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Equity Fund's Islamic Screening: Effects on its Financial Performance

Abul Hassan[*] *and Antonios Antoniou*[**]

1. Introduction

Integrating religious principles with modern markets, Islamic investing is the popular term for the modern-day practice of buying and selling securities in accordance with the principles of Islam. The basic tenet of Islamic investing is that a Muslim should invest his/her assets to reflect the Islamic principles that govern his/her daily life. For example, just as drinking alcohol and eating pork products are prohibited in Islam, so too is investing in wine or pork processing companies. Islamic investing also prohibits stock positions in companies whose 'primary business' involves are banking, alcohol, gaming, pornography, tobacco and weaponry industries (Usmani, 1999). The seemingly constricting process of Islamic investing has not hindered its growth and prominence in the financial services industry. Often hailed by conventional financial observers as the pre-eminent international emerging market, Islamic investing has grown from a regional, small market to an industry encompassing mutual fund complexes, investment banks, and retail brokerage, etc. As the popularity of equity markets increases, Muslim scholars and business people have moved towards defining and implementing the principles underlying Islamic investing (DeLorenzo, 2001). Of particular note was the establishment in 1996 of the Dow Jones Islamic Market Index (hereafter, the DJIM), and later in the year the 1999 FTSE Global Islamic

[*] The paper was written while Abul Hassan was a PhD candidate, Department of Economics & Finance, University of Durham, UK.
[**] Professor of Finance and Director of School of Economics, Finance and Business, University of Durham, United Kingdom.

Index. Between these two index families, over fifteen style[1] and regional indexes have been created to track stocks conforming to Islamic principles. The industry continues to draw assets under management in spite of the recent lull in conventional financial markets, as both the religious and secular communities develop more complex and liquid investment products.

Sharīʿah scholars have accepted the common stock guidelines, and as a result interest has been generated among the fund managers of the equity funds. It has been agreed that buying and selling corporate stocks does not violate Islamic norms because stocks and shares represent real assets. Dividends comply with Sharīʿah, whereas payments or receipt interest (*ribā*) in transactions are not allowed. Therefore, unlike fixed income assets such as government bonds and term bank deposits, equities are more compatible with the Islamic doctrine of profit and risk sharing principles. Islamic equity funds experienced excellent growth during the late 1990s as they rode on the technology boom. In 1996, for example, there were twenty-nine Islamic equity funds on the market with US$800 million in assets. By early 2000 the number of funds had grown to ninety-eight with approximately US$5 billion in assets. According to the study on Islamic equity funds conducted by Failaka for the year ending 2001, the high growth rate, about 50%, enjoyed by the industry during the 1990s has dropped, although, today there are over one hundred Islamic equity funds, their total assets estimated at roughly US$5.3 billion (Failaka, 2001).

The DJIMs were created and marketed by Dow Jones and Company, which provides Islamic investors with an acceptable universe of stocks to invest in and a benchmark against which performance can be measured (Iqbal, 2000). Being an index, the DJIM provides a unique opportunity to assess the impact of the constraints on performance free of other considerations such as investment style, fund objectives and timing, and is needed the analysis of the performance of both Islamic and ethical mutual funds.

Currently included in the Islamic Market family of indexes are the broad Dow Jones Islamic Market Index, the Dow Jones Islamic Market US Index, the Dow Jones Islamic Market Technology Index, the Dow Jones Islamic Market Extra Liquid Index, the Dow Jones Islamic Market Canadian Index,

[1] If the current style of a fund, either estimated from a fund's returns or identified from a fund's holdings, is a reliable indicator of the future style of the fund, the fund sponsor can do a better job in the future risk control of the portfolio. Therefore, the predictability of the style is a much more valuable piece of information for fund sponsors and individual investors.

the Dow Jones Islamic Market UK Index, the Dow Jones Islamic Market Europe Index, and the Dow Jones Islamic Market Asia/Pacific Index. The DJIM addresses demand by creating a standard for applicable Islamic equity investing. It was designed to track the performance of leading, publicly traded companies whose activities are consistent with Islamic Sharīʿah principles. Sharīʿah principles, following guidelines provided by its *fatwā* and Sharīʿah Supervisory Committee on the DJIM, rule out those companies whose business activities are incompatible with Islamic law. After removing companies with unacceptable core business activities, the remaining list is tested by a financial-ratio 'filter', the purpose of which is to remove companies with an unacceptable debt ratio.

Screening criteria are general rules followed by Islamic funds, and are also known as "Qualitative Screening". Their basic target is to deal with industry screening and business practices. Funds need to investigate whether the industry they plan to invest in is permissible in Islam.

By way of guidance, stocks whose core activities come under, or are related to the following headings, are excluded:

a) banking or any other interest related activity,
b) alcohol,
c) tobacco,
d) gaming,
e) insurance,
f) pork production, packaging and processing or any other activity related to pork,
g) activities deemed offensive to the principles of Islam,
h) sectors/companies significantly affected by the above.

Companies with incompatible lines of business are removed from the 'universe' of stocks included in the Dow Jones Global Index (DJGJI). Companies classified in other industry groups may also be excluded if deemed to have a material ownership in, or revenues from, prohibited business activities.

Besides qualitative screening, "Quantitative Screening" is required, as Islamic law reaches beyond the simple exclusion of business conducted by non-permissible companies to analysing financial data and ratios. Debt and asset ratio is considered, as to how much of the company's capital is financed by debt in relation to assets. Although Islamic Sharīʿah law does not allow the interest-based loans, however, based on the Islamic legal principle and sub-sequent *fiqh* opinions, a company is not a permissible investment if debt

financing is more than 33% of its capital. Quantitative screening is also concerned with interest-related income, which includes companies which place their surplus funds in investments which yield interest income. Companies which pass these screens are generally eligible for inclusion in the DJIM's investable universe.

Islamic screening criteria provide a complete framework that fund managers follow in performing their investment practices. The exclusion of some sectors and preference for others may have an effect on the direction Islamic equity funds follow. This can have a positive or negative effect depending on the balance of sectors in the portfolio. For instance, Islamic equity funds, which are over-loaded with technology, achieved their best performance during the technology boom period dominant in the second half of the 1990s and which lasted until April 2000.

Despite the increasing attention of practitioners to ethically screened investments, there is relatively little academic research on Islamic ethical equity funds, if any. Therefore, this research sought to address the following objectives:

a) To examine the potential impact of Islamic screening restrictions on investment performance by comparing the performance characteristics of a diversified portfolio of Islamic screened stock indexes (DJIM) with conventional benchmark (DGI).

b) To assess the degree of correlation in price movement and volatility among the Islamic stocks (DJIM), Islamic technology related stocks (DJIM-Tech) and UK Islamic stocks (DJIM-UK).

The layout of the paper is as follows:

In section 2 we review the performance evaluation literatures on ethical funds. Section 3 discusses the models and methodology used in the performance analysis. Section 4 focuses the data and sample period. Section 5 presents the empirical results. Finally section 6 contains conclusions.

2. Review of the Empirical Evidence

Islamic investing has much in common with modern forms of investing known as 'ethical investing', 'socially responsible investing', 'faith investing' and 'green investing'. Each of these investment funds has much of value to contribute and each has something in common with the teaching of Islam (DeLorenzo, 2001). It is, therefore, important to keep abreast of what is happening in the ethical funds sector. Most studies which have examined the

performance of managed funds or mutual funds have found that they do not outperform the market, and in some cases significantly under perform the market. This conclusion seems also to have been reached worldwide. In the UK, Samuels (1968), Guy (1978), Moles (1981) and Fletcher, (2000) found that managed funds or mutual funds did not outperform the market. These studies are, therefore, all supportive of the early studies in the US by Treynor (1965), Sharpe (1966) and Jensen (1968 and 1969).

There is no significant evidence on the performance of ethical mutual fund or unit trusts outside UK and USA markets. Studies done by Sauer (1997) and then Statman (2000) compared the returns of ethical and non-ethical USA mutual funds to each other, and to both the S & P 500 and the Dominic Social Index (DSI). Both studies used Jensen's Alpha and concluded that no significant differences between risk-adjusted returns for ethical and non-ethical funds exist.

Luther, Matatko and Corner (1992) and Luther and Matatko (1994) studies were based on UK data, comparing ethical funds to market-wide indices like the FT All Share Price Index. Luther, Matatko and Corner (1992) investigate the returns of 15 ethical mutual funds. Their results provide some weak evidence that ethical mutual fund tend to out perform general market indices. Besides, a bias towards smaller companies for ethical mutual fund is documented. Luther and Matatko (1994) also find this small cap bias and show that comparing ethical funds to a small cap benchmark significantly improved their relative performance. Later Mallin, Saadouni and Briston (1995) made efforts to solve the benchmark problem by using a matched pair analysis. Using a sample matched on the basis of fund size and formation date, they provide evidence of ethical mutual funds out performance, based on Jensen's Alpha. Then Gregory, Matatko and Luther (1997) argue that matching based on fund size does not control for a small cap bias in the ethical portfolios. Based on the two-factor Jensen approach, firstly they confirm their prior observation of the small cap bias. Secondly, no significant difference between the financial performance of ethical and non-ethical mutual fund is found.

3. Research Methodology

The Performance of Dow Jones Islamic Market Index (DJIMI) and Datastream Global Index (DGI) is assessed using the traditional performance measure e.g. Sharpe, Treynor and Jensen measures. A correlation model is also applied to detect the degree of correlation between price movements in

Islamic investments and technology related stocks and United Kingdom (UK) stocks, resembled by the DJIM-Technology Index (DJIM-Tech) and DJIM-UK Index (DJIM-UK) respectively. Volatility of all used indexes is measured for a further insight into the risk associated with investing in each of them.

3.1 Jensen's Alpha

Jensen's Alpha (1968) represents the average risk premium per unit of systematic risk and shows how to determine whether the difference in risk adjusted performance is statistically significant, measuring the ability of active management to increase returns above those which result purely from taking the risk which lies in the fund. Jensen's Alpha is based on the Capital Asset Pricing Model (CAPM) which calculates the expected return on a security or a portfolio over a specific period of time by the following equation:

$$E(R_p) = R_{rf} + \beta[E(R_m) - R_{rf}] \quad (1)$$

where:

$E(R_p)$ = expected average return of the portfolio,

$E(R_m)$ = expected average excess return of the market,

R_{rf} = average risk free rate,

β = the systematic risk measure of the portfolio.

However, after allowing an intercept to measure for any abnormal performance, the following regression will be run:

$$ER_p = \alpha + \beta ER_b \quad (2)$$

where:

$ER_p = E(R_p) - R_{rf}$ is the average excess return of the portfolio,

$ER_b = E(R_b) - R_{rf}$ is the average excess return of the benchmark,

α = the Alpha measure for out/under performance.

3.2 Sharpe Measure

The Sharpe measure (1966) deals with return and risk in terms of the Capital Market Line (CML). It measures the return of a portfolio, in excess of the risk-free rate, relative to its total risk.

$$\text{Sharpe measure} = \frac{R_p - R_{rf}}{\sigma_p} \quad (3)$$

R_p = average portfolio's return for a given period of time,
R_{rf} = average risk free rate for the same period,
σ_p = standard deviation of the rate of return of a portfolio for the same period.

3.3 Treynor Measure

The Treynor Measure (1965) is based on a widely employed criterion for assessing portfolio performance, which is the Security Market Line (SML). The Treynor ratio gives the excess return per unit of systematic risk (non-diversifiable).

$$\text{Treynor Measure} = \frac{R_p - R_{rf}}{\beta_p} \quad (4)$$

where:
R_p = average portfolio's return for a specific period of time,
R_{rf} = average risk free rate for the same period,
β = portfolio's beta for the same period.

3.4 The Correlation Model

To detect the degree of co-movement between the performance of the DJIM and the DGI, the log of the prices of the two indexes will be individually regressed against the log of the prices of the Dow Jones Islamic Market-Technology Stocks (DJIM-Tech) and the beta coefficient will be compared. The following regressions will be run:

$$\ln P_{DJIM} = \alpha + \beta_1 \ln P_{DJIM\text{-}Tech} + \beta_2 \ln P_{DJIM\text{-}UK} \quad (5)$$

$$\ln P_{DGI} = \alpha + \beta_1 \ln P_{DJIM\text{-}Tech} + \beta_2 \ln P_{DJIM\text{-}UK} \quad (6)$$

where:

$\ln P_{DGI}$ = log of the price of Datastream Global Index at time t,

$\ln P_{DJIM\text{-}Tech}$ = log of the price of DJIM-Technology Index at the time t,

$\ln P_{DJIM}$ = log of the price of Dow Jones Islamic Market Index (DJIM) at time t,

$\ln P_{DJIM\text{-}UK}$ = log of the price of DJIM- United Kingdom Stock Index at time t.

In the above models, the beta measures the elasticity of the Dow Jones Islamic Market Index (DJIM) with respect to the DJIM-Technology Index and the DJIM-United Kingdom Stock Index, i.e. the percentage change in DJIM for a percentage change in the DJIM-Tech and the DJIM-UK. However, due to non-stationarity problems associated with the previous regression, the first difference (returns) will be checked instead and new beta coefficients will be assessed. The new regressions will be:

$$R_{DJIM} = \alpha + \beta_1 R_{DJIM\text{-}Tech} + \beta_2 R_{DJIM\text{-}UK} \quad (7)$$

$$R_{DGI} = \alpha + \beta_1 R_{DJIM\text{-}Tech} + \beta 2 R_{DJIM\text{-}UK} \quad (8)$$

where:

$$\Delta \ln P_{DJIM} = R_{DJIM} = \ln P_{DJIM}^{t+1} - \ln P_{DJIM}^{t} =$$

return on DJIM (9)

$$\Delta \ln P_{DJIMTech} = R_{DJIMTech} = \ln P_{DJIMtech}^{t+1} - \ln P_{DJIMtech}^{t} =$$

returns on DJIM-Technology Index (10)

$$\Delta \ln P_{DGI} = R_{DGI} = \ln P_{DGI}^{t+1} - \ln P_{DGI}^{t} =$$

returns of Datastream Global Index (11)

$$\Delta \ln P_{DJIMUK} = R_{DJIMUK} = P_{DJIMUK}^{t+1} - \ln P_{DJIMUK}^{t} =$$

return of DJIM UK Index (12)

The degree of correlation between returns on the Dow Jones Islamic Market Index (DJIM) and Datastream Global Index (DGI) is examined by checking whether the betas of the independent variables (DJIM-Tech and DJIM-UK) in both regressions are statistically significant, while, comparing the values of betas will indicate which of the two indexes is more influenced by the performance of DJIM-Tech stocks and DJIM-UK market stocks. It is expected that the performance of the DJIM to be more affected by the performance of technology stocks because it is over-weighted with technology stocks if compared to Datastream Global Index, over 26% versus 24% respectively. Therefore, this would partly explain the slip in the DJIM performance over the past three years, tracking the drop in technology and UK Stocks prices.

3.5 Volatility

Volatility shows the dispersion of the percentage changes in prices or rate of return. The most commonly used measure of stock return volatility is

standard deviation. Financial economists find this statistic useful because it summarises the probability of seeing extreme values of return. When the standard deviation is large the chance of a large positive or negative return is large (Schwert, 1990).

4. Data and Sample Period

This study examines the returns of the global Dow Jones Islamic Index (DJIM) against the Datastream Global Index (DGI) over the period January 1996 to March 2003. The DJIM is a subset of the Dow Jones Global Index (DJGI). Made up of over eight hundred stocks, it is an Islamic equity benchmark index that excludes stocks from the DJGI whose company and primary business is non-permissible, based on Sharīʿah principles. The prohibited industries are banking, alcohol, tobacco, gaming, insurance and pork. Companies are excluded if their debt ratio is equal or greater than 33.33%. According to Sharīʿah screening, the index completely excludes banks and all other financial institutions because their main business involves interest. It is also noted that the index's heavy load of technology stocks, with a total exposure of over 26% in the index out of the total Islamic stocks. The DJIM is a capitalisation weighted price index computed on the basis of the last prices. It does not include reinvested dividends and is based on December 31, 1995 with the base value set at 1000. The DJIM obtained the data directly from Dow Jones & Company. Our data consists of the weekly price of the DJIM, DJIM-Tech, DJIM-UK (Wednesday to Wednesday to limit the day of the week effect). The choice of the weekly data interval is largely a practical decision given the short sample period available. The use of monthly data, though common in empirical stock market studies (Jensen, 1968, Fama & MacBeth, 1973, Guy, 1978), Since our present study uses the short sample period which would reduce the number of observations to a level where the robustness of the results would be compromised, we, therefore**,** use the weekly data interval.

The Datastream Global Total Market Index (DGI) for the period from January 1996 to March 2003 obtained from Datastream is used as the proxy for the market portfolio. The three-month US Treasury bill return obtained from Datastream is used as a proxy for the risk-free rate. This rate is subtracted from the DJIM and benchmark index returns to compute weekly excess returns.

In order to evaluate the performance, the data will consist of three periods consisting of weekly excess returns. The first is the period from

January 1996 to March 2000 (250 observations), during which international stock markets were going up. The second period goes from April 2000 to March 2003 (156 observations), during which markets were mainly going down, while, the third period consists of the first and second periods combined, that is from January 1996 to March 2003 (406 observations), which provides the general market fluctuations of ups and downs during that period. The division of the data samples is based on market performance over each period, helping provide a better picture of how our indexes have reacted to the general health of stock markets depending on their sectoral selection.

The following formula is used to calculate the returns on indexes from prices:

$$\Delta \ln P_{DJIMTech} = R_{DJIMTech} = \ln P^{t+1}_{DJIMtech} - \ln P^{t}_{DJIMtech}$$

where :

ln P_{DGI} = log of portfolios priced at time t+1,

ln P_{DGI} = log of the portfolios priced at time t .

To obtain the weekly excess returns, the risk free rate is subtracted from the weekly returns of each index, as the used measures are based on relative performance. The formula used is:

$ER_p = R_p - R_{rf}$

where: R_p = index weekly return,

R_{rf} = risk free rate.

5. Empirical Results

The Sharpe and Treynor measures and the Jensen Alpha are calculated and explained. The validity and results of the correlation models are also checked and interpreted in order to prove the strong relationship between the DJIM and DJIM Technology and DJIM-UK stocks. The volatility of the indexes is presented and results also analysed.

Table 1: Summary of Weekly Excess Returns

Jan 1996-March'00	*Mean*	*Std. Error*	*Min.*	*Max.*	*Normality Test*[1]	*ADF*[2]
ER_{DJIM}	0.0034	0.0208	-0.0396	0.0531	0.2911 [0.8744]	-11.114**
ER_{DGI}	0.0031	0.0216	-0.0515	0.0613	0.0038 [0.9891]	-11.412**

April'00-March'03	*Mean*	*Std. Error*	*Min.*	*Max.*	*Normality Test*	*ADF*
ER_{DJIM}	-0.0049	0.0291	-0.0911	0.0861	2.2155 [0.3511]	-14.22**
ER_{DGI}	-0.0053	0.0282	-0.0956	0.0897	9.1032 [0.0168]*	-14.44**

Jan.1996-March'03	*Mean*	*Std. Error*	*Min.*	*Max.*	*Normality Test*	*ADF*
ER_{DJIM}	-0.0026	0.0254	-9.2101	0.07661	1.8832 [0.4211]	-15.97**
ER_{DGI}	-0.0025	0.0252	-9.8543	0.07992	11.7652 [0.0056]*	-15.99**

1. Normality Test following Chi^2(2) distribution.
2. Augmented Dickey-Fuller Test for stationarity.
* 5% level of significance
** 1% level of significance

Normality test results on indexes excess returns are mixed with ER_{DGI} statistically significant for two out of the three examined periods, while, ER_{DJIM} are not normally distributed. ADF tests show statistically significant figures at 1% level of significance, indicating the stationarity of the data examined. Excess returns show that DJIM was only able to outperform DGI in the first period, which can be attributed to rising stock markets, especially technology related during that period. In his study Guerard (1997) found that higher excess returns for portfolio using ethical screens than those from an unscreened portfolio for the period 1987-1996. Although standard deviations of DJIM proved to be higher than that of DGI throughout our sample periods, concluding that DJIM is risky than its benchmark.

5.1 The Sharpe and Treynor Measures

Sharpe and Treynor measures have been reported as under for the three periods under study.

Table 2: Sharpe and Treynor Measures for the January 1996 to March 2000

	Datastream Global Index (DGI)	*Dow Jones Islamic Market Index (DJIM)*
Sharpe	0.1148	0.1711
Treynor	0.0022	0.0036

As per result, for the period from January 1996 to March 2000, both ratios indicate that the DJIM provided an average excess weekly return of 0.17 versus 0.11 for DGI as per Sharpe measure. According to Treynor measure, per unit of Beta, DJIM provided an average excess weekly return of 0.0036 versus 0.0022 for the DGI. These results are supported by the fact that during the sample period, global stock markets surged to new record highs. The out performance of DJIM may be explained by its overweighing in technology as technology related stocks did better than other sectors up late March 2000, reaching their all times highs, with NASDAQ reached its highest level at 4704.73, gaining 93%.

In view of the above results, it may be pointed out that during rising stock market cycles, Islamic investments seem to outperform unscreened investments, stating a positive Islamic screening sectoral bias.

Table 3: Shape and Treynor Measures for the April 2000 – March 2003

	DGI	*DJIM*
Sharpe	-0.1521	-0.1743
Treynor	-0.0051	-0.0066

As per result for the period from April 2000 to March 2003, the Sharpe and Treynor ratios indicate that the Dow Jones Islamic Market Index (DJIM) under-performed Datastream Global Index (DGI). According to Sharpe measure, per unit of total risk, DJIM provided a negative average excess weekly return of 0.1743 versus 0.1521 for Datastream Global Index. According to Treynor measure, per unit of Beta, DJIM provided a negative average excess weekly return of 0.0066 versus 0.0051 for the Datastream Global Index. These results are consistent with the fact that stock prices were mainly down throughout the sample period. Hence, the under-performance of DJIM may also be attributed to declining technology related stocks during the examined period, reaching their lowest prices. NASDAQ lost 140% of its value during the period going down to 1046.72 points, while DJIM UK index dropped by 49% reaching 519.55 points.

In view of the above results, it may be pointed out that during falling stock markets periods, Islamic investments seem to under perform unscreened investments due to its sectoral and country biases.

Table 4: Sharpe and Treynor Measures for the period January 1996 to March 2003

	DGI	*DGIM*
Sharpe	-0.1621	-0.1742
Treynor	-0.0049	-0.0059

As per result for the period from January 1996 to March 2003, the Sharpe and Treynor ratios indicate that the DJIM under-performed DGI. As per Sharpe measure, per unit of total risk, DJIM provide a negative average excess weekly return of 0.1742 versus 0.1621 for DGI. Whilst per unit of Beta, DJIM provided a negative average excess weekly return of 0.0059 versus 0.0049 for DGI, as per Treynor measure.

Above results are supported by the fact that during the sample period, global stock prices had gone through high as well as low stages, which explains the negative excess average weekly returns reported for all indexes.

5.2 Jensen's Alpha

The following are the results of Jensen's Alpha's statistical tests.

Table 5: Statistical Tests

	R^2	*RESET*	*DW[1]*
Jan. 1996-March 2000	0.8801	0.8702	1.79**
April 2000-March 2003	0.8033	3.3339 [0.3011]	2.91**
Jan. 1996-March 2003	0.9001	3.8411 [0.0661]	2.81**

1. Durbin-Watson test for correlation.
** 1% significant level.

The null hypothesis of the Ramsey's RESET test is rejected as all test's values are statistically insignificant. The coefficients of determination for all periods are above 80%, suggesting that much of the variations in the returns on DJIM are due to worldwide markets' movements**,** while results obtained from DW test are statistically significant at 1% level of significance supporting the acceptance of the hypothesis that there is no autocorrelation.

ER_{DJIM} = 0.0013 + 1.0075_{DGI}

Std Error	0006	0.0271
T-Value	2.2601**	37.9011

During the period from January 1996 to March 2000, the above results show a positive Alpha against the benchmark, indicating positive abnormal returns for the DJIM.

T-values show that the Alpha is statistically significant at 1% level. This proves that the DJIM return is greater than was expected for that level of risk, indicating superior performance over DGI, which is consistent with the results obtained using the Sharpe and Treynor measures.

ER_{DJIM} =	-0.0012 +	0.8785 ER_{DGI}
Std. Error	0.0001	0.3612
T-value	-1.15	25.21

During the period from April 2000 to March 2003, results show a negative Alpha against the benchmark, indicating negative abnormal returns for the DJIM. It means the DJIM return is lower than expected for that level of risk, indicating inferior performance over DGI. However, T-values show that the Alpha is statistically insignificant.

ER_{DJIM} =	-0.00004 +	0.8921 ER_{DGI}
Std. Error	0.0008	0.0324
T-value	-0.4455	34.0001

During the whole sample period from January 1996 to March 2003, results show a negative Alpha against the benchmark, indicating negative abnormal returns. The DJIM return is lower than expected for that level of risk, indicating inferior performance over DGI. However, T-values show that the Alpha inferior performance is statistically insignificant for Islamic investments when stock prices are dropping.

5.3 The Correlation Model and Volatility

The summary statistics of the DJIM, DGI, DJIM Technology Index, and DJIM UK Index for the period from January 1996 to March 2003 are given in Table 6 below.

Normality tests for the above mentioned indexes suggest that only R_{DGI} and $R_{DJIM\text{-}UK}$ are normally distributed. Results also show that absolute ADF values of all indexes are statistically significant at 1% significant level, indicating that R_{DJIM}, R_{DGI}, $R_{DJIM\text{-}Tech}$ and $R_{DJIM\text{-}UK}$ are stationary.

Table 6: Summary of the Weekly Returns

	Mean	*Std. Error*	*Min.*	*Max.*	*Normality*	*ADF*
R_{DJIM}	-0.0021	0.0257	-0.0886	0.8101	1.6901 [0.4401]	-15.123**
R_{DGI}	-0.0025	0.0259	-0.0832	0.7921	11.0124 [0.0039]*	-15.982**
$R_{DJIM-Tech}$	-0.0019	0.0487	-0.1722	0.1624	0.8967 [0.6712]	-16.341**
$R_{DJIM-UK}$	-0.0015	0.0299	-0.0766	0.1101	7.6525 [0.0243]*	-15.552**

*5% significant level
** 1% significant level

R_{DJIM} =	-0.000512 +	0.037961 $R_{DJIM-Tech}$ +	0.2411 $R_{DJIM-UK}$
Std. Error	0.0006713	0.01452	0.02771
T-Value	- 0.711	24.94511	7.9932

The RESET test suggests that the model is not mis-specified. As the result of the test is statistically insignificant, it allows us to reject the hypothesis of mis-specification. The fact that d=2.41 (DW) supports acceptance of the hypothesis that there is no autocorrelation as d>du (2.41 >1.77). The F value (570.8) statistically significant at 1% level of significance, showing that the dependent variable R_{DJIM} is linearly related to the explanatory variables R_{DJIM} and $R_{DJIM-UK}$. The coefficient of determination R^2 = 0.84 means that around 84% of the total variations in R_{DJIM} is explained by the model. This is not surprising, as the DJIM index includes a large number of global technology and UK stocks.

R_{DJIM} =	-0.000512 +	0.288215 $R_{DJIM-Tech}$ +	0.254311 $R_{DJIM-UK}$
Std. Error	0.001189	0.226512	0.05311
T-values	-0.39	11.89	7.22

The statistically insignificant result of the RESET test rejects the hypothesis that the model is mis-specified. The DW test (d=2.54) supports the acceptance of the hypothesis that there is no autocorrelation as d>du (2.54>1.77). The F value (190.9) is statistically significant at 1% level of significance, showing that the dependent variable R_{DGI} is linearly related to the explanatory variables $R_{DJIM-Tech}$ and $R_{DJIM-UK}$. The coefficient of determination R^2 = 0.625, suggests that almost 62% of the total variation in R_{DGI} is explained by price movements of sectors other than technology related.

The Beta coefficients shown in the regressions explain the relationship between returns on the DJIM-Tech index and returns on the Dow Jones Islamic Market Index (DJIM) the Datastream Global Index (DGI). T-values indicate that the coefficients are statistically significant. But the values of $R_{DJIM\text{-}Tech}$ coefficients show relatively larger correlation between returns on the DJIM and returns on the DGIM-Tech in comparison to that between returns on the DGI and DJIM-Tech. This result is consistent with the fact that the GJIM is overweighted with technology stocks (above 26%) in comparison to the DGI (around 24%). But the values of R_{DJIMUK} coefficients show a greater influence for price movements of UK stocks on the Datastream Global Index than on the Dow Jones Islamic Index.

Table 7: Average Weekly Returns and Volatility

Jan.'96- March 03	*DJIM*	*DGI*	*DJIM-Tech*
Average Weekly Return	-0.0054	-0.0057	-0.0085
Standard Deviation	0.0272	0.02741	0.0457

The above standard deviations for the average weekly returns of three indexes indicate that the standard deviation of the DJIM Technology index is the largest, proving that the DJIM-Tech is the most volatile index. However, the DGI has the lowest volatility level and hence the least volatile index, which may be due to its balanced sectoral diversification. The foregoing discussion shows that the DJIM seems to be more volatile than the DGI, which indicates that the Islamic index may be riskier than the conventional index. However, this result is closely related to the current composition of the Islamic index, characterised by high exposures to technology and UK stocks and its exclusion of banking stocks that are far less volatile than technology related stocks.

6. Conclusions

In our study, we show that the impact of Islamic screens is closely related to the performance of stock markets worldwide. However, the bias of Islamic equity towards technology stocks has proved beneficial during rising stock market periods (as per our sample January 1996 to March 2000), but it hit the performance of Islamic equity investments during falling stock markets (April 2000 to March 2003 sample period) badly. In a comparative study done by

Luther and Matatko (1994) in respect of UK ethical mutual funds, compared to the whole UK stock market and taking as a sample period 1985-1992, the result indicated that ethical mutual funds are heavily concentrated in the smaller company sector and had performed poorly over the study period. It is clear; therefore, that Islamic or ethical screening is a major determinant in portfolio selection, hence international and sectoral diversification. Our results show that any argument that Islamic equity investments are less profitable than conventional types of investments is questionable. This is supported by relatively major differences between Sharpe and Treynor measures and significant positive Alpha over the positive returns period when the Dow Jones Islamic Market Index outperformed the Datastream Global Index. It is not out of place here to mention that Islamic equity investments face a greater number of difficulties than conventional equity investments, with screening criteria regarding stock selection imposing either a positive or negative influence, mainly depending on the health of the market. Hence the growth and development of the Islamic equity funds market will depend largely on the nature of innovations, including different investment strategies and risk assessing tools, to be used in compliance with Sharīʿah rules.

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