

# “The use of fixed income in emerging markets: empirical evidence”

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## The use of fixed income in emerging markets: empirical evidence

### Abstract

Ever since the dollars started flowing as a result of the sale of petroleum, the Middle East region has been faced the dilemma of where to invest such funds. Investors wanted to deposit their funds in investments in line with *Shari'ah* rules. The western banking system responded swiftly and efficiently to tap into this lucrative and expansive market, by offering equity funds that are deemed to be socially responsible. The downside of this investment strategy is that most of these funds have a concentration risk. One way how to reduce this risk is to include sukuk bonds. It has been demonstrated that after introducing such securities modern portfolio theory indicates that the risk return profile is pushed closer to the efficient frontier. This outcome is a favorable occurrence that all investors would gladly acknowledge.

**Keywords:** managed funds, Markowitz portfolio theory, sukuk bonds.

**JEL Classification:** G20, G23, G28.

### Introduction and motivation

Ever since the dollars started flowing as a result of the sale of petroleum, the Middle East region has been faced the dilemma of where to invest such funds. Furthermore, this investment decision had to be done in line with strict Islamic principles. This proved to be quite a difficult task since the western financial markets were not geared for such requests.

Several attempts have been made since the late 1970's to set up Islamic equity funds<sup>1</sup> and over the years these equity funds have grown, with statistics presenting a \$6.3 billion figure under investment in 2005<sup>2</sup>. The Islamic equity market has grown over 25% during the sample period of 1996-2002 as demonstrated in Al-Rifai (2003). Despite this steady growth, Islamic equity funds are still at an early stage of their development. This emerging market had approximately 10 equity funds prior to 1995. However, since then, the number of equity funds shot up to over 100 as identified in Iley et al. (2002).

The Muslim faith accounts for 20 percent of the world's population<sup>3</sup>, approximately 1.2 billion which is most certainly a sizeable market. In India alone, there are more than 120 million who adhere to the Muslim faith. Within this significant group of individuals there exists a growing middle income group that recognizes the importance of saving for the future. According to Al-Rifai (1999), this is viewed as an untapped market and financial firms are eagerly eyeing this market. The growing awareness of one's religious beliefs coupled with the cost effectiveness of Islamic financial products is fuelling increased demand for products that will allow those investors who adhere to strict Muslim behavior

while providing the opportunity to enhance their standard of living. It is no surprise that major U.S. and European fund managers are active in this field<sup>4</sup> as they endeavor to enter this vibrant emerging market.

Islamic fund management has been boosted by the issuance of a fatwa<sup>5</sup>, or religious ruling in the mid 1990s that stated that investment in modern-day equities did not violate any of the *Shari'ah*<sup>6</sup> principles. The growing popularity within Islamic-style investing is not necessarily a backlash against the West according to Kassem (2003). But quite the contrary, investors are simply looking for diversity, choice and good performance and this may not be offered by traditional 100% equity funds. *Riba* better known as fixed income securities is strictly prohibited in Islamic finance but scholars are introducing new securities to the market that may help alleviate the concentration risk of the existing 100% equity funds.

The label "Islamic fund" suggests that they are administered under strict *Shari'ah* rules. Because *Shari'ah* rules impose restrictions<sup>7</sup> on where to invest, these types of funds have an extra obligation towards their investors to invest in equities that will render a reasonable return without exposing themselves to greater risk. However, investors all share a common objective. Rational investors regardless their religious beliefs demonstrate a preference for high returns which are proportionate to the level of risk faced<sup>8</sup>. This study looks into the use of fixed income (Sukuk bonds which are accepted under *Shari'ah* law) securities within Islamic equity funds and measures the risk-return profile of such a simu-

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<sup>1</sup> Islamic equity funds which adhere strictly to the principles of Islamic beliefs have been made within various jurisdictions of the Middle East as well as in Asian countries, particularly in Malaysia.

<sup>2</sup> Source: Arab News: February 2006; Khalil Hanware: How have Islamic Funds Performed?

<sup>3</sup> CIA website, [www.cia.gov/cia/publications/factbook/](http://www.cia.gov/cia/publications/factbook/)

<sup>4</sup> These fund managers include AXA, Brown Brothers Herriman, Citibank, Commerzbank, Deutsche Bank, HSBC, Merrill Lynch, Permal, Pictet & Cie, UBS and Wellington Management.

<sup>5</sup> A Fatwa is a declaration by the Mulla (Spiritual director). It is usually closely followed by the faithful.

<sup>6</sup> *Shari'ah* means Islamic Law.

<sup>7</sup> A detailed discussion on these restrictions will be carried out in the Literature review.

<sup>8</sup> The common definition of risk is the uncertainty of future income.

lated fund. The main objective of such a study is to investigate the impact of sukuk bonds on an equity portfolio and compare the risk and return before and after the introduction of such a security.

This paper attempts to address this question by examining the risk profile of one of the largest currently existing Islamic funds, namely the Amana fund. This fund is managed in the US and is considered to be one of the most popular funds amongst Muslims living in the US and worldwide. Markowitz Modern Portfolio Theory will be utilized to compare the risk level of the Amana fund based on an optimal portfolio. We further investigate the risk-return profile by examining the impact within the portfolio on the fund's risk level as a result of incorporating the sukuk bond.

The results of this paper find that by introducing the sukuk bond, the same return similar to an all equity portfolio can be achieved, furthermore the overall risk of such a new portfolio is also reduced. These results should motivate investors to look into the use of sukuk bonds more carefully and consider including them to their portfolio. As indicated earlier on, investors require and seek a diversified portfolio and sukuk bonds have the ability to achieve such a diversification without compromising any existing returns and religious beliefs. This paper is developed as follows: Section 1 details relevant literature review and hypothesis development. Data and the methodology are presented in Section 2. In Section 3 the results are discussed. Concluding remarks and future research will be provided in the final section.

## 1. Literature review and hypothesis development

**1.1. Islamic equity funds.** Initially, much of the money flowing into equity funds has originally come from founding institutions or a few high profile investors. This is expected given the fact that the industry is still at the developmental stages. This emerging market is gaining momentum but is still not on a mass-market appeal level. There are now a large number of potential funds for a wide cross-section of Islamic investors<sup>1</sup> to select from based on their individual preferences. As global financial institutions develop niche markets to differentiate themselves from the ever-increasing competitive environment, new and innovative products and services will be available for a wide variety of investors regardless of the religious fervor.

The drive to invest according to one's religious beliefs is not only a matter of importance in the Middle East, it is also present around the globe. In the

UK, with a population of 1.8 million Muslims<sup>2</sup>, the U.K. Financial Services Authority has approved an application for the first ever fully fledged Islamic Bank (see Fardan (2003) for further detail). It is only a matter of time until more Islamic banks beginning opening their doors throughout Europe.

According to Drexhage (1998), when capital markets are combined with Islamic beliefs, the results can be complex. Financial institutions have caught on to the intricacies and opportunities, and their efforts will help both investors and firms that are looking at Moslem-oriented business.

Islamic finance is still at its infancy stage. Notwithstanding the strong interest from the Islamic community, the Islamic capital markets are not well developed and the whole market is still struggling to find a strong foothold. The sector must improve the range and sophistication of the instruments being offered. This is required to diversify the investors' position. Consistency throughout the Islamic markets is also another factor required to streamline all products. Speculation, and use of derivatives are clearly not allowed under *Shari'ah* law, and according to El Qorchi (2005), purchase and sale of debt contracts in secondary markets are only allowed in Malaysia.

The vast majority of *Shari'ah* scholars are in agreement that investments in stocks are allowed, they meet certain criteria designed to minimize un-Islamic activities – since eliminating them could be impossible in most cases. These criteria were designed to help Muslims participate in the growth of equity markets while at the same time adhere to their religious beliefs. *Shari'ah* scholars continue to push for uniform rulings on investment guidelines and the need to develop equity markets in Muslim countries.

Islamic finance prohibits the following transactions:

- ◆ dealings in unethical goods and services like, for example, casinos, tobacco companies and wineries;
- ◆ earning returns from a loan contract – *Riba/Interest*;
- ◆ excessive uncertainty in contracts – *Gharar*;
- ◆ gambling and other forms of probability games;
- ◆ trading in debt contracts at a discount; and
- ◆ forward exchange contracts.

Further to these restrictions, if a company's interest-bearing debt divided by its assets is equal to or greater than 33.33% it is also excluded (<33.33% is acceptable). "Tainted dividend" receipts relate to the portion, if any of a dividend paid by a company that

<sup>1</sup> There are Global equity funds; Asian equity funds; US equity funds; European funds; Emerging market funds; Single company funds; Technology funds; Capital guaranteed and balance/hedge/hybrid funds.

<sup>2</sup> CIA website, [www.cia.gov/cia/publications/factbook/](http://www.cia.gov/cia/publications/factbook/)

has been determined to be attributable to activities that are not in accordance with *Shari'ah* principles should be donated to a proper charity.

There are two main Islamic indices referred to as the Dow Jones Islamic Index and the FTSE Islamic index serving as a benchmark to assess the fund managers' performance against an Islamic standard. These indices have also created an opportunity to develop new Islamic products.

Besides having an index, Ho (2005) argues that structuring a *Shari'ah* compliant fund is a costly process that requires a lot of time and money. There are high legal costs because first, the investment house structures the fund and then passes on the contracts to the *Shari'ah* board for their approval. The *Shari'ah* board may refuse such work drafted earlier on by the first legal team. Furthermore, different *Shari'ah* boards often have different interpretations of what complies with *Shari'ah*. It only becomes worthwhile if there are enough investment funds.

Although significant progress has been made, the Middle East region has still plenty of work to do in the Islamic market. According to Bossuyt (2005), the Middle East investment market is worth approximately \$200 billion, yet only a \$5.8 billion is in Islamic equity funds. The reason may be in the risk profile of these funds. Islamic funds cannot use derivatives (Nida'ul, 1995), therefore creating hedge funds becomes even more difficult. The majority of hedge funds follow long/short strategies and/or employ derivatives such as futures, swaps and options. To attract Islamic investors, these instruments cannot be used. Furthermore, the transactions must be asset-backed. In view of the many restrictions that are imposed on Islamic finance, a sukuk bond seems to be one of the instruments recommended and accepted by most scholars. This financial instrument aids to minimize risk and also offers diversification to investors.

**1.2. Sukuk / Fixed income bonds.** *Shari'ah* scholars and academics around the world have devised many creative products to meet the needs of practicing Muslims. Significant ideas were put forward by Ariff and Mannan (1990) and Ahmad and Khan (1997). Other works were presented to make clear any misconceptions on certain Islamic principles. Al-Suwailm (2000) wrote extensively on how to deal with uncertainty from an Islamic perspective. Further to these scholars/academics there is a regulatory body known as the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) that in its year 2002 report provides guidance to users as to how to conform with Islamic financial principles.

Broadly speaking, the areas in which Islamic banks are most active are trade and commodity finance property and leasing. There are a number of traditional Islamic contracts that are now well accepted within the Muslim world. As a general rule, these contracts are asset-backed and they have a stable and constant return. These trust certificates are better known as *Sukuk*.

Islamic banks around the world have devised many creative products on the risk-sharing, profit-sharing principles of Islamic banking. Broadly speaking, the areas in which Islamic banks are most active are trade and commodity finance property and leasing. Islamic investments in European property also continue to grow, reaching nearly €2.5 billion in 2005, up from €2 billion in 2004. Most Islamic investors are income-driven, seeking annual returns higher than 8%. Some will be motivated by total returns rather than cash yield, seeking capital growth of at least 30%. In either case, the Islamic investor will be motivated, in the first instance, quickly to assess the potential returns of an asset, to filter out transactions that deliver insufficient profits, before spending more time considering the underlying prohibitions (Tan, 2005).

The last five years have witnessed the rapid growth of Islamic securities, known as Sukuk bonds, with more than US\$6 billion issued in 2004, and major western banks such as Citigroup and HSBC involved in their management (Wilson, 2005).

Sukuk bonds are similar to securitized assets and therefore belong to the category of Asset Backed Securities (ABS). Unlike conventional ABS structures, Sukuk bonds need to have an underlying tangible asset transaction either in ownership or in a master lease (Gassner, 2005). With conventional ABS one has cash flow streams from credit portfolios undertaken from the mortgage market. With Sukuk bonds the amount of the debt is limited to the value of the underlying assets. The owners of the property create a specially created entity (SCE) to serve as an interface with the public. The SCE becomes the new owner of the property and sub-leases the same property to the original owners. Investors purchase Sukuk bond certificates from the SCE, with the property being held as security. The return that the investors receive is a variable rent benchmarked to an interest rate index and may also include further bases points to the return. Some of the basic forms of sukuk are as follows:

***Musharaka:*** This is a partnership, normally of limited duration, formed to carry out a specific project. It is therefore similar to a Western-Style joint venture, and is also regarded by some as the purest form of Islamic financial instrument, since it conforms to

the underlying partnership principles of sharing in, and benefiting from, risk. Participation in a *musharaka* can either be in a new project, or by providing additional funds for an existing one. Profits are divided on a pre-determined basis, and any losses shared in proportion to the capital contribution.

In this case, the bank enters into a partnership with a client in which both share the equity capital and perhaps even the management – of a project or deal, and both share in the profits or losses according to their equity shareholding.

***Ijara Wa Iktina:*** Equivalent to the leasing and instalment – loan, hire purchase, practices that put millions of drivers on the road each year. These techniques as applied by Islamic banks include the requirement that the leased items be used productively and in ways permitted by Islamic law.

***Muqarada:*** This technique allows a bank to float Islamic bonds effectively to finance a specific project. Investors who buy *muqarada* bonds take a share of the profits of the project being financed, but also share the risk of unexpectedly low profits, or even losses. They have no say in the management of the project, but act as non-voting shareholders.

The *Sukuk* issuance scenario has been quite busy lately with a couple of prospectuses being issued by corporations, banks and also sovereigns. Case in point was the Tabreed UAE issue in 2004. Gutheri Malaysia in 2002 and other countries like Qatar in 2003, Malaysia in 2001 and Institutions like the Islamic Development bank in 2003. These alternative forms of fixed income securities try to replicate the functions of interest rate swaps and derivatives. Neftci and Santos (2003) try to explain these structures by creating synthetic framework that works like an Interest rate swap. Based on the above mentioned literature the following hypothesis is tested.

*H<sub>1</sub>: The inclusion of sukuk bonds in all equity portfolios reduces risk exposure without affecting return for a given fund.*

**1.3. Modern Portfolio Theory.** Modern Portfolio Theory (MPT) is founded on the simple premise that investors desire higher rather than lower returns, and prefer lower risk over higher risk. The theory is established by the pioneering work of Harry Markowitz (1952) where he demonstrated that assets can be combined in such a way as to produce a portfolio, namely the ‘efficient portfolio’, that will generate the highest level of portfolio return for any given level of risk, as measured by total risk (the standard deviation).

MPT explores how risk-averse investors can construct optimal portfolios taking into consideration the trade-off that exists between market risk and

expected returns<sup>1</sup>. The theory quantifies the benefits of diversification (Fama, 1976). Also, it should be noted that the Markowitz model is a single period approach (Mossin, 1966). This means that it is assumed that an investor has a given initial level of wealth for investment purposes and that this investment will be held for a specified period of time. At the end of this period, the investor is then required to liquidate the holdings and will then have to either reinvest or use it for personal consumption requirements (or a combination of both). Markowitz’s work of course is attributed with the spark that ignited further research into the area of asset pricing, namely the Capital Asset Pricing Model (Sharpe, 1963, 1964; Lintner, 1965; and Mossin, 1966) and the Arbitrage Pricing Theory (Ross, 1976). However, that is a story best left for another day<sup>2</sup>.

## 2. Data, research design and methodology

Every rational investor, irrespective of what is the background, has one main objective – to maximize return on the investment and minimize risk as much as possible. With the help of the MPT developed by Markowitz one may calculate the efficiency frontier of the portfolio and assess the impact of a new investment on the portfolio. Islamic funds are prohibited to take up fixed income but nowadays due to the sukuk (bond) market developed particularly in Malaysia and other countries investors are allowed to take in such investments as part of their portfolio.

Therefore, this paper will test whether including sukuk bonds within the existing equities in the portfolio will achieve the same rate of return with less overall risk for the portfolio.

To test the paper’s hypothesis, an Islamic equity fund was chosen. This fund is the Amana Fund, which is split into two categories: the income fund and the growth fund. A list of equities making up the fund was identified and prices of the respective equities were downloaded from Datastream. The time range of the data set spans over two years. Subsequent to the equities, the sukuk (bond) prices were downloaded from [www.bondweb.my](http://www.bondweb.my)<sup>3</sup> at the same corresponding time period. Solver<sup>4</sup> was used to allocate the amount of equities and bonds respectively to work out the efficiency frontier.

<sup>1</sup> For a detailed account of the development of Markowitz’s work refer to Peter L. Bernstein, *Capital Ideas: The improbable Origins of Modern Wall Street*, chapter two, New York: the Free Press, 1992.

<sup>2</sup> For a more detailed discussion regarding CAPM and APT we refer you to Thomas Copeland and Fred Weston, *Financial theory and Corporate Policy (third Ed.)*, chapter seven, Addison-Wesley, 1992.

<sup>3</sup> This is the official web-site where prices and other finance related information services are issued. All the information is with regards to the Malaysian market.

<sup>4</sup> Excel Solver is a portfolio optimizing tool, where funds are allocated to create efficient portfolios by maximizing return for a given level of risk.

To illustrate the derivation and benefit of an efficient portfolio within the Islamic managed fund industry, we have used weekly data from the Amana Fund, over the time period 2002-04 through to 2004-05. The actual summary statistics for the two asset classes (Growth and Income) are provided in Table 1. These statistics are generated for the time period investigated using actual asset allocation, as made available within the Amana Annual Report from the 31st May 2004.

Table 1. Actual investment risk and return measures for Amana Fund

	Growth fund	Income fund
Mean	16.30%	9.61%
Standard deviation	20.85%	5.47%
Coefficient of variation	1.279	0.569

As can be seen in Table 1, it is evident that the Growth fund offers the highest level of return (16.3%), but also has the highest level of risk (20.85%), so that the risk-return trade off for the growth fund (1.28) is considerably larger than that of the other asset class (0.57). This simplified table provides simple risk and return measures that are easily interpreted and are useful for informed decision-making.

Investments can be diversified on many levels. They can be categorized by: asset class by holding a mix of stocks, bonds and cash; by geographic sector, taking advantage of global opportunities and the fact that if one economy is weak, another is strong. Furthermore, one can use economic sectors to include a variety of industries, because when one industry is slowing down, another is picking up. Each of these diversifications will serve to increase returns and reduce risk. Once the asset classes are identified, then they can be diversified into multiple investment styles, for example growth, value and income and by market capitalization, including a mix of small-cap, mid-cap and large-cap companies. Portfolio returns can be enhanced by using multiple managers with complementary investment styles which react in their own ways to varying market conditions. It would be impossible for most individual investors to achieve such levels of diversification on their own. The amount of capital required would be immense. Investors can enjoy the advantages of this kind of multi-level diversified portfolio through certain mutual funds and investment programs.

In this study we are concerned with the construction of an efficient portfolio once the risk-free asset has been added to the mix. The risk-free asset is an important security as it allows for significant risk reduction without an impact on the expected return of a given portfolio. The portfolio expected return is a

weighted average of securities that make up the portfolio which can be demonstrated as a proportion of investment in the risk-free asset and the balance remaining of an investor's wealth invested in the risky efficient portfolio. This is demonstrated for the case of a two risky asset portfolio in equation 1. However, this extension to  $n$  assets is relatively simple and discussed in any introductory investments text.

$$E(R_P) = w_{RF} (RF) + (1 - w_{RF}) \times E(R_O), \quad (1)$$

where  $E(R_P)$  represents the expected rate of return of the portfolio consisting of investment in risky and risk free assets;  $E(R_O)$  represents the expected rate of return on the efficient risky portfolio O;  $w_{RF}$  represents the proportion of the portfolio invested in the risk-free asset;  $(1 - w_{RF})$  represents the proportion of the portfolio invested in the efficient risky portfolio O;  $RF$  represents the risk free return.

In order to find the portfolio risk the portfolio variance (equation 2) is obtained by finding the squared weights of investment in each security that makes up the portfolio along with the relationship between the assets that make up that portfolio as determined by the covariance.

$$E(\sigma_P^2) = (w_{RF} \times \sigma_{RF})^2 + ([1 - w_{RF}]^2 \times \sigma_O^2) + 2 \times w_{RF} \times [1 - w_{RF}] \times \sigma_{RF,O} \quad (2)$$

where  $\sigma_P^2$  represents the variance of the portfolio,  $\sigma_{RF}$  represents the risk of the risk free asset,  $\sigma_O$  represents the risk of the risky efficient portfolio,  $\sigma_{RF,O}$  represents the covariance between the risk free asset and the risky efficient portfolio.

The portfolio risk (equation 3) is then found by obtaining the square root of the variance.

$$E(\sigma_P) = \sqrt{(\sigma_P^2)}. \quad (3)$$

Modern Portfolio Theory (MPT) initially requires the identification of an efficient frontier from the derived minimum variance frontier. A number of alternatives exist when it comes to creating the efficient frontier (see Figure 1 for the efficient frontier of Amana Growth Fund) but, like many before us, we propose using Excel SOLVER, an optimization tool available in Microsoft EXCEL. The approach involves the following:

Step (1). From the total combination of securities that you wish to include in the portfolio, find the maximum return portfolio and then compute the risk for this  $[\sigma_1]$ .

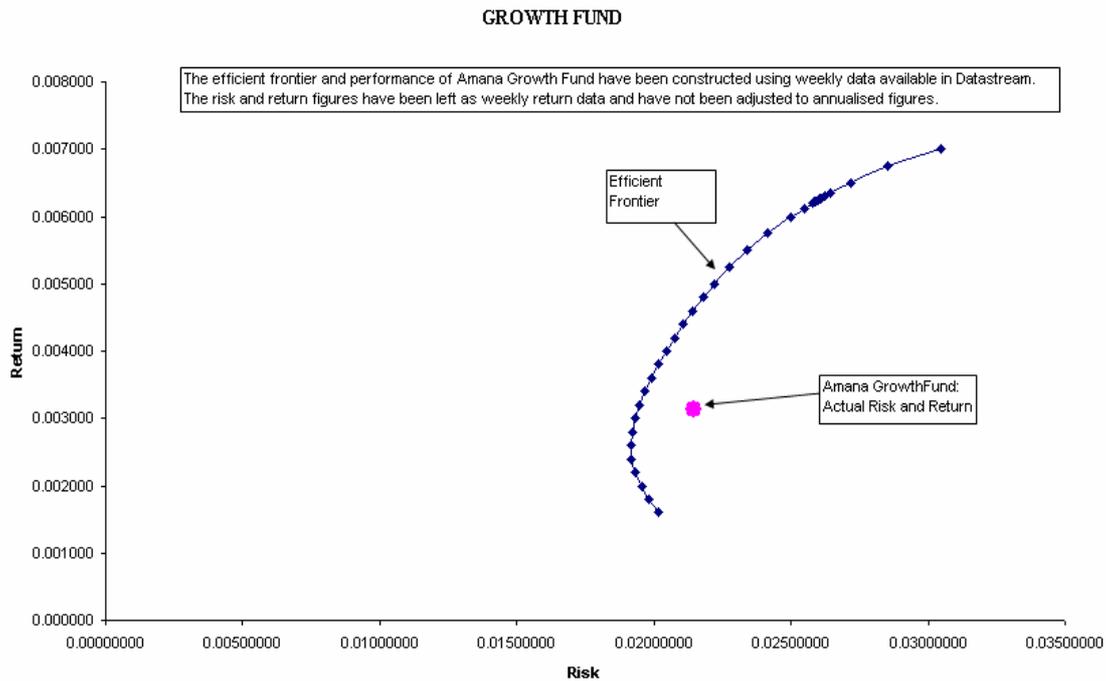
Step (2). From the total combination of securities that you wish to include in the portfolio, find the minimum risk  $[\sigma_2]$  portfolio and compute the return for this. The points we have found in step (1) and step (2) represent the start and end points for the efficient frontier.

Step (3). Compute the difference between  $\sigma_1$  and  $\sigma_2$  ( $\sigma_2 - \sigma_1$ ) and divide this into a sufficient number of points to produce a reasonable looking graph. This step requires some subjectivity, but the greater the number of iterations carried out, the more accurate the efficient portfolio will be.

Step (4). Solve the maximum return combination for each of these risk levels. Tabulate, or better still, graph these returns against the risks.

In order for the calculation of the return for each level of risk to be calculated, SOLVER has to be used a number of times. This repeated computation

can be carried out manually, by changing the risk level in SOLVER and storing each of the results in a table. However, given the number of securities many of today's modern investment funds invest in, manual adjustments can be time-consuming. It is, therefore, much more efficient to automate the process by creating a Macro using Visual Basic, which is a common add-in facility within the later versions of EXCEL. The steps involved in creating the macro are beyond the scope of this research paper. For the purpose of our illustration, the efficient frontier and the graphical output are presented in Figure 1.



**Fig. 1. Efficient frontier and efficient portfolio – Amana Growth Fund**

### 3. Results and discussion

When using the information available in the 2004 annual report we reveal that despite the reported superior performance of Amana Growth Fund, it lies within the boundary of the identified efficient frontier (refer to Figure 1). The implication of this position (below the efficiency frontier) is that firms which are on the frontier are performing better than those placed under the frontier. The rationale is that it can achieve an equal rate of return but at substantially less risk. An investor will target a point along the efficient frontier based on utility function and attitude towards risk. Figure 1 indicates that despite its annualized return figure of 16.3% (refer to Table 2), if MPT was adopted by Amana Fund then this return could have been achieved with lower risk. MPT requires the inclusion of a risk-free asset in the mix and for the purposes of this illustration we highlight the impact of including the sukuk bond as a proxy for that risk-free asset. Summary statistics are condensed in Table 2, where we illustrate the intro-

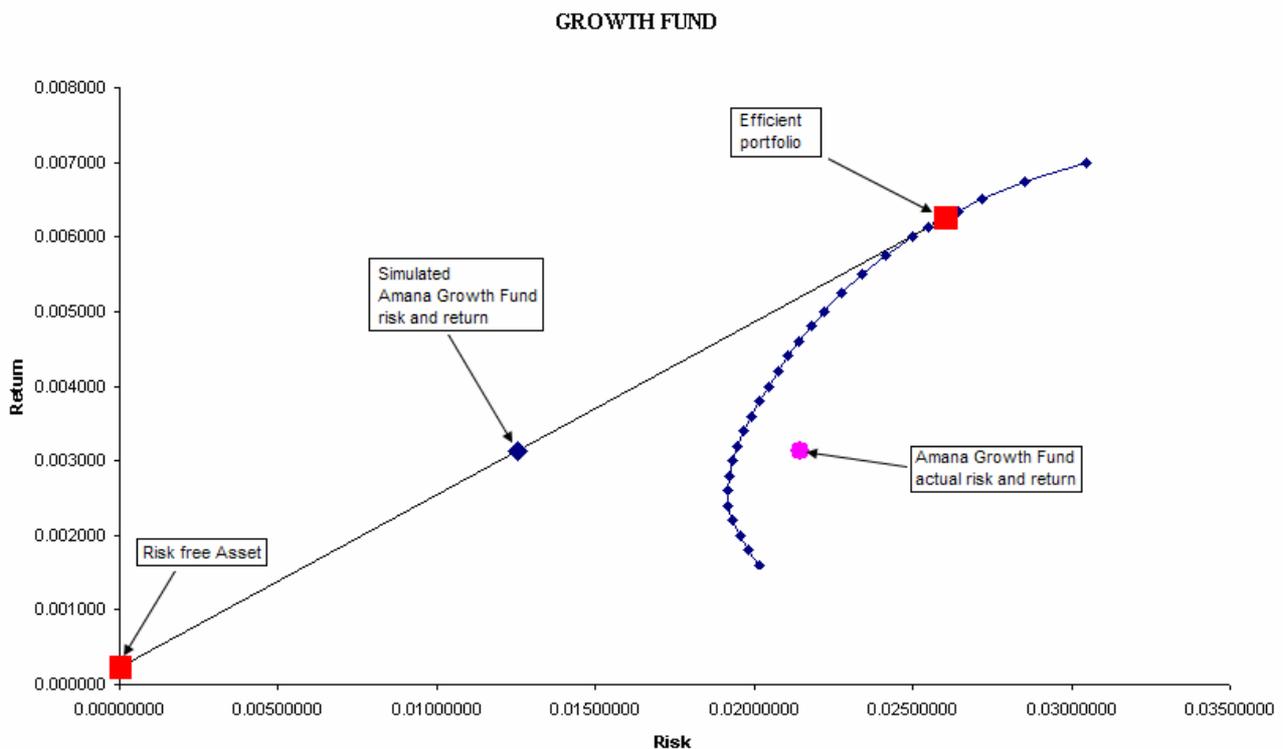
duction of the risk-return profile effect on the risk assessment of the portfolio mix.

**Table 2. Simulated investment risk and return measures with the inclusion of the sukuk bond for Amana Fund – growth & income**

	Growth fund	Income fund
Mean	16.30%	9.61%
Standard deviation	9.41%	4.94%
Coefficient of variation	0.577	0.514

What can be concluded from the summary statistics provided in Table 2 is that the return levels generated by Amana Growth (16.3%) and Income funds (9.61%) can be achieved, but at significantly reduced levels of risk, by including a risk-free asset in the mix. As regards the Growth fund, standard deviation decreased from 20.85% to 9.41%, a decrease of 11.44%. As regards the Income fund, there was a slighter decrease, from 5.74% to 4.94%. Once the sukuk bond is combined with the efficient portfolio, as highlighted in Figure 2, the risk-return profile for

Amana growth fund shifts to the left, indicating a more favorable position than before, since the same returns are achieved but with less risk.



**Fig. 2. Capital market line and simulated Amana Growth Fund Risk-Return Profile**

MPT dictates that once the efficient portfolio is combined with a risk free asset, the risk-return trade off for any given level of risk will lie on the Capital Market Line (CML). The CML, which is represented in Figure 2 as the straight line between the y-intercept (representing the risk-free asset) and the efficient portfolio, illustrates the risk-return trade off for any rational investor for any given level of risk. For a more detailed discussion regarding the CML we refer you to Henry Markowitz's Nobel prize-winning contribution.

## Conclusion

Malaysia has been in the forefront of the development and sale of Sukuk and, in 2002, it launched the first issue of such instruments, raising US\$600 million in the first and largest sale of Islamic dollar bonds. Since then, the Islamic Development Bank has sold US\$400 million of similar securities, and the Philippines and Turkey are showing a great amount of interest. In 2003 Qatar sold as much as US\$700 million of these bonds. One of our future projects is to run the same test as above, replacing the US Treasury bond rate with one of the many issues of sukuk bonds. In this way we can present a holistic picture of Islamic finance and demonstrate that MPT facilitates investors' return by reducing the risk.

The findings in this paper indicate that by using sukuk bonds, one may still achieve the same expected return and what is better is that same return can also be achieved by exposing oneself to less risk. This win-win situation should serve as an eye opener to Muslims that are sceptical about the returns on sukuk bonds. Sukuk bonds are still part of a developing market and in the future beyond any doubt this will attract further attention both from Islamic and non-Islamic investors. This study has demonstrated that with sukuk bonds the portfolio's risk is reduced and should be an eye opener for some funds that have a high risk profile.

Portfolio managers, whether situated in Abu Dabu or New York, constantly are on the look-out for new developments within the financial sector in an endeavor to provide the best fund performance to existing and potentially new clients. MPT since its inception has been empirically demonstrated to show that introducing a risk-free asset reduces risk. Islamic investors now have (thanks to the developments within the Malaysian financial sector) an instrument that can help investors achieve the same returns with a lower risk. It is now up to the Shariah boards of the various equity funds to assess whether it is worthwhile embracing these sukuk bonds.

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