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Comparison of Portfolio Selection and Performance: Shari'ah-Compliant and Socially Responsible Investment Portfolios

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This study examines the effect of Islamic screening criteria on Shari'ah-compliant portfolio selection and performance compared to Socially Responsible Investment (SRI) portfolio. Each portfolio constructed from 15 stocks based on FTSE 100 using data from year 1997. Mean-variance portfolio optimization is employed with some financial ratios added as constraints for the Shari'ah portfolio. Annual expected return of each portfolio from 2008 to 2013 is used to calculate Sharpe's ratio, Treynor ratio and Jensen's alpha as the performance measurement tools. Macroeconomic variables are assessed using ordinary least square to examine whether they influence the portfolios' expected returns or not. The result finds that Shari'ah portfolio has a better performance than SRI from year 2008 to 2010 shown by higher value of the measurement tools. However, from 2011 to 2013, SRI portfolio has better performance than Shari'ah portfolio.

Keywords: *Islamic screening criteria, Shari'ah portfolio, SRI portfolio, portfolio performance, macroeconomic variables*

Introduction

Portfolio optimisation remains an important research area, which has essential consequences for the practice of it. Theoretically, Markowitz (1952) suggests that portfolio optimization should be determined by mean-variance theory. Investors will choose asset with higher risk as long as it is compensated with higher return. However, investors who consider about investing in *Shari'ah*-compliant assets would like to have an alternative for their investment that could fulfil Islamic finance principles. The rising awareness from investors about Shari'ah-compliant investment and also development of Islamic finance led to the establishment of *Shari'ah* screening processes for assets to be classified as *Shari'ah*-compliant assets or stocks; Dow Jones, S&P, and FTSE established the Islamic screening criteria and Islamic indices as guidance for investors to participate in capital market that complies with their belief.

For assets to be classified as *shari'ah-compliant*, the assets have to go through screening process. There are two types of *Shari'ah* screening processes: qualitative and quantitative criteria (Derigs & Marzban, 2008). The qualitative criteria is related to the type of products and business the company engaged with, while quantitative criteria related to the proportion of asset, liabilities, equity, and revenues in the balance sheet and income statement. The former does not relatively change over time, since it needs planning and management to change the products sold by company. Another portfolio investment that does not only consider about mean-variance is Socially Responsible Investment (SRI). There are some requirements to

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be fulfilled for a stock to be classified as SRI stocks. The difference from *Shari'ah*-compliant stocks is that SRI does not have quantitative criteria to be fulfilled.

This research aims to examine the effect of additional requirements other than mean-variance theory in Islamic portfolio selection and performance. In doing so, this study examines Islamic portfolio by comparing with SRI portfolio selection and performance, which then examining the macroeconomic variables' effect on portfolio return.

Literature Review

Islamic finance has unique characteristics in conducting business transactions. Two of the main principles are to avoid *riba* and *gharar* (Kahf, 2009). The prohibition of *riba* and *gharar* affects the operation of capital markets, and therefore, investors who want to invest in capital market without violating *Shari'ah* principles need guidance to participate in investment. Thus, *Shari'ah* scholars develop Islamic screening criteria for investing in capital market, especially investing in stocks.

As mentioned, Islamic screening criteria consist of two types, qualitative and quantitative criteria. The qualitative criteria are that companies should not be involved in money-lending and interest transactions, such as banks and insurance companies (Ghoul & Karam, 2007). Other criteria are that the companies should not involve in the production, distribution, and/or profiting from alcohol, pornography, tobacco, gambling, weapons, music, entertainment, processing pork meat or non-*halal* meat, hotels, and airlines which serve alcohol on their premises.

However, there are different requirements for the quantitative criteria depending on the institutions issuing the criteria (Derigs & Marzban, 2008). The quantitative criteria are related to liquidity ratio, interest ratio, debt ratio, and non-permissible ratio.

As for SRI, it is initially based on religious reasoning, for example the prohibition of usury from Christianity and Islam. However, as the time and knowledge evolves, modern SRI is more based on the varying personal ethical and social beliefs of individual investors (Renneboog et al., 2008). First modern SRI is the Pax World Fund established 1971 in United States, which aims for investors who are opposed to Vietnam War.

The SRI screening criteria is divided into positive and negative. The positive screening is that investing in company which has strong labour relations and workplace conditions, involves in recycling, waste reduction, and environmental clean-up, concerns about sustainability, employment diversity, renewable energy, biotechnology, and community involvement.

On the other hand, the negative screening results imply that investors should not consider investing in companies which involve in tobacco, alcohol, gambling, defence/weapons, irresponsible foreign operations, antitrust violations, consumer fraud, marketing scandals, human rights violation, animal testing, development of genetic engineering for agricultural applications, insurance for non-married couples, healthcare, interest-based financial institutions, and pork producers.

To construct portfolio, Markowitz (1952) introduces the mean-variance optimization for finding the optimal portfolio. The optimization problem is solved by minimizing variance of the portfolio subject to certain expected portfolio return and the sum of the assets weight is equal to one. Non-negativity constraint could be imposed if short sale is not allowed.

There could be many efficient portfolios according to the expected portfolio return determined. Those portfolios could form efficient frontier line, as investors decide the portfolio to invest by maximizing their utility function. The optimal portfolio is located in the tangent point between efficient frontier and indifference curve formed from the utility function.

Derigs & Marzban (2009) develops the mean-variance theory by imposing financial ratio requirements, as constraints to adjust for the quantitative Islamic screening criteria. In addition, Hazny *et al.* (2011) develops mean-variance under Islamic framework by imposing income cleansing or purification to the equation of portfolio's expected return and standard deviation.

One way to evaluate portfolio performance is by examining the rate of return and comparing it with other portfolios, which have similar characteristics. However, this could be better if the return is adjusted to risk so that the port-

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Table 1. Summary Statistics

Share Prices' Returns	Mean	Std. Dev.	Minimum	Maximum
WEIR	0.0136	0.0893	-0.2352	0.2833
GKN	0.0059	0.0897	-0.2202	0.2120
MGGT	0.0152	0.0936	-0.3696	0.2552
BNZL	0.0119	0.0723	-0.1643	0.3050
PSN	0.0137	0.0996	-0.2296	0.3313
SHP	0.0179	0.1043	-0.3643	0.4285
CPI	0.0236	0.1045	-0.3172	0.5880
TLW	0.0222	0.1239	-0.2878	0.3333
ANTO	0.0227	0.0982	-0.2165	0.4743
SN.	0.0115	0.0774	-0.1505	0.3333
RR.	0.0064	0.0669	-0.2191	0.2073
AZN	0.0046	0.0753	-0.2078	0.2181
BG.	0.0212	0.0700	-0.2187	0.2660
AAL	0.0154	0.1074	-0.3654	0.4724
RIO	0.0181	0.0958	-0.2174	0.2798
AHT	0.0171	0.2004	-0.7523	1.0965
BAB	0.0212	0.1060	-0.2944	0.3118
SGE	0.0184	0.1292	-0.2330	0.7444
GFS	0.0154	0.0896	-0.2778	0.2932
ITV	0.0011	0.1105	-0.4000	0.3440
WPP	0.0125	0.1024	-0.2790	0.3936
VOD	0.0135	0.0874	-0.2383	0.2823
IMI	0.0037	0.0854	-0.2931	0.1988
TPK	0.0102	0.0867	-0.2138	0.2602
BDEV	0.0097	0.1104	-0.3207	0.3459

folios are truly comparable. The risk-adjusted return portfolio performance measurements are Sharpe's ratio, Treynor ratio, and Jensen's alpha (Bodie *et al*., 2009).

In addition, using different kind of dataset, prior studies show different results. For example, Hashim (2008) also finds that Islamic index has better performance than SRI index. However, Girard & Hassan (2008) find that there is no different performance between Islamic and non-Islamic index. Moreover they find that there is similar reward to risk and diversification benefit for both portfolios. Lastly, Hazny *et al.* (2011) find that the efficient frontier of Islamic portfolio outperforms for low risk, but underperforms for high risk.

Research Method

The dataset contains data from 101 companies listed in London Stock Exchange and included in FTSE 100. The monthly adjusted stock prices, annual UK interbank 6-month (risk-free rate of return), FTSE 100 price index (market return), income statement, and balance sheet are generated from Datastream. The use of 6-month UK interbank does not violate shari'ah clauses as long as the basic requirements are being complied, for example the screening for shari'ah stocks (Ayub, 2007). In addition, the data for annual interest income and interest expense are taken from Bloomberg.

Monthly stock prices are generated from January 1997 up to December 2007 to calculate return employed for portfolio construction. Then annual financial ratios calculated from income statement and balance sheet information are applied for constraints in the *Shari'ah* portfolio optimization. Moreover, stock prices at the end of the year of 2008 until 2013 are used to evaluate the portfolio performance. The period of the study includes the time of crisis so that its effect could be examined.

For this study, two portfolios are constructed: *Shari'ah* and SRI portfolio. Qualitative screening criteria based on FTSE Shariah Global Equity Index Series Ground Rules are used to determine stocks included in *Shari'ah* portfolio, while FTSE4Good Index Inclusion Criteria are employed to determine stocks belonging to SRI portfolio. For the SRI portfolio, companies classified as having risk level of 3 for environmental management are excluded.

After employing qualitative screening criteria, the next requirements are examined. Companies which do not have stock price starting January 1997 and annual report ending in December are excluded. As a result, 21 stocks for *Shari'ah* portfolio and 50 stocks for SRI portfolio remained. To construct portfolio, 15 stocks were considered to be included in each type of portfolio. For *Shari'ah* portfolio, those 21 stocks divided into 3 parts based on market capitalisation: small, medium, and large capitalisation and 5 stocks selected from each category. For SRI portfolio, companies which are classified as risk level 1 are selected first then followed by the risk level 2 companies. Table 3.1 shows the list of the stocks.

Markowitz (1952) introduces the mean-variance theory to construct portfolio optimization. It is argued that mean or expected return is desirable by investors, while variance of return is not desired by investors. Moreover, the objective and constraints in constructing the portfolio are shown in equations from (1) to (4).

$$Min\ Variance = \sum_{i=1}^{n}\sum_{j=1}^{n} X_i X_j \sigma_{ij} \qquad 1)$$

Subject to:

$$Expected\ return = \sum_{i=1}^{n} X_i \mu_i = \text{targeted} \qquad 2)$$

$$\sum_{i=1}^{n} X_i = 1 \qquad 3)$$

$$X_i \geq 0, \qquad i = 1,2,3,\ldots,n \qquad 4)$$

where X_i is weight of asset i, μ_i is the return of asset *i*, and σ_{ij} is covariance between asset *i* and asset *j*.

Derigs & Marzban (2009), as an extension, impose quantitative criteria of Islamic screening as constraints in constructing portfolio optimization shown in equation (5) to (9).

$$r_i(g) \leq T(g), \quad r_i = financial\ ratio, \quad T = permissible\ threshold$$

$$X_i = 0 \quad if \quad r_i(g) > T(g)$$

$$Z_i = \begin{cases} 1 & if\ it\ is\ compliant \\ 0 & otherwise \end{cases} \qquad 6)$$

Thus, the additional constraints are:

$$X_i \leq z_i, \qquad i = 1,2,3,\ldots,n \qquad 8)$$

$$r_i(g).z_i \leq T(g) \qquad i = 1,2,3,\ldots,n \qquad 9)$$

The next step is determining different values of expected return so that there are many portfolios, which then construct minimum-variance set line. The line above minimum global variance is known as efficient frontier since it has higher return for the same risk. Having the efficient frontier, indifference curve should be drawn to determine the optimal portfolio, which is the intersection point between those two curves. This procedure is repeated for the following years to determine the portfolio composition and examine the performance.

In this research, financial ratios established by FTSE are used, since it has more requirements than other institutions and it uses total assets as denominator rather than market value which represent the true value of company. After constructing the portfolio optimization, the portfolio performance is examined. There are three portfolio performance measurements used: *Sharpe's* ratio, Treynor ratio and Jensen's alpha. The reason of using these ratios for measuring shari'ah portfolio performance is the same as using 6-month UK interbank rate for the risk-free rate of return mentioned before.

Sharpe's ratio indicates that portfolio with higher ratio value has higher excess return by having the same risk meaning that this portfolio has better performance. Treynor ratio indicates that portfolio with higher ratio value has higher excess return by having the same systematic risk meaning that this portfolio has better performance. As for Jensen's alpha, portfolio which has positive Jensen's alpha indicates that this portfolio could generate abnormal return compared to return calculated using Capital Asset Pricing Model (CAPM) assuming that CAPM holds.

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Table 2. Macroeconomic Variables and Definition

Variable	Definition	Calculation
rshar	Shari'ah portfolio return	$rshar = \sum_{i-1}^{n} X_i \mu_i$
rsri	SRI portfolio return	$rsri = \sum_{i-1}^{n} X_i \mu_i$
dInd	Change in Industrial production index	$dInd_t = Ind_t - Ind_{t-1}$
dExch	Change in Exchange rate (£/$)	$dExch_t = Exch_t - Exch_{t-1}$
dUnemp	Change in Unemployment rate	$dUnemp_t = \frac{(Unemp_t - Unemp_{t-1})}{100}$
dTerm	Change in Term structure	$dTerm_t = \frac{(LTGB_t - Tbill_t) - (LTGB_{t-1} - Tbill_{t-1})}{12x100}$
dInflation	Change in Inflation	$dInflation_t = \frac{(CPI_t - CPI_{t-1})}{CPI_{t-1}} - \frac{(CPI_{t-1} - CPI_{t-2})}{CPI_{t-2}}$
dM1	Change in Money supply	$dM1_t = In(M1)_t - In(M1)_{t-1}$
dOil	Change in Crude oil price	$dOil_t = In(Oil)_t - In(Oil)_{t-1}$

Notes: LTGB is Long-term Government Bond, CPI is Consumer Price Index

Macroeconomic variables could be examined whether they have any effect on the portfolio return or not. Based on the previous studies, multiple regression using Arbitrage Pricing Theory (APT) with ordinary least square procedure could be used to examine the macroeconomic effects (Brooks, 2002). Table 2 explains the variables and their definition.

Result and Discussion

In constructing the portfolio optimization, expected return and covariance matrix of the assets are estimated using historical data. The first portfolio is constructed at the end of year 2007 by using historical data from January 1997 until December 2007.

After calculating the expected return and covariance of the assets in the previous section, optimal portfolio could be obtained. The next procedure in the analysis is to draw minimum-variance set, which contains optimal portfolios. After obtaining the efficient frontier, indifference curve is required to determine the portfolio preferred by investors. Having all the data, optimal portfolio, which is preferred by investors could be determined.

Since the financial ratios change every year, it is required to evaluate the portfolio composition annually for *Shari'ah* portfolio. In addition, the SRI portfolio is also evaluated annually by this study to examine the different composition with *Shari'ah* portfolio. The procedure of portfolio optimization is conducted by obtaining the minimum-variance set, through which establishing efficient frontier, leading to the estimation of utility function and indifference curve. This process is repeated from year 2008 to 2012.

There is optimal portfolio each year for both *Shari'ah* and SRI portfolios. These portfolios are constructed from 15 assets, which then due to the optimization requirements, the portfolios consist of smaller

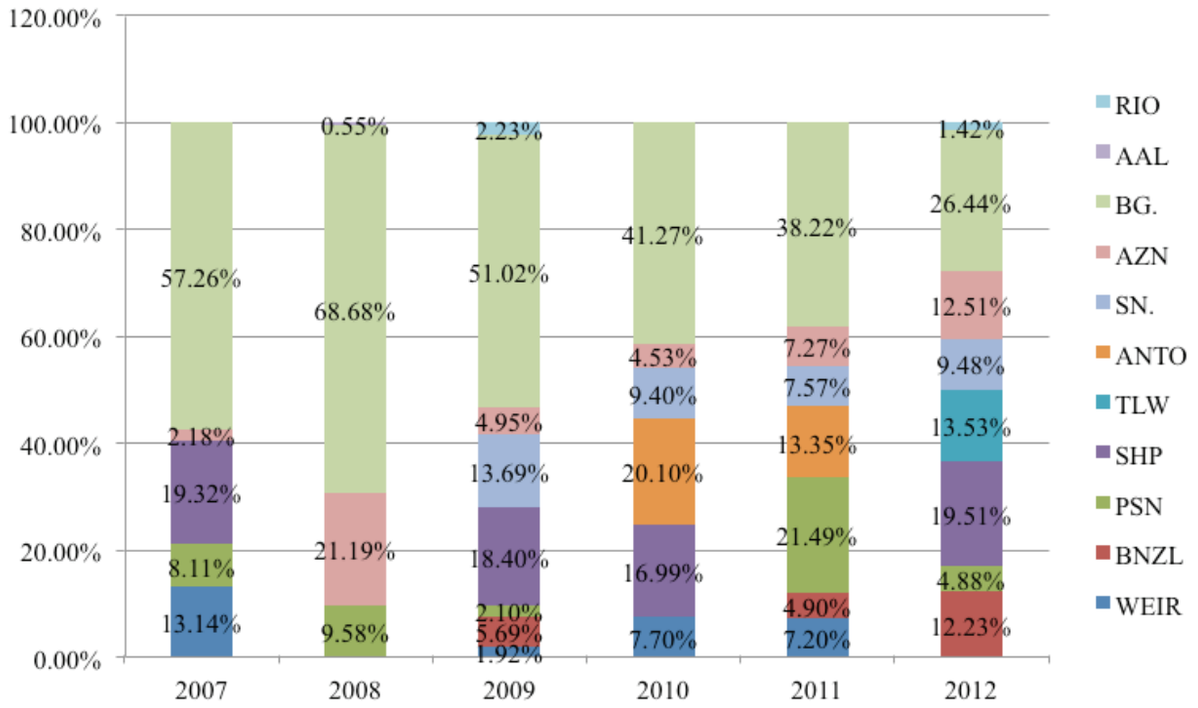

Figure 1. Portfolio Composition – *Shari'ah*

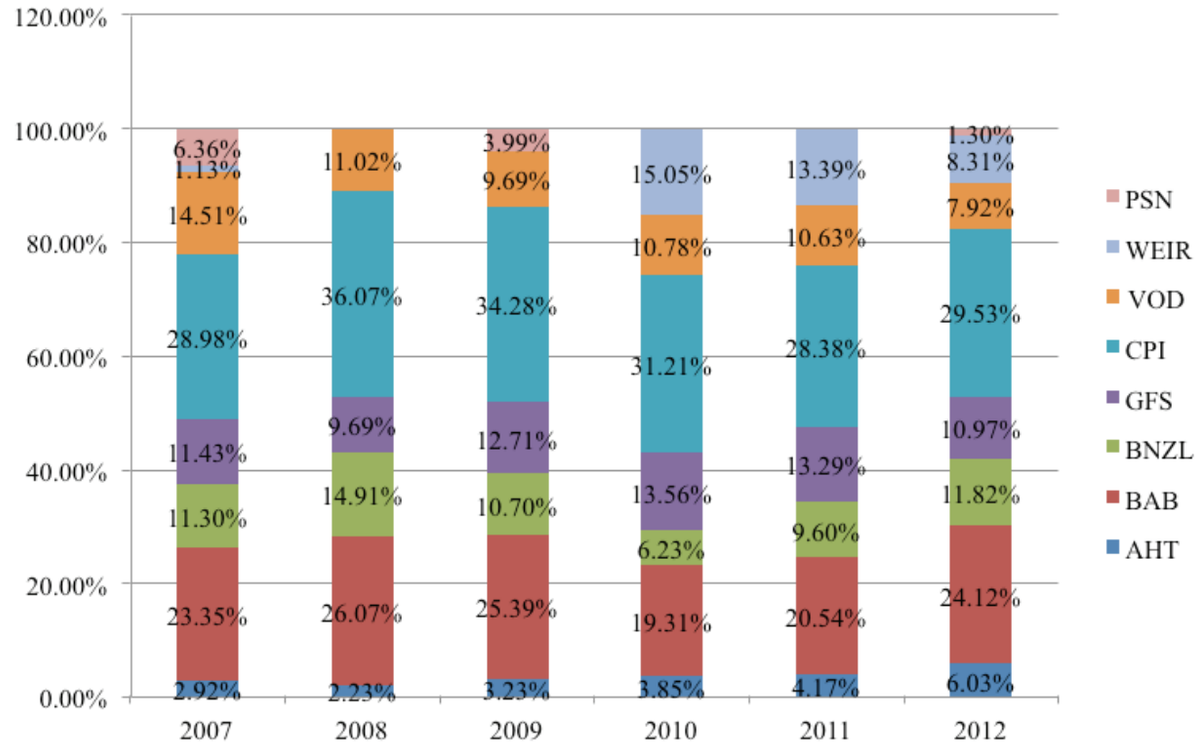

Figure 2. Portfolio Composition – SRI

number of assets with its percentage. Figure 1 shows assets composition of the *Shari'ah* portfolio, while figure 2 demonstrates the assets composition of SRI portfolio.

Figure 1 shows the different portfolio composition in every year. In year 2008, WEIR is not included in the portfolio, because the ratio for interest expense and interest income exceeded the threshold. Moreover, SHP is also excluded, because it had debt ratio higher than the required value. As can be seen, for year 2009, WEIR is included in the portfolio again, be-

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Table 3. Portfolio Performance

	Portfolio Performance					
	2008	2009	2010	2011	2012	2013
Shari'ah						
Beta	1.3666	0.4500	0.6089	1.3117	1.2621	1.1672
Expected return	-0.0185	0.0170	0.0157	0.0053	-0.0093	0.0174
Standard Deviation	0.0991	0.0417	0.0391	0.0572	0.0450	0.0462
Sharpe's Ratio	-0.2291	0.3918	0.3890	0.0824	-0.2171	0.3677
Treynor Ratio	-0.0166	0.0363	0.0250	0.0036	-0.0077	0.0146
Jensen's Alpha	0.0228	0.0085	0.0104	0.0108	-0.0156	0.0036
SRI						
Beta	0.7712	0.3958	0.9028	0.7616	0.7084	0.8433
Expected return	-0.0125	0.0115	0.0144	0.0073	0.0119	0.0263
Standard Deviation	0.0647	0.0462	0.0608	0.0362	0.0393	0.0343
Sharpe's Ratio	-0.2578	0.2346	0.2296	0.1855	0.2899	0.7569
Treynor Ratio	-0.0216	0.0274	0.0155	0.0088	0.0161	0.0307
Jensen's Alpha	0.0090	0.0039	0.0068	0.0102	0.0081	0.0163

cause the interest expense and interest income ratios did not exceed the threshold. This is also true for SHP, which the debt ratio did not surpass the required value. In addition, there are two stocks, BNZL and SN, included in portfolio after the two previous years, had debt ratio higher than the required.

It should be noted that in year 2010, ANTO becomes part of portfolio after three years of absence, as it had cash and short-term investment to total asset ratio higher than the threshold. In year 2012, TLW is included after the four previous years, as it had interest expense to total revenue higher than the required value.

Figure 2 shows that the SRI portfolio composition tends to be stable for five years. There is only change in composition for WEIR and PSN in certain years because when they have the lowest return among all assets, they will not be included in the portfolio.

The next procedure is to examine Sharpe's ratio, Treynor ratio and Jensen's alpha since they are risk-adjusted performance measurement. To calculate these ratios, monthly portfolio return, market return (FTSE100 return), and risk-free rate of return (6-month LIBOR) are needed. Having the data, annual ratio is calculated to evaluate the portfolio performance, which can be found in Table 3.

Table 3 shows that *Shari'ah* portfolio has beta value greater than 1 for year 2008, 2011, 2012, and 2013 meaning that this portfolio has higher volatility than market. However, SRI portfolio always has beta value less than one meaning that this portfolio has less volatility than market. Moreover, both portfolios have negative expected return for year 2008, which then begins to increase for the next years. However, *Shari'ah* portfolio has negative expected return again in year 2012.

Table 3 also shows that *Shari'ah* portfolio has higher risk than SRI in 2008, shown by the standard deviation. However, *Shari'ah* portfolio has lower risk than SRI portfolio for year 2009 and 2010 even though it turns to be higher again in the following three years. Table 3 also explains that both *Shari'ah* and SRI portfolios have negative value for Sharpe's ratio in year 2008 due to the negative value of expected return from each portfolio. In addition, as can be seen, *Shari'ah* portfolio performs better than SRI portfolio in year 2008, 2009, and 2010, because having higher value for Sharpe's ratio means that *Shari'ah* portfolio has higher additional return for adding one unit of total risk. However, it has a decreasing value in year 2011 and 2012, far lower than the SRI portfolio performance. It increases in year 2013, but not as high as the SRI ratio.

As for Treynor ratio, *Shari'ah* portfolio performs better than SRI portfolio in year 2008, 2009 and 2010, because it has higher value of Treynor ratio meaning that *Shari'ah* portfolio has higher additional return for adding one unit systematic risk. However, its value decreases in

2011 followed in 2012 even though it bounces back in 2013. Meanwhile, SRI portfolio has a relatively stable value for Treynor ratio for five years, although it has experienced decrease between 2009 and 2011.

As for Jensen's alpha, both *Shari'ah* and SRI portfolios have positive alpha meaning that there is excess return that is not anticipated by the systematic risk. From 2008 to 2011, *Shari'ah* portfolio has higher Jensen's alpha than SRI portfolio, but it decreases very steeply in year 2012 even though it bounces back in year 2013. On the other hand, SRI portfolio has relatively positive stable value of Jensen's alpha for six years.

In overall, *Shari'ah* portfolio performs better in year 2008 until 2011, but it has the low value of ratios in year 2012. Looking at the table 3, due to having negative expected return in 2012, it has low performance. This low performance could be due to the stocks composing the portfolio. Based on the figure 1, the stocks included are BNZL, PSN, SHP, TLW, SN, AZN, BG, and RIO.

The assets SHP, TLW, AZN, and BG have decreasing price trend from year 2011 to 2012. The decreasing trend means that those assets have negative rate of return in 2012. Thus, it contributes to the fact that the portfolio return is negative. In oil sector, TLW and BG's performances were hampered as the oil prices fell gradually from May to November 2012 (Sjolin, 2012).

The fall in 2012 preceded by decrease in 2011, which is not caused by negative value of portfolio's expected return like in year 2012. Based on the information in figure 2, the portfolio composition in 2011 consists of WEIR, BNZL, PSN, ANTO, SN, AZN, and BG.

Lastly, *Shari'ah* portfolio has demonstrated a better performance in 2008, 2009 and 2010, because some of the stocks in the portfolio have a good performance on those years. The annual composition of stocks is depicted in figure 1. RIO had an increase in share prices because there was an increase in gold and copper futures prices (Turner, 2010).

According to the analysis above, it seems that macroeconomic variables, such as oil price, have an effect on the return of stock prices. Since these companies work within the larger macroeconomic conditions, it is very normal that they are affected by the developments in macroeconomy. To examine such effects, multiple regression method using Arbitrage Pricing Model (APT) is utilised with ordinary least square regression procedure by ensuring that there is no multicollinearity, autocorrelation, and heteroskedasticity (Brooks, 2002). Table 2 explains the variables and their relevant definitions. The regression starts by calculating the variables and the lagged variables, as they may have an effect on the return.

The result shows that *Shari'ah* portfolio return at time *t* is affected by change in oil price at time *t*, change in inflation at time t and change in industrial production at the previous period. The coefficients imply that 1% change in oil prices will lead to 16.45% increase in *Shari'ah* portfolio return, 1% change in inflation will lead to 249.39% increase in the return and 1% change in industrial production index in the previous period leads to 1.04% increase in return.

The positive effect of oil price could be because some stocks in *Shari'ah* portfolio are oil companies, which implies that if the oil price decreases then the companies have lower revenue and it might affect the share prices. Moreover, investing in stocks is one way to hedge inflation meaning that if the prices decrease then people tend to invest in stocks, *vice versa* (Chen *et al*., 1986). However, the result shows that the relationship is positive and significant. It could indicate that investors presume that they will buy more stocks since inflation increases meaning that there is an increase in nominal value of the companies and their revenue. The positive sign of change in industrial production index is based on that returns are based on the future cash flow, which depends on future economic conditions (Bilson *et al*., 2001). The result is supported by James *et al*. (1985) who report that current stock returns are related to industrial production lagged by 2 months.

Moreover, the result also explains that SRI portfolio return is only influenced by change in oil price at time *t*. The coefficient shows that 1% change in oil prices will lead to 18.51% increase in SRI portfolio return. This positive effect could be because companies included in

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SRI portfolio are able to offset the bad effect of oil price increase with the good effect. In understanding the results, it is important to state that based on figure 2, since most of the companies are business support services, which provide services even in the condition of increasing oil prices where costs are rising as well.

Conclusion

To reiterate, this research aims to examine the effect of Islamic screening criteria to the portfolio selection and performance by comparing it to SRI portfolio, which also has specific criteria to determine the investments.

The findings in this study conclude that *Shari'ah* portfolio selection and performance were influenced by the Islamic screening criteria, which was shown by the difference in the *Shari'ah* portfolio composition and performance from SRI portfolio. Composition of *Shari'ah* portfolio could be from oil, mining, and pharmaceuticals companies, while SRI portfolio does not allow those types of companies to be included in the portfolio. In addition, there are some financial ratios which have to be fulfilled by *Shari'ah* portfolio, while SRI portfolio does not have such requirements. This led to the result that Shari'ah portfolio performs better in 2008, 2009, and 2010, mainly the financial crisis years, indicating that *Shari'ah* portfolio could be used to hedge the crisis. However, the portfolio returns were influenced much by change in oil prices since the portfolio mostly comprised of oil and mining companies.

In reflecting upon further research, it could be conducted by expanding the data sample, portfolio size and time period so that a generalised analysis can be developed in a robust manner. In addition, by expanding the time horizon, Gross Domestic Product and Openness Index could be included, since both data are available in quarterly which are not suitable for this research. Regarding the methodology, more advance portfolio optimization and cointegration methods in examining the macroeconomic variables' effect could be employed to obtain broader result and analysis.

References

Ayub, M. (2007). *Understanding Islamic Finance*. Chichester: John Wiley & Sons Ltd.

Bilson, C. M., Brailsford, T. J., & Hooper, V. J. (2001). Selecting macroeconomic variables as explanatory factors of emerging stock market returns. *Pacific-Basin Finance Journal,* 9(4), 401-426.

Bodie, Z., Kane, A., & Marcus, A. (2009). *Investments International Edition* 8th ed. Singapore: McGraw-Hill Irwin.

Brooks, C. (2002). *Introductory econometrics for finance* 1st ed. Cambridge: Cambridge University Press.

Chen, N. F., Roll, R., & Ross, S. A. (1986). Economic forces and the stock market. *Journal of Business*, 383-403.

Derigs, U., & Marzban, S. (2008). Review and analysis of current Shariah-compliant equity screening practices. *International Journal of Islamic and Middle Eastern Finance and Management*, 1(4), 285-303.

Ghoul, W., & Karam, P. (2007). MRI and SRI mutual funds: A comparison of christian, islamic (morally responsible investing), and socially responsible investing (SRI) mutual funds. *The Journal of Investing*, 16(2), 96-102.

Girard, E. C., & Hassan, M. K. (2008). Is there a cost to faith-based investing: evidence from FTSE Islamic indices. *The Journal of Investing*, 17(4), 112-121.

Hashim, N. (2008). The FTSE global Islamic and the risk dilemma. *AIUB Business and Economics Working Paper Series*, (2008-08).

Hazny, M. H., Hashim, H. M., & Yusof, A. Y. (2012). Revisiting Markowitz's Mean Variance analysis: A review from shariah perspective. *In Statistics in Science, Business, and Engineering (ICSSBE), 2012 International Conference on* (pp. 1-6). IEEE.

James, C., Koreisha, S., & Partch, M. (1985). A VARMA analysis of the causal relations among stock returns, real output, and nominal interest rates. *The Journal of Finance*, 40(5), 1375-1384.

Kahf, Monzer. (2009). Prohibition of Riba in the Islamic Economic System. *Encyclo-*

paedia of Islamic Economics Volume II, pp. 71-84.

Markowitz, H. (1952). Portfolio selection. *The journal of finance*, 7(1), 77-91.

Renneboog, L., Ter Horst, J., & Zhang, C. (2008). The price of ethics and stakeholder governance: The performance of socially responsible mutual funds. *Journal of Corporate Finance*, 14(3), 302-322.

Sjolin, S. (2012). Tullow Oil tumbles in choppy U.K. market. *Market Watch*, 4th of December 2012 [Online]. Available at: http://www.marketwatch.com/story/rio-tinto-rises-in-upbeat-uk-market-2012-12-04 (Accessed at 19th of July 2014).

Turner, S. (2010). Rio Tinto posts higher iron-ore production. *Market Watch*, 14th of October 2010 [Online]. Available at: http://www.marketwatch.com/story/rio-tinto-quarterly-iron-ore-production-rises-2010-10-14 (Accessed at 19th of July 2014).

https://scholarhub.ui.ac.id/icmr/vol7/iss1/5
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