Investment Strategies in Malaysian *Shariah*-Compliant Equities with Transaction Costs

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Abstract

Shariah compliant equity is a type of security that is permissible in Islam for investment purposes. Classification of Shariah compliant equity includes the process of screening firm's nature of business and investment activities that are free from the element of riba, gharar and maysir. In Islamic perspective, risk management is highly encouraged. Therefore, investors are expected to accumulate wealth responsibly by applying risk management measures in their investments. In this study, 50 equities have been selected from stocks listed in FBM EMAS KLCI from January 2009 until June 2011. This study intends to enlighten investors in term of constructing optimal portfolio of diversified Shariah compliant equities in Malaysian market by applying Markowitz portfolio selection model. The aim of the model is to maximize portfolio's return by specifying investor's tolerable level of risk. Furthermore, this study extended the model with regards to transaction costs in measuring cost effectiveness of portfolio rebalancing. This study will benefit investors in selecting portfolio of Shariah compliant equities which are not only optimal but also cost effective. Results from the study shows that by applying Markowitz model, investor can achieve higher return at fixed level of tolerable risk as compared to naïve investment strategy. While the benefits of portfolio rebalancing outweigh the disadvantage when transaction cost is taken into consideration during portfolio rebalancing. The performance of portfolio by applying Markowitz model outperforms the FBM EMAS KLCI index. With this knowledge, Shariah compliant investors are capable to invest responsibly in managing their wealth. By applying risk management measure, Shariah compliant investor will become more confident investing in Shariah compliant equity portfolio to safeguard and accumulate wealth.

Keywords: Shariah compliant equities, optimal portfolio, transaction cost.

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INTRODUCTION

Shariah Requirements in Investment
The science of Islamic economics, is the study of human efforts in allocating resources to meet the needs of life in ways consistent with Islamic teachings (Muhammad Ridhwan Ab. Aziz, 2012). Thus, in the process of meeting the needs in life, Islam promotes the *ummah* on acquiring money and wealth in proper and permissible ways and spends the wealth according to the mandated *Shariah* rules. This in turn will prevent Muslims from poverty and hunger. Thus, investment is one of the modes that can be applied for Muslim to acquire wealth. In line with Islamic economics, investment in Islamic perspective must comply with the principles of *Shariah*.

The *Shariah* requirements in investments can be categorized further into three important aspects which are asset allocation, investment and trading processes and purification (Said Elfakhani et al, 2005). In terms of asset allocation, it refers to portfolio selection that needs to undergo screening process. In conventional system, investors can choose freely between debt – bearing and investment bearing in all kinds of industries. In Islamic systems, portfolio selection has to follow certain rules and guidelines in accordance to *Shariah* principles in both qualitative and quantitative approach. The qualitative measure includes the process of filtering the nature of a company business that covers the aspects of alcoholic elements or business that deals with human cloning and aborted embryo. In terms of quantitative aspects, *Shariah* requirements prohibit the elements of *riba'* (interest), *gharar*, refers to selling something that is not owned or something that cannot be describe in accurate detail and *maysir*, which refers to gambling and pure games of chance.

In terms of investment and trading process, the *Shariah* requirements prohibits investors to trade in margin as it involves interfere debt – paying. Besides, the process of sale and repurchasing agreements are also prohibited as involves interest charging indirectly. Speculation, in addition is not allowed to be practiced by Islamic fund managers. The Islamic investment need to assume and expect risks related after making risk assessment with available information.

The purification aspect of *Shariah* guidelines refers to the process of cleaning tolerable revenues from unacceptable business activities and interest from an investment that has been allowed by some contemporary scholars. For example, suppose an investment of a company has 10 percent interest related income, thus each dividend payment must be cleansed through charity.

Another form of purification can be achieved through *Zakah*, a form of charity paid on personal wealth that excess minimum requirement of *nisab*, held idle for one lunar year. A rate of 2.5% of *Zakah* is obligated in terms of monetary wealth and earned income.

These requirements in investment play a major role for an investor to invest in *Shariah* compliant equities or securities. Nowadays there are special bodies designated to screen companies which comply with *Shariah* rules to be classified under *Shariah* compliant equities. Now we shall discuss further on the regulation on *Shariah* compliant equities in Malaysia.

Shariah Compliant Equities Regulations in Malaysia

Shariah compliant equities regulation in Malaysia focus on the screening process of equities listed in Malaysian stock market (Khatkhatay and Nisar, 2007). It is done by *Shariah* Advisory Council (SAC) of Securities and Exchange Commission (SEC) Malaysia. The screening process requires information from income statements of companies. Individual funds or investment companies do not make their own *Shariah* screening criteria. This is to ensure reliability and professionalism in *Syariah* screening process.

The core activities of the companies should be compatible with the principles of *Shariah*. Therefore companies which do not comply with business activities permitted by *Shariah* law will be excluded. While for companies with activities comprising both permissible and non – permissible elements, there are two additional criteria proposed by SAC which are the public perception of the company must be good and the core activities of the company are important and considered as *Maslahah* (in the public interest) to the Muslim *ummah* and the country. While the non – permissible element is very small and do involves matters such as *umum balwa* (common plight and difficult to avoid), *uruf* (custom) and the rights of the non – Muslim community which are accepted by Islam.

In terms of mixed activities, the SAC has set up certain level in benchmarks of tolerance. If the contributions in turnover or profit before tax from non – permissible activities of a company exceed the benchmark, the securities of the company are classified as *Shariah* non – approved. The benchmark levels are as follows:-

  i.   5 percent benchmark which applied to assess the level of mixed contributions from the activities that are clearly prohibited such as riba, gambling, liquor and pork.

  ii. 10 percent benchmark which applied to assess the level of mixed contributions from the activities that involve the element of *umum*

balwa which is a prohibited element affecting most people and difficult to avoid. Examples include interest income from fixed deposits in conventional banks.

iii.   25 percent benchmark which used to assess the level of mixed contributions from activities that are generally permissible according to *Shariah* and have an element of *Maslahah*, but there are other elements that may affect the *Shariah* status of these activities. Examples are hotel and resorts operations, share trading which may involve other activities that are deemed non permissible according to the *Shariah*.

While in debt and liquidity of a company, there is no restriction on the proportion of liquid asset in total assets.

With the strict screening practice, investors could now rely on the *Shariah* classification produced by SAC. Thus investors become more confident in selecting equities which comply with *Shariah* rules to be included in their portfolio. Until now, approximately 86% of stocks available in Malaysian market are classified as *Shariah* compliant. However, the large number of stocks would become a challenge for investors in term of selecting the right stocks for their portfolios. Therefore, with profound understanding on the concept of portfolio management, investors will be able to make investment decision which could be tailored to match their risk appetite.

The Concept of Portfolio Management
Portfolio theory deals with the selection of portfolio that maximizes expected return which consistently with the level of risk accepted by an investor (Drake and Fabozzi, 2010). While discussing on portfolio selection, an investor needs to understand the concept of diversification in selecting stocks in his portfolio. Portfolio diversification is defined as inclusion of number of investable asset in a portfolio. It deals with asset allocation matter, which focuses on the number and weight of a single asset to be included and invested when constructing a diversified portfolio. While constructing a diversified portfolio, an investor need to consider certain indicators like return and risk that the investor wish to bear.

The concept of portfolio selection developed by Harry Markowitz (1952) which also known as   mean – variance portfolio analysis highlights the benefits of portfolio diversification. This theory of portfolio selection emphasizes on maximization of return with a certain level of risk or minimization of risk with certain level of return. The concept of portfolio developed by Markowitz is later known as Modern Portfolio theory.

Apart from that, an investor needs to apply suitable approach to manage a portfolio. There are two types of portfolio management approach which are active and passive portfolio management (Collins and Stampfli, 2005). An active portfolio management includes tactical asset allocation and rebalancing. Whereas passive approach deals with buy and hold strategy over a long investment period. Rebalancing plays an important role in active portfolio management strategy as it relates reallocating assets over a short time period. Furthermore, in an investment strategy, rebalancing is vital to ensure that the outcome from the investment in line with an investor's risk and return objective.

On the other hand, the simplest portfolio diversification strategy is known as naïve investment strategy in which investor allocate their fund equally in each asset available for investment during each rebalancing date. This simple strategy is sometime defined as 1/N strategy. Following this strategy, investor needs to allocate 1/N of wealth to each of N number of assets available (DeMiguel et al, 2007).

For the purpose of the study, we will compare on active portfolio management by applying periodical portfolio rebalancing. On the other hand, during the whole investment period, an investor needs to bear certain transaction cost. It is also important factor where transaction cost need to be taken into consideration to ensure cost effectiveness of an investor's strategy in managing his or her portfolio.

Therefore, question has been raised in terms of how to help *Shariah* compliant investor to invest responsibly in accumulating and managing their wealth. Apart from that, this study focuses on how to provide knowledge of risk management approach towards investor in *Shariah* compliant equities in Malaysian market. The objectives of the study are :-
  i. To construct an optimal portfolio of diversified *Shariah* compliant equities in Malaysian market
  ii. To apply Markowitz model that maximize portfolio return with predetermine level of tolerable risk of *Shariah* compliant equity investor.
  iii. To incorporate transaction cost in Markowitz model in ensuring cost effectiveness of investment strategy that includes portfolio rebalancing.

This paper has been organized in the following way. The paper first gives a brief introduction of *Shariah* requirements in investing and portfolio management process. In part 2, it focuses on literature review that is related in this study. While in part 3 emphasizes on methodology used in solving the

optimal portfolio selection with certain assumptions. Part 4 will discuss on the results from the study and conclusion will be made in part 5.

LITERATURE REVIEW

Investment and Risk Management in Islamic Perspective
In investment activity based in Islamic financial activities, it is important that an investor needs to bear the risk. Asyraf Wajdi Dusuki (2012) clarifies this based on the principle of *al – ghunm bi al – ghurm*, which means that entitlement to profit is accompanied by responsibility for attendant expenses and possible loss. This has been backed by the hadith collected by al – Thirmidi, Abu Dawud, Ibn Majah and Ahmad, '*Inna al – kharaj bi al – daman*,' which means the entitlement to profit from something is dependent on responsibility for attendant expenses and possible loss and defects. Thus, any investment based on the separation between *al- ghunm* (profit) and *al – ghurm (loss),* where an investor are qualified to receive profit without bearing daman (responsibility for losses or risk) are not allowed.

Risk Management in Islamic perspective plays a vital role in investment since it does include the protection of property which emphasize on defending the rights in ownership. This argument lies in the context of *Maslahah* and *Maqasid al – shariah*, whereby *Maslahah* takes into consideration that secure benefit and prevent harm but harmonious with *Maqasid al – shariah* (Mohammed Obaidullah, 2002).

Optimal Portfolio Selection
The theory of portfolio selection and diversification developed by Markowitz (1952) served as a platform for further studies on portfolio management. It does include the development in solving Markowitz model via linear programming model. Even though there is claim that Markowitz quadratic programming is cumbersome and time consuming, it has been proven that Markowitz quadratic programming yields the lowest risk compared to Maximin and Minimization of Absolute Definition (MAD) (Papahristodoulou and Dotzauer, 2004). The prominence of Markowitz modern portfolio theory has been proven because after 50 years, this theory is still being used in many investment houses for decision making and measuring performance (Rubinstein, 2002).

The portfolio concept developed by Markowitz has been benefited investor in terms of portfolio selection and diversification. Portfolio diversification could also benefited investors in emerging market such as Ukraine (Shabalina and Zhuraylyola, 2011). This study suggests that the application of Markowitz is more appropriate rather than Sharpe Model in terms of portfolio selection

for investors in Ukrainian Stock Market. While in Malaysian market, Anton Abdulbasah Kamil et al (2006) conduct portfolio analysis from stocks listed in Kuala Lumpur Stock Exchange (KLSE). By applying Markowitz model, it helps the investor to achieve the objective of maximizing portfolio return and minimizing portfolio risk while investing in KLSE. In consistent with the application of Markowitz, Plessis and Ward (2009) prove that the application of Markowitz in portfolio construction from stock listed in Johannesburg Stock Exchange (JSE) shows that the portfolio constructed outperformed the market as compared to FTSE/JSE 40 index. While in Nepalese Stock Exchange (NAPSE), Paudel and Koirala (2006) provide the evidence that the application of Markowitz benefits the investor in terms of risk reduction and offers better option towards investor in terms of decision making in the choice of optimal portfolio in NAPSE.

The trading and investment activity in equities does include the element of transaction cost that an investor needs to bear. Thus, further studies in mean – variance portfolio selection developed by Markowitz (1952) has been extended further with the inclusion of transaction cost. Incorporation of transaction cost estimated in mean – variance portfolio construction helps the investor in terms of reduced level of risk and provides an improvement of net returns made by an investor (Borkovec et al., 2010). In addition, transaction cost needs to take into consideration during portfolio construction as transaction cost charged and incurred to an investor is certain while the return on a security is uncertain (Yoshimoto, 1996).

Portfolio Rebalancing
In investment activity, an investor needs to consider as an important strategy while investing in a portfolio of securities. Rebalancing helps to bring the portfolio aligned with the original target weight of each asset in order to maintain the risk profile of an investor. Furthermore, rebalancing will ensuring a portfolio to remain in line with risk and return objective of an investor where portfolio must be rebalanced periodically to the strategic assets allocation (Weinstein et al., 2003 and Gitsham, 2011). Therefore, rebalancing serves as tool in terms of risk reduction.
In portfolio rebalancing, certain transaction cost will be charged to an investor. Longer rebalancing period will possess lower transaction cost (Nersesian, 2006). But this will results in the disadvantage of increased tracking errors in portfolio investment. While transaction cost is a key consideration of disadvantage in portfolio rebalancing, it has been shown that the benefits outweigh the disadvantage even when transaction cost is taken into consideration (Weinstein et al., 2003).

RESEARCH METHOD

Markowitz Quadratic Programming with Transaction Cost

For the purpose of this study, we will apply Markowitz Quadratic Programming that will maximize the return on portfolio of an investor. By referring equation (1), further extension has been made by the inclusion of transaction cost that refers to brokerage fees that an investor needs to bear. Thus, the formulations are as follows:-

Maximize
$$\left(\sum_{j=1}^{n} [\bar{r}_j\, x_j)T - C]\right)\left(\sum_{j=1}^{n} [\bar{r}_j\, x_j)T - C]\right) \tag{1}$$

where
$$C = c_1 + c_2 \tag{2}$$

if $|x_{jt} - x_{j\,t-1}| > y$
$$c_1 = \sum_{i=1}^{n} |x_{jt} - x_{j\,t-1}| \times \omega \tag{3}$$

else if $0 < |x_{jt} - x_{j\,t-1}| \le y$
$$c_2 = \varepsilon \times k \tag{4}$$

subject to the following constraints
$$\sum_{i=1}^{n}\sum_{j=1}^{n} \sigma_{ij} x_i x_j \le \alpha \tag{5}$$

$$\sum_{j=1}^{n} x_j = B \tag{6}$$

$$x_j \ge 0 \tag{7}$$

where
$$i = 1,2,\dots,n$$
$$j = 1,2,\dots,n$$

$$\sigma_{ij} = \frac{1}{T}\sum_{t=1}^{T} (r_{it} - \bar{r}_i)(r_{jt} - \bar{r}_j) \tag{8}$$

n	=	number of securities	
i, j	=	securities	
T	=	total period	
t	=	period	
σ_{ij}	=	covariance of equities i and j	
r_{jt}	=	monthly return of equity j per Ringgit Malaysia over period t	
$\overline{r_j}$	=	average monthly return of equity j over the entire period T	
x_j	=	portfolio allocation of equity j in Ringgit Malaysia	
x_{jt}	=	portfolio allocation of equity j in Ringgit Malaysia over period t	
$x_{j\,t-1}$	=	portfolio allocation of equity j in Ringgit Malaysia over period $t-1$	
C	=	total transaction cost $c_1 + c_2$	
c_1	=	transaction cost 1	
c_2	=	transaction cost 2	
ω	=	brokerage fees in percentage %	
k	=	brokerage fees in Ringgit Malaysia	
ε	=	number of transaction	
y	=	transaction value in Ringgit Malaysia	
α	=	acceptable level of predetermine risk measured by portfolio variance	
B	=	maximum capital to be invested	

While implementing this model, two assumptions have been made adapted from Markowitz. The first assumption is return on an equity is multivariate normally distributed. While in terms of investor's behavior, an investor is a risk averse investor, that prefer high return but low level of risk.

The first constraint as from equation (5) is imposed to indicate the tolerable risk level that should be lower than or at most equal to an investor risk level, denoted by α. The model above will develop an optimal portfolio that in turn will provide at most or lower than the risk level that has been tolerable by an investor. The second constraint, equation (6) is known as capital constraint, *B* which gives the maximum capital available to be invested. It is assumed that all the capital is invested in the optimal portfolio construction.

The transaction cost could be divided into two parts. It concerns with a certain minimum transaction amount and minimum brokerage fees. Transaction cost

c_1 c_1 , from equation (2) is imposed when the amount of transaction exceeds the transaction value, y y . While, transaction cost c_2 c_2 in equation (3) refers to minimum brokerage fees k k when the number of transaction has value is less than or equal y y and greater than zero.

Finally in equation (7), investment in each stock is set to be equal or more than zero to avoid short selling. It is in line with *Shariah* principle and Bursa Malaysia regulation that prohibits investor to practice short selling while trading in securities.

Data Selection and Assumptions
For the purpose of the study, we apply Markowitz quadratic programming by adapting monthly returns for *Shariah*–compliant equities listed in FTSE Bursa Malaysia Emas Index (FBMEMAS) from January 2009 to June 2011. In total, there are 290 companies listed under FBMEMAS. The companies that do not have adequate data during the whole study period have been eliminated. We select companies from various sectors. The selection process includes the consideration of equity's average return and variance for the measurement of tolerable level of risk.

The proportion of selected companies are tabulated as follows :

Table 1 : The Proportion of Selected Companies

Sector	Total Companies	Selected Companies	Proportion (%)
Basic materials	29	5	17.24
Consumer goods	64	11	17.19
Consumer services	13	3	23.07
Financials	33	7	21.21
Health care	12	2	16.67
Industrial	90	13	14.44
Oil and gas	20	4	20.00
Technology and telecommunication	17	3	17.64
Utilities	12	2	16.67
Total	290	50	

It can be shown that from the table, there are 50 companies selected in the sample that comprises 17.24% of the total equities listed in FBM EMAS KLCI. The percentage of companies selected from each sectors ranging from 16.67% to 23.07%.

During the study period, we divide the data into five sub periods which consists of 6 months in each period. These include, January 2009 to June 2009, July 2009 to December 2009, January 2010 to June 2010, July 2010 to December 2010 and January 2011 to June 2011. This will allows us to measure the performance of portfolio rebalancing for every six month based on the six month optimal portfolio selected by using Markowitz quadratic programming. In order to make sure that our investment strategy is cost effective, the extension has been made in this study by taking into consideration of transaction cost during the whole investment period that include initial investment and portfolio rebalancing. In contrast with studies done by Kamil Anton Abdulbasah et al. (2006) on portfolio analysis for stocks listed in KLCI via Markowitz model, further extension has been made in our study by the inclusion of periodical portfolio rebalancing for equities listed in FBMEMAS.

In additions, few assumptions have been made by us in order to test the model. We assume that an individual has RM100000 budget allocation, B to invest in equities. The acceptable risk level $\sqrt{\alpha}$, $\sqrt{\alpha}$ is set up at rate of 3.53% based on average standard deviation of 50 selected companies. The transaction cost is set up based on average brokerage fees that been imposed in Malaysia stock market which are minimum at RM40 for the number of transaction below minimum transaction value of RM 6666. For the transaction value of above RM6666, the transaction cost is imposed at rate of 0.6% of the total transaction amount. The transaction costs are taken into consideration during initial investment and portfolio rebalancing where we assume an investor rebalances his portfolio every 6 month. We incorporate transaction cost in the model by deducting transaction costs from portfolio return.

In this study, we will use return from FBMEMAS index as a benchmark in this study. Besides, we will compare the findings of performance between naïve investment strategy and optimal portfolio derived from Markowitz Portfolio Optimization Model. The process of analyzing and constructing of an optimal portfolio via Markowitz model will be done through Excel Solver.

RESULTS

FBMEMAS Return

The return from FBMEMAS Index serves an important role as a benchmark for our study. Table 2 shows the performance of FBM EMAS KLCI index in each semiannual period.

Table 2: Performance of FBM KLCI Index in each semiannual period

Period	Jan – June 2009	July– Dec 2009	Jan – June 2010	July – Dec 2010	Jan – June 2011
Average monthly Return, (%)	4.05	2.86	0.73	2.67	0.76
Monthly Standard Deviation, $\sqrt{\alpha}$ $\sqrt{\alpha}$ (%)	6.06	3.61	3.28	1.83	2.08

Base on the table, it can be shown that the highest average monthly return recorded is 4.05 % during the period of January – June 2009 with the standard deviation of 6.06%. While the lowest return is recorded on Jan – June 2010 with standard deviation of 3.28%. While during the whole investment period, the total recorded is 66.38% with the average monthly return of 2.21% and standard deviation of 3.67%.

Naïve Investment Strategy

In our study, we apply naïve investor's strategy in portfolio allocation where with the assumptions of budget RM100 000 with the 50 equities that have been selected, we allocate 2% or RM2000 on each equity. We do the same strategy in each 6 months. We then examine the performance of portfolio via measuring the return and risk, where risk is measured by standard deviation of the portfolio. Table 3 shows the performance of portfolio on each 6 months period.

Table 3: Portfolio performance by adapting Naïve Investor's Strategy

Period	Jan - June 2009	July - Dec 2009	Jan - June 2010	July - Dec 2010	Jan - June 2011
Monthly Return(%)	7.16	4.23	3.13	5.83	2.54
Monthly Standard Deviation (%)	4.03	0.97	2.11	1.35	1.25

Optimal Portfolio Based Markowitz Portfolio Optimization Model
We then conduct our study by analyzing portfolio allocation via Markowitz portfolio optimization model. We divided the findings into two sections, where the first sections we apply passive portfolio management through buy and hold strategy and the second category we apply active portfolio management by practicing semiannual periodical rebalancing. We examine portfolio allocation on each sectors and measure portfolio return with the acceptable predetermine risk level as measured by standard deviation.

Buy and Hold Strategy
In this strategy, the investor constructs a diversified portfolio of *Shariah* – compliant equities that cover the period from January 2009 until June 2011. All the budget allocation is fully invested while constructing a diversified portfolio of *Shariah* – compliant equities. The transaction cost is taken into consideration during beginning of the whole investment period. The optimal portfolio allocation of equities in each sector is represented in table 4.

Table 4: Sectors and Portfolio Allocation to construct optimal portfolio during the whole investment period

Sectors	Portfolio Allocation (%)
Basic Materials	7.62
Consumer Goods	27.53
Consumer Services	9.48
Financials	4.85
Health Care	6.06
Industrials	27.49
Oil & Gas	4.91
Technology& Telecommunications	6.06

Utilities	6.00
Total	100.00

By setting up predetermine risk level at 3.53% for the whole period of portfolio investment, it can be shown that the highest level of portfolio allocation is 27.53% in consumer goods sector and the lowest portfolio allocation is 4.85% in financial sector. The buy and hold strategy generates portfolio return of 146% with average monthly return of 4.86% after deducting transaction cost during initial investment period worth RM1640.00.

Periodical Semiannual Rebalancing
With the same budget allocation of RM100000, the investor invests all the allocation in diversified portfolio of *Shariah* – compliant equities from January 2009 until June 2009. Then the portfolio rebalancing occurs semiannually in each 6 months where the transaction cost is taken into consideration during the portfolio rebalancing. The acceptable predetermine risk level is set as the same in buy and hold strategy at 3.53%. The optimal portfolio allocations in each sector for each period are tabulated in table 5.

Table 5: Sectors and Portfolio Allocation to construct optimal portfolio in each semiannual period

Sectors	Jan – June 2009	July - Dec 2009	Jan - June 2010	July - Dec 2010	Jan - June 2011
Basic Materials	8.36%	0.00%	24.01%	45.36%	44.48%
Consumer Goods	22.76	6.20	21.20	16.11	10.25
Consumer Services	6.22	0.00	11.75	4.40	5.96
Financials	13.72	0.00	3.48	8.24	9.44
Health Care	3.98	90.51	5.56	1.67	2.59
Industrials	27.28	3.30	25.55	13.66	15.95
Oil & Gas	8.00	0.00	2.74	5.39	5.74
Technology & Telecommunications	5.19	0.00	4.16	3.42	4.63
Utilities	4.48	0.00	1.54	1.74	0.97
Total allocations (%)	100.00	100.00	100.00	100.00	100.00
Average Monthly Return (%)	6.99	13.48	8.29	11.34	5.84

Monthly Standard Deviation (%)	3.53	3.53	3.53	3.53	2.66
Transaction cost (RM)	1960.00	2450.29	2528.51	2270.75	2405.26

With the consideration of transaction cost on each period, the highest monthly return recorded is 13.48% in the period of   June – July 2009.Due to the efficient frontier, with the lower monthly standard deviation 2.66%, the maximum return generated is 5.84% in the period of Jan – June 2011. In consistent with the assumptions made by Markowitz where investor is risk averse, thus it is proven that the portfolio that is being selected is the one which provides high return with lower level of risk based on the outcome in the period of Jan – June 2011.

Based on the findings from naïve investment strategy, during the whole investment period, the total return generated is137.44% with a transaction cost of RM2000 at the beginning of the investment period. While application of Markowitz in buy and hold strategy generates return of 146% at predetermine risk level at 3.53%.Interestingly, by practicing semiannual portfolio rebalancing in active portfolio management, the total return generated for the whole investment period is 343.8% at the same predetermine acceptable risk level of 3.53% where the lowest transaction cost recorded is RM1960.00 during the early period in January – June 2009 and the highest transaction cost occurred during January – June 2010 worth RM2528.51 and the total cost recorded for the whole period is RM11614.81.

DISCUSSION

Based on the performance of portfolio by applying Markowitz portfolio optimization model, it outperforms the return from FBM EMAS KLCI in the whole investment period and in each semiannual period. This is in line with findings made by Plessis and Ward (2009) where the application of Markowitz has been used in portfolio construction for stocks listed in Johannesburg Stock Exchange (JSE) outperformed the market as compared to FTSE/JSE 40 index.

The current study of portfolio selection in *Shariah*–compliant equities listed in FBMEMAS by Markowitz portfolio optimization model produces results which indicate that the application of Markowitz model will produce return that outperforms naïve investment strategy throughout the investment period. Investors are now being offered a wide range of portfolio diversification by applying Markowitz model while in the process of maximizing portfolio return with the acceptable level of predetermined risk and choosing the optimal portfolio of diversified *Shariah*–compliant equities. The findings of

this study is in line with the findings made by Paudel and Koirala (2006) where proved that application of Markowitz offers better option towards investor in terms of decision making of optimal portfolio listed in NAPSE. While in Malaysia, this study is in agreement from studies made by Anton Abdulbasah Kamil et al (2006) that apply Markowitz model in portfolio analysis for stocks listed in KLCI while in the objective of maximizing return and minimization of risk level with the consideration of transaction cost and the exclusion of portfolio rebalancing.

The application of Markowitz in buy and hold strategy and periodical semiannual rebalancing provides an interesting argument. With regards to the high total transaction cost which is a key consideration of disadvantage of portfolio rebalancing, findings from this study indicates that it is worth towards the investor since it is proven from this study which indicates that the returns of periodical semiannual portfolio rebalancing outperforms the non – rebalanced portfolio during the whole investment period during January 2009 until June 2011 with the similar rate of fixed level of acceptable predetermine risk. On top of that, the result from rebalancing portfolio clearly shows the advantage in terms of achieving an investor's goal in maximizing portfolio return while keeping up the same rate of acceptable predetermine risk level. The result of this study is in line with findings made by Weinstein et al. (2003) where the advantage of portfolio rebalancing outweigh the disadvantage when transaction cost is taken into consideration and helps the investor to improve absolute performance of a portfolio investment. While ensuring the benefits of portfolio rebalancing which maximize portfolio return, the findings support the argument made by Gitsham (2011) where rebalancing must lock in return towards an investor. This provides a positive argument of ensuring cost effectiveness of portfolio rebalancing.

CONCLUSION

Nowadays, *Shariah* compliant equities investors especially in Malaysia are bewildered with the large number of equities that can be included in their equities portfolio. Thus, investment decision should be wisely made to avoid wastage of wealth and also safeguarding wealth as suggested in Islamic teachings. Therefore, this study suggested the application of Markowitz portfolio optimization model to find the balance between risk and return in equity investment. Furthermore, rebalancing is done every six month period by taking into consideration transaction cost which is a vital issue especially when investors decide to change equities' allocation in their portfolios. This study serves an important tool towards the *Shariah* – compliant equities investor in terms of applying suitable risk management measure while investing in equities. The knowledge of diversification is vital in optimal portfolio construction and also during portfolio rebalancing.

While *Shariah*–compliant is a main concern of equity investment in Islamic perspective, investor can maximize portfolio's return by actively monitoring and rebalancing their portfolios using Markowitz model. This study shows that portfolio rebalancing for every six month period is cost effective and gives higher return to investor compared to passive and naïve strategy.

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