Capital asset pricing model importance in financial world

Capital asset pricing model popularly referred to as CAPM has been of great importance in the asset pricing world. There have been wide acceptances as well as strong arguments regarding the validity of the model over the years, with regards to the fundamental assumptions of the model and the practicability of the model (Bodie, Kane and Marcus, 2005).

(Bodie, Kane and Marcus, 2005) The capital asset pricing model provides a yardstick rate of return for appraising possible investments. The standard rate of return is a fair return given the risk involved in the investment.

“ The model also helps us make an educated guess as to the expected return on assets that has not yet been traded in the market place.” (Bodie, Kane and Marcus 2005)

“ The CAPM assumes that the security market is large and investors are price takers, there are no taxes or transaction costs, all risky assets are publicly traded, investors can borrow and lend any amount at a fixed risk free rate, all investors analyze securities in the same way and share the same economic view about the world.” (Bodie, Kane and Marcus 2005)

The organisation of this write-up is as follows a detailed introduction of the capital asset pricing model (CAPM), followed by a literate review of the model which goes into an in-depth analysis of the model as regards to its functions, compatibility and suitability as it relates to asset pricing. Finally, in conclusion a capsulation of the defects, modification and significance of CAPM.

J. Balvers, 2001 “ The Capital Asset Pricing Model (CAPM) is the most popular model of the determination of expected returns on securities and other financial assets. It is considered to be an “ asset pricing” model since, for a given exogenous expected payoff, the asset price can be backed out once the expected return is determined. Additionally, the expected return derived within the CAPM or any other asset pricing model may be used to discount future cash flows” (J. Balvers, 2001. p. 35).

Furthermore according to Bodie, Kane and Marcus, 2005, described “ CAPM as a method suitable for determining required rate of return of an asset. The model is considered as an extension of Markowitz’s portfolio theory”. It is expressed in a linear relationship between the return required on an investment and its systematic risk. As described below:

E [Ra] = RF + Î²a [E (Rm) – RF),

Where, E [Ra] is expressed as the required return on financial assets. Rf is the risk-free rate of return, E [Rm] is the expected market return and Î²a is the measure of risk [Beta].

CAPM advocates; investors need to be rewarded in two ways: firstly for the time value of money and secondly risk associated with the security. The first half of the 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 [Î² E(Rm – Rf)] risk premium for bearing additional risk. (Hanif and Bhatti 2010)

A more graphical and pictorial representation of CAPM is expressed in the Security Market Line (SML); the line shows the most efficient risk and return to an investor. It shows the expected rate of return of an individual security as a function of systematic risk (beta).

FIGURE 1: THE SECURITY MARKET LINE

Y

X

Source: Balvers,(2001: 41)

The Y-intercept (beta= 0) of the SML is equal to the risk-free interest rate. The slope of the SML is equal to the market risk premium (μm -rf) and reflects the risk return trade off at a given time:

SML: $E(\mu M) = Rf + \hat{I}^2 i\ [E(\mu m)-Rf]$

The risk expected return relationship is called the security market line (SML). The expected return on security equals the risk free rate plus the risk premium. In CAPM the risk is measured as beta times the expected return on the market minus the risk free rate. The risk premium of a security is a function of the risk premium of the market and varies directly with the level of beta, no measure of non-systematic risk appears in the risk premium, as CAPM assumes that diversification has eliminated it. (Mullins 2000.)

LITERATURE REVIEW

“ Beta is the standard CAPM measure of systematic risk, one way to think of beta is that it gauges security volatility relative to the market volatility”

(Mullins, 2000, p. 108). Stock whose beta are greater than 1 has a high level of systematic risk and are very sensitive to the market changes, stock with beta less than 1 has a very low level of systematic risk and less sensitive to market changes, stock whose beta is equal to 1 as an average level of systematic risk, rise and falls at the same percentage as the broad market index. (Mullins, 2000)

In a freely competitive financial market described by CAPM, no security can sell for long at a price low enough to yield more than its appropriate return on the SML. The security will be very attractive compared with other securities of similar risk and investors would bid its price up until its expected return fell to the appropriate position on the SML. Conversely, investors would sell off any stock, selling at a price high enough to put its expected return below its appropriate position. The resulting reduction in price would continue until the stocks expected return rose to the level defensible by its systematic risk. (Mullins 2000).

On the SML the stocks with low beta will lead to a low risk premium. Despite the stock’s high level of total risk, the market would price it to yield a low expected return. In practice such counterintuitive examples are rare, most companies with high total risk also have high betas and vice versa. Though according to CAPM the financial market cares only about systematic risk and price securities such that expected return lie along the SML. (Mullins 2000).

One of the major purposes of the Capital asset pricing model is the determinant of the institutional demand for common stock. At the most basic level, institutional demand should be a function of the risk-return attributes

of individual stocks. (Hanif and Bhatti 2010). It is mostly used by the finance managers and/or investors in finding the risk of the investment and to predict the expected return of the stock (Jagannathan and Wang, 1993).

It is also used to find out the cost of capital, Capital budgeting is used by a firm to note profitable and unprofitable projects. A key variable in any capital budgeting procedure is the cost of capital, also referred to as the opportunity cost of the capital necessary to finance the project. The opportunity cost accounts for time preference as measured by the risk free interest rate and risk.

It assumes that relevant risk is systematic risk that can be measured based on the (estimated) beta of the project and the anticipated market excess return. A related application is in regulation. In a case, for instance, where the government fixes the price of a particular service provided by a utility, the administered price depends on providing the utility with a fair return on capital. This “ fair” return is often calculated by applying the CAPM to determine the systematic risk of the utility’s activities and thus obtaining the required return (J. BALVERS, 2001).

CAPM is also an effective tool for portfolio return evaluation; it is used to find out how a managed portfolio has performed. This is because higher levels of systematic risk in the portfolio imply higher average returns. In practice it is used to adjust for risk and also differentiate abnormal returns from simply excess returns. (J. BALVERS, 2001)

Mullins, 2000 states that CAPM as an idealized theory of financial markets is surrounded by some controversies in that the model’s assumptions are

viewed as clearly unrealistic. But the true test of CAPM is naturally evident in how well it works there have been numerous empirical test of CAPM. Most of these have been examined in the past to determine the extent to which stock returns and betas have corresponded in the manner predicted by the security market line. With few exceptions the major empirical bodies in this field have concluded that betas are not fixed through time. This fact creates difficulty when betas estimated from historical data are used to calculate costs of equity in evaluating future cash flows.

Beta which is used as a measure of risk appears to be associated to with past returns, due to the close link between total and systematic risk, distinguishing their effects will be difficult. Under CAPM it is believed that Beta should change has both company fundamentals and capital structure changes in reality. It is also argued that beta estimates from the past are subject to statistical estimation error. The estimate of the future risk free rate and the expected return on the market are also subject to error, although quite alot of research has concentrated on developing methods to reduce the possible error (Mullins, 2000).

Reality matches what the CAPM foretell as the relationship between beta and past returns is linear. Also the relationship is positively sloped which implies that high returns are associated with high risk and low returns are associated with low risk (J. BALVERS, 2001)

CONCLUSION

In conclusion despite CAPM shortcomings in measuring the cost of capital and due to its single period model coupled with its inability to reflect all

market information (efficient market hypothesis) (Johnson, Spearin & Groenewegen 2006). Speaking of the inability of CAPM to fully capture and reflect a real life situation this can be better explained in the role CAPM plays in efficient market hypothesis (EMH). Basically there are three forms of market the strong form of market efficiency (EMH) in which the market prices reflects all available information which includes both the insider information and forecast information on a real time basis making asymmetry information absent. Though this cannot be totally assured in the two remaining forms of EMH the semi-weak and weak form of efficiency do no justice when it comes reflecting all available information present in the market on a timely basis and a more informed investor can outperform both uninformed investor and the market as a whole (Z. A. Ozidemir 2008).

In line with the above statement (Merton 1987) was of the notion that in reality some investors were better more informed than others to the extent that some less informed investors were not aware of the existence of some opportunities in the capital market. Despite this deficiency some investors still used CAPM to measure asymmetry information that was present in the market by modifying it to take care of the heterogeneous information. Which included the measurement of how asymmetry information influences stock prices and cost of capital (Easley and O'Hara 2004). An in-depth examination of the model proves that the use of CAPM both in theory and in practice cannot be totally discarded in that it has much to say as regards to the way returns are determined in the financial market as compared to other models. Its key advantage is that it quantifies risk and provides a widely applicable, relatively objective routine for translating risk measured into estimates of an

expected return coupled with modification of the traditional CAPM contain the impact of changes in expected return distribution (Javed, 2000).

Finally a major advantage of CAPM is the objective nature of the estimated cost of equity that the model can yield. CAPM cannot be used in isolation because it necessarily simplifies the world of financial markets. But financial managers can use it to supplement other techniques and their own judgement in their attempts to develop realistic and useful cost of equity calculations (Mullins, 2000).