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Risk and Return under Shari'a Framework: An Attempt to Develop Shari'a Compliant Asset Pricing Model (SCAPM)

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Abstract

A speedy emerging area of finance is the Shari'a compliant financial system. In first decade of 21st century Islamic financing has shown tremendous increase and global volume has reached to US $ 1,041 billion by the end of 2009. Being financial intermediaries Islamic Financial Institutions (IFIs) have shown commendable progress in deposit collection under profit and loss sharing schemes however investment avenues are limited in comparison of conventional banks. Although a large number of financing modes are available to IFIs, yet maintenance of required liquidity is serious issue because money market and capital market is dominated by interest based instruments and conventional practices (some are clearly prohibited by Shari'a). Recently Al-meezan Investment Management Ltd. (AIML) has started screening of Shari'a compliant stocks on KSE, and provided an avenue for Shari'a Compliant Investors/IFIs to invest in equities. This study is conducted to understand conventional asset pricing models, document any mismatching with Shari'a financial system, and suggest amendments if required. Findings suggest existing models of equity pricing (CAPM, APT/MFM) are very much practicable under Shari'a framework with slight modification of risk free return because under Shari'a frame work risk free returns do not exist.

Keywords: SCAPM, Islamic financing, APT, Security pricing, valuation.

1. Introduction

Islamic finance has shown tremendous growth in last two decades. By the end of December 2009, in more than 50 countries approximately 300 institutions are operating and they manage funds of US$ 1,041 billion. Persian Gulf Area is the centre of Islamic finance with a share of 81% approximately followed by South Asia and Fareast region 14% and balance from all over the world including Europe, North America and Africa (IFSL 2011). Islamic banking has shown tremendous growth in Pakistan in last seven and half years (01/04-06/11). By the end of June 2011, five[1] full-fledged Islamic banks and

[1] On October 30, 2010, merger of Albaraka and EGIB taken place and number of full fledged Islamic banks reduced to five.

12-conventional banks with Independent Islamic Banking Branches are operating in Pakistan. Number of branches has been increased from 17 to 799 within seven and half years (01/04 to 06/11) an average annual increase of 70%. Assets increased at average annual rate of 69% while deposits increased at average annual rate of 77% and financial disbursements and investments increased at average annual rate of 66% during the period (01/04 - 06/11). Overall an average growth of 71% per annum in the last seven and half years was achieved by Islamic banking in Pakistan. (SBP, 2011).

Islamic financing is the working within the Shari'a (Islamic law) frame work; following certain restrictions including following. First IFIs cannot provide finance for an activity which is prohibited by Shari'a (Islamic law) irrespective of its profitability and economic viability e.g. business of liquor, pork and pornography. Second IFIs cannot lend any amount in cash for interest (only charitable loans are allowed) however needs are fulfilled either through supply of required assets or through profit and loss sharing in the underlying investment project. Third under Islamic financial system, when financing is provided under profit and loss sharing although profit can be shared as per agreement between the parties involved, however, loss must be shared according to capital contribution/ownership.

One of the prime needs of modern banking is liquidity as depositors have flexibility to withdraw their savings as and when required except in fixed deposits. Deposits are collected by IFIs following Mudaraba principles (except current deposits which are taken as loan), whereby IFI interacts as mudarib and charges fee for investing savings of depositors. To ensure liquidity, all funds of depositors are not issued in loans (invested) rather certain portion is invested in short term liquid securities. In order to meet liquidity requirements conventional banking has wider options based on interest, including money at call and short notices, interest bearing government securities, interest based bonds etc. For IFIs Investment avenues are very limited to create required liquidity at the same time to earn profit by investing in short term and liquid securities due to Shari'a noncompliance risk. Another option available is the investment in equities through stock exchanges which is although offering liquidity but not ensuring capital maintenance. Investment in equities through stock exchange has got the (bad) name of speculation over the period which is prohibited by Islamic financial system. There is a need to address the operations of stock exchange by Shari'a experts (AAOIFI) to decide which of the activity is contradicting with Islamic law.

As for investment in market able securities are concerned again IFIs are not free to invest in any equity security due to two reasons. First Halal business of the underlying firm is required. Second financial operations of underlying firm should be ideally interest free or at least should not be dominating. Keeping in view the dominance of conventional banking and existing business practices one can conclude very safely that a very negligible number of firms meet both conditions.

The much appreciable job has been done by Al-meezan Investment Management Ltd. (AIML) in this regard. A list of Shari'a compliant securities is being maintained and updated every six monthly out of which 30 companies are selected for Kse-Meezan Index

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This work is an attempt to develop capital asset pricing model under Shari'a frame work and must not be taken as Juristic opinion (Fatwa) on the subject. It should be considered as brain storming exercise on the subject and an effort to understand risk and return under Shari'a frame work.

(KMI-30). KMI-30 was established in June 2008. IFIs can invest only in those securities which are declared Shari'a compliant securities through filtering of Shari'a compliance criteria. Listing here the major conditions to qualify a security as Shari'a compliant is worth mentioning as follow. Meeting of following tests is required to declare a security as Shari'a compliant (KMI-2008). (1) The core business of the company should be Halal (not prohibited by Islamic Law such as liquor, pork and pornography etc). (2) Illiquid assets should be at least equal to 20% of total assets of the company. Shares of a company merely dealing in liquid assets are not Shari'a compliant hence IFIs cannot invest. (3) Ratio of all interest based debts including preferred stock should be less than 40% of total assets of the company. (4) Ratio of non Shari'a compliant investments to total assets of the company should be less than 33%. (5) Revenue from non compliant investments should be less than 5% of total revenue of the company and even then IFIs are required to purify their earnings by spending this non compliant revenue as charity. (6) Market price per share should be greater than the net liquid asset per share.

1.1. Need for SCAPM

As IFIs are entering into equity market for investment hence guidance in the field of risk and return trade off and security pricing under Shari'a framework is required. Risk taking (but not Gharar) in business is accepted by Shari'a; and experts in business/finance are in consensus about positive relationship of risk and return. Islamic Law discourages risk free return by banning charging of interest. Security pricing is at the heart of financial literature and numerous valuation models have been developed so for including cash flows discount models and technical models. There is a need to analyze the existing security pricing models within the filter of Shari'a compliance, document any mismatching with Shari'a financial system and suggest alternatives where required. This study is an attempt to analyze the technical asset pricing models (CAPM, APT and multifactor models), based on behavior of stock market and macroeconomic factors, test the validity through Shari'a compliance filter and suggest modifications if required. Certain efforts on this front are already made e.g. Ashker (1987) proposed replacement of RF with Zaka rate, Sheikh (2010) suggested replacement of RF with Nominal GDP growth rate, while Tomkins & Karim (1987) suggested simply deletion of RF. This study rejects the deletion of RF without replacement because in that case inflation is also linked with riskiness of security while in real world inflation hits every investment irrespective of riskiness, and proposes replacement of RF with inflation index because the first preference of an investor is to maintain the capital and then expect return. In section II technical models of asset pricing have been discussed briefly, followed by proposed Shari'a compliant asset pricing model in section III. Section IV concludes.

2. Technical Factors Asset Pricing Models

2.1. Capital Asset Pricing Model

Capital asset pricing model (CAPM) developed by Nobel Laureate William Sharpe (1961), states that expected return on an asset is the linear function of expected risk. According to the model total risk of a security is distributed between systematic and unsystematic risk. Whereas unsystematic risk can be reduced/ eliminated through efficient diversification while systematic risk is priced by the market. As the total risk of a security is measured by standard deviation while systematic risk is measured by Beta, hence, the Beta is relevant measure of risk for expected return. Beta measures the co movement of the security with the market. Beta is calculated by applying the formula:

$$[\beta\square = \frac{CovXM}{VarM}] \quad (1)$$

Whereby $\beta\square$ is the Beta of security x; $CovXM$ is the covariance of returns of security x with the market returns; and $VarM$ is the variance of market returns. Once the Beta of a security is determined required return is calculated by applying following equation:-

$$[R_j = R_f + B_j(R_m - R_f)] \quad (2)$$

CAPM advocates that investors need to be rewarded in two ways: firstly for time value of money and secondly risk associated with the security. First half of formula represents risk free return (RF) that compensates the investors for placing money in any investment over a period of time. The other half of the formula represents [β(Rm-Rf)] risk premium for bearing additional risk. Capital Assets Pricing Model (CAPM) is widely used by the finance managers and/or investors in finding the risk of the investment and to predict the expected returns of the stock (Jagannathan & Wang, 1993).

Empirical evidence on explanatory power of CAPM is mixed. Since the development of the CAPM, number of studies has been conducted for testing the validity of the model. [e.g. Lau, et. al; (1974), Bjorn and hordahl, (1998), Huang, (2000), Gomez and zapatro, (2003), Fraser, et. al; (2004), Michailidis, et. al., (2006), Guo et. al; (2008),]. In Pakistan at least four studies are known to this author (Iqbal & Brook, 2007, Eatzaz and Attiya, (2008); Hanif & Bhatti, (2010); and Hanif, (2010), on Karachi stock market. To conclude results are although mix but favoring inapplicability of CAPM in its original farm and demands modification. CAPM relies on single measure of risk (Beta) and ignores the other factors contributing in risk of a security. The basic risk return relationship is not rejected hence model retains its place in literature and can be a helping hand to investors with certain modifications especially inclusion of more risk factors as suggested in APT/ multifactor models.

2.2. Arbitrage Pricing Theory

Arbitrage pricing theory was developed by Ross in 1976. Unlike CAPM theory of arbitrage pricing advocates that multifactor are contributing in security risk hence during calculation of required return one should not rely on single risk factor. Following is the basic equation depicted from Reilly, and Brown, (2003):

$$[E(R_i) = \lambda_0 + \lambda_1 b_{i1} + \lambda_2 b_{i2} \dots\dots\dots\dots \lambda_k b_{ik}] \quad (3)$$

In the equation λ_0 represents the intercept/ constant which is like risk free return in CAPM while λ_1 to λ_k represents the risk premium of each factor and b_{i1} to b_{ik} represent sensitivity of the security with relevant risk factor.

The original theory has not specified either identity or number of risk factors to be included while determining required return. Identification of factors relevant to a security or portfolio had left with the investor. Factors used in testing the multifactor models by researchers are grouped by Reilly, and Brown, (2003), as Macroeconomic based risk factors and microeconomic level factors. Macro economic factors used by Chen, et. al., (1986) include Market index, industrial production index, inflation (total and unexpected), unanticipated change in credit spread and unanticipated term structure shift. Micro economic factors used by Fama, and French, (1993), include size of the company and market to book ratio.

In local institutional frame work at least two recent studies are available to this author including Hassan & Javed (2009); and Butt & Rehman (2010). Factors included in these studies are industrial production, oil prices, exchange rate, treasury bills rate, inflation,

money supply and foreign portfolio investment etc. Results provide evidence of relationship between stock market returns and macro economic variables. Although, all the macro economic variables included in studies are not affecting the index significantly.

3. Shari'a Compliant Asset Pricing Model (SCAPM)

The land mark achievement in asset pricing is the modern portfolio theory by Great Markowitz (1952) whereby capital market line (CML) is developed based on risk and return. In development of capital market line risk measure used was standard deviation covering the total risk of an investment opportunity. Building on developments of Markowitz, William Sharpe (1961) developed capital asset pricing model (CAPM) and created Security market line (SML) based on systematic risk (measured through Beta) only because unsystematic risk is diversifiable and rational investors do diversify the unsystematic risk of a security while constructing portfolio. Following is the basic equation of CAPM. $[R_j = R_f + (R_m - R_f) B_j]$. Whereby, required return of a security consists of two parts. (1) Risk free return and (2) is risk premium according to Beta of the security with the bench mark like stock market index. CAPM advocates that investors should be compensated in two ways. First for time value of money in the form of risk free rate (normally interest rate on government securities is taken as proxy for risk free rate) and second for taking the systematic risk i.e. risk premium.

What is the essence of CAPM? It helps in determining the profit rate (required rate) on an investment. Under Shari'a frame work profit charging is allowed in business. Practically profit rate is determined by market forces of demand and supply of underlying commodity offered for sale. Investment in equities (shares) is the ownership right of an investor and of course price of a share is also determined by demand for and supply of the underlying security. Demand and supply of shares is also affected by futures, forwards and short selling which have turned equity investment into speculative business. As for Islamic financial system is concerned; ownership, possession and existence of a commodity, to be sold, is required except for Salam and Istisna'a. Whether Salam and Istisna'a sale is applicable to equity shares? This point requires attention of Shari'a scholars although the essence of Salam is dealing in agricultural products and of Istisna'a is dealing in manufactured commodities. Leaving apart the debate whether deferred delivery contracts are allowed for equity investments, I have focused upon the issue of required return. One of the options (to determine required rate) available to the investor is opportunity cost (the reward available on second best investment option). However CAPM has its place traditionally as for investment in equities is concerned.

Traditional CAPM is developed in interest based environment which does not exist under Shari'a based financial system. Under Shari'a (Islamic law) risk and return mechanism is bit different from conventional business environment, as no risk free investment opportunity exists (allowed), hence original equation of risk and return is not workable.

While the component of RF is not present in Shari'a compliant financial environment so the original equation of required return after modification becomes as documented by Tomkins & Karim :-

$$[R_j = (R_m) B_j] \qquad (4)$$

Whereby required return of investor depends upon relationship of individual security with bench mark (e.g. stock market) measured through beta and there is no minimum compensation in the form of Risk free return.

According to Ashker (1987) RF Should be replaced by Z which is equal to $[Zaka\ rate/1 - Zaka\ rate]$ which is 2.56% because in order to attract capital for investment it is minimum return an investor would expect (willing) for investment to cover Zaka, otherwise investor would prefer spending instead of investing. Hence equation of CAPM becomes as follows (adopted from Ashker, 1987):-

$$K_e = Z + (R_m - Z)\,B_j] \qquad (6)$$

Whereby required return of investor depends upon two components; return to cover Zaka and risk premium measured through beta of a security in relation to a bench mark (e.g. stock market).

Sheikh (2010) proposed the linkage of debt servicing with nominal gross domestic product growth (NGDPg)and replacement of RF with Nominal Gross domestic product growth rate. Under his proposed model equation of CAPM turns into following shape:-

$$R_j = NGDPg + (R_m - NGDPg)\,B_j] \qquad (5)$$

Whereby required return of investor depends upon two components; Nominal GDP growth rate and risk premium measured through beta of a security in relation to a bench mark (e.g. stock market).

Now the important question is should there be minimum compensation (as RF in conventional frame work) for investor under Shari'a compliant financial system. To answer this question we have to look into composition and justification of RF in conventional frame work. Nominal RF is composed of two things (1) is real RF and (2) is inflation charge. Real RF represents time value of money. It is the rent for using money. According to Keynes' liquidity preference theory it is the compensation for sacrificing liquidity by investor. Under Shari'a frame work money is medium of exchange and not commodity (which can satisfy any need of humanity by its own….. like medicine cures the disease) hence deserve no rent. Time value of money is not recognized by Shari'a scholars in the area of finance. Money can be used in the utility creation process (production and delivery of goods and services) and deserves return on profit and loss sharing basis. Time value/ rent of money falls in the category of 'Riba' (interest) which is forbidden in all known revealed religions including Judaism, Christianity and Islam.

Certain quarters are of the view that Riba which is prohibited by revelations is the Usury (interest charged on consumption loans) and banking interest (interest charged on productive loans) is not covered by the Term. The consensus view of Muslims about the meaning of Riba is that the Term covers both concepts of predetermined charge in a transaction of loan including usury (additional charge on a need based loan) and commercial interest (additional charge on a business loan) presented here under.

Extract from the decision of Supreme court (Pakistan) follows: *"It is thus clear that the permissibility of interest can neither be based on the financial position of the debtor, nor on the purpose for which money is borrowed, and therefore the distinction between consumption loans and productive loans in this respect is contrary to the well-established principles"* (Usmani, 1999 Para 72).

Islamic Fiqh Academy India[2] defines: *"Riba (interest) is a very important term in the Islamic terminology showing disapproval and it refers to the instrument by which a*

[2] http://ifa-india.org/english/arabic_Words.html accessed on 20th March, 2010.

loaner charges some amount lump sum or in installments over and above his principal amount from the loanee and thus increases his wealth manifold without participating in the business process of profit and loss".

Siddiqi, (2004) concluded that unanimous view of Muslims throughout history remained is--- any excess charge in a contract of loan is riba ---- and bank interest has no exception. Islamic Fiqh Academy (IFA) Jeddah of OIC representing the collective wisdom of Shari'a experts is of the view that any increase stipulated in a contract of loan irrespective whether consumption loan or productive loan is Riba and prohibited by Allah (SWT): *"The equivalence of riba to interest has always been unanimously recognized in Muslim history by all schools of thought. In conformity with this consensus the Islamic Fiqh Academy of the Organization of the Islamic Conference (OIC) has recently issued a verdict in its Resolution No. 10(10/2) upholding the historical consensus on the prohibition of interest"* [Iqbal and Molyneux, p. 9; IFC/2000][3].

It is clear from above citations that risk free return (interest) is Riba prohibited by Shari'a, hence, no question of its existence under Shari'a compliant financial system.

The second component of RF is inflation charge. Under paper currency regime due to inflation purchasing power of currency reduces and owner of currency looses it wealth. It should be prime responsibility of Islamic state to protect the wealth of its citizens along with life, faith, next generation and honor[4]. Wealth is reducing due to excessive inflation in the economy and government of Islamic country should not let this phenomenon unchecked. Under Shari'a compliant financial system, Should the investor be compensated for at least equal to inflation rate in the economy is an issue which is being debated among the Shari'a scholars and we expect an early outcome.[5] Leaving apart the debate on indexation, let us consider the makeup of required return under SCAPM. Any investor who is willing to invest in a business, foremost priority is the capital maintenance and then profit. Without covering the reduction in capital due to inflation, through profit, one cannot maintain his capital under paper currency regime. Furthermore inflation hits all the investments irrespective of risk level and impact of inflation should not be linear with riskiness of a security. Equation (4) developed by Tomkins & Karim (1987) missing this fact and puts the inflation in linear relationship with riskiness of a security. In order to accommodate forgoing observations following equation of Shari'a compliant asset pricing model looks appropriate:-

$$[R_j = N + (R_m - N)B_j] \qquad (7)$$

Where by R_j is required return of a security; N is inflation charge; R_m average return on market portfolio and B_j is beta of security (relationship of returns between security and bench mark such as stock market). For inflation proxies of Consumer Price Index (CPI), wholesale price index (WPI), Basket of selected commodities or even basket of selected currency can be used.

[3] http://www.globalwebpost.com/farooqm/writings/islamic/r-i-consensus.html accessed on March 20th 2010.
[4] Objectives of Islamic law (Maqasad-e-Shari'a).
[5] For details on the topic of indexation please see "Indexation of loans by Mohay ud Din Hashmi" chapter in book " Institutions of collective Juristic opinions, Concept, Evolution and Practical ways" [Ijtamai Ijtehad kay idarey; tasawer aor amaly tareekay; in Urdu language], Institute of Islamic Research, International Islamic University, Islamabad, Pakistan.

Traditional CAPM was criticized on account of relying on single factor as measure of risk (Beta) and multifactor models were presented as an extension of CAPM including Arbitrage Pricing Theory (APT) by Ross in 1976. Unlike CAPM theory of arbitrage pricing advocates, that, multifactor are contributing in security risk hence during calculation of required return one should not rely on single risk factor. Following is the basic equation depicted from Reilly, and Brown, (2003). $[E(R_i) = \lambda_0 + \lambda_1 b_{i1} + \lambda_2 b_{i2} \dots\dots \lambda_k b_{ik}]$ In the equation λ_0 represents the intercept/ constant which is like risk free return in CAPM while λ_1 to λ_k represents the risk premium of each factor and b_{i1} to b_{ik} represent sensitivity of the security with relevant risk factor. Following the Tomkins & Karim (1987), the only objectionable component in the equation is λ_0 representing RF and without it equation becomes:-

$$[E(R_i) = \lambda_1 b_{i1} + \lambda_2 b_{i2} \dots\dots\dots\dots \lambda_k b_{ik}] \qquad (8)$$

Whereby $E(R_i)$ is the expected return/ required return of security and λ_1 *to* λ_k is the risk factors while b_{i1} *to* b_{ik} is the beta coefficients. However as discussed earlier inflation impact is same for all investment opportunities, hence, it should not depend upon riskiness of a security and must be accommodated separately. If we delink the inflation charge from risk premium then original equation of Ross (1976) remains intact with a slight modification as follow:-

$$[E(R_i) = N + \lambda_1 b_{i1} + \lambda_2 b_{i2} \dots\dots \lambda_k b_{ik}] \qquad (9)$$

Whereby N is inflation while λ_1 to λ_k represents the risk premium of each factor and b_{i1} to b_{ik} represent sensitivity of the security with relevant risk factor.

4. Conclusion

Growth in Islamic finance has led to diversified investments and services by IFIs which demands attention of Shari'a experts on regular basis to settle the Shari'a compliance status of any business activity performed (or intended to be performed) by IFIs. With the advent of KMI-30 Index, IFIs have got an opportunity to invest in capital market (being dominated by conventional practices) to increase their liquidity, consequently numbers of issues are emerging and require attention of Shari'a experts. Shari'a experts alone may not be able to settle the matters (given the lack of training in finance), hence, team effort is required by Shari'a and finance experts to meet the challenges as practice remained in the past.

In this study I discussed the technical asset valuation models used under conventional frame work and their likely application under Islamic frame work. Islamic financing is working within the Shari'a frame work following certain restrictions including investing in Halal (lawful) businesses, prohibition of predetermined fixed charge on capital and sharing outcome of underlying project. Existing technical equity pricing models are very much applicable under Shari'a frame work with a minor modification of risk free return as under Islamic financial system risk free return does not exist. Traditional CAPM is convertible into SCAPM by eliminating risk free return and including inflation charge. Islamic finance is supposed to work in existing business environment within Shari'a restrictions hence only modifications to existing literature are required to bring it in conformity with Shari'a instead of re-inventing the wheel, as remained the approach of pioneers in Islamic financial system. Future research area includes comparative testing of conventional and Shari'a compliant asset pricing models.

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