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COSKEWNESS IN ISLAMIC, SOCIALLY RESPONSIBLE AND CONVENTIONAL MUTUAL FUNDS: AN ASSET PRICING TEST

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ABSTRACT

Intuition suggests that constraint investment strategies will result in losses due to a limited portfolio allocation. Two types of constrained assets have been particularly growing over the last few decades: Islamic Mutual Funds and Socially Responsible Mutual Funds. Although research regarding the performance of these types of constrained investments has been performed, little attention has been given to their relative performance. In this paper we assess, and rank, the relative performance of Islamic, Socially Responsible, and conventional mutual funds from 11 Islamic markets and the United States by expanding the traditional mean-variance frontier to account for higher moments; constrained assets tend to be smaller and skewed in nature, thus violating the normality assumption under the mean-variance frontier. We find that controlling for skewness risk, by using an unconditional coskewness measure, has the power to improve asset pricing tests by expanding the mean-variance frontier specification. We find supporting evidence suggesting that Islamic mutual funds perform better than Socially Responsible Investing, which in turn outperform conventional mutual funds.

Keywords: Mutual Funds; Performance; Coskewness; Risk Factors; Risk Premia; Islamic Funds; SRI; Socially Responsible Investing; Ethical Investing; International Finance.

1. INTRODUCTION

The literature in empirical asset pricing has relied, for the most part, on normality of returns. But the mean-variance frontier is only consistent with traditional utility theory if

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either stock returns are normally distributed or the utility function is quadratic in nature (see for example Joro and Na, 2006). Since both assumptions are violated if returns are skewed, normality of returns is usually the only sufficient condition. And while this may be an acceptable condition when dealing with highly traded assets, like it is the case of U.S. Mutual Funds, this condition is not satisfied when dealing with constraint investments.

In fact, the literature agrees that returns are not necessarily normally distributed (see: Fama, 1965; Kon, 1984; So, 1987; Gray and French, 1990). And therefore investors need to be compensated for further moments (Kraus and Litzenberger, 1976). More specifically, the risk-return paradigm needs to be re-evaluated to account for skewness when pricing stocks and mutual funds: equities which are positively skewed should be regarded as riskier, thereby requiring higher returns (Ang et al., 2006).

We continue the discussion about constrained investment assets in regards to their performance. We analyze two main constrained groups: (1) Islamic mutual funds and (2) Social and Responsible Investing. For comparison and control purposes we include traditional US based mutual funds.

In a sense, both Socially and Responsible investments (herein SRI) and Islamic funds work similarly. Both types of investments rely on 'purging' non-accepted stocks from any investment portfolio. The difference relies on whether this purging occurs due to secular or non-secular reasons. On one side, managers of ethical funds have to follow socially responsible constraints on environmental risk, social risk, and governance risk (Basso and Funari, 2008). And on the other, Islamic investments are driven by Shariah law which rules out the consumption of alcohol and pork as well as activities related to gambling, which consequently eliminates firms that derive their income from these activities (Derigs and Marzban, 2009).

It follows that, due to a limited pool of assets, there will be some overlapping between the permitted asset universe from which both SRI and Islamic investments would gather their stocks. For example, SRI and Islamic funds would not invest, regardless, on gambling, alcohol, or tobacco industries. Here we provide a brief summary of the performance of both types of investments and the relation to one another given that, to the best of our knowledge, no other paper has examined Islamic and SRI funds vis-à-vis. This work is built on Rubio, Hassan, Merdad, (2012) and Rubio, Hassan, Maroney (2017) who examined both Islamic and SRI funds based on data envelopment analysis; they find that, when independently studied, SRI are less efficient than traditional mutual funds while Islamic funds are more efficient than traditional funds.

Hamilton and Statman (1993) proposed three alternative hypotheses: (1) the risk-adjusted expected returns of socially responsible portfolios are equal to the risk-adjusted expected returns of conventional portfolios, as the social responsibility feature of stocks is not priced; (2) the risk-adjusted expected returns of socially responsible portfolios are lower than the expected returns of conventional portfolios, as the market prices the social responsibility characteristic by increasing the value of socially responsible companies relative to the value of conventional companies by driving down the expected returns and the cost of capital of socially responsible companies; and (3) (also suggested by

Moskowitz), the risk-adjusted expected returns of socially responsible portfolios are higher than the expected returns of conventional portfolios, as the market prices social responsibility (incorrectly) in the case of "doing well while doing good."

The literature shows inconstant evidence of the impact of investing in constrained investments. Believers in the efficient market hypothesis argue that it is impossible that SRI funds outperform their conventional peers (Renneboog, Horst, and Zhang, 2008). But clearly the performance would depend on the level of screening faced by constraint funds (Goldreyer and Diltz, 1999, Basso and Funari, 2003); as well as the lever of volatility faced by said assets (Bollen, 2007). But most of the literature shows that constraint investments are not statistically different than unconstraint investments.

For the Islamic funds, Elfakhani, Hassan, and Sidani, (2007) and Girard and Hassan (2008 and 2010) find no statistical performance differences between Islamic funds and market benchmarks. Hassan, Khan, and Ngow (2010) find no convincing performance differences between Islamic and non-Islamic Malaysian unit trust funds. And even BinMahfouz and Hassan (2012) conclude that Shariah investment constrains do not provide a lower performance and higher risk. For the SRI funds, on the other hand, Hamilton and Statman (1993), Diltz (1995), Statman (2000), Bauer, et al. (2005), Renneboog, et al. (2008) find no statistical difference between the Jensen's alphas of SRI funds and traditional funds for different time periods.

Quite surprisingly, many authors have found an overperformance of these constraint assets. Abdullah et al. (2007) find that Islamic funds performed better than conventional funds during bearish economic trends. Donia and Marzban (2010) conclude that Shariah-compliant investments outperform conventional investments using the mean-variance frontier because the former benefits from the lower leverage feature. Mansor and Bhatti (2011) find on average IMFs in Malaysia outperform its Conventional peers and the market portfolio proxy by the KLCI returns. Shah et al. (2012) show that Pakistani Islamic funds, when compared to Pakistani non-Islamic funds, present a lower average risk rate with higher compensations.

Statman (2000) shows that the DSI index[1] (which is one of the most well-known SRI indexes) has a higher Sharpe ratio than the S&P 500. Gil-Bazo, Ruiz-Verdú and Santos (2010) show that ethical funds have better before and after fees performance when compared to non-ethical funds of the same characteristics. Bollen (2007) justifies this profitability of SRI given that investors see beyond the traditional risk-reward optimization problem, as they may possess a multi-attribute utility function which incorporates a set of personal and societal values.

In this paper, we show that mutual funds are highly skewed. Based on the Jarque Bera statistic and data driven confidence intervals for the 95th and 99th percentiles, we show that all markets, except Turkey, have non-normally distributed mutual funds. This is quite

[1] Domini 400 Social Index: A market cap weighted stock index of 400 publicly traded companies with positive records on employee and human relations, product safety, environmental safety, and corporate governance. Companies engaged in the business of alcohol, tobacco, firearms, gambling, nuclear power and military weapons are automatically excluded. http://www.investopedia.com/terms/d/domini_400.asp#ixzz26NyXf2Ft

expected given that many mutual funds are non-actively traded, especially small Islamic mutual funds. For example, 10 out of the 13 Egyptian Islamic mutual funds in or data have only traded, on average, once or twice per week. This would suggest that this particular fund should be regarded as risky. Indeed, their average skewness measure is -1.13.

The remaining of this paper is structured as follows. Section 2 explains the data collection and description. Section 3 develops the estimation of the coskewness factor and its interaction in asset pricing models. Finally, section 6 provides concluding remarks.

2. DEFINING THE EMPIRICAL MODELS AND THE COSKEWNESS MEASUREMENT

2.1. Testing for Normality of Returns

Using the Jarque Bera[2] (JB) test statistic, $JB_j = \frac{T}{6}\left[S_j^2 + \frac{K_j^2}{4}\right] \sim \chi^2(k)$, we estimate the number of mutual funds that can be regarded as normally distributed. However, since we are dealing with daily mutual funds, the test-statistic's traditional confidence intervals are biased towards non-normality[3] of returns. We estimate confidence intervals for the 95th and 99th percentiles based on the fund's expected normal returns. That is, we estimate the fund's normal return based on: $\tilde{r}_{M_i} \sim N(\mu_i, \sigma_i^2)$ where μ_i is the mean and σ_i^2 is the variance of the i^{th} market index. Table 1 summarizes the results.

As expected, the majority of mutual funds, conditional on the market, are non-normally distributed. In fact, none of the Islamic mutual funds in Egypt, Kuwait, and Qatar can be regarded as normally distrusted. On the other hand, all Islamic funds in Turkey are normally distributed, while India, Indonesia, Pakistan, and Thailand have a majority of normally distributed mutual funds. Quite surprisingly, United States mutual funds have less normal mutual funds than Socially Responsible Investments, which are smaller in nature.

All in all, we show supporting evidence of non-normality of mutual funds across all markets (except for Turkey). It is worth noting that while positively skewed returns suggest more likeliness of a negative return, ergo more risk, the existence of negative skewness does not guarantee safety. For example, the average skewness value for Egyptian funds[4], for example, is -3.20, yet Islamic Egyptian funds have very low volume of trading and they only move once or twice per week on average. Therefore, the sole

[2] Jarque and Bera: 1980, 1981, 1987

[3] Normality would be normally rejected when JB is larger than 5.99 for the 5% significance level and 9.21 for the 1% significance level. However, this would suggest that more than 90% of funds, across all markets, are non-normal.

[4] For simplicity, statistics on the skewness values are not reported in preference of the unconditional coskewness values.

existence of skewness, i.e. non-normally distributed returns, should be regarded as risk. The following section defines an appropriate proxy for skewness risk.

Table 1: Normality of Returns

Market	Currency	95^{th} Percentile	99^{th} Percentile
Egypt	Egyptian Pound	100%	100%
India	Indian Rupee	20%	20%
Indonesia	Indonesia Rupiah	48%	48%
Kuwait	Kuwait Dinar	100%	100%
Kuwait	US Dollar	100%	100%
Malaysia	Malaysian Ringgit	71%	71%
Malaysia	US Dollar	71%	71%
Oman	Oman Rial Omani	67%	67%
Pakistan	Pakistan Rupee	39%	39%
Qatar	Qatar Riyal	100%	100%
Qatar	US Dollar	100%	100%
Thailand	Thai Baht	25%	25%
Turkey	Turkish Lira	0%	0%
United Arab Emirates	UAE Dirham	93%	93%
United Arab Emirates	US Dollar	93%	93%
United States	US Dollar	69%	69%
Socially and Responsible	US Dollar	57%	57%

Notes: Table 1 provides a summary, by market and currency, of the percentage number of funds which can be regarded as non-normally distributed based on the Jarque Bera statistic: $JB_j = \frac{T}{6}\left[S_j^2 + \frac{K_j^2}{4}\right] \sim \chi^2(k)$. The results are based on data driven confidence intervals for the 95th and 99th percentiles based on a normally distributed market return: $\tilde{r}_{M_i} \sim (\mu_i, \sigma_i^2)$ where μ_i is the mean and σ_i^2 is the variance of the i^{th} market index.

2.2. The Coskewness Measurement

We expand the literature on constraint investment assets by looking at skewness risk throughout different markets. We compare Islamic mutual funds, non-Islamic mutual funds, and even Socially Responsible funds vis-à-vis for 17 markets. We focus on the outdated Capital Asset Pricing Model[5] and the addition of a proxy for skewness risk. This is supported because (1) we are extending our analysis to 12 international small markets that we want to analyze independently, (2) we want our results to be robust towards individual market behavior and not necessarily to global exposure since we are assessing the performance of constrained investments, and (3) Islamic mutual funds are still quite novel and trading does not span sufficiently back into the past to be able to assess monthly returns which are needed to use global factors.

We incorporate a measurement of skewness risk following that positively skewed returns should be regarded as riskier than negatively skewed returns given that the possibilities

[5] Other versions of our research have been conducted using the Fama and French's five factor model (2015) with monthly global factors, but the data spam for Islamic finance is not sufficiently large to yield statistically significant results.

of a loss are higher for such assets. That is, the downside risk is higher for positively skewed assets while the upside reward is higher for negatively skewed assets. Kraus and Litzenberger (1976) extended the classical asset pricing model to account for said systematic skewness effect. The three-moment conditional CAPM takes the form:

$$R_i - R_f = \lambda_1 \beta_i + \lambda_2 \gamma_i \quad (1)$$

where

R_i is one plus the expected return of a risky asset
R_f is defined as one plus the return of a risk-free asset
β_i is the systematic risk
γ_i denotes the systematic skewness
λ_i denotes the risk premium, respectively

Then, from an empirical standpoint, Harvey and Siddique (2000) developed a standardized unconditional coskewness measurement as:

$$CSK_i^{VALUE} = \frac{E\left(\varepsilon_{i,t+1}\varepsilon_{M,t+1}^2\right)}{\sqrt{E\left(\varepsilon_{i,t+1}^2\right)}E\left(\varepsilon_{M,t+1}^2\right)} \quad (2)$$

where $\varepsilon_{i,t+1} = r_{i,t+1} - \alpha_i - \beta\left(r_{m,t+1}\right)$; that is, the residuals from the regression of the excess return on the contemporaneous market excess return. $\varepsilon_{M,t+1}$ then represent the residuals from the regression of market the excess returns over their mean. Negative measures mean that the security is adding negative skewness. The authors explain that according to the utility assumptions, a stock with negative coskewness should have a higher expected return which implies a negative premium.

Since the unconditional skewness by itself cannot be cataloged as a risk factor, prior literature shows that a Fama and French like transformation should be employed. That is, sorting the assets based on the proposed measurement and creating three portfolios: the top 30% (S_i^+), the middle 40% (S_i^0), and the bottom 30% (S_i^-); the risk premia factor will then be defined as $CSK = S_i^- - S_i^+$. By construction, the coskewness factor is negatively defined so that increases in coskewness exposure will increase returns.

We look at two different interactions of skewness risk. We first look at coskewness as a characteristic, meaning the actual fund's coskewness value, $CSK_{i,t}^{VALUE}$. Then we move to a version using the market independent coskewness factor described above, CSK_t^{FACTOR}. Our analysis is as follows. We start by stablishing a benchmark based on the Capital Asset Pricing Model. Then look at the difference of swapping the market premium with either the level of coskewness or coskewness risk. And finally, we test whether adding either the coskewness value or risk premium enhances the pricing power of the CAPM. The models are thus:

The Coskewness Value Models:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i^m\left[R_{M,t} - R_{f,t}\right] + e_{i,t} \quad (3)$$

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i^{CSK} CSK_{i,t}^{VALUE} + e_{i,t} \quad (4)$$

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i^{m}\left[R_{M,t} - R_{f,t}\right] + \beta_i^{CSK} CSK_{i,t}^{VALUE} + e_{i,t} \quad (5)$$

The Coskewness Risk Models:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i^{m}\left[R_{M,t} - R_{f,t}\right] + e_{i,t} \quad (3)$$

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i^{CSK} CSK_{t}^{FACTOR} + e_{i,t} \quad (6)$$

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i^{m}\left[R_{M,t} - R_{f,t}\right] + \beta_i^{CSK} CSK_{t}^{VALUE} + e_{i,t} \quad (7)$$

3. DATA SPECIFICATION

The data contains Thompson Reuters' global daily Islamic Mutual Fund (IMF) returns from March 2011 until March 2016 from: Egypt, India, Indonesia, Kuwait, Malaysia, Oman, Pakistan, Qatar, Saudi Arabia, Thailand, Turkey, and the United Arab Emirates. We include the United States data, taken from DataStream, divided in two groups: traditional and Socially Responsible funds. This results in Total Net Assets (TNA) for 1129 valid mutual funds from 12 Islamic markets and the United States. Kuwait, Malaysia, Qatar, and the United Arab Emirates can be listed in either the local currency or in U.S. dollars. We therefore match all mutual fund with its appropriate market index and currency.

We estimate the unconditional coskewness described in section 2 based on a 90-day rolling window. At time *t* we create a window *t+90* requiring a minimum of 60 observations. Since, requiring full trading history would result in fully eliminating funds, we imposing a sixty-day trading history to ensure statistical significance. We define the fund's coskewness measurement for window $T = t + 90$ as:

$$CSK_{i,j,T}^{VALUE} = \frac{E\left(\varepsilon_{i,t+1}\varepsilon_{M,t+1}^2\right)}{\sqrt{E\left(\varepsilon_{i,t+1}^2\right)E\left(\varepsilon_{M,t+1}^2\right)}} \qquad \forall\, t = \{1,2,\ldots,90\}$$

That is, the value for coskewness for the i^{th} fund within the j^{th} market at time *T*. After finding each valid fund's coskewness measurement, we rank the funds, every month, in deciles and estimate the daily coskewness factor based on the daily top 30% (S_i^+) and the bottom 30% (S_i^-) conditioned on the market; the daily risk premia factor is thus defined as $CSK_{j,t}^{FACTOR} = S_{i,t}^- - S_{i,t}^+$. This is our measurement to proxy global coskewness risk; that is, each day $CSK_{j,t}^{FACTOR}$ represents the coskewness risk premium applied to all funds within the j^{th} market during a day.

Table 2 summarizes the data. Panel A reports descriptive statistics for each country, while Panel B reports the correlations amongst the regressors. Table 2 Panel A reports the descriptive statistics of the overall variables in the analysis. For Islamic funds, Total Net Assets (TNA) is reported in thousands at the local currency making comparison

meaningless without converting them into a common currency. For United States funds, we report price per share in dollars. Kuwait, Malaysia, Qatar, and the United Arab Emirate have funds listed in both the local currency and in US dollars from which Kuwait has the largest average fund with 66.88 million dollars.

Moreover, returns are also estimated in the local currency also making direct comparison difficult. But we can compare their Sharpe ratios from highest to lowest: Indonesia (6.04%), Thailand (5.58%), India (4.77%), Malaysia in dollars (3.25%), Turkey (3.05%), Malaysian in local currency (2.7%), Pakistan (2.06%), Qatar (1.83%), United Arab Emirates in US. dollars (1.62%), United Arab Emirates (1.49%), Socially Responsible Investments (1%), Qatar in local currency (0.33%), United States (0.19%), Egypt (0.1%), Kuwait in local currency (-2.02%), Oman (-3.29%), and Kuwait in US. dollars (-4.08%).

Looking at the unconditional coskewness measurement, in order, Thailand, India, Qatar, Turkey, Pakistan, Kuwait, United Arab Emirates, Malaysia, Indonesia, and the United States have a negative coskewness measurement suggesting a highest downside risk. On the other hand, Socially Responsible Investments, United Arab Emirates (in US. dollars), Malaysia (in US. dollars), Egypt, Kuwait (in US. dollars), and Oman have a positive coskewness measurement.

Not surprisingly, Thailand and India have the highest returns which is consistent with having the highest skewness risk (most negative coskewness measurement). In fact, the relationship is well preserved except for Qatar (in both the local currency and in US. Dollars) and Kuwait (in local currency) which have low returns in relationship with their coskewness measurement; and Indonesia and Malaysia (only in US. Dollars) which have a return above their level of coskewness.

Moreover, we generate the market specific coskewness factor. Despite the fact that we have reported a value for all markets (except for Kuwait and Qatar in US. Dollars), having a coskewness factor with less than 9 funds per market has no rationale. Therefore, we only report our regression findings for markets with more than nine mutual funds. The ranking based on the level of coskewness factor, by market, is, from riskier to safest: Indonesia, Malaysia (local currency), Socially Responsible Investments, Pakistan, United States, the United Arab Emirates (US. Dollars), Kuwait (local currency), Egypt, Malaysia (in US. Dollars), and India.

The literature has suggested that IMFs usually underperform the unconstrained investments. However, they have based this in comparing the traditional asset pricing models based on the alphas. But considering that this type of investments would not even consider the unconstrained universe, it is perhaps a problem with the specification of the models themselves and the efficiency frontier. In other words, we expect that traditional asset pricing models will not be able to price IMFs.

Table 2: Descriptive Statistics and Cross-Correlations

Market	N		Panel A: Descriptive Statistics				Panel B: Cross - Correlations				
			Mean	Standard Deviation	Minimum	Maximum	Total Net Assets	Return	MKT	CSK	CSK-F
Egypt	13	Net Assets	$80,135	$41,073	$7,631	$196,680	1				
in local currency		Return	1.19E-07	1.17E-04	-1.55E-03	1.20E-03	0.01	1			
		Market	2.24E-06	1.55E-04	-9.59E-04	7.59E-04	-0.01	0.18	1		
		CSK	4.83E-04	4.25E-03	-8.49E-03	2.14E-02	-0.11	0.06	0.04	1	
		CSK Factor	-3.01E-03	1.91E-03	-9.89E-03	-3.75E-06	-0.03	-0.01	-0.01	-0.53	1
India	10	Net Assets	$46,218	$32,197	$9,950	$142,619	1				
in local currency		Return	5.20E-06	1.09E-04	-6.45E-03	3.36E-04	0.01	1			
		Market	3.29E-06	1.04E-04	-5.94E-04	3.77E-04	-0.01	0.6	1		
		CSK	-2.14E-03	1.94E-03	-8.31E-03	2.28E-03	-0.13	-0.03	-0.03	1	
		CSK Factor	-1.37E-03	8.43E-04	-3.52E-03	-6.14E-05	0.05	0.02	0.03	0.03	1
Indonesia	76	Net Assets	$1,638,530	$853,558	$733,430	$6,322,936	1				
in local currency		Return	4.96E-06	8.21E-05	-9.71E-04	7.96E-04	0.02	1			
		Market	1.69E-06	1.12E-04	-8.88E-04	4.76E-04	0.01	0.69	1		
		CSK	-4.74E-04	2.61E-03	-1.24E-02	1.36E-02	-0.05	0.02	0	1	
		CSK Factor	-5.30E-03	1.79E-03	-1.14E-02	-2.46E-03	-0.01	0.03	0.01	0.16	1
Kuwait	17	Net Assets	$837	$361	$288	$1,827	1				
in local currency		Return	-1.48E-06	7.32E-05	-2.01E-03	1.77E-03	0.03	1			
		Market	-1.08E-06	7.79E-05	-4.87E-04	5.19E-04	0	0.06	1		
		CSK	-5.71E-04	2.44E-03	-1.50E-02	7.96E-03	0.04	0.07	0	1	
		CSK Factor	-3.64E-03	2.26E-03	-9.44E-03	-6.86E-04	0.04	0.08	0.04	0.18	1
Kuwait	1	Net Assets	$66,886	$43,623	$10,061	$100,603	1				
in U.S. dollars		Return	-1.51E-05	3.70E-04	-9.00E-03	2.25E-06	0.05	1			
		Market	1.08E-06	1.28E-05	-4.92E-05	4.60E-05	0.08	0	1		
		CSK	7.30E-04	1.39E-03	-2.89E-03	3.69E-03	0.25	-0.01	-0.03	1	
		CSK Factor	*Not enough data to create factor*								
Malaysia	219	Net Assets	$1,457	$8,906	$149	$111,510	1				
in local currency		Return	1.51E-06	5.59E-05	-6.65E-03	1.12E-03	0	1			
		Market	5.88E-07	6.18E-05	-2.70E-04	3.38E-04	0	0.4	1		
		CSK	-4.90E-04	2.60E-03	-1.50E-02	1.24E-02	0.01	0	-0.02	1	
		CSK Factor	-5.17E-03	9.14E-04	-7.90E-03	-3.31E-03	0.01	0	-0.03	0.14	1

Table 2: Descriptive Statistics and Cross-Correlations (con't)

Market	N		Panel A: Descriptive Statistics				Panel B: Cross - Correlations				
			Mean	Standard Deviation	Minimum	Maximum	Total Net Assets	Return	MKT	CSK	CSK-F
Malaysia	10	Net Assets	$4,026	$6,365	$108	$17,677	1				
in U.S. dollars		Return	2.73E-06	8.40E-05	-4.61E-04	5.53E-04	0	1			
		Market	3.38E-06	5.72E-05	-3.59E-04	2.05E-04	-0.01	-0.49	1		
		CSK	3.38E-04	2.34E-03	-7.45E-03	8.67E-03	0.02	0.01	0	1	
		CSK Factor	-2.93E-03	2.05E-03	-7.66E-03	-1.28E-05	0.18	-0.01	0	-0.05	1
Oman	3	Net Assets	$1,075	$150	$740	$1,391	1				
in local currency		Return	-3.27E-06	9.93E-05	-8.44E-04	8.33E-04	0.07	1			
		Market	-3.47E-06	8.34E-05	-6.21E-04	5.52E-04	0.03	0.39	1		
		CSK	9.73E-04	4.26E-03	-1.70E-02	1.36E-02	0.25	0.05	0.03	1	
		CSK Factor	-5.36E-03	2.55E-03	-1.45E-02	-2.12E-04	-0.07	-0.01	-0.05	0.25	1
Pakistan	10	Net Assets	$126,893	$146,942	$9,944	$508,307	1				
in local currency		Return	1.79E-06	8.67E-05	-2.39E-03	8.11E-04	0.02	1			
		Market	7.36E-06	8.99E-05	-4.46E-04	4.52E-04	0.01	0.35	1		
		CSK	-7.25E-04	2.86E-03	-1.57E-02	9.25E-03	0.15	-0.02	-0.02	1	
		CSK Factor	-4.37E-03	2.96E-03	-1.69E-02	-1.62E-04	0	-0.01	-0.02	0.4	1
Qatar	1	Net Assets	$1,298	$258	$947	$1,720	1				
in U.S. dollars		Return	1.29E-06	7.03E-05	-1.28E-03	8.43E-04	0.01	1			
		Market	8.66E-10	1.23E-06	-1.13E-05	9.07E-06	0	0.01	1		
		CSK	-9.68E-04	3.56E-03	-2.00E-02	9.30E-03	-0.18	0.02	0	1	
		CSK Factor	*Not enough data to create factor*								
Qatar	3	Net Assets	$326,098	$553,400	$955	$1,552,920	1				
in local currency		Return	2.51E-07	7.71E-05	-1.47E-03	1.02E-03	0	1			
		Market	3.77E-06	9.75E-05	-6.84E-04	7.54E-04	0	0.05	1		
		CSK	-1.37E-03	2.20E-03	-1.16E-02	7.66E-03	-0.09	0.1	0.04	1	
		CSK Factor	-1.19E-03	1.35E-03	-8.32E-03	-3.86E-05	0	0.05	0.1	0.35	1
Thailand	4	Net Assets	$15,977	$4,522	$8,692	$24,878	1				
in local currency		Return	5.58E-06	1.00E-04	-8.64E-04	4.38E-04	0.01	1			
		Market	2.38E-06	1.07E-04	-5.65E-04	5.92E-04	0.02	0.88	1		
		CSK	-2.17E-03	2.45E-03	-1.07E-02	3.40E-03	0.28	-0.02	-0.02	1	
		CSK Factor	-3.07E-03	2.05E-03	-8.97E-03	-7.56E-05	0.17	-0.01	-0.02	0.24	1

Table 2: Descriptive Statistics and Cross-Correlations (con't)

Market	N		Panel A: Descriptive Statistics				Panel B: Cross - Correlations				
			Mean	Standard Deviation	Minimum	Maximum	Total Net Assets	Return	MKT	CSK	CSK-F
Turkey	5	Net Assets	$351	$286	$10	$1,017	1				
in local currency		Return	2.77E-06	9.09E-05	-5.80E-04	4.87E-04	0.01	1			
		Market	3.01E-06	1.47E-04	-1.05E-03	6.44E-04	0.01	0.73	1		
		CSK	-1.26E-03	2.27E-03	-8.44E-03	4.27E-03	-0.39	0.06	0.04	1	
		CSK Factor	-3.77E-03	2.66E-03	-1.19E-02	-1.77E-04	-0.01	0.03	-0.03	0.06	1
United Arab Emirates	4	Net Assets	$63,280	$56,274	$6,760	$190,090	1				
in local currency		Return	1.62E-06	1.09E-04	-1.65E-03	1.74E-03	0.01	1			
		Market	5.01E-06	9.87E-05	-6.90E-04	6.70E-04	0	0.12	1		
		CSK	-4.98E-04	2.85E-03	-1.30E-02	9.98E-03	0.08	-0.02	-0.04	1	
		CSK Factor	-4.58E-03	1.97E-03	-1.28E-02	-2.01E-04	0	-0.01	-0.04	-0.05	1
United Arab Emirates	9	Net Assets	$11,554	$8,080	$898	$39,946	1				
in U.S. dollars		Return	8.99E-07	5.55E-05	-1.20E-03	1.23E-03	0.02	1			
		Market	-1.43E-09	5.78E-07	-2.45E-06	3.00E-06	0	0	1		
		CSK	2.27E-04	2.36E-03	-5.54E-03	1.21E-02	0.05	0	0	1	
		CSK Factor	-4.17E-03	1.98E-03	-1.01E-02	-4.63E-04	-0.04	0	0	-0.38	1
United States Socially and	72	Price	$18.80	$10.00	$5.38	$58.27	1				
Responsible Funds		Return	9.78E-07	9.75E-05	-2.84E-03	6.22E-04	0.01	1			
in local currency		Market	4.40E-06	1.03E-04	-6.97E-04	4.97E-04	0.01	0.76	1		
		CSK	1.03E-04	2.14E-03	-9.48E-03	1.38E-02	0.12	0.01	0	1	
		CSK Factor	-4.46E-03	1.34E-03	-1.19E-02	-1.61E-03	0	-0.01	0	0.1	1
USA	672	Price	$14.95	$10.91	$5.64	$96.94	1				
in local currency		Return	1.86E-07	9.75E-05	-7.85E-03	2.39E-03	0.01	1			
		Market	4.18E-06	1.02E-04	-6.97E-04	4.97E-04	0	0.69	1		
		CSK	-4.69E-04	2.19E-03	-2.16E-02	1.31E-02	0.02	0	-0.01	1	
		CSK Factor	-4.34E-03	1.17E-03	-1.14E-02	-1.96E-03	0.01	0.01	0.01	0.2	1

Notes: Table 2 Panel A provides descriptive statistics daily Islamic Mutual Fund (IMF) returns from March 2011 until March 2016 from Thompson Reuters from 12 Islamic countries. We also include the United States divided in two groups: traditional and Socially Responsible funds. Panel B then shows correlations between the proposed regressors.

Table 2 Panel B provides summary statistics of the correlations between daily mutual fund returns and their corresponding markets as well as the proposed coskewness measurements. It is striking that even after matching Islamic mutual funds to their corresponding markets, the correlation between mutual fund returns and the market return is less than 50% for 11 out of 17 markets; four out of the eleven are listed in US. Dollars. The only markets with a correlation more than 50% are Thailand, Socially Responsible Investments, Turkey, Indonesia, the United States, and India.

On the other hand, looking at both Coskewness and the Coskewnes risk factor, neither of both is highly correlated with the market return. The highest degree of correlation comes from the coskewness factor in Qatar (local currency) and it is only 4.3%. But at the same time, the correlation between our proposed regressors and the corresponding mutual fund returns is also small, ranging from 9.99% (Qatar) to 0.43% for the United Sates to -2.7% for India. The following section provides further analysis of the effect of skewness risk in asset pricing.

4. MEASURING THE EFFECT OF ASSET PRICING MODELS

We estimate all regression with a requirement of 100 valid data points in order to preserve statistical properties. Additionally, since many markets have less than 30 mutual funds, providing summary statistics regarding the significance of the parameters is impossible. Instead, we report the average number of funds per market whose parameter estimates are significant at the traditional levels.

We expect that because IMFs go beyond the traditional risk-reward paradigm, CAPM would not be sufficient to explain IMF returns; that is, using CAPM alone would result in large alphas, insignificant parameters, and even very low R-squares. Adding the coskewness value would expectedly increase the explanatory power of the model.

4.1. The Capital Asset Pricing Regression

Our guideline would always be the basic version of the Capital Asset Pricing Model. Our objective is to show that controlling for skewness risk would improve results on the any underlying asset pricing model. We thus start by estimating $R_{i,t} - R_{f,t} = \alpha_i + \beta_i^m \left[R_{M,t} - R_{f,t}\right] + e_{i,t}$. Table 3 Panel A summarizes the results. Strikingly, only 5 markets have average market betas greater than 0.60; sorted from the highest beta: Qatar (in US Dollars), Socially Responsible funds, the United States, India, and Malaysia (in US Dollars) which has a beta of -0.72. Regarding R-square, it seems like CAPM fits quite well when pricing mutual funds in their local currency. Thailand (77%), Socially Responsible (69%), India (63%), and the United States (59%) have the highest values of r-square. Qatar, Kuwait, and the United Arab Emirates have the lowest R-squares with values less than 1%.

Regarding alphas, Egypt has the lowest possible average alpha with a monthly value -0.30 basis points only significant in one fund. Ranking underperforming funds, from lowest to highest: Pakistan (-41 bp), Kuwait (-42 bp), Oman (-50), Socially Responsible Funds (-75), the United States (-91) and Kuwait (-450 bp, in US. Dollars). All alphas reported

in monthly bases. On the other hand, the order of over-performing funds, from lowest to highest, follows with Qatar (5 bp) Malaysia (10 bp), Indonesia (18 bp), the UAE (20 bp in US. Dollars and 27 bp in local currency), Thailand (30 bp), Qatar (39 bp in US. Dollars), Turkey (48 bp), Malaysia (50 bp in US. Dollars), and India (79 bp). All alphas reported in monthly bases.

As mentioned before, our main focus is to address skewness risk. We are therefore concerned with the effect of controlling for such downside risk. The following section discusses the results.

4.2. Coskewness Value Regressions

We proceed to estimate both coskewness value models following equations 5 and 6. Table 3 reports the effects of using the coskewness value alone (Panel B) and the effect of adding it to the Capital Asset Pricing Model (Panel C). We first analyze if coskewness alone can work better than the Capital Asset Pricing Model. The highest possible R-square value is 1.01% for Qatar in local currency and the factor loadings are somewhat significant in 11 markets; B^{CSK} is significant for the majority of funds in Egypt, Kuwait (in local currency), Qatar (in local currency), and Turkey.

Despite the low fit, alphas do decrease in 8 markets. Going from biggest to lowest improvement (in parenthesis the improvement and the percentage of significance of B^{CSK} at the 5% confidence level): The United States (90 bp, 3.61%), Socially Responsible Investments (58 bp, 2.82%). Kuwait (42 bp, 52.94% in local currency; 35 bp, 0% in US. Dollars), Pakistan (23 bp, 22%), India (21 bp, 20%), UAE (8 bp, 11.11%), and Malaysia (3 bp, 0%, in US. Dollars).

Having looked at the explanatory power of the proposed coskewness measurement, we expect that adding coskewness to CAPM will improve on its results. Rapid inspection through the Adjusted R-squares, which now capture the improvement of adding an extra regressor, confirms that adding coskewness to the mix improves the model. At least 4 markets have adjusted R-square values higher than 50%: Thailand, SRI, India, and the United States. The factor loading remain mostly unchanged in comparison to the individual regressions. But more importantly, solely adding coskewness to CAPM has the power to reduce average mispricing errors.

Based on the full factor regression, Alphas do decrease in 7 markets plus 2 on which the change is barely noticeable; the only differences between the individual coskewness regressions are UAE in local currency which have improved, and Socially Responsible Investments, with a change less than 2 basis points, and Malaysia in US. Dollars. Going from biggest to lowest improvement (in parenthesis the improvement and the percentage of significance of B^{CSK} at the 5% confidence level): India (74 bp, 10%), Kuwait (40 bp, 47.06% in local currency; 37 bp, 0% in US. Dollars), the United States (13 bp, 11.45%), UAE (8 bp, 11.11% in US. Dollars), Pakistan (6 bp, 77.78%), and UAE (3 bp, 50% in local currency); Socially Responsible Investment increased by 1.5 basis points where 10 funds had significant alphas.

Having stablished that adding coskewness improves the results on the Capital Asset Pricing Model, we rank the performance of mutual funds, by markets, based on the average level of alphas under the full factor regression. We report supporting evidence that Islamic performance does better than Socially Responsible Funds which also do better than traditional US. Mutual funds.

The highest level of underperformance is given by mutual funds in the United States with a monthly alpha of -78 basis points, followed by Socially and Responsible Investing mutual funds with and alpha of -77 basis points, and then aggregate Islamic Investing from Thailand, Pakistan, Kuwait, and Egypt (in this actual ranking by individual alphas) has an average underperformance of -32 basis points per month. On the other hand, Qatar, Turkey, Indonesia, United Arab Emirates, Malaysia, and India have actual over-performance averaging 29 basis points. Altogether, Islamic mutual funds seem to do better.

4.3. Coskewness Factor Regressions

As mentioned before, although, mathematically, a coskewness factor could be estimated with 2 observations, it would lack statistical meaning. Therefore, we report the results based on a minimum requirement of 9 mutual funds per market. Table 4 Panel A summarizes the results of the regression of excess returns and the proposed daily coskewness factor per day: $R_{i,t} - R_{f,t} = \alpha_i + \beta_i^{CSK} CSK_t^{Factor} + e_{i,t}$. The initial results of using the coskewness factor alone are quite similar as the level regressions. That is, R-square is low and the factor loading are not statistically significant. But alphas are smaller.

But our main objective is to provide evidence of the interaction of the coskewness factor with an asset pricing model. Panel C provides the results for the estimation under: $R_{i,t} - R_{f,t} = \alpha_i + \beta_i^m [R_{M,t} - R_{f,t}] + \beta_i^{CSK} CSK_t^{VALUE} + e_{i,t}$, The results suggest a significant overall improvement from the value regression, given that investors should not be compensated for a characteristic but only on the bases of risk premia. Looking at adjusted R-squares, the results are consistent with the level regression. Socially Responsible, India, United States, and Indonesia have adjusted R-squares greater than 50%; but the number of markets has now decrease to 11.

Looking at the alphas under de full regression with coskewness factor, mispricing error are significantly reduced, as compared to the level regression, when it comes to underperformance. But now must funds seem to be over-performing the market. The overall ranking under the full factor regression still ranks Islamic funds first with an over-performance of 96 basis points per month, but now they are followed by US mutual funds with a now over-performance of 31 basis points, and finally SRI with a striking underperformance of 127 basis points per month.

Regarding the individual alphas, only 3 markets have negative alphas: SRI (127 bp), Oman (7 bp), and Pakistan (-3 bp). The remaining markets, in order, are Kuwait (217 bp in local currency), India (113 bp), Malaysia (110 bp in local currency; 100 bp in US. Dollars), Indonesia (66 bp), United Sated (31 bp), UAE (20 bp), and Egypt (5 bp).

Table 3: Coskewness Value Regressions

Market	N	Panel A: Capital Asset Pricing Model			Panel B: Coskewness			Panel C: Capital Asset Pricing Model with Coskewness			
		Alpha	Market		Alpha	CSK		Alpha	MKT	CSK	Adj-R^2
Egypt	13	-0.0001%	0.12	3.00%	-0.0047%	0.131%	0.58%	-0.0066%	0.118	0.117%	3.27%
in local currency		(15.38%)*	(84.62%)*		(15.38%)*	(76.92%)*		(15.38%)*	(84.62%)*	(69.23%)*	
		(15.38%)**	(84.62%)**		(15.38%)**	(69.23%)**		(15.38%)**	(84.62%)**	(53.85%)**	
		(15.38%)***	(84.62%)***		(15.38%)***	(15.38%)***		(15.38%)***	(84.62%)***	(7.69%)***	
India	10	0.0264%	0.647	63.21%	0.0195%	-0.152%	0.16%	0.0017%	0.647	-0.126%	63.17%
in local currency		(80.00%)*	(100.00%)*		(0.00%)*	(20.00%)*		(20.00%)*	(100.00%)*	(20.00%)*	
		(50.00%)**	(100.00%)**		(0.00%)**	(20.00%)**		(0.00%)**	(100.00%)**	(10.00%)**	
		(30.00%)***	(100.00%)***		(0.00%)***	(0.00%)***		(0.00%)***	(100.00%)***	(0.00%)***	
Indonesia	72	0.0061%	0.49	44.97%	0.0512%	0.104%	0.39%	0.0092%	0.49	0.045%	44.88%
in local currency		(20.83%)*	(70.83%)*		(45.83%)*	(12.50%)*		(19.44%)*	(70.83%)*	(22.22%)*	
		(15.28%)**	(70.83%)**		(31.94%)**	(9.72%)**		(15.28%)**	(70.83%)**	(11.11%)**	
		(9.72%)***	(66.67%)***		(22.22%)***	(2.78%)***		(9.72%)***	(66.67%)***	(2.78%)***	
Kuwait	17	-0.0142%	0.057	0.56%	-0.0001%	0.181%	0.69%	0.0007%	0.057	0.184%	1.00%
in local currency		(17.65%)*	(29.41%)*		(17.65%)*	(64.71%)*		(17.65%)*	(29.41%)*	(58.82%)*	
		(11.76%)**	(23.53%)**		(11.76%)**	(52.94%)**		(11.76%)**	(23.53%)**	(47.06%)**	
		(11.76%)***	(23.53%)***		(11.76%)***	(41.18%)***		(11.76%)***	(23.53%)***	(41.18%)***	
Kuwait	1	-0.1502%	-0.054	0.00%	-0.1386%	-0.167%	0.00%	-0.1378%	-0.059	-0.168%	-0.34%
in U.S. dollars		(0.00%)*	(0.00%)*		(0.00%)*	(0.00%)*		(0.00%)*	(0.00%)*	(0.00%)*	
		(0.00%)**	(0.00%)**		(0.00%)**	(0.00%)**		(0.00%)**	(0.00%)**	(0.00%)**	
		(0.00%)***	(0.00%)***		(0.00%)***	(0.00%)***		(0.00%)***	(0.00%)***	(0.00%)***	
Malaysia	209	0.0034%	0.362	22.98%	0.0136%	-0.004%	0.25%	0.0039%	0.362	0.015%	22.91%
in local currency		(18.66%)*	(71.29%)*		(24.88%)*	(9.57%)*		(18.18%)*	(70.81%)*	(9.09%)*	
		(13.88%)**	(69.86%)**		(17.70%)**	(5.74%)**		(13.40%)**	(69.86%)**	(5.74%)**	
		(7.18%)***	(66.99%)***		(7.66%)***	(1.44%)***		(8.13%)***	(66.99%)***	(2.39%)***	

Table 3: Coskewness Value Regressions (con't)

Market	N	Panel A: Capital Asset Pricing Model			Panel B: Coskewness			Panel C: Capital Asset Pricing Model with Coskewness			
		Alpha	Market	R^2	Alpha	CSK	R^2	Alpha	MKT	CSK	Adj-R^2
Malaysia	9	0.0169%	-0.723	39.38%	0.0160%	0.159%	0.14%	0.0274%	-0.723	-0.011%	38.99%
in U.S. dollars		(11.11%)*	(100.00%)*		(0.00%)*	(0.00%)*		(11.11%)*	(100.00%)*	(0.00%)*	
		(11.11%)**	(100.00%)**		(0.00%)**	(0.00%)**		(11.11%)**	(100.00%)**	(0.00%)**	
		(0.00%)***	(100.00%)***		(0.00%)***	(0.00%)***		(0.00%)***	(100.00%)***	(0.00%)***	
Oman	3	-0.0167%	0.496	18.98%	-0.0514%	0.118%	0.32%	-0.0253%	0.495	0.057%	18.78%
in local currency		(0.00%)*	(100.00%)*		(0.00%)*	(33.33%)*		(0.00%)*	(100.00%)*	(0.00%)*	
		(0.00%)**	(100.00%)**		(0.00%)**	(0.00%)**		(0.00%)**	(100.00%)**	(0.00%)**	
		(0.00%)***	(100.00%)***		(0.00%)***	(0.00%)***		(0.00%)***	(100.00%)***	(0.00%)***	
Pakistan	9	-0.0139%	0.368	28.21%	0.0063%	-0.050%	0.44%	-0.0118%	0.369	-0.038%	27.91%
in local currency		(11.11%)*	(77.78%)*		(0.00%)*	(22.22%)*		(11.11%)*	(77.78%)*	(0.00%)*	
		(0.00%)**	(77.78%)**		(0.00%)**	(22.22%)**		(0.00%)**	(77.78%)**	(0.00%)**	
		(0.00%)***	(77.78%)***		(0.00%)***	(0.00%)***		(0.00%)***	(77.78%)***	(0.00%)***	
Qatar	1	0.0129%	0.782	0.02%	0.0167%	0.039%	0.04%	0.0167%	0.786	0.039%	-0.06%
in U.S. dollars		(0.00%)*	(0.00%)*		(0.00%)*	(0.00%)*		(0.00%)*	(0.00%)*	(0.00%)*	
		(0.00%)**	(0.00%)**		(0.00%)**	(0.00%)**		(0.00%)**	(0.00%)**	(0.00%)**	
		(0.00%)***	(0.00%)***		(0.00%)***	(0.00%)***		(0.00%)***	(0.00%)***	(0.00%)***	
Qatar	3	0.0018%	0.041	0.41%	0.0562%	0.377%	1.02%	0.0538%	0.038	0.370%	1.18%
in local currency		(0.00%)*	(33.33%)*		(66.67%)*	(100.00%)*		(66.67%)*	(33.33%)*	(100.00%)*	
		(0.00%)**	(33.33%)**		(66.67%)**	(100.00%)**		(66.67%)**	(33.33%)**	(100.00%)**	
		(0.00%)***	(33.33%)***		(0.00%)***	(100.00%)***		(0.00%)***	(33.33%)***	(100.00%)***	
Thailand	4	0.0102%	0.779	77.24%	0.0425%	-0.057%	0.04%	-0.0255%	0.78	-0.035%	77.15%
in local currency		(25.00%)*	(100.00%)*		(0.00%)*	(0.00%)*		(0.00%)*	(100.00%)*	(0.00%)*	
		(0.00%)**	(100.00%)**		(0.00%)**	(0.00%)**		(0.00%)**	(100.00%)**	(0.00%)**	
		(0.00%)***	(100.00%)***		(0.00%)***	(0.00%)***		(0.00%)***	(100.00%)***	(0.00%)***	
Turkey	3	0.0160%	0.345	47.56%	0.0711%	0.124%	0.82%	0.0272%	0.345	-0.045%	47.61%
in local currency		(0.00%)*	(100.00%)*		(33.33%)*	(66.67%)*		(0.00%)*	(100.00%)*	(33.33%)*	
		(0.00%)**	(100.00%)**		(33.33%)**	(33.33%)**		(0.00%)**	(100.00%)**	(0.00%)**	
		(0.00%)***	(100.00%)***		(33.33%)***	(33.33%)***		(0.00%)***	(100.00%)***	(0.00%)***	

Table 3: Coskewness Value Regressions (con't)

Market	N	Panel A: Capital Asset Pricing Model			Panel B: Coskewness			Panel C: Capital Asset Pricing Model with Coskewness			
		Alpha	**Market**	**R^2**	**Alpha**	**CSK**	**R^2**	**Alpha**	**MKT**	**CSK**	**Adj-R^2**
United Arab Emirates	4	0.0090%	0.136	2.11%	0.0135%	-0.078%	0.05%	0.0081%	0.135	-0.056%	2.14%
in local currency		(0.00%)*	(75.00%)*		(0.00%)*	(0.00%)*		(0.00%)*	(75.00%)*	(0.00%)*	
		(0.00%)**	(50.00%)**		(0.00%)**	(0.00%)**		(0.00%)**	(50.00%)**	(0.00%)**	
		(0.00%)***	(50.00%)***		(0.00%)***	(0.00%)***		(0.00%)***	(50.00%)***	(0.00%)***	
United Arab Emirates	9	0.0067%	-0.108	0.10%	0.0041%	-0.059%	0.14%	0.0041%	-0.118	-0.059%	0.25%
in U.S. dollars		(11.11%)*	(11.11%)*		(11.11%)*	(11.11%)*		(11.11%)*	(11.11%)*	(11.11%)*	
		(11.11%)**	(11.11%)**		(11.11%)**	(11.11%)**		(11.11%)**	(11.11%)**	(11.11%)**	
		(0.00%)***	(0.00%)***		(0.00%)***	(11.11%)***		(0.00%)***	(0.00%)***	(11.11%)***	
United States	71	-0.0253%	0.768	68.69%	0.0059%	0.006%	0.09%	-0.0259%	0.768	0.023%	68.74%
SRI		(60.56%)*	(100.00%)*		(0.00%)*	(12.68%)*		(50.70%)*	(100.00%)*	(14.08%)*	
in local currency		(38.03%)**	(100.00%)**		(0.00%)**	(2.82%)**		(33.80%)**	(100.00%)**	(7.04%)**	
		(9.86%)***	(100.00%)***		(0.00%)***	(0.00%)***		(9.86%)***	(100.00%)***	(0.00%)***	
United States	664	-0.0305%	0.7	59.82%	-0.0005%	0.005%	0.13%	-0.0262%	0.7	0.064%	59.91%
in local currency		(59.19%)*	(98.95%)*		(3.77%)*	(7.53%)*		(46.08%)*	(99.10%)*	(17.32%)*	
		(42.62%)**	(98.34%)**		(2.11%)**	(3.61%)**		(31.02%)**	(98.19%)**	(11.45%)**	
		(17.17%)***	(97.29%)***		(0.75%)***	(1.66%)***		(15.36%)**	(97.14%)***	(3.92%)***	

Notes: Table 3 presents the parameter estimates of three different specifications of coskewness level regressions. Panel A: summarizes results based on the Capital Asset Pricing Model; Panel B exchanges the market factor for a coskewness value; while Panel C incorporates coskewness level to the CAPM specification. Averages parameters across funds are reported. Because of small sample problems, traditional standard errors are not estimated across funds but rather percentage of times on which the regression resulted in significant estimations.

Table 4: Coskewness Factor Regressions

Market	N	Panel A: Capital Asset Pricing Model			Panel B: Coskewness			Panel C: Capital Asset Pricing Model with Coskewness			
		Alpha	Market	R^2	Alpha	CSK	R^2	Alpha	MKT	CSK	Adj-R^2
Egypt	13	-0.0001%	0.12	3.00%	0.0007%	-0.008%	0.23%	0.0016%	0.12	0.005%	2.99%
in local currency		(15.38%)*	(84.62%)*		(15.38%)*	(15.38%)*		(15.38%)*	(84.62%)*	(15.38%)*	
		(15.38%)**	(84.62%)**		(15.38%)**	(15.38%)**		(15.38%)**	(84.62%)**	(15.38%)**	
		(15.38%)***	(84.62%)***		(15.38%)***	(7.69%)***		(15.38%)***	(84.62%)***	(7.69%)***	
India	10	0.0264%	0.647	63.21%	0.0844%	0.252%	0.03%	0.0376%	0.647	0.089%	63.13%
in local currency		(80.00%)*	(100.00%)*		(0.00%)*	(0.00%)*		(20.00%)*	(100.00%)*	(0.00%)*	
		(50.00%)**	(100.00%)**		(0.00%)**	(0.00%)**		(0.00%)**	(100.00%)**	(0.00%)**	
		(30.00%)***	(100.00%)***		(0.00%)***	(0.00%)***		(0.00%)***	(100.00%)***	(0.00%)***	
Indonesia	72	0.0061%	0.49	44.97%	0.1733%	0.268%	0.55%	0.0220%	0.49	0.035%	44.94%
in local currency		(20.83%)*	(70.83%)*		(40.28%)*	(16.67%)*		(22.22%)*	(70.83%)*	(12.50%)*	
		(15.28%)**	(70.83%)**		(23.61%)**	(9.72%)**		(13.89%)**	(68.06%)**	(6.94%)**	
		(9.72%)***	(66.67%)***		(5.56%)***	(1.39%)***		(6.94%)***	(65.28%)***	(0.00%)***	
Kuwait	17	-0.0142%	0.057	0.56%	0.0741%	0.245%	0.66%	0.0723%	0.055	0.238%	0.95%
in local currency		(17.65%)*	(29.41%)*		(52.94%)*	(70.59%)*		(52.94%)*	(29.41%)*	(70.59%)*	
		(11.76%)**	(23.53%)**		(35.29%)**	(70.59%)**		(29.41%)**	(23.53%)**	(58.82%)**	
		(11.76%)***	(23.53%)***		(11.76%)***	(41.18%)***		(5.88%)***	(23.53%)***	(35.29%)***	
Malaysia	209	0.0034%	0.362	22.98%	0.0003%	-0.029%	0.25%	0.0368%	0.362	0.064%	22.92%
in local currency		(18.66%)*	(71.29%)*		(10.53%)*	(11.00%)*		(19.14%)*	(71.77%)*	(14.83%)*	
		(13.88%)**	(69.86%)**		(7.66%)**	(6.70%)**		(13.40%)**	(70.33%)**	(12.44%)**	
		(7.18%)***	(66.99%)***		(5.26%)***	(4.78%)***		(6.22%)***	(66.99%)***	(5.26%)***	
Malaysia	9	0.0169%	-0.723	39.38%	-0.1939%	-0.474%	0.70%	0.0334%	-0.723	0.020%	39.04%
in U.S. dollars		(11.11%)*	(100.00%)*		(0.00%)*	(22.22%)*		(22.22%)*	(100.00%)*	(11.11%)*	
		(11.11%)**	(100.00%)**		(0.00%)**	(0.00%)**		(0.00%)**	(100.00%)**	(0.00%)**	
		(0.00%)***	(100.00%)***		(0.00%)***	(0.00%)***		(0.00%)***	(100.00%)***	(0.00%)***	

Table 4: Coskewness Factor Regressions (con't)

Market	N	Panel A: Capital Asset Pricing Model			Panel B: Coskewness			Panel C: Capital Asset Pricing Model with Coskewness			
		Alpha	Market	R^2	Alpha	CSK	R^2	Alpha	MKT	CSK	Adj-R^2
Pakistan	9	-0.0139%	0.368	28.21%	0.0032%	-0.030%	0.52%	-0.0010%	0.368	0.029%	28.01%
in local currency		(11.11%)*	(77.78%)*		(0.00%)*	(22.22%)*		(0.00%)*	(77.78%)*	(0.00%)*	
		(0.00%)**	(77.78%)**		(0.00%)**	(11.11%)**		(0.00%)**	(77.78%)**	(0.00%)**	
		(0.00%)***	(77.78%)***		(0.00%)***	(0.00%)***		(0.00%)***	(77.78%)***	(0.00%)***	
United Arab Emirates	9	0.0067%	-0.108	0.10%	0.0067%	0.001%	0.05%	0.0066%	-0.106	0.000%	-0.03%
in U.S. dollars		(11.11%)*	(11.11%)*		(0.00%)*	(0.00%)*		(0.00%)*	(11.11%)*	(0.00%)*	
		(11.11%)**	(11.11%)**		(0.00%)**	(0.00%)**		(0.00%)**	(11.11%)**	(0.00%)**	
		(0.00%)***	(0.00%)***		(0.00%)***	(0.00%)***		(0.00%)***	(0.00%)***	(0.00%)***	
United States	71	-0.0253%	0.768	68.69%	0.0129%	0.014%	0.11%	-0.0424%	0.768	-0.036%	68.67%
SRI		(60.56%)*	(100.00%)*		(4.23%)*	(4.23%)*		(35.21%)*	(100.00%)*	(16.90%)*	
in local currency		(38.03%)**	(100.00%)**		(0.00%)**	(4.23%)**		(19.72%)**	(100.00%)**	(5.63%)**	
		(9.86%)***	(100.00%)***		(0.00%)***	(0.00%)***		(2.82%)***	(100.00%)***	(1.41%)***	
United States	664	-0.0305%	0.7	59.82%	0.0619%	0.149%	0.10%	0.0104%	0.7	0.098%	59.77%
in local currency		(59.19%)*	(98.95%)*		(3.31%)*	(2.86%)*		(5.27%)*	(98.95%)*	(13.25%)*	
		(42.62%)**	(98.34%)**		(1.51%)**	(1.51%)**		(2.41%)**	(98.19%)**	(5.42%)**	
		(17.17%)***	(97.29%)***		(0.30%)***	(0.00%)***		(0.90%)***	(97.29%)***	(0.45%)***	

Notes: * percentage at 10% significance count; ** percentage at 5% significance count; *** percentage at 1% significance count. Table 4 presents the parameter estimates of three different specifications of coskewness factor regressions. Panel A: summarizes results based on the Capital Asset Pricing Model; Panel B exchanges the market factor for a coskewness factor; while Panel C incorporates a coskewness factor to the CAPM specification. Averages parameters across funds are reported. Because of small sample problems, traditional standard errors are not estimated across funds but rather percentage of times on which the regression resulted in significant estimations.

5. CONCLUDING REMARKS

Looking at the different models, there is a clear winner: Islamic funds. However, second and third place are not consistent depending on the estimation. In this paper, we have provided evidence that even under a more recent inclusion of a risk factor, and subsequent premium, pricing Islamic investments results difficult considering that the alphas in some markets remain large. However, we provide evidence of an over-performance rather than un underperformance which has been reported in the literature. But we must provide a word of caution since our database is significantly small to account for Islamic finance which still a growing segment.

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