

ETHICAL INVESTMENT AND SHARI'AH-COMPLIANT INVESTMENT COMPARED: CAN INVESTORS BENEFIT FROM DIVERSIFICATION?¹

ROSYLIN MOHD. YUSOF*, MEJDA BAHLOUS** and SALINA H. KASSIM***

ABSTRACT

This study assesses the extent of correlation between ethical investment and Shari'ah-compliant investments in different economic situations. By employing a battery of time series investigation techniques, this study aims to determine if the nature of the relationship between the funds changes in the non-crisis period and during the 2007 crisis period for three developed markets and major financial centers i.e. US, UK and Japan.

By estimating the short- and long-term dynamics between the ethical and Islamic indexes, and the extent of cointegration between the two funds, our analysis aims to help fund managers as well as investors in the composition of their portfolio by answering the following question: should investors chose one of the two funds or can they further diversify by investing in a fund of funds containing both ethical and Islamic funds for better risk to return performance? Our findings show that ethical and Islamic funds in the three major financial centers have a significantly different behavior in the short run as well as in the long run. This study shows that in the US as well as in the UK and Japan, there are potential diversification benefits for active investors in the short run, as well as for passive investors in the long run before the crisis in the US and in both sub periods in Japan and UK.

Keywords: Islamic investment; ethical investment; performance; diversification benefits.

JEL Classification: C32, C53, G11.

* e-mail: rosylinyusof@yahoo.com.

** e-mail: mbahlous@ix.netcom.com.

*** e-mail: ksalina@iium.edu.my.

¹ We would like to thank the anonymous referee for his/her valuable comments in helping us to improve this paper.

1. INTRODUCTION

Ethical investment represents a distinct investment option which relies on ethical and social criteria to select and manage the investment portfolio (Cowton, 1994). The growth of ethical investments, also frequently referred to as socially responsible investments (SRI) or sustainable investments has gained significance over the last few decades. Ethical investments require a process which integrates social, environmental and ethical considerations into the investment decisions (Renneboog et al., 2008). It is important to note that the definition for “ethical” is relative depending on the values and beliefs of the evaluator. However, for the purpose of this study, this terminology is used as it is being widely adopted in the finance and investment literature.

Investors opting to invest in the ethical investment mainly consider the characteristics of the companies to be invested in, together with the risk-return criteria. Despite being constrained by the ethical screening criteria, the interests in ethical investments continue to grow. According to the Ethical Investment Research Services (EIRIS), ethical investments which have been in existence since the mid-1970s are now gaining increasing interest among the investors. The SRI is a growing market in both the US and Europe as well as Australia and New Zealand. Assets in socially screened portfolios climbed to \$2.71 trillion in 2007, an increase over the \$2.16 trillion in 2003 according to the Social Investment Forum’s Report. From 2005 to 2007 alone, SRI assets increased more than 18 percent, while the broader universe of professionally managed assets increased by less than 3 percent. As of 2007, about 11% of the \$25.1 trillion in total assets under management in the US was undertaking socially responsible investing. As at 2010, total amount of funds invested in SRI increased remarkably to USD3.07 trillion in the US. Indeed, this figure represents approximately 12 percent of the professionally managed assets from both institutional and retail investors in the world (Social Investment Forum, 2010)². The European SRI market grew from €1 trillion in 2005 to €1.6 trillion in 2007 according to the same report. The ethical funds industry is expected to expand rapidly on the back of increasing demand by the investors. A survey conducted by EIRIS³ suggests that more than 70 percent of the respondents interviewed favor their pension scheme to be invested in the ethical investment funds.

From the broad definition of the ethical investment, the Islamic invest-

² Social Investment Forum (2010), www.socialinvest.org.

³ Ethical Investment Research Services, www.eiris.org.

ment or commonly known as the *shari'ah*-compliant investment represents a unique category of the ethical investment (Atta, 2000). Investments are categorized as *shari'ah*-compliant if they are free from the elements that could result in exploitation and unfair gains, namely usury/interest (*riba*), uncertainty (*gharar*), and gambling (*maysir*). *Shari'ah*-compliance also prohibits investments in companies that produce goods that have been scientifically proven to result in damage to health such as alcohol, tobacco, and pork-related products. Similar to the ethical investments which experience rapid growth, *shari'ah*-compliant investments are also at the pinnacle of growth, particularly in the aftermath of the current global financial crisis. According to some estimates, total assets of the Islamic investment funds have reached more than USD250 billion at the end of 2009 (Failaka, 2009). At the global level, the Islamic banking and finance industry are currently experiencing impressive growth rates of approximately 20-25 percent per annum (Bank Negara Malaysia, 2008).

The basic principle of the SRI and the Islamic investment seems to be fundamentally close as both are faith-based traditionally. In fact, ethical investing has its origins in religions such as Judaism, Christianity as well as Islam. Judaism and Christianity originally have teachings and ethical restrictions on how to use money, on loans as well as investments. The Catholic Church imposed a universal prohibition on usury starting 1139 until the 19th century. In England, there was a law which prohibited excessive usury being implemented from 1571-1624. The Methodism (1703-1791) also advocated against sinful trade and profiteering from exploiting others. In contrast to these ancient traditions of ethical investing, the modern SRI is now based on personal values and social convictions of the individual investors. Issues like anti-war, anti-racist movements, environmental protection, human rights and labour relations are common in the SRI investment screen (Reenboog et al., 2008).

Although, these two funds emphasize on a more just and healthy society, one of the main differences between the two lies in the prohibition by Islamic investment of interest bearing loans known as *riba*. An Islamic investor may not purchase fixed income instruments such as Treasury Bills or bonds or preferred stocks as the return is fixed and is not a share of the income generated by the company.

The main criterion distinguishing SRI from Islamic investment is that Islamic investment requires a big emphasis on liquidity, solvency and non-operating interest income. Firms should therefore adhere to financial criteria such as: leverage ratio (debts/12 month trailing market capitalization) should not exceed one third; cash plus interest bearing securities (non-oper-

ating interest income)/12 month average market capitalization] should be at a maximum of 33.3 percent; and accounts receivable cannot represent the majority of total assets (account receivables/12 months average market capitalization) – should be at a maximum of 33.3 percent. Evidently, these requirements make the *shari'ah*-compliant companies much less risky financially (Hussein, 2004; Hayat and Kraeussl, 2011).

While several of the screening criteria of the ethical investment are different compared to the *shari'ah*-compliant investment, the fact that these investments are constrained compared to the unethical investments raised the issue of unfavourable returns of ethical and *shari'ah*-investments. However, this is not necessarily the case. A study conducted by EIRIS (1999) shows that the investment universe constructed on an ethical basis can provide a balance of risk and return which does not look materially different from the FTSE⁴ All-Share Index. Indeed, the study illustrates that several of the ethical investment funds have better returns on average and other funds having lower risk than the conventional funds. Additionally, Renneboog (et al., 2006) investigate the behavior of the investors for socially responsible funds (SRI) or ethical funds by examining the money flows into and out of the SRI funds around the world. The study concludes that in contrast to the conventional funds investors, ethical funds investors care less about the funds riskiness and fees. There is a strand of literature emerging in the recent years on whether the decisions of ethical funds' investors are also affected by non-financial criteria. For instance, Bollen (2007) highlights that investors may have "multi attribute utility function" that is not only based on risk-return performance but also integrates both personal and societal values in the decision making process. This study lends support to the studies of Renneboog (et al., 2006, 2008, 2011) and Zhang (2006).

Consistent with Bollen (2007), Renneboog (et al., 2011) document evidence that the returns of SRI funds in the US, UK, Continental Europe, Asia and the Pacific Rim region are less attributable to past returns than are the conventional funds. This therefore infers that investment decision made by investors may be guided more by the ethical and social issues rather than the fund performance.

A string of other studies lends support to the EIRIS's findings. A study on the risk and return for 15 ethical unit trusts by Luther et al. (1992) suggests that in terms of risk, most of the UK ethical trusts offer a level of volatility closer to that of an internationally diversified index than to a domestic benchmark. Meanwhile, in terms of performance, there appeared to be little

⁴ Financial Times and Stock Exchange, www.ftse.com/Indices/.

evidence of underperformance, instead, there is some weak evidence showing possible above index performance. It is also highlighted that the size distribution of the ethical trust portfolios are skewed towards smaller companies. More importantly, ethical investing is found to possess three common criteria that may have an impact on realized returns: low market capitalization, international diversification and low dividend yield. In a related study, Gregory (et al., 1996) carried out a time-series matched pairs analysis of unit trust performance together with cross-sectional analysis of unit trust performance during the period from January 1986 to December 1994. The study shows that ethical unit trusts have significantly greater exposure than the general unit trusts to the 'small firms' effect, and there is no significant evidence of over- or under-performance by the ethical trusts using an adjusted Jensen measure. However, when a conventional Jensen measure was used, the ethical trusts appeared to exhibit some significant under-performance.

Similarly, Bauer (et al., 2005) analyze the performance of the US, UK and German ethical mutual funds during the period of 1996-2001, and find no evidence of significant difference in terms of risk-adjusted returns between ethical funds and conventional funds.

While there are extensive studies and surveys on the performance of ethical funds, comparative studies on the performance of ethical and *shari'ah* compliant funds have been rather limited. Due to the rather recent nature of the Islamic investment industry, the results of the empirical studies on the performance of the *shari'ah*-compliant funds are generally inconclusive with mixed results found depending on the selection of funds and the periods of analysis.

By using the capital asset pricing model (CAPM), Hakim and Rashidian (2004) examine the extent to which the *shari'ah*-compliant index is correlated with Dow Jones World Index (DJW) and Dow Jones Sustainability World Index (DJS) or green index. The study further concludes that the screening criteria adopted to filter away the non-*shari'ah* compliant funds brings about a unique risk return profile of the *shari'ah* compliant funds which hence, are not affected by other broad equity market. Hussein (2005) examines the impact of *shari'ah* screening on the performance of the FTSE Global Islamic Index and Dow Jones Islamic Market Index (DJIMI). By dividing the sample period between bear and bull market periods, the study provides evidence that *shari'ah* investments do not offer inferior investment performance as compared to their unscreened counterparts. The findings of this study further suggest that application of ethical screenings does not have adverse impact on *shari'ah* compliant funds and vice-versa.

Based on this background, this study aims to determine the difference be-

tween the performance of the ethical investment and *shari'ah*-compliant investment in the pre-crisis and crisis periods in major financial markets such as the US, Japan and UK markets. By employing a battery of time series investigation techniques, the study seeks to examine the extent of correlation between the performance of *shari'ah*-compliant investment and ethical investments in these markets and to determine whether investors can benefit from investing in both funds both in short run and long run.

This study aims to also contribute towards enriching the literature by providing recent evidence on the performance of these special types of funds. To date, empirical evidence on these funds remained limited if compared to the voluminous studies on the conventional funds. In the context of the increasing financial market interests in exploring for alternatives to the current conventional financial instruments in the aftermath of the 2007 global financial crisis, this study is indeed, timely.

While a conventional investor is not restricted in his/her choice of funds, the Islamic investor is restricted to investing in Islamic funds. In this study, we would also examine whether Islamic investors who would like to go beyond Islamic funds and invest also in ethical funds will benefit from diversification. If the Islamic funds are found to be cointegrated with the ethical funds, one can thus infer that there are no benefits of diversification for both Islamic and conventional investors and therefore, for the Islamic investors who invest only based on their religious beliefs, not diversifying does not lead to any loss of return or to any excess risk. However, if both ethical funds and Islamic funds are found to be not cointegrated, both types of investors can therefore benefit from diversification and thus Islamic fund investors may want to invest beyond Islamic funds.

Important implications can also be drawn for the policy prescription of the various countries which are in the process of promoting Islamic finance such as Malaysia, Indonesia, Turkey and Tunisia and in US, UK and Japan. For instance, if Islamic funds and Ethical funds are found to be correlated, the profile of the performance will be considered comparable to Ethical funds, which then, justifies the promotion of Islamic finance by all countries, and vice versa. The promotion of Islamic finance is even more justifiable, if there is no correlation between Ethical and *Shari'ah* funds as this will provide better opportunities of investments by diversifying. The findings of the study would also help fund managers in the selection and management of investment portfolios. In addition, the results of this study will contribute to assisting the industry players to depend on a reliable benchmark for their investments.

2. DATA AND METHODOLOGY

2.1 Data and Data Sources

In line with the objective of understanding the relationship between the ethical investment and Islamic investment, the stock market indices being selected for the purpose of analysis in this study are categorized into two types. First, the ethical investment indices include the FTSE4Good Global Index, FTSE4Good US Index, FTSE4Good UK Index and FTSE4Good Japan Index. The stock returns behavior of the ethical indices are then measured against those of Islamic indices, namely the Eureka Hedge Funds Global Islamic Market Index, Dow Jones Islamic Market US Index, Dow Jones Islamic Market UK Index and Dow Jones Islamic Market Japan Index.

Monthly data are gathered from the *Bloomberg Database*, *FTSE4Good* database and *Eurekahedge Funds* database, covering the period from January 2006 to December 2009. In order to provide enriching discussion of the comparisons between the ethical and Islamic funds, the study analyzes three sample periods: first, the entire period which spans from January 2006 to December 2009; the pre-crisis period from January 2006 to June 2007; and during the crisis period from July 2007 to December 2009. The sub periods are chosen based on the argument that it is during crisis period that investors need to hedge against risk by diversifying their portfolio as opposed to non crisis period. Therefore in this study, a combination of Islamic funds and Ethical funds would bring more diversification benefits in a period of crisis if they are found to be not correlated as opposed to pre-crisis period.

2.2 Autoregressive Distributed Lag Approach (Long Run Analysis)

An Autoregressive Distributed Lag (ARDL) approach as introduced by Pesaran (et al., 1996) is adopted to explore the long-run relationship between the ethical investment and *shari'ah*-compliant investment. The ARDL has numerous advantages. Firstly, unlike the most widely method used for testing cointegration, the ARDL approach can be applied regardless of the stationary properties of the variables in the samples and allows for inferences on long-run estimates, which is not possible under the alternative cointegration procedures. In other words, this procedure can be applied irrespective of whether the series are $I(0)$, $I(1)$, or fractionally integrated (Pesaran and Pesaran 1997; and Bahmani-Oskooee and Ng, 2002), thus avoids problems resulting from non-stationary time series data (Laurenceson and Chai, 2003). Secondly, the ARDL model takes sufficient numbers of lags to capture the data generating process in a general-to-specific modeling framework (Lau-

renceson and Chai, 2003). It estimates $(p+1)k$ number of regressions in order to obtain optimal lag-length for each variable, where p is the maximum lag to be used, k is the number of variables in the equation.

Specifically, the ARDL model used in this study are as follows:

$$FTSE4GGL_t = \alpha_0 + \alpha_1 DJIJP_t + \alpha_2 DJIUK + \alpha_3 IMUS_t + \alpha_4 EUREKAGLI_t + e_t \quad (1)$$

$$FTSE4GJP_t = \alpha_0 + \alpha_1 DJIJP_t + \alpha_2 DJIUK + \alpha_3 IMUS_t + \alpha_4 EUREKAGLI_t + e_t \quad (2)$$

$$FTSE4GUK_t = \alpha_0 + \alpha_1 DJIJP_t + \alpha_2 DJIUK + \alpha_3 IMUS_t + \alpha_4 EUREKAGLI_t + e_t \quad (3)$$

$$FTSE4GUS_t = \alpha_0 + \alpha_1 DJIJP_t + \alpha_2 DJIUK + \alpha_3 IMUS_t + \alpha_4 EUREKAGLI_t + e_t \quad (4)$$

Where indexes are as follows:

FTSE4GGL is Ethical Funds Global; FTSE4GJP is Ethical Funds Japan; FTSE4GUK is Ethical Funds UK; FTSE4GUS is Ethical Funds US; EUREKAGLI is Eureka Global Islamic Funds; DJIJP is Dow Jones Islamic Japan; DJIUK is Dow Jones Islamic UK; and IMUS is Dow Jones Islamic US.

A dynamic error correction model (ECM) can be derived from the ARDL through a simple linear transformation (Banerjee et al., 1993). The ECM integrates the short-run dynamics with the long-run equilibrium, without losing the long-run information. The error correction representation of the ARDL model can be written as follows:

$$\begin{aligned} \Delta \ln FTSE_t = & \alpha_0 + \sum_{j=1}^{k1} b_j \Delta \ln FTSE_{t-j} + \sum_{j=0}^{k2} c_j \Delta \ln DJIJP_{t-j} + \sum_{j=0}^{k3} d_j \Delta \ln DJIUK_{t-j} + \\ & \sum_{j=1}^{k4} e_j \Delta \ln IMUS_{t-j} + \sum_{j=0}^{k5} f_j \Delta \ln EUREKAGLI_{t-j} + \\ & n_1 \ln FTSE_{t-1} + n_2 \ln DJIJP_{t-1} + n_3 \ln DJIUK_{t-1} + n_4 \ln IMUS_{t-1} + \xi_t \end{aligned}$$

Where $FTSE_t$ is the Ethical Funds at time t , DJIJP, DJIUK, IMUS and EUREKAGLI are the Islamic Funds for JP, UK, US and Global respectively.

The terms with the summation signs in the ECM representation are the error correction dynamic while the second part (terms with s) corresponds to the long run relationship. The null of no cointegration in the long run relationship is defined by $H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_0$ is tested against the alternative of $H_a: \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq 0$, by the means of familiar F-test. However, the asymptotic distribution of this F-statistic is non-standard irrespective of

whether the variables are $I(0)$ or $I(1)$. For a small sample size study ranging from 30 to 80 observations, Narayan (2004) has tabulated two sets of appropriate critical values. One set assumes all variables are $I(1)$ and another assumes that they are all $I(0)$. This provides a bound covering all possible classifications of the variables into $I(1)$ and $I(0)$ or even fractionally integrated. If the F-statistic lies exceeds upper bound level, the null hypothesis is rejected, which indicates the existence of cointegration. On the other hand, if the F-statistic falls below the bound level, the null hypothesis cannot be rejected, which supporting no cointegration exist. If, however, it falls within the band, the result is inconclusive.

Finally, in order to determine the optimal lag-length incorporated into the model and select the ARDL model to be estimated, the study employs the Akaike Information Criteria (AIC). Since our study utilizes quarterly data with only 36 numbers of observations, the possible optimal lag-length to be considered is only 4.

In case of ARDL model not significant in the long run, one would infer that the funds are not correlated both in the long run and short run. Therefore, no further short run analysis is required. Conversely, in case the ARDL model is found to be significant in the long run, which means that the two funds are correlated in the long run, we proceed to the short run analysis in order to investigate the behavior of these two funds in the short run and to assess the possible diversification benefits for an active portfolio manager who revises his portfolio continuously

2.3 Variance Decompositions and Impulse Response Functions (Short Run Analysis)

The Variance Decompositions (VDCs) and Impulse Response Functions (IRFs) analysis are respectively adopted to examine the multivariate causality among the variables and to capture the relative strength of the causality among the variables during the sample period. We estimate the VAR and generate the IRFs to study the impacts of the shocks in the ethical funds on the Islamic funds, vice versa (Equations 1 to 4). An IRF measures the time profile of the effect of shocks at a given point in time on the (expected) future values of variables in a dynamical system (Pesaran and Shin, 1998). The approach is well-suited because not only that it allows for the relative strength of the various shocks to be quantified in terms of their contributions to variations in a particular variable of interest, but it also enables the pattern and direction of the transmission of shocks to be traced. (Pesaran and Pesaran, 1997; Narayan, 2004; Ang, 2008)

Further insights about the relationships among the variables can be ob-

tained through the VDC. The VDC which is termed as an out-of-sample causality tests, provides an indication of the dynamic properties of the system by partitioning the variance of forecast error of a certain variable into proportions attributable to innovations (or shocks) in each variable in the system including its own. In other words, the VDC provides a literal breakdown of the change in the value of the variable in a given period arising from changes in the same variable in addition to others in previous periods. According to Sims (1986), a variable optimally forecast from its own lagged values will have all its forecast error variance accounted for by its own disturbances. It is generally observed that in applied research, it is typical for a variance to explain almost all its forecast error variance at short horizons and smaller proportions at longer horizons.

In this present study, we assume that an active portfolio manager is more interested in analyzing the behavior of the funds in the short run as he is managing his portfolio continuously and on a regular basis, while a passive portfolio manager like an individual investor who revises his portfolio on a longer term basis hence will only be impacted by the long run analysis.

By employing ARDL model, it is important to highlight that if both Islamic funds and Ethical funds are found to be positively cointegrated in the long run, we therefore conclude that a passive portfolio manager will not benefit from diversifying in both Islamic and Ethical Funds; if on the other hand they are negatively correlated, we will infer that substantial benefits of diversification exist and investors should therefore diversify in order to reduce the risk. If no correlation is found, one can conclude that there are still possibilities of diversification as the two funds are completely independent. Similarly, if correlation between these two funds is found in the short run (as specified in the 12-month horizon) by using Variance Decompositions and Impulse Response Functions, we can infer that even by being an active portfolio manager, one will not gain from diversification.

3. EMPIRICAL FINDINGS

3.1 Results of ARDL Estimates (Long Run Analysis)

In estimating the short- and long-run relationships between the ethical and Islamic indexes, the first step is to determine the lag-length of the first-differenced variables. Bahmani-Oskooee and Bohl (2000) have shown that the results of this first step are usually sensitive to the lag-length. To verify this, in line with Bahmani-Oskoe and Ng (2002), due to a small sample size,

we impose the optimal lag length of 0 and 1 on the first difference of each variable to compute the F-statistics for the joint significance of lagged levels of variables for the Equations (1) to (4).

The computed F-statistics for lag-length equal to 1 and 0 for all the models are reported in Table 1. The computed F-statistics are significant at least at the 90 percent level when the order of lags equals 1 for all the models tested. This suggests that there exists a cointegrating relationship among the selected variables for all the models. These results are considered as preliminary which enable us to retain the lagged level of the variables.

Table 1: F-statistics for Testing Existence of Long-run Equation

Period	Lag Length	Model 1 GLOBAL	Model 2 JAPAN	Model 3 UK	Model 4 US
Entire	1	2.6989**	2.8418**	3.2669**	2.8000**
Pre-crisis	0	22.4796**	4.9382*	30.0969***	38.8556**
Crisis	1	2.8282*	4.1630**	3.4507**	3.4486**

Note: *, **, and *** denotes that F-Statistics falls above the 90%, 95% and 99% upper bound, respectively.

The next step involves estimating Equations (1) to (4) using the appropriate lag-length selection criterion based on the Akaike Information Criterion (AIC). The results of the estimations are summarized in Table 2. For the entire period of analysis, the results of the long-run ARDL estimates suggest that there is no significant long run relationship between any of the Islamic indices and the ethical indices in any of the model. The results based on the entire period could be inaccurate since in the whole sample period of January 2006 to December 2009, several rounds of significant economic and financial shocks might have significant impact on the performance of both the ethical and Islamic funds and influence the behaviour of both types of funds.

However, when the whole sample period is divided into the pre-crisis and during the crisis periods, several interesting observations can be made. Firstly, there seems to be no long run correlations between ethical funds and *shari'ah* compliant funds in the Global market in both sub periods as captured by Model 1. From this, one can infer that a passive investor may benefit from diversifying between both Ethical and Islamic funds in the global markets.

Secondly for the Japanese market, the DJI Japan is shown to be significantly negatively correlated with the ethical funds as measured by FTSE4GJP during the pre-crisis period but not correlated during the crisis period (as

Table 2: Long-run ARDL Model Estimates

<i>Entire Period</i>	Model 1 GLOBAL (0,0,0,2,2)	Model 2 JAPAN (1,1,0,2,1)	Model 3 UK (0,0,2,2,2)	Model 4 US (0,0,1,2,2)
C	13.5962	89.8952	6.5714	53.7806
DJIJP	7.8618	-11.0333	8.4170	1.7893
DJIUK	-5.4592	28.8299	-6.9700	8.2584
LIMUS	-22.0998	-4.6904	-25.1091	-27.3402
LEGLI	30.8336	-43.3174	39.0615	17.1504
<i>R-Squared</i>	0.83170	0.60906	0.68701	0.72115
<i>DW- Stats</i>	-1.6211	2.0689	2.1593	1.7923
<i>Pre-Crisis Period</i>	Model 1 GLOBAL (0,1,1,1,1)	Model 2 JAPAN (1,1,0,1,0)	Model 3 UK (1,0,1,1,1)	Model 4 US (0,1,0,0,1)
C	-23.2120	346.0287	56.0404	-13.6906
DJIJP	11.7865	-88.6359**	-10.8988	13.003
DJIUK	-13.3848	-31.1238	-21.3612	-25.9844
LIMUS	-25.9456	70.3636	13.3183	-69.9385*
LEGLI	52.4190	-1.1706	18.7194	143.0567**
<i>R-Squared</i>	0.94431	0.70071	0.83508	0.82527
<i>DW- Stats</i>	2.6321	2.1256	2.2383	2.3765
<i>During Crisis Period</i>	Model 1 GLOBAL (0,0,0,0,1)	Model 2 JAPAN (0,1,0,0,1)	Model 3 UK (0,0,0,0,1)	Model 4 US (0,0,0,0,1)
C	-272.0631	132.7698	-327.5309	-522.4797
DJIJP	0.0027912	-0.036073	-0.005660	-0.0026739
DJIUK	-0.015814	0.021052	-0.015929	-0.028513*
LIMUS	23.4226	-5.0881	46.6052	64.3527*
LEGLI	27.0711	-22.1300	2.8016	19.7105
<i>R-Squared</i>	0.79262	0.65942	0.6613	0.65452
<i>DW- Stats</i>	1.8917	2.5512	2.4509	2.0310

Notes: *, ** and *** denotes significantly at 10 percent, 5 percent and 1 percent level of significance, respectively. Figures in the parentheses and squared parentheses are the *t*-statistics values and the selected ARDL model. D-W denotes Durbin-Watson test for autocorrelation.

captured in Model 2 in Table 2). It is important to highlight that a negative correlation between the two funds means possibility of substantial diversification benefits for an investor who holds both Ethical funds and Islamic funds in the pre-crisis period. It is important to remember that a no correlation means that the performance of the two funds are independent and even in this case there are some benefits of diversification in holding both funds in the portfolio. From this one can therefore conclude that a passive investor in Japan can benefit from diversification in both pre-crisis and crisis periods.

Thirdly, for the UK market (as captured by Model 3 in Table 2), the UK Islamic index (DJIUK) is found not to be correlated with the ethical funds in the long run in both periods of analysis. We can then infer that the two funds are also not correlated in the short run. From the investors' point of view, in the UK market, both active and passive investors can benefit from diversification in both pre-crisis and crisis periods. From this it can be inferred that in the UK during all periods of analysis and both in the short run and in the long run, there exist benefits of diversification for investors by considering the *shari'ah*-compliant stocks as well as ethical funds stocks. The different criteria and screening procedures for both ethical funds and Islamic funds may result in different stock returns behavior of these two funds. As such, both types of funds may have responded differently to the economic and financial shocks, providing the portfolio diversification benefits to investors in investing in these funds in the UK.

Finally, for the US, Islamic Funds Index (IMUS) is negative and significantly correlated with the US ethical funds (FTSE4GUS) in the pre-crisis period as evident in Model 4 in Table 2 and Table A-1. This is an interesting result as it suggests that substantial diversification benefits can be gained by investing in both Ethical and Islamic investments in the pre-crisis period. Therefore we can infer that in the long run, a passive investor can benefit from diversification during the pre-crisis period as there is a negative long run correlation of these funds. However, during the crisis period, in the long run, the correlation between the performance of Ethical and Islamic investments is positive and significant in the US. The magnitude of the crisis in the US seemed to have affected both the ethical and Islamic funds in a similar way regardless of the different screening criteria adopted by these funds. In addition, our results in Model 4 (as in Table 2) further indicates that even the performance of Islamic funds in the UK market is found to be negatively correlated with that of US Islamic funds during the crisis period. This suggests that a passive investor in the US can also benefit from diversifying between Islamic funds and between UK and the US markets. It is therefore interesting to note that even though the screening criteria for both *shari'ah*-compliant

TABLE A-1
Summary of Results: Correlation between Ethical Funds and Islamic Funds

	Pre-Crisis		During Crisis		
	Short Run	Long Run	Short Run	Long Run	
Tests Conducted	VDCs & IRFs	ARDL	VDCs & IRFs	ARDL	
Financial Market					Findings: In-Country and across time periods (pre-crisis vs crisis)
US	Not significant	Significant (Negative)	Not significant	Significant	Negative long run correlation during the pre-crisis and long run correlation in crisis periods in the US market.
UK	Not significant	Not significant	Not significant	Not significant	No correlation in the UK market during the pre-crisis and crisis periods.
Japan	Significant (around 30 percent over a 12 month horizon)	Significant (Negative)	Not significant	Not significant	Negative long run correlation in the pre-crisis period in Japanese market during pre-crisis period.
Findings: Short run and Long run Correlations Across-Countries.	Short run Correlation exists for Japanese market in this pre-crisis period.	Long run Correlation exists for both US and Japanese markets in this pre-crisis period.	No Short run Correlation exists for the US, UK and Japanese markets.	Long run Correlation exists in the US market.	

Note: Negative correlation means substantial diversification benefits which can lead even to complete elimination of risk.

TABLE A-2
Summary of Results: Benefits of diversification between Ethical Funds and Islamic Funds

	Pre-Crisis		During Crisis		
	Short Run	Long Run	Short Run	Long Run	
Tests Conducted	VDCs & IRFs	ARDL	VDCs & IRFs	ARDL	
Financial Markets					Findings: In-country and across time periods
US	Yes	Yes	Yes	No	Benefit of diversification exists during the pre-crisis both in the short run and in the long run and for the crisis periods, benefits of diversification exist in the US market only in the short run.
UK	Yes	Yes	Yes	Yes	There exist benefits of diversification in the UK market during the pre-crisis and crisis periods and both in the short and in the long long run.
Japan	No	Yes	Yes	Yes	Benefits of diversification in Japanese market exist during the pre-crisis period in the long run and during crisis period both in the short run and in the long run.

and ethical funds differ, they exhibit the same behavior in the long run during the crisis period. We can therefore conclude that from the ARDL model, Islamic investors in the US during crisis periods, who invest only based on their religious beliefs, not diversifying does not lead to any loss of return or to any excess risk in the long run.

3.2 Results of Variance Decomposition Analysis (Short Run Analysis)

The VDC enables the determination of which Islamic indices are important in explaining the forecast error variances of the ethical indices in the pre-crisis and post-crisis periods in the short run. As an extension to the long run ARDL results, VDC for the stock indices are shown to have significant relationship with other stock indices over a 12 month horizon. Therefore, only the VDCs for the following stock indices: Model 4 for the US for the pre-crisis and during-crisis period, and Model 2 for Japan in the pre-crisis period are presented.

As shown in Table 3, the VDC results suggest a weak relationship between the FTSE4GUS with the IMUS. Specifically, the IMUS accounts for around 19 percent of the forecast error variances of the FTSE4GUS. These findings suggest that there is no significant correlation between the Islamic index of the US and its ethical index counterpart in the short run during the pre-crisis period. In the crisis period, the VDC results suggest similar findings. There is no significant influence of the Islamic indices (contributing around 19 percent) in explaining the forecast error-variances of the FTSE4GUS (or vice versa). As evident in the Table 4, in the pre-crisis period, in the short run, the Ethical funds in Japan are significantly correlated with the Islamic Indices in Japan. For instance, both Islamic Indices in Japan contributes around 27-29 percent in explaining the forecast error variances of the Ethical Funds in Japan.

3.3 Results of Impulse Response Functions (Short Run Analysis)

The results of the Impulse Response Functions (IRF) seem to support earlier findings on Variance decompositions. As evident in Figure 1, in the short run (a period of 12 months), ethical funds in the US are not significantly correlated to Islamic Indices during the pre-crisis period. The same result is observed during the crisis period. It is interesting to note that while in the long run during the crisis, no possibilities of diversification are found because of the positive correlation, in the short run however benefits of diversification exist in the US market during both pre-crisis and crisis periods. If passive investors could have gained from diversifying only in pre-crisis, on the contrary, active investors in the US could have benefited in the short run during both sub periods by the diversification of their portfolio.

Table 3: Variance Decomposition for US Ethical Index

Period	D4GUS	DDJIJP	DDJIUK	DIMUS	DEGLI
<i>Pre-Crisis Period</i>					
1	100.0000	0.000000	0.000000	0.000000	0.000000
2	74.42391	2.048210	8.810229	9.353700	5.363956
3	67.52147	1.959854	6.348696	10.24642	13.92355
4	61.40540	1.868185	6.587405	17.03486	13.10416
5	59.21316	2.080957	6.125200	16.01390	16.56678
6	56.36839	1.982091	5.800205	18.78123	17.06808
7	56.45558	2.075790	5.977128	18.72304	16.76846
8	56.14675	2.084110	5.935918	18.99155	16.84167
9	56.09518	2.067340	6.079106	19.06229	16.69609
10	56.07282	2.065765	6.233422	18.99319	16.63480
11	56.11167	2.062758	6.245070	18.96112	16.61937
12	56.08588	2.059238	6.339972	18.92235	16.59256
<i>During Crisis Period</i>					
1	100.0000	0.000000	0.000000	0.000000	0.000000
2	74.42391	4.406829	8.810229	9.353700	3.005337
3	67.52147	6.035780	6.348696	10.24642	9.847627
4	61.40540	5.440112	6.587405	17.03486	9.532230
5	59.21316	6.581039	6.125200	16.01390	12.06670
6	56.36839	6.292089	5.800205	18.78123	12.75808
7	56.45558	6.348001	5.977128	18.72304	12.49625
8	56.14675	6.387315	5.935918	18.99155	12.53847
9	56.09518	6.325752	6.079106	19.06229	12.43768
10	56.07282	6.305921	6.233422	18.99319	12.39465
11	56.11167	6.295364	6.245070	18.96112	12.38677
12	56.08588	6.285403	6.339972	18.92235	12.36639

The impulse response functions of the Japanese market, shows that in the short run, during the pre-crisis period, ethical funds in Japan are significantly correlated to the Islamic funds. This is not the case during crisis period as no significant correlation is found. In the context of this present study, it is important to reiterate the existence of potential diversification benefits only in the long run in the pre-crisis period and both in short run and long run

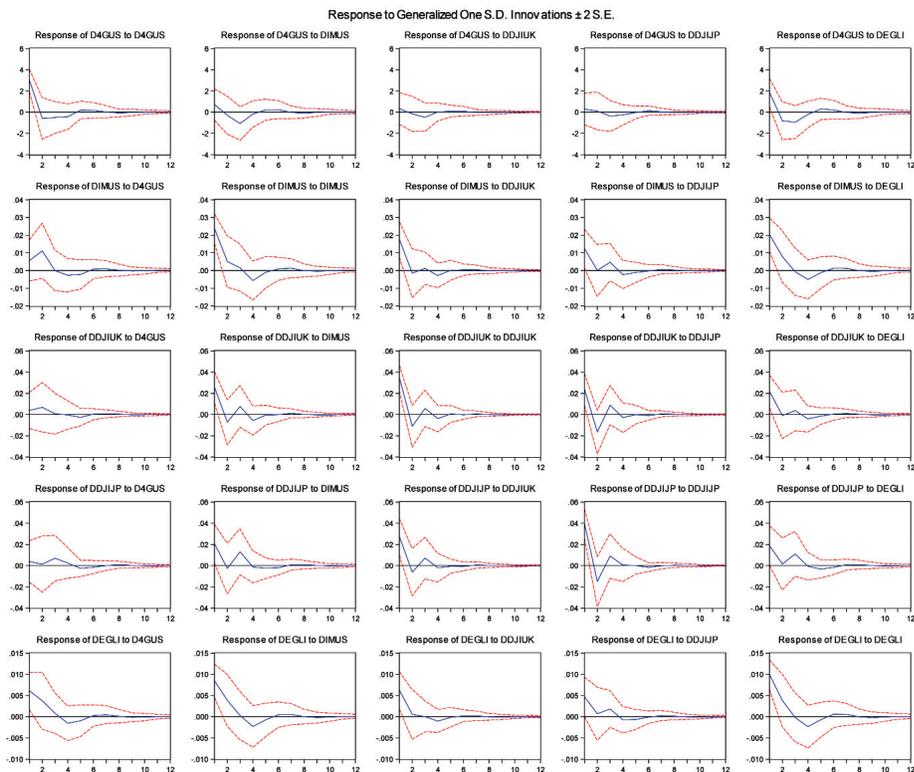
Table 4: Variance Decomposition in Pre-Crisis Period

Period	S.E.	D4GJP	DDJJP	DIMUS	DDJIUK	DEGLI
Variance Decomposition of D4GJP						
1	4.768661	100.0000	0.000000	0.000000	0.000000	0.000000
2	7.022078	54.59642	23.26567	19.48061	0.837331	1.819972
3	8.079889	41.28797	28.97312	25.45820	2.366702	1.914011
4	8.285834	39.46388	29.04182	26.69047	2.874806	1.929026
5	8.298585	39.46072	28.95491	26.69455	2.948451	1.941373
6	8.307326	39.38584	29.06138	26.67017	2.942390	1.940232
7	8.312941	39.33515	29.10660	26.67559	2.944227	1.938436
8	8.313991	39.33056	29.10927	26.67572	2.946133	1.938312
9	8.314091	39.33158	29.10869	26.67509	2.946200	1.938441
10	8.314201	39.33073	29.10930	26.67534	2.946173	1.938453
11	8.314254	39.33023	29.10953	26.67556	2.946233	1.938444
12	8.314263	39.33018	29.10953	26.67560	2.946257	1.938442
Variance Decomposition of DDJJP						
1	0.040659	5.446137	94.55386	0.000000	0.000000	0.000000
2	0.046164	11.61999	81.12068	4.462428	0.003244	2.793650
3	0.047431	14.05469	76.87091	5.226827	0.204943	3.642635
4	0.048132	14.05915	75.71358	5.921677	0.411781	3.893812
5	0.048472	13.87439	75.04960	6.681269	0.472366	3.922380
6	0.048532	13.84455	74.92325	6.774111	0.524008	3.934078
7	0.048537	13.84373	74.91005	6.782646	0.526313	3.937262
8	0.048540	13.84222	74.91017	6.783430	0.526333	3.937842
9	0.048541	13.84181	74.90982	6.783891	0.526616	3.937859
10	0.048541	13.84205	74.90939	6.783997	0.526654	3.937913
11	0.048541	13.84214	74.90925	6.784018	0.526655	3.937935
12	0.048541	13.84213	74.90920	6.784070	0.526663	3.937938

during the crisis period. An active investor can only benefit from diversification between these two funds in Japan during the crisis period, whereas, a passive investor, can benefit from diversification in both pre-crisis and during crisis periods.

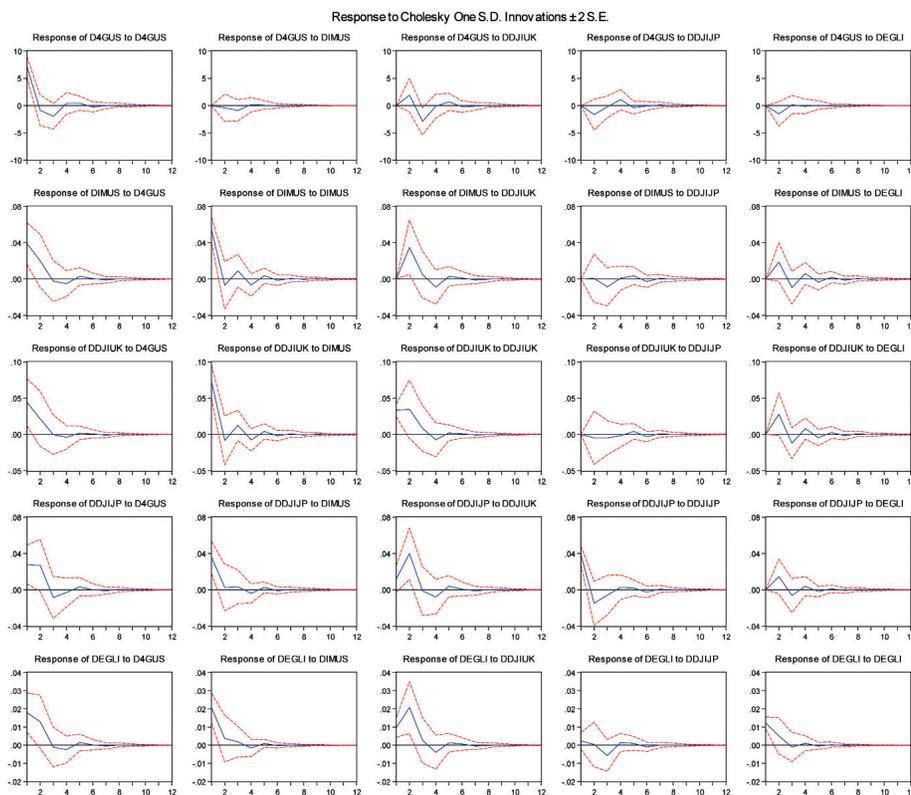
One can therefore conclude that an active portfolio manager in the US, in both pre-crisis and during crisis periods, can benefit from the difference of

Figure 1. Impulse Response Functions in Pre-Crisis Period



the behavior of these funds in the short run, while a passive investor could have benefited from diversifying in the two funds in the pre-crisis period (negative correlation) but not during the crisis period (positive correlation). For Japan, during crisis period both active and passive investors can benefit from diversification, whereas, for pre-crisis period, only a passive investor in Japan could have benefited from diversifying in both the funds. This could be due to the fact that both Islamic funds and Ethical funds react differently during crisis as opposed to during the pre-crisis period. Even though the two funds in Japan were correlated before the crisis period, holding them both during crisis could have helped to diversify away some of the unwanted movements of the portfolio value. This is indeed an interesting result, as it is during crisis that investors need to hedge against risk and will do so by diversifying in both funds. As highlighted in the long run analysis, the two

Figure 2. Impulse Response Functions During Crisis Period



funds in the UK are correlated neither in the short run nor in the long run. This therefore suggests that in the UK, investors can benefit from diversifying in the two funds both in the short run and the long run.

Lastly, the stability of the long run coefficients is examined together with the short-run dynamics. Following Pesaran and Pesaran (1997), we apply the cumulative sum (CUSUM) and the cumulative sum squared (CUSUMSQ) of recursive residual test proposed by Brown et al. (1975). Based on the graphical representations for CUSUM and CUSUMSQ tests, the results indicate no evidence of any significant structural instability⁵. Therefore we can infer that all models tested are stable which adds to the robustness of our results.

⁵ Because of space constraints, the graphical plots of the CUSUM are not included here. However, the plots are readily available upon request from the authors.

4. CONCLUSION

With the objective of comparing the performances of the ethical investments and *shari'ah*-compliant investments in different economic situations, this study adopts several investigation techniques to arrive at conclusive findings. It also aims to determine if the nature of the relationship between the funds changes in the non-crisis period and during crisis period for three developed markets; US, UK and Japan. We examine both short run and long run dynamics between these funds based on in-country as well as across-countries analyses.

The study finds that the ethical and *shari'ah* funds are significantly negatively correlated in the long run during the pre-crisis period in the US as well as in Japan; while during the crisis period they are significantly positively correlated in the US and not correlated in Japan. The results based on the VDC analysis show that in the short run, there is no significant correlation between the ethical and *shari'ah* funds in the US during these two periods and only during crisis in Japan. An active investor can therefore benefit from diversification in the US market by investing in both Ethical and Islamic funds, while a passive investor who cares only about the long run could have eliminated substantially the variability of the fund by investing in both Ethical and Islamic before the crisis in the US and in Japan as well as during the crisis for Japan. Accordingly, for the UK market, there is no correlation between the ethical and *shari'ah* funds in both short run and long run as well as in both pre-crisis and during crisis periods. For both active and passive investors in the UK market, considering a distinct option to diversify their investment portfolio, this study suggests that there exist benefits of diversification by considering both the *shari'ah*-compliant stocks and ethical funds stocks. The different criteria and screening procedures for both ethical funds and Islamic funds seem to have resulted in different stock returns behavior of these two funds in the UK.

Holding Islamic funds or Ethical funds in the crisis period would have yielded the same performance because they seem to be positively correlated in the long run. However, an active portfolio manager would have benefited from short term differences in their behavior. It is therefore possible to conclude that there are benefits of diversification in all major markets analyzed i.e. US, UK and Japan. An investor who is not only investing according to his religious beliefs can therefore go beyond ethical funds or Islamic funds as they can benefit from diversification by investing in both ethical and *shari'ah* compliant funds in all major markets.

Islamic fund investors who are constrained (due to their religious belief)

to invest solely in Islamic funds should investigate other possibilities of diversification. This is also true for ethical funds' investors, who would be constrained to invest only in ethical funds. Further research should therefore address the following question: can these investors benefit from holding an internationally diversified portfolio of solely Islamic products or solely ethical funds?

References

- Atta H., 2000, *Ethical Rewards*, available at: http://www.failaka.com/Failaka_Research.htm.
- Ang J.B., 2008, "What Are the Mechanisms Linking Financial Development and Economic Growth in Malaysia?", *Economic Modeling*, Vol. 25, 2008, pp. 38-53.
- Bahmani-Oskooee M. and R.W.C. Ng, 2002, "Long-run Demand for Money in Hong Kong: An Application of the ARDL Model", *International Journal of Business and Economics*, Vol. 1, No. 2, pp. 147-155.
- Banerjee A., J.J. Dolado, J.W. Galbraith and D.F. Hendry, 1993, *Cointegration, Error-Correction and the Econometric Analysis of Non-stationary Data*, United Kingdom: Oxford University Press.
- Bank Negara Malaysia, 2008, *Annual Report*.
- Bauer R., K. Koedijk and R. Otten, 2005, "International Evidence on Ethical Mutual Fund Performance and Investment Style", *Journal of Banking and Finance*, Vol. 29, No. 7, pp. 1751-1767.
- Bollen N., 2007, "Mutual Fund Attributes and Investor Behavior", *Journal of Financial and Quantitative Analysis*, Vol. 42, pp. 683-708.
- Cowton C.J., 1994, "The Development of Ethical Investment Products", published in *The ACT Guide to Ethical Conflicts in Finance*, pp. 213-232, Oxford, UK: Blackwell Publishers.
- Ethical Investment Research Service, 2002, *EIRIS SRI Fund Statistics*, available at: <http://www.eiris.org>.
- Failaka International, 2002, *Islamic Equity Funds: Analysis and Observations on the Current State of the Industry*, available at: <http://www.failaka.com>. Accessed in August 2002.
- Gregory A., J. Matatko and R. Luther, 1997, "Ethical Unit Trust Financial Performance: Small Company Effects and Fund Size Effects", *Journal of Business Finance and Accounting*, Vol. 24, No. 5, pp. 705-24.
- Hakim S. and M. Rashidian, 2004, "How Costly Is Investor's Compliance to Sharia?", paper presented at the *11th Economic Research Forum Annual Conference* in Sharjah, U.A.E, December 14-16, Beirut, Lebanon.
-

- Hayat R. and R. Kaeussl, 2011, "Risk and Return Characteristics of Islamic Equity Funds", *Emerging Markets Review*, 12 (2011), 189-203.
- Hussein K., 2004, "Ethical Investment: Evidence From FTSE Islamic Index", *Islamic Economic Studies*, Vol. 12, No. 1, pp. 22-40.
- Hussein K., 2005, "Islamic Investment: Evidence From Dow Jones and FTSE Indexes", paper presented at the 6th International Conference on Islamic Banking and Finance, Jakarta, Indonesia, November 21-14, 2005.
- Laurenceson J. and J.C.H. Chai, 2003, *Financial Reform and Economic Development in China*, Edward Elgar, Cheltenham, UK.
- Luther R., J. Matatko and D. Corner, 1992, "The Investment Performance of UK "Ethical" Unit Trusts", *Accounting Auditing & Accountability Journal*, Vol. 5, No. 4, pp. 57-70.4
- Narayan P.K., 2004, "Reformulating Critical Values for the Bounds F-Statistics Approach to Cointegration: An Application to the Tourism Demand Model for Fiji", *Discussion Paper*, No. 02/04, Department of Economics, Monash University.
- Pesaran M.H. and B. Pesaran, 1997, *Working with Microfit 4.0: Interactive Econometrics Analysis*, Oxford University Press, UK.
- Pesaran M.H., Y. Shin and R.J. Smith, 1996, "Testing for the Existence of a Long-Run Relationship", *DAE Working Paper*, No. 9622, Department of Applied Economics, University of Cambridge.
- Renneboog L., J.T. Horst and C. Zhang, 2006, "Is Ethical Money Financially Smart?", *TILEC Discussion Paper*, Tilburg University, pp. 1-47.
- Renneboog L., J.T. Horst and C. Zhang, 2008, "Socially Responsible Investments: Institutional Aspects, Performance and Investor Behavior", *Journal of Banking and Finance*, Vol. 32, pp. 1723-1742.
- Renneboog, L., J.T. Horst and C. Zhang, 2011, "Is Ethical Money Financially Smart? Nonfinancial Attributes and Money Flows of Socially Responsible Investment Funds", *Journal of Financial Intermediation*, Vol. 20, No. 4, 1-27.
- Zhang C., 2006, *Ethics, Investments and Investor Behavior*, PhD thesis, No. 179, Tilburg University.

Résumé

L'étude vise à analyser de façon robuste la corrélation entre le rendement des investissements éthiques et des investissements islamiques conformes à la *shari'ah* durant deux situations économiques différentes dans les grands centres financiers i.e. U.S., U.K., et le Japon et ceci en utilisant une batterie de tests en séries temporelles. En évaluant les relations à court et à long terme entre les indices éthiques et islamiques et en analysant l'étendue de la cointégration entre les deux fonds, l'étude vise également à aider les gérants de portefeuille ainsi que les investisseurs à apporter une ré-

ponse à la question suivante: Doit-on choisir entre les deux fonds islamiques et éthiques ou peut-on diversifier davantage en formant un portefeuille contenant les deux fonds ensemble afin d'atteindre une meilleure performance en termes de rendement-risque? Cette étude montre des différences significatives dans le comportement des deux fonds sur les différentes sous périodes et sur les différents marchés étudiés. Sur le marché américain, Japonais et Anglais, il y a eu des possibilités de gains de diversification à court terme. Un gérant de portefeuille actif bénéficierait en effet des différences dans le comportement de court terme des deux fonds alors qu'à long terme, aux USA uniquement avant la crise, et au Royaume Uni et au Japon sur les deux sous périodes analysées, on pouvait réduire le risque grâce à la diversification.

Mots-clés: investissement islamique; l'investissement éthique, performance; avantages de la diversification.