative risk aversion (IRR)– With growing wealth, wealthier people hold fewer risky assets (b) R_R(W) = 0: constant relative risk aversion (CRR)- With increasing wealth, wealthier people hold stable risky assets, and (c) R_R(W) < 0 decreasing relative risk aversion (DRR)- Wealthier people increase risky assets with growing wealth.

As wealth increases, there is an increased relative risk aversion (IRR), indicating that more wealth will be invested in risky assets. Still, a smaller percentage of the wealth will be invested (Arrow, 1965). Wealthier people are less risk-averse regarding the same risks as poorer ones. Therefore, DRR is necessary for risky assets to be considered common goods, i.e., to increase their demand as wealth increases (instead of increasing absolute risk aversion (IAR)). Hypothesizing IRR assumes that risk acceptance should decline as wealth and risk magnitude increase. In other words, the wealth elasticity of risky asset demand is lower than one based on IRR. DRR is supported mainly by experimental and empirical evidence. As DR decreases, positive skewness is preferred (Arditti, 1967). According to Campbell and Viceira (2002), the quadratic utility function cannot adequately describe investor preferences. Functions of power and logarithmic magnitude, for example (Roy & Wagenvoort, 1996), have both DR and IRR:

U(W) = $(W + a)^c$ if a > 0 and 0<c<1

U(W) = $(W + a)^{-c}$ if a > 0 and c>01

U(W) = ln (W+a) if a > 0

In these equations, a and c are constants.

Utility functions that are risk-averse at all times (CRR) are among the most famous alternatives in the previous studies. When the relative-risk aversion (RR) coefficient is greater than 1, Excess kurtosis and negative skewness are embedded in this function. In differentiable, monotonic, and concave utility functions $U^{'''}(W) > 0$, there is an embedded preference for positive skewness; this behavior is prudence (Kimball, 1990). In the case of risk aversion to excess ′kurtosis, that will accommodate $U^{'''}(W) < 0$, temperance is a characteristic associated with this behavior (Kimball, 1992; Gollier and Pratt, 1996).

2. Literature Review

Sharpe (1964), Lintner (1965), Mossin (1966), and Black (1972) after Markowitz's (1952) enhanced the capital Asset Pricing Model (CAPM). They developed an article on modern portfolio theory to get diversification. An asset's return using CAPM can be calculated based on its beta multiplied by its return on the market. An asset's beta is covariance with the portfolio's return divided by market variance. Both academic research and professional analysis to explain the affiliation between risk and return still rely on this model. Indeed, CAPM remains theoretically and empirically sound, but it has some limitations. The variance of returns measures risks in CAPM, which assumes normally distributed property of returns. However, the mean-variance model should only be applied when an investor has quadratic nature of utility or a normal distribution of returns. High moments cannot be ignored unless the quadratic utility function or the normally distributed asset returns (Arditti, 1967, 1971; Rubinstein, 1973). In an extension of classical CAPM, systematic skewness impacts asset valuation substantially. Positive skewness is preferred by investors whose marginal utility of wealth decreases and whose total risk aversion is not increasing (Kraus and Litzenberger, 1976).

Coskewness is essential according to the CAPM three-moment - stocks with negatively skewed values are more likely to have a risk premium than those with positive coskewness values. Cross-sectional regression models, including coskewness, are more effective than those without coskewness in explaining expected returns (Harvey & Siddique, 2000). Stock portfolios sorted by industries are used to price higher-order moments (Dittmar,2002). and future markets support the four-moment CAPM return explanation (Chiao, Hung, & Srivastava, 2003).

A variable's kurtosis is the amount of peaking in its probability distribution compared to the other variables. Smith (2007) demonstrates that coskewness risk has a high empirical price, especially at times of negative market skewness. In the calculation of cokurtosis, historical pricing data for security and the market are used as variables. According to this theory, a higher cokurtosis translates to a fatter probability distribution for the first variable (Brunnermeier, Gollier, & Parker, 2007). In this way, the market risk associated with the

security can be estimated. Risk estimation can be enhanced with cokurtosis in finance. The returns of an investment with a low cokurtosis will be similar to those of the market, making it more attractive to risk-averse investors (Fu, 2009).

In terms of the predictive power of coskewness and cokurtosis on security prices, they find that cokurtosis is even more potent than coskewness. Morreno and Rodriguez (2009) examined the performance of US equity funds on standard CAPM along with co-skewness in Carhart's (1997) four-factor model. Despite considering values, sizes, book-to-market ratios, and momentum, a statistically significant co-skewness was found. In both unconditional and conditional models, including a coskewness factor increases explanatory power. Taking coskewness into account affects average fund performance. In light of this, mutual funds may receive biased risk-adjusted returns if systematic skewness is not considered.

On the other hand, some studies indicate that coskewness risk doesn't significantly affect unconditional portfolio prices (Poti & Wang, 2009). The pricing of higher-order co-moments in US stocks between 1963 and 2010 was studied by Heaney et al. (2012). According to the authors, there was evidence of co-skewness and co-kurtosis of costs, even though the factors are subsumed by size and book-to-market factors by Fama and French (1992). As far as the Asian SCF industry is concerned, higher moment risk remains unexplored.

Basu and Huang-Jones (2015) elaborate that, like systematic market risk (covariance), cokurtosis risk is considered the same as beta risk. That is, portfolios with greater beta risk and cokurtosis risk require greater returns. An expected return is higher when covariance and cokurtosis are high. Since investors prefer positive skewness, the expected return on assets is higher when a portfolio has negative skewness. The return will likely be lower as the coskewness increases. The higher expected returns from covariance and cokurtosis are rewarded to investors when they bear the risks of covariance and cokurtosis. In exchange for increasing positive coskewness, investors sacrifice their expected excess return. It is impossible to price coskewness and cokurtosis in a mean-variance framework. Three-moment models do not price cokurtosis.

Three idiosyncratic moments are analyzed: skewness, volatility, and kurtosis., Ayadi et al. (2019) contribute to the literature on how pricing is affected by these moments. Between 1966 and 2016, they examined variations in idiosyncratic volatilities, idiosyncratic skewnesses, and idiosyncratic kurtoses over time. Using stock data on the US Between 1966 and 2016, they looked at variations in idiosyncratic volatilities, idiosyncratic skewnesses, and idiosyncratic kurtoses over time. As a result, the distinctive nature of skewness varies over time from the cross-sectional expectation of the other higher moments. They revealed two significant results from portfolio analysis. As a result of sorting stocks according to their expected idiosyncratic kurtosis, portfolios containing assets with idiosyncratic kurtosis are

non-monotonic. In addition, distinctive kurtosis portfolios are not formed from assets with high (low) expected idiosyncratic volatility. Considering all three desired peculiar moment variables, they believed there was a strong diversification effect. Using a Fama-MacBeth approach to cross-sectional analysis, they found that neither expected returns nor individual stock characteristics were significantly correlated. These tests demonstrate that maximum daily returns are consistently calculated for all specifications. Portfolios built using expected idiosyncratic kurtosis sorting are found to bear some effect on pricing when expected idiosyncratic skewness is used. Although some explanatory power can be found in very few tested specifications, expected idiosyncratic volatility or kurtosis do not exhibit pricing evidence.

To analyze how fund managers alter their investment exposure when co-skewness varies, Wattanatorn and Padungsaksawasdi (2020) examined investment managers' timing abilities of co-skewness. They found that small-growth and small-blend mutual fund managers were most likely to possess coskewness timing ability, although more substantial evidence is found when financial crises are removed. Small stock mutual fund managers may be accustomed to managing tail risks due to their frequent and predominant investment in small stocks. Because tail risk is used to measure co-skewness, they can predict future coskewness risk more accurately. Wattanatorn and Padungsaksawasdi (2020) found those fund managers failed to beat the market following prior findings on actively managed mutual funds. In addition, they discovered that many fund managers exhibit co-skewness timing capabilities in various investment objectives, as well as similar outcomes for individual funds and portfolios. Risk-adjusted returns and total returns for market skewness timers are higher than those for non-market skewness timers. Finally, they found that by controlling for coskewness, the ability to predict market movements and volatility movements. There has been no significant change in the results of the two significant financial crises and the formation of coskewness (in some cases, the results have even improved).

The systematic skewness and kurtosis of stock returns can be timed correctly by successful fund managers and cannot be diverged and significantly affect the fund's allocation (Wattanatorn & Padungsaksawasdi, 2021). This study examined higher-order moments timing abilities by analyzing US equity returns from December 1972 to March 2018 on mutual fund managers' abilities. They found mutual fund managers demonstrated no positive abnormal return or timed market moments. However, the top-performing groups of managers were able to time market moments successfully based on decile analysis, indicating that market timing ability. Higher-order moments timing showed significant positive relationships, while volatility timing ability showed effective negative relationships using the fourth moment to zero-trade generates the highest abnormal returns. According to the statistical bootstrap analysis, higher-order co-moment timing abilities can be attributed to more than luck.

It's more common for stock returns in emerging economies to be non-normal than in advanced economies (Harvey et al., 2010). In a high-volatility environment like emerging markets, it is essential to analyze returns and associated risks at a higher moment (Samuelson, 1970). Wattanatorn et al. (2020) Investigated the liquidity timing in the developing economy of Thailand by taking 339 domestic equity mutual funds from 2000 to 2018 under higher-order moments by incorporating the co-skewness risk factor along with liquidity timing ability models. They found that top-performing fund managers showed higher order moments timing abilities, but low-performing mutual fund managers showed no timing abilities in the study period.

The Islamic funds and socially responsible investments (herein collectively referred to as SRI) work similarly, but Islamic funds further have to follow Shariah principles. Investing in either type of investment involves purging unaccepted stocks from portfolios. In both cases, the difference lies in the reason for the purging. When managing ethical funds, managers must adhere to socially responsible constraints regarding environmental, social, and governance issues. Alternatively, Shariah law dictates that Islamic investments should exclude alcohol, pork, and gambling activities, eliminating firms that rely on them for their income (Derigs & Marzban, 2009). Since there are a limited number of assets available to both SRI and Islamic investments, there will be some overlap between the permitted assets. Gambling, alcohol, and tobacco industries are not investment opportunities for SRI or Islamic funds. This study summarizes the performance of both types of investments.

SCF does not differ statistically significantly from market benchmarks in performance (Elfakhani et al. 2007; Girard & Hassan 2010). The SCF of Malaysians does not exhibit any convincing performance differentials compared to CF (Hassan et al., 2010). A similar finding was reached by BinMahfouz and Hassan (2012), who did not find any evidence that Shariah investment constraints are linked with lower returns or greater risks. On the other hand, there is surprising evidence that constraint assets outperform their counterparts. Abdullah et al. (2007) stated that SCF had beaten CF in bearish market conditions. A lower leverage element in Shariah-compliant investments makes them outperform traditional investments. There is a strong argument that Shariah-Compliant investments are more valuable than conventional assets (Donia & Marzban, 2010). According to Mansor and Bhatti (2011), SCF has outperformed conventional funds and the KLCI as a proxy for market returns in Malaysia. Pakistani SCFs have a lower average risk rate and higher compensation levels than Pakistani non-Islamic funds (Shah et al., 2012).

Hassan et al. (2017) indicated a high degree of skewness among mutual funds by using the Jarque Bera methodology to calculate this estimate. They found mutual funds in all markets except Turkish are not normally distributed. This is not surprising because most mutual funds, tiny Islamic ones, are not actively traded. Ten of the 13 Egyptian SCF in their data have changed once or twice per week on average, as reported by Hassan et al. (2017). Thus, it seems reasonable to consider this fund to be risky. They measure skewness with an

average of -1.13. A limited portfolio allocation will likely result in losses when using constraint investment strategies.

Constrained assets such as SCF have increased over the past few decades. With various Islamic and the United States conventional and SRI markets, Hassan et al. (2017) ranked Islamic, traditional, and socially responsible funds, expanding the conventional mean-variance frontier by including higher-order moments. Under the mean-variance bush, constrained assets are typically smaller and skewed, violating the normality assumption. As a result of increased mean-variance frontier specifications, enhanced asset pricing tests are possible when skewness risk is controlled by using an unconditional coskewness measure. Their findings show that SCF outperforms CF, exceeding socially responsible investing. They also prove that Islamic investments are difficult to price even after including a systematic moments factor and their associated premium. They suggested that high levels of alpha still exist in some markets, making a more formal inclusion of a risk factor unnecessary. Their results, however, showed an overperformance rather than an underperformance, as previously reported. However, their database is not large enough to accommodate Islamic finance, which is still a rapidly growing sector.

In recent years, several studies have evaluated mutual fund performance. The higher-order moment timing ability of mutual funds has received little attention, particularly in developing Islamic economies, as have SCF managers' abilities in higher-order moments timing. This study hardly found a study on higher-order moments timing abilities in SCF. This study will fill this gap by investigating SCF managers' higher-order moment timing abilities in various major Islamic countries.

It has been commonly assumed that returns are normal in empirical asset pricing literature for most of its history. Traditional utility theory is consistent with the mean-variance frontier only when stock normally distributed returns and quadratic utility functions (Joro & Na, 2006). In the case of skewered returns, only the normality of returns suffices to satisfy both assumptions. It is because even though this condition applies to highly traded assets, such as the assets of US funds, it does not apply to constraint investments. As the literature shows (Fama, 1965; Gray & French, 1990), a normal distribution does not always apply to returns.

Consequently, investors require compensation for systematic higher-order moments (Kraus & Litzenberger, 1976). Risk-return paradigms need to be re-evaluated for stock and mutual fund pricing to account for higher order moments (Ang et al., 2006): funds with positive skew should be considered riskier, resulting in higher returns. According to Shariah law, Islamic investment managers are not permitted to invest in alcohol, pork, or gambling activities, so firms that rely on these activities are eliminated from the portfolio (Derigs & Marzban, 2009).

Systematic higher-order moments risk is studied across Islamic fund markets to extend the literature on constraint investment assets. Using three major Islamic markets (Malaysia,

Pakistan, and Saudi Arabia), this study compares SCF performance with CF based on fund managers' timing abilities. An indicator for higher-order moments risk is included in this study as a proxy in the outdated Capital Asset Pricing Model. The study supports this perspective in three significant ways: (1) it extends the analysis to three major Islamic fund markets, analyzes each market independently, and looks at each market separately. (2) In this study, the results are intended to be robust and not necessarily impacted by global exposure since constrained investments are being assessed. (3) SCF are still relatively novel and young. Further trading has not spanned enough to allow a monthly return analysis, which is needed to consider global factors.

3. Data and methodology

3.1 Data

This study uses data on Saudi Arabia (KSA), Malaysia (MAL), and Pakistan (PAK) from Jan 2010 to June 2022. The information was collected from the Saudi exchange website (Tadawul) for KSA funds data, and for a risk-free rate, the study used 3-month T bills from Saudi Central Bank's website (SAMA Bills). Individual fund websites are used to find information about MAL, and Bank Negara Malaysia provides information about 3-month T bills. For Pakistan, the fund's information is obtained from the Mutual Fund Association of Pakistan (MUFAP). The three-month T-bill data is collected from the State Bank of Pakistan's website. These data include daily Net Asset Value (NAV), fund age (using inception date data), expense ratios, asset under management (AUM), management fee, and leverage. The market data is collected from the stock exchange websites of each country.

Due to the study's purpose, only equity funds were used in the study to evaluate the fund manager's time management abilities. Equity fund management is the real judgment timing skill of the fund manager. The study used data after the global fund crisis, including the corona phase, to see how fund managers deal with pandemic problems humans do not control. Further, this time is also depending on the availability of data. The study includes almost all equity funds whose data were available during the selected time. This study contains data on both SCF and CF for each country. This study covers 280 equity funds, 130 of which are Islamic equity funds and 150 of traditional equity funds. The summary of each country's data is given in the Table. 1.

Table1. The number of funds used in this study shows in this Table. PAK, KSA, and MAL represent Pakistan, Saudi Arabia, and Malaysia. SCF and CF represent Shariah-Compliant and conventional funds, respectively.

Country	SCF	CF	Total
PAK	28	41	69
KSA	60	26	86
MAL	42	83	125
Total	130	150	280

The monthly mutual fund's returns for each country on Islamic and conventional funds from daily NAV are as follows:

$$R_{pt} = \frac{NAV_t - NAV_{t-1}}{NAV_{t-1}} \quad (1)$$

3.2 *Methodology*

Mutual funds come with the primary advantage of being professionally managed by investment managers. The rational investor, therefore, believes that mutual fund managers who choose stocks and utilize market timing can generate superior returns. A mutual fund manager's first skill is investing in undervalued stocks. Identifying potentially undervalued stocks is one of the functions of mutual fund managers, who will buy these undervalued stocks. Traditional beliefs hold that asset prices adjust over time to their intrinsic value. The managers of mutual funds can produce positive abnormal returns once stock values have been brought to their inherent levels. Therefore, investors prefer to invest in funds managed by managers who provide superior anomalous returns (Wattanatorn & Nathaphan, 2019).

The second skill is the ability to predict market returns, also known as "market timing." The portfolio composition will be changed in advance of the adjustment. The fund manager can make an accurate prediction of the market return. For example, mutual fund managers' returns will increase more than the market's when the market rises because they can time the market perfectly. In light of these observations, Treynor and Mazuy's (1966) unconditional and Hendriksion and Merton's (1981) conditional models are among the predominant mutual fund managers' market timing models. Hendriksion and Merton (1981) developed a market timing model that shows:

$$R_{p,t} = \alpha_{pt} + \beta_p R_{mt} + \delta_p (I \times R_{mt}) + \mathcal{E}_{pt} \quad (2)$$

Where $R_{p,t}$ represents the funds and the market return R_{mt} in the month t above the risk-free rate R_f . The risk-free rate is the three-month T bills rate of each country which is denoted by R_f. The systematic risk of the CAMP here is represented by α_{pt} and β_p Respectively. The dummy variable 'I' represents is equal to 1 if the market return is positive and 0 otherwise. Fund managers who have access to market timing will increase (decrease) their investment in market assets when the market is predicted to increase or decrease. Fund

managers are characterized by their market timing abilities when the coefficient, δ_p is positive and significant.

3.3 *Market Timing Abilities*

Prior literature has extensively examined mutual fund managers' ability to time the market in developed markets. According to previous literature, fund managers have demonstrated mixed timing abilities. Global asset allocation funds cannot predict market movements in an international context (Comer, Larrymore, & Rodriguez 2008). A similar finding was also reported by Bauer, Otten, and Rad (2006), who found that New Zealand funds could not make accurate market predictions. Some authors strongly supported the knowledge of US market timing (Jiang, Yao, and Yu, 2007). Mutual fund managers can time the market, as Bollen and Busse (2001) demonstrated. In emerging markets, mutual fund managers have successfully timed market liquidity following a recent study (Wattanatorn and Tansupswatdikul 2019). Avramov et al. (2020) found no best performance or excellent knowledge for mutual funds among mutual fund managers. Market timing studies produce frightening results in emerging markets, especially in Islamic markets, despite emerging markets being more predictable. According to Mansor and Bhatti (2011), Malaysian fund managers have both selectivity and market timings. Mansor et al. (2015) found that market timing disappears when the fee is considered. Mansor et al. (2020) also found no timing abilities in Islamic and conventional funds based on extended data.

The Carhart (1997) four facto model is as follows:

$$R_{p,t} = \alpha_{p,t} + \beta_m R_m + \beta_{smb}\text{SMB} + \beta_{hml}\text{ HML} + \beta_{mom}\text{ MOM} + \mathcal{E}_{pt} \quad (3)$$

A four-factor model of Carhart (1997) is included in Equation (2) to forecast the return on the market by a mutual fund:

$$R_{p,t} = \alpha_{p,t} + \beta_m R_m + \beta_{smb}\text{SMB} + \beta_{hml}\text{ HML} + \beta_{mom}\text{ MOM} + \delta_p\ (\text{I} \times R_{mt})\ + \mathcal{E}_{pt} \quad (4)$$

3.4 *Co-Skewness timing ability*

Market portfolios refer to coskewness as the relationship between assets and market skewness. The left side (negatively) coskewness of a portfolio asset causes undesirable extremes in the left tail of its return distribution due to a negative skew in the distribution's return distribution. The risk factor for coskewness is calculated similarly to Fama and French (1993). Using Harvey and Siddique (2000), this study builds the co-skewness risk factor, assisting mutual fund managers in managing portfolios by timing systematic skewness. The investigation continues with a traditional CAPM-based market-timing formula, in which only the first two moments are crucial to the investor's preference for the fund investment. As shown below, fund managers who can time the market generate portfolio gains:

$$R_{p,t} = \alpha_i + \beta_{i,t} R_{m,t} + \varepsilon_{p,t} \quad (5)$$

Wattanatorn & Padungsaksawasdi (2020) suggested fund managers' timing ability to time systemic skewness (co-skewness). It is determined as follows to test whether a fund manager is capable of time co-skewness:

$$\beta_{p,t} = \beta_m + \gamma_p(CSK_{m,t} - \overline{CSK_m} + \varepsilon_{p,t}) \quad (6)$$

Where $CSK_{m,t}$ is the co-skewness risk factor in time t and $\overline{CSK_m}$ is the time-series mean of $CSK_{m,t}$ over the whole period of the sample.

The study follows Harvey and Siddique's (2000) technique for constructing systematic risk factors, which allows fund managers to time the coskewness of their portfolios. Which is defined as:

$$S_p = \frac{E(\varepsilon_{p-} \varepsilon^2_{m,t})}{\sqrt{E(\varepsilon^2_{p,t})(E(\varepsilon^2_{m,t})}} \quad (7)$$

$\varepsilon^2_{p,t}$ represents the squared residual of the fund 'i' on the excess market, calculated from the regression model and $\varepsilon^2_{m,t}$ is the squared residual mean return of market excess return calculated from the regression model.

The study can directly measure coskewness (S_i) for each security i through a rolling window of 60-monthly excess returns. Next, we form two portfolios according to coskewness values. A portfolio S^- consists of 30% negative stocks during a portfolio S^+ contains 30% positive stocks. A coskewness risk factor exists when there is a difference between two portfolio returns (S^-- S^+). A comparison between the size premium (SMB) and the value premium (HML) can be made. It is possible to view coskewness risk as a coskewness premium. The forecasting error $\varepsilon_{i,t+1}$ of a fund manager, IIDs are distributed as part of this scheme and cannot be anticipated perfectly by a fund manager. During month t, portfolio beta $\beta_{p,t}$ is calculated by averaging the fund manager's beta β_m and coskewness timing ability γ_p .

$$R_{p,t} = \alpha_p + \beta_{p,t-1} MKT_t + \gamma_i MKT_t (CSK_{m,t} - \overline{CSK_m}) + \varepsilon_{i,t} \quad (8)$$

$\gamma_p =$ This measure shows the degree to which the fund manager's timing ability is skewed. Fund managers can adjust their market exposure accordingly based on the co-skewness coefficient's positive value. Co-skewness timing ability using the four-factor model of Carhart (1997) is:

$$R_{p,t} = \alpha_p + \beta_{p,t-1} MKT_t + \beta_{p,2} SMB_t + \beta_{p,3} HML_t + \beta_{p,4} MOM_t + \gamma_p CSK_{m,t} + \varepsilon_{p,t} \quad (9)$$

3.5 *Co-kurtosis timing ability*

Cokurtosis refers to how asset price kurtosis is related to market kurtosis. The cokurtosis of an asset increases the likelihood that the portfolio's return will be extreme when incorporated into the portfolio by adding large kurtosis. The higher-order moments has extensively tested in the US stock market (Harvey and Siddique, 2000), in the UK stock markets (Kostakis et al., 2012), and in emerging conventional stock markets (Hwang & Satchell, 1999), in traditional mutual funds (Heaney, Land, & Treepongkaruna, 2012; Wattanatorn & Padungsaksawasdi, 2020). But this area is almost ignored in Islamic markets, especially in the Islamic mutual fund industry. Three fast-growing Asian countries, Saudi Arabia, Malaysia, and Pakistan, are evaluated for fund performances based on the higher-order moments timing in the present dissertation. Even though all these countries have large Muslim populations, the same Shariah rules govern them. This study will evaluate higher-order moment timing skills by fund managers, compare them to conventional fund managers, and find any differences in fund performance based on higher-order moment timing abilities among them.

Therefore, standardized co-kurtosis can be obtained by using the following formulas for each stock's return relative to the market returns from t-60 to t:

$$\text{Co-Kurtosis} = K_p = \frac{E\left(\varepsilon_{p-}\,\varepsilon_{m,t}^3\right)}{\sqrt{E(\varepsilon_{p,t}^2)}\left(E(\varepsilon_{m,t}^3\right)} \tag{10}$$

A co-kurtosis is the relationship between an asset's kurtosis and a market portfolio's kurtosis. The co-kurtosis of an asset is a measure of its ability to contribute to the kurtosis of the portfolio, thus increasing the likelihood that the portfolio will encounter undesirable infrequent extreme returns. Beta (β) and cokurtosis are interpreted in the same way. A portfolio with the most positive cokurtosis (K+) is preferred over a portfolio with the least positive cokurtosis (K-). Therefore, the cokurtosis risk factor (CKT) equals the return on the portfolio with the most positive cokurtosis (K+) minus the return on the portfolio with the least positive cokurtosis (K- Rather than going in the same direction as the co-skewness risk factor, it goes the other way. The spread of returns determines cokurtosis risk factors CKT (K^+- K^-) across A portfolio of the t+1 month's portfolio.

$$R_{p,t} = \alpha_p + \beta_{p,t-1}\, MKT_t + \gamma_i MKT_t\, (\, CKT_{m,t}) + \varepsilon_{i,t} \tag{11}$$

Carhart's (1997) four-factor model is extended to include co-skewness and co-kurtosis risk factors to investigate the performance of SCF. As co-skewness and co-kurtosis of equity returns are not diversifiable and affect the distribution of a fund, skilled fund managers can earn abnormal by correctly timing co-skewness and co-kurtosis (Wattanatorn & Padungsaksawasdi, 2020).

$$R_{p,t} = \alpha_p + \beta_{p,t-1}\, MKT_t + \beta_{p,2}\, SMB_t + \beta_{p,3}\, HML_t + \beta_{p,4}\, MOM_t + \gamma_p\, CKT_{m,t} + \varepsilon_{p,t} \quad (13$$

The study constructs a higher moment market timing model which combines co-skewness and co-kurtosis risk factors as follows:

$$R_{p,t} = \alpha_p + \beta_{m,1}\, R_{m,t} + \beta_{smb,2}\, SMB_t + \beta_{hml,3}\, HML_t + \beta_{mom,4}\, MOM_t + \delta_p\, (\mathrm{I} \times R_{mt}) + \gamma_{csk}\, CSK_{m,t} + \gamma_{ckt}\, CKT_{m,t} + \varepsilon_{p,t} \quad (14)$$

4. Analyses and Conclusions

This section discusses and reports the findings of the study. The Kingdom of Saudi Arabia's (KSA) descriptive statistics are presented in (Table 2a). The performance of both SCF and CF is better than the market of the KSA. At the same time, SCF is better than CF. The per month return of the CF is .54% and .63% for the SCF. Although the mutual funds are well diversified by definition, the results show the higher nature of riskiness of the mutual fund in KSA compared to the market. The risk measure of conventional funds is higher than the market risk, whereas the threat of Islamic funds is almost equal to the market risk of KSA. The skewness of traditional funds, Islamic funds, HML, and MOM is negative, whereas all variables' kurtosis is positive. Various variables show skewness and kurtosis, which are significant at the p-value. Using the Shapiro-Wilk to test the normality, and found all variables deviated from the normality distribution. Furthermore, the study rejected the null hypothesis of the normal distribution by performing a Jarque-Bera test on majority of the funds in the sample. The result further proves that the critical higher-moments plays a significant role in risk assessment.

Table2(a). Descriptive Statistics (KSA)

Variables	Obs	Mean	Std. Dev.	Min	Max	Skew.	Kurt	p-value
Mutual Funds								
Rc	150	.54	5.5	-31.71	11.024	-1.74***	10.61***	0.000
Ri	150	.63	4.71	-16.09	11.67	-.78***	4.02**	0.000
Risk Factors								
Rf	150	.05	.03	.02	.12	1.04***	2.78	0.000
Rm	150	-.50	5.48	-15.27	18.99	.65***	4.16**	0.002
SMB	150	.27	2.04	-6.90	6.06	.20	3.63*	0.000
HML	150	.29	1.18	-3.02	2.65	-.21	2.76	0.000
MOM	150	1.00	2.39	-8.42	7.03	-.69***	4.86***	0.000
CSKC	150	-.05	.87	-3.18	4.94	.52**	11.31***	0.000
CSKI	150	-.10	1.01	-4.15	4.78	-.47**	9.67***	0.000
CKTC	150	.76	2.43	0.00	24.39	6.96***	62.59***	0.000
CKTI	150	1.01	3.00	0.00	22.85	5.05***	31.08***	0.000

Here Rc and Ri is the return on CF and SCF. Rf represents a risk-free rate. Rm represents market return. HML, SMB, and MOM represent the value, size, and momentum. CSKI, CSKC CKTI, and CKTC are the coskewness and cokurtosis factors of SCF and CF. *, **, *** representing the significance 10%, 5%, and 1% levels, respectively.

Table (2b) represents the descriptive statistics of Malaysian mutual funds. The results showed that SCF and CF returns are positive and statistically significant compared to MAL's market returns. The monthly return of SCF is equal to.11%, and the monthly returns of conventional funds are equivalent to.08%, showing the better performance of SCF than CF in MAL. But both funds do not beat the market returns. The risk of both SCF and CF is also superior than that of the market. The skewness of the market, SCF, and CF are negative, and all variables' kurtosis is positive and statistically significant. According to the Shapiro-Wilk normality tests, no variables deviate from the normality distribution. The study also tested the null hypothesis that the mutual funds were not distributed normally using Jarque-Bera tests on most of the funds in our sample.

Table2(b). Descriptive Statistics (Malaysia)

Variables	Obs	Mean	Std. Dev.	Min	Max	Skew.	Kurt.	p-value
Mutual Funds								
Rc	150	.08	3.10	-13.82	7.56	-1.45***	7.75***	0.000
Ri	150	.11	3.27	-12.94	11.10	-.57***	5.15***	0.000
Risk Factors								
Rm	150	.11	2.97	-9.31	7.28	-.31	3.47	0.000
Rf	150	.02	.00	.01	.03	-.35*	1.39	0.000
SMB	150	.09	1.26	-3.05	4.34	.59***	4.45***	0.001
HML	150	.25	.90	-2.98	2.64	.19	4.34***	0.029
MOM	150	.62	1.88	-7.67	5.45	-.42**	5.50***	0.000
CSKI	150	.40	1.09	-1.10	8.25	4.03***	24.58***	0.000
CSKC	150	.54	1.27	-1.03	9.40	4.20***	24.78***	0.000
CKTI	150	1.33	6.44	0.00	68.06	8.40***	81.86***	0.000
CKTC	150	1.90	9.09	0.00	88.27	7.57***	65.39***	0.000

Here Rc and Ri is the return on CF and SCF. Rf represents a risk-free rate. Rm represents market return. HML, SMB, and MOM represent the value, size, and momentum. CSKI, CSKC CKTI, and CKTC are the coskewness and cokurtosis factors of SCF and CF. *, **, *** representing the significance 10%, 5%, and 1% levels, respectively.

Similarly, the Pakistani mutual fund's performance is worse than the market. The conventional fund's return is -0.045%, and the Islamic fund's return is -.022% as compared to the market, which is .855% per month. The SCF risk is better than CF and the market. The skewness of the market, SCF and CF are negative, and the kurtosis of all variables are positive and statistically significant. According to the Shapiro-Wilk normality tests, no variables deviate from the normality distribution. The study also tested the null hypothesis that the mutual funds were not distributed normally using Jarque-Bera tests on most of the funds in our sample.

Table2(c). Descriptive Statistics (Pakistan)

Variables	Obs	Mean	Std. Dev.	Min	Max	Skew.	Kurt.	p-value
Rc	150	-.045	5.188	-22.872	16.86	-.83***	6.70***	0.000
Ri	150	-.022	4.426	-19.147	11.699	-.80***	5.50***	0.000
Rf	150	.098	.027	.034	.155	.148	1.82***	0.000
Rm	150	.855	5.657	-26.318	15.321	-.67***	5.82***	0.000
SMB	150	.27	2.039	-6.9	6.06	.20	3.63	0.161
HML	150	.286	1.182	-3.02	2.65	-.21	2.76	0.507
MOM	150	1.004	2.385	-8.42	7.03	-.69***	4.86***	0.000
CSKC	150	.043	1.444	-11.251	8.127	-1.36***	35.42***	0.000
CSKI	150	.015	1.36	-11.049	7.318	-2.36***	36.55***	0.000
CKTC	150	2.072	12.159	0	126.593	8.52***	80.60***	0.000
CKTI	150	1.837	10.975	0	122.087	9.60***	100.8***	0.000

Here Rc and Ri is the return on CF and SCF. Rf represents a risk-free rate. Rm represents market return. HML, SMB, and MOM represent the value, size, and momentum. CSKI, CSKC CKTI, and CKTC are the coskewness and cokurtosis factors of SCF and CF. *, **, *** representing the significance 10%, 5%, and 1% levels, respectively.

A correlation matrix is presented in (Table 3a) based on independent variables. Correlations between independent variables are significant. HML, MOM and CKTI show a positive correlation with the market return, whereas SMB, CSKC, and CSKI show a negative correlation. SMB shows a robust negative correlation with HML, CSKC shows a strong positive correlation with CSKI, and CKTC also shows a strong positive correlation with CKTI, indicating a multicollinearity problem. A similar result is obtained for KSA. CSKI, SMB, CSKC, CKTI, and CKTC show a negative correlation with market return, while HML and MOM show a positive correlation. But a robust positive correlation exists between CSKI, CSKC, CKTI, and CKTC, showing a strong positive and significant correlation. The independent correlation matrix of Pakistan is represented in (Table 3c). CSKI is significantly positively correlated with CSKC, and CKTI is significantly positively correlated with CKTC. On the other hand, CSKI is negatively correlated with CKTI, and CSKC is also negatively correlated with CKTI but significant. To quantify multicollinearity problems, the study uses the variance inflation index, VIF. Table 4 shows the correlation matrix for KSA, MAL, and Pak. According to the VIF test, all VIF indices have a value lower than ten, and there is no evidence of a multicollinearity problem.

Table3(a). Correlation Matrix (KSA)

Variables	Rm	SMB	HML	MOM	CSKC	CSKI	CKTC	CKTI
Rm	1.000							
SMB	-0.090	1.000						
HML	0.120	-0.426*	1.000					
MOM	0.058	-0.487*	0.391*	1.000				
CSKC	-0.162*	-0.186*	-0.024	0.081	1.000			
CSKI	-0.287*	-0.148	-0.044	0.069	0.954*	1.000		
CKTC	-0.002	-0.269*	0.120	0.128	0.125	0.028	1.000	

CKTI	0.176	-0.263*	0.160*	0.114	-0.098	-0.221*	0.915*	1.000

This Table shows the correlation among the independent variable of KSA. The market return represented by Rm is over the risk-free. Rf represents the risk-free rate. HML, SMB and MOM represent the value, size, and momentum factors. CSKI and CSKC represent the coskewness factor of SCF and CF. CKTI and CKTC represent the cokurtosis factors of SCF and CF, respectively. *, **, *** representing the significance 10%, 5% and 1% level, respectively.

Table3(b). Correlation Matrix (Malaysia)

Variables	Rm	SMB	HML	MOM	CSKI	CSKC	CKTI	CKTC
Rm	1.00							
SMB	-0.07	1.000						
HML	0.073	-0.587*	1.000					
MOM	0.033	-0.458*	0.475*	1.000				
CSKI	-0.072	-0.051	0.072	0.023	1.000			
CSKC	-0.068	-0.033	0.068	0.035	0.923*	1.000		
CKTI	-0.173*	-0.036	0.006	-0.023	0.870*	0.828*	1.000	
CKTC	-0.236*	-0.029	0.019	0.024	0.830*	0.897*	0.918*	1.000

This Table shows the correlation among the independent variable of MAL. The market return represented by Rm is over the risk-free. Rf represents the risk-free rate. HML, SMB and MOM represent the value, size, and momentum factors. CSKI and CSKC represent the coskewness factor of SCF and CF. CKTI and CKTC represent the cokurtosis factors of SCF and CF, respectively. *, **, *** representing the significance 10%, 5% and 1% level, respectively.

Table3(c). Correlation Matrix (Pakistan)

Variables	Rm	SMB	HML	MOM	CSKI	CSKC	CKTI	CKTC
Rm	1.000							
SMB	-0.044	1.000						
HML	-0.071	-0.426*	1.000					
MOM	-0.035	-0.487*	0.391*	1.000				
CSKI	-0.346*	0.170*	-0.015	-0.116	1.000			
CSKC	-0.362*	0.144*	-0.006	-0.104	0.984*	1.000		
CKTI	0.034	-0.318*	0.124	0.206*	-0.393*	-0.345*	1.000	
CKTC	-0.021	-0.307*	0.120	0.206*	-0.289*	-0.222*	0.983*	1.000

This Table shows the correlation among the independent variable of PAK. The market return represented by Rm is over the risk-free. Rf represents the risk-free rate. HML, SMB and MOM represent the value, size, and momentum factors. CSKI and CSKC represent the coskewness factor of SCF and CF. CKTI and CKTC represent the cokurtosis factors of SCF and CF, respectively. *, **, *** representing the significance 10%, 5% and 1% level, respectively.

Fig1(a). Correlation Matrix (KSA, MAL, PAK)

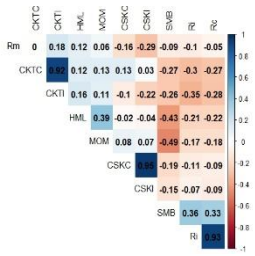
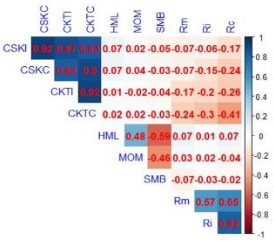
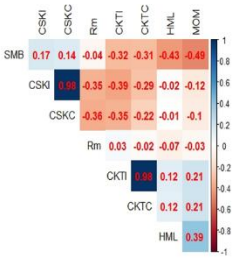

Table 4. Variance inflation factor

	VIF-KAS	VIF_MAL	VIF-PAK
Rm	5.29	1.24	5.29
CKTC	1.65	1.65	1.65
SMB	1.56	1.41	1.56
MOM	1.41	1.69	1.41
CSKC	1.39	17.05	1.39
HML	1.31	12.58	1.31
CKSI	1.63	17.22	1.63
CKTI	19.2	12.58	19.2

This Table shows the variance inflation factor among the independent variable in the study. Rm is the market excess return. Rf is the risk-free rate. SMB, HML, and MOM represent the size, value, and momentum factors. CSKI and CSKC represent the coskewness factor of SCF and CF. CKTI and CKTC represent the cokurtosis factors of Islamic and conventional funds, respectively. *, **, *** representing the significance 10%, 5% and 1% level, respectively.

Here, the study presents a quantitative analysis of the timing abilities of SCF and CF managers. Based on maximum likelihood theory, generalized linear models are used in the study. Moreover, the study uses the Newey-West (1987) method for estimating our results so that serial correlation and heteroskedasticity problems can be eased. These estimation methods, therefore, minimize the serial correlation and heteroscedasticity problem. The standard four-factor model is estimated using Equation (3) (Model1). Next, we estimate Equations (4) (Model2) and Equation (14) (Model3) using the same method. Table (5) represents the results of SCF and CF for the selected Islamic countries (KSA, MAL, and PAK). The market return explains both types of funds. Table (5a) shows that the market beta of KSA is negatively insignificant and not significant for both SCF and CF. In Model 1, the results of alphas for both SCF and CF are positive, suggesting that the selective timing abilities exist in both types of funds but are insignificant in KSA fund managers. The results are the same as those of the previous literature's findings. A size mimic portfolio explains significantly more of the SCF fund's return than any other factor. Neither the SCF nor the CF fund exhibit significant momentum. In addition, both the SCF and CF funds have positively insignificant alphas. The SCF fund and the CF fund are thus capable of generating abnormal returns or selecting undervalued stocks. Only SCF can time the market return according to Mode 2. The results from Model 2 show a positive beta for SCF funds, and the remaining results are the same as in Model 1. The alpha is positively significant as compared to CF funds in Model 2.

Table5(a). Timing Abilities of KSA Fund Managers

	Model1		Model2		Model3	
	SCF	CF	SCF	CF	SCF	CF
RM	-.052	-.016	.055	-.024	-.156	-.229*
	(.067)	(.078)	(.135)	(.158)	(.144)	(.173)
SMB	.778***	.773***	.767***	.774***	.553**	.613**
	(.213)	(.250)	(.214)	(.251)	(.216)	(.257)
HML	-.283	-.431	-.232	-.435	-.315	-.516
	(.350)	(.410)	(.355)	(.417)	(.173)	(.410)
MOM	.044	-.003	.034	-.002	.038	.013
	(.179)	(.210)	(.179)	(.211)	(.173)	(.207)
CSK					-.471	.008
					(.389)	(.517)
CKT					-.527***	-.568***
					(.148)	(.205)
HM			-.196	.015	.226	.380*
			(.215)	(.252)	(.254)	(.290)
Alpha	.432	.448	.849*	.416	.521	.117
	(.425)	(.498)	(.625)	(.734)	(.621)	(.737)
AdjR^2	.1152	0.0932	.1141	0.087	.179	.123

This Table shows the different timing abilities according to models defined in the study on SCF and CF equity funds in the study. The excess market return is Rm over the risk-free rate of Rf. HML, SMB, and MOM represent the size, value, and momentum factors. CSKI and CSKC represent the coskewness factor of SCF and CF. CKTI and CKTC represent the cokurtosis factors of Islamic and conventional funds, respectively. *, **, * representing the significance 10%, 5% and 1% level, respectively.**

The higher-order moments timing abilities are based on Model 3. Neither fund has a positive market beta, and only conventional funds have a significant beta. The study also finds that the SMB beta is the superior statistically substantial and finds a positive relationship between both types of mutual funds. There is a high prevalence of market premiums and size premiums in SCF and CF funds. However, value premiums are statistically insignificant in both types of funds. It has been suggested that a value premium is caused by distressed risk by Fama and French (1993) and Chen and Zhang (1998). Due to this, an investment portfolio with idiosyncratic-distressed risks will have a marginal impact. These findings are consistent with Wattanatorn and Nathaphan (2019). According to Lambert and Hubner (2014), size may also play a role in explaining the value of stocks. It is also interesting to note that none of the models shows significant momentum.

Further, the study finds that CSKI is negative and CSKC is positive but insignificant. This means that SCF prefers positive skewness over negative skewness compared to CF. When trying to avoid skewness risk, these funds may pay an excessive premium to hedge against negatively skewed security (Wattanatorn &Nathaphan 2019). The negative skewness premium has also been supported by (Carter et al., 2011). CF and SCF, however, found positive and significant results in the study of CKT.

Table5(b). Timing Abilities of Malaysia Fund Managers

	Model1		Model2		Model3	
	Islamic	Conventional	Islamic	Conventional	Islamic	Conventional
RM	.627*** (.075)	0.67*** (.066)	.69*** (.137)	.79*** (.119)	.70*** (.170)	.52*** (.146)
SMB	.0039 (.226)	.0782 (.197)	.001 (.227)	.07 (.197)	.-.05 (.224)	.04 (.186)
HML	-.134 (.321)	.309 (.280)	-.13 (.322)	.32 (.280)	-.22 (.319)	.27 (.266)
MOM	.039 (.139)	-.149 (.122)	.034 (.139)	-.160 (.122)	.01 (.138)	-.14 (.115)
CSK					1.01** (.476)	.48 (.427)
CKT					-.18*** (.072)	-.16*** (.053)
HM			-.13 (.382)	-.25 (.212)	-.24 (.316)	.10 (.285)
Alpha	.049 (.249)	.009 (.218)	.204 (.383)	.302 (.333)	.211 (.400)	-.048 (.333)
AdjR^2	0.305	0.426	.301	0.411	.322	.501

This Table shows the different timing abilities according to models defined in the study on SCF and CF equity funds in the study. The excess market return is Rm over the risk-free rate of Rf. HML, SMB, and MOM represent the size, value, and momentum factors. CSKI and CSKC represent the coskewness factor of SCF and CF. CKTI and CKTC represent the cokurtosis factors of Islamic and conventional funds, respectively. *, **, * representing the significance 10%, 5% and 1% level, respectively.**

Table 5(b) shows the result of the timing abilities of Malaysian SCF and CF managers. In all three models, the market betas are significantly positive for both types of funds. Model 1 and 2 results show positive but insignificant alpha on both funds. This means two kinds of funds generate minor abnormal returns, but in Model 3, Islamic funds generate abnormal returns compared to conventional funds. Model 3's alpha value is positive for traditional funds but negative for Islamic funds. The results suggest that in model 1 and model 2, the fund managers of both types represent insignificant selectivity skills. However, according to Model 3, Islamic fund managers show trivial selectivity skills, and conventional fund managers show no selectivity skills. Consequently, traders do not rely universally on market and size premium trading strategies, and both groups' momentum premiums are statistically insignificant.

Moreover, the market factors insignificantly explain the returns of both types of funds. The results of Malaysian fund managers for both types are not similar, although KSA and MAL are both Islamic countries working with both types of funds. These results show the different nature of markets, risk preferences of the investors, and various skills of both types of funds in both countries. Further, the study found that there are no market timing abilities of both kinds of fund managers according to the results of Model 2. Model 3 represents the higher order moments timing abilities of both funds. The study finds that the coskewness coefficient is positive and significant for Islamic funds but positively insignificant for conventional funds, which means that Islamic fund investors do not like positive skewness and prefer negative skewness; on the other hand, traditional fund investors prefer positive

skewness. The cokurtosis of both types of funds is negatively significant, which is not in line with the finding (Wattanatorn &Nathaphan 2019) in emerging markets which shows the different nature of Islamic funds in Islamic emerging markets.

Table5(c). Timing Abilities of Pakistan Fund Managers

	Model1		Model2		Model3	
	Islamic	Conventional	Islamic	Conventional	Islamic	Conventional
RM	.02 (.064)	.045 (.074)	.24** (.115)	.323** (.133)	.090* (.137)	.04 (.156)
SMB	.33* (.211)	.43* (.246)	.24 (.212)	.31 (.246)	.08 (.205)	.12 (.234)
HML	.30 (.346)	.23 (.402)	.25 (.341)	.18 (.396)	.24 (.325)	.17 (.370)
MOM	-.25 (.177)	-.32* (.206)	-.27* (.175)	-.34* (.202)	-.20 (.166)	-.25 (.190)
CSK					.20 (.315)	-.01 (.313)
CKT					-.14*** (.042)	-.18*** (.040)
HM			-.45** (.197)	-.57** (.228)	-.10* (.230)	-.01 (.258)
Alpha	.042 (.425)	.058 (.494)	1.083* (.620)	1.38* (.719)	.533 (.625)	.493 (.709)
AdjR^2	.0241	0.0390	0.0514	0.724	.1458	.1894

This Table shows the different timing abilities according to models defined in the study on SCF and CF equity funds in the study. The excess market return is Rm over the risk-free rate of Rf. HML, SMB, and MOM represent the size, value, and momentum factors. CSKI and CSKC represent the coskewness factor of SCF and CF. CKTI and CKTC represent the cokurtosis factors of Islamic and conventional funds, respectively. *, **, * representing the significance 10%, 5% and 1% level, respectively.**

The results of Model.1, 2, and 3 are shown in Table 5 for Pakistani Islamic and conventional funds. A market return can explain both SCF funds and CF funds. The alpha from Model 1 results delivers an insignificantly positive value. Based on this finding, both mutual funds show stock selection timing abilities. The small-size mimic portfolio explains some of the returns of the SCF and CF funds, on average. SCF's momentum, however, is negligible, while CF's momentum is significant. The study also finds positive insignificant alphas for the SCF and the CF. SCF and CF are capable of producing abnormal returns or identifying undervalued stocks. Model 2, both SCF and CF perform well at timing market return. Both funds show similar performance regardless of their ability to time the market. As for other variables, the previous model's results remain unchanged except for the insignificance of the size variable. Study results for Model 3 are based on our higher-moment market timing model. The results show that the market beta for SCF is positive and significant, but for CF, it is positive and insignificant.

However, the study also found no statistically significant correlation between the risk factor-beta of SCF and CF funds, despite seeing a positive correlation between the small-size portfolio mimic return and both types of mutual funds. Several researchers have credited distressed risk for the value premium (Fama & French 1993; Chen & Zhang 1998). As a result, well-diversified portfolios like mutual funds are marginally affected by idiosyncratic-distressed risks. Also, the results tally with those of Kot et al. (2015), who observed that the Hangseng Stock Exchange displayed a minor value premium, and Cheema and Nartea (2017), who followed a nominal risk premium on the Shanghai and Shenzhen exchanges. Another possible explanation for the size effect in value stocks can be found in Lambert and Hubner (2014). All models have significant momentum except Model 3, which is interesting to note. In addition, the study finds that CSK has a positive insignificance for SCF, and CF has a negative triviality. Positive skewness is preferred by CF, on average, over negative skewness. According to Perez-Quiros & Timmermann (2001), funds paying overpriced hedges to mitigate the adverse skewness risk are trying to avoid skewness risks. Carter et al., 2011 support the negative skewness premium. The study found that CKT is negatively significant for both SCF and CF. The findings in this study are inconsistent with those found in the US and UK markets (Doan et al. 2010; Kostakis et al. 2012; Lambert & Hubner 2013) and with traditional emerging markets (Wattanatorn &Nathaphan 2019).

7. Concluding Remarks

This study examines the performance of SCF and CF in Saudi Arabia, Malaysia, and Pakistan based on fund managers' market and higher-order moments timing abilities from Jan 2010 to June 2022. On average, the Islamic funds produced positive alpha compared to conventional funds in almost all selected Islamic countries. On the other hand, the study concludes that SCF made abnormal returns for their investors compared to CF. SCF managers have better market timing abilities than CF managers. The higher-order moments timing abilities are also better for Islamic funds than conventional funds. These results conclude that Islamic funds could generate higher returns for their investors than conventional funds. The study found that both types of funds preferred positive skewness. Thus, they pay overpriced hedges against negative skewness securities to avoid the skewness risk (Wattanatorn & Nathaphan, 2019). In particular, Islamic and conventional funds have negative risk premiums for co-skewness risk.

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