A COMPARATIVE ANALYSIS OF LEADING COMPANIES OF THREE SECTORS

(AUTOMOBILE, TELECOM AND IT SECTOR) LISTED IN NSE:

USING CAPITAL ASSET PRICING MODEL

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ABSTRACT

Return and risk are two important characteristics of every investment. Investors attempt to reduce the level of variability of returns through diversification of investment. This research paper shows the companies scrip behaviour with market reaction. The prime objectives of the research paper is to know expected return, risk associated with market return, Applicability of CAPM in five leading companies of each selective three sectors. Data collection is based on secondary collected from website www.nseindia.com. Sample of study have compared companies which have been listed on NSE.

The study is based on Five Leading Companies Of Three Sector (Automobile Sector, IT Sector, Telecom Sector) that were part of the index from the beginning – 1st January, 2012 to 30 the 31st December, 2012. The Sample consists of 5 companies which are from each three sectors. The sectors are Automobile, IT, Telecom. The study was undertaken with the objectives of comparative testing the validity of CAPM Model for companies during the upward trends in the Indian Stock market.

_____: (1) Expected Return, (2) Risk, (3) Market Return, (4) Portfolio Diversification.

Introduction

The past few decades have witnessed economists, statisticians and financial experts taking keen interest in developing and listing models about the stock price behaviour in the capital markets. Such a keen interest has led to greater application of the tools and techniques of contemporary investment management in a quest to outperform the benchmark of the market.

The investors are interested in high returns for their investments, even if the investment is done in riskier securities or business projects. For this purpose, the investors constantly try to find out and calculate the risk existing behind their investments, and thus they use different models for their calculations. The capital asset pricing model (CAPM), in this regard has been widely used by the investors or finance managers, for finding out the risk and return of their investments.

This paper tests whether Capital Assets Pricing Model (CAPM) holds in the Indian stock market by applying the test for the slope for the standard form of CAPM. Now -a -days, people are more interested and attracted towards capital markets than ever before, Today's well regulated market has given more scope for proper valuation of securities and is a safer and more transparent place where they can materialize the gains of their transactions, which are affected to a lesser degree by the erratic market movements.

Review of Existing Literature

Blume (1993) provides a CAPM, explaining the equilibrium risk/return relationship, that the CAPM is based on the concept - there is a linear relationship between the systematic risks (non-diversifiable), measured by beta and the expected returns. This linear relationship is described by security market line (SML), which compares the systematic risk of a share and the return, along with the risk of the market and risk-free rate of return (Watson and Head, 1998) Like other models, the CAPM too, has some assumptions (Van Horne, 2006). Higher the risk (systematic risk), higher will be the return; unsystematic risk can be minimized almost completely, through diversification of the portfolio; investors are to be compensated for the systematic risk of the securities those can't be diversified away (Lau & Quay, 1974). The systematic risk is measured by beta (β), which is in positive correlation with return. The CAPM, uses beta for finding out the risk, and also uses beta for determining the expected returns (O' Brien and Srivastava, 1995).

Beta enables us to find out the fluctuations in price of a share, along with determining the relative movement of share portfolio to the market portfolio (Jones, 1998). After the enhancement of the CAPM, the use of beta has been noticed to increase, especially in investment

community for finding out risk (Blume, 1993). Many researchers
have tried to test the validity of CAPM, in different setups, and also were able to give different results with significant empirical evidence. The CAPM model was tested in Japanese setup, by applying the model to Tokyo stock market, where the results supported the model, and the investors were compensated for the systematic risk (Lau &Quay, 1974).

Similarly, this model was applied to the Swedish stock market by Bjorn and Hordahl, (1998), and proved that their results showed a difference from international evidence regarding CAPM. The results of Bossaert et al (1999), as cited in Levy et al (2000), initially, did support the CAPM, butlater on the statistical tests, discarded the model, due to either market thinness or time constraints. Further experiments by Levy, Levy and Solomon (2000), using microscopic simulation (computer –based study), led them to give results, supporting the CAPM. The CAPM, was tested with reference to US securities from S&P 500 index by Gomez and Zapatro,(2003), whereby their results supported the two Beta model, also, the researchers came up with same results, supporting the CAPM in UK, most probably due to the similarities in both US and UK setups. In South African context, the researchers Keogh, (1994), found the fluctuations in beta, negatively affecting the significance of beta and CAPM, especially in South Africa. Whereas, the results provided by Bradfield, Barr and Affleck-Graves's study (1988) supported the CAPM, and declared it to be a useful model, in the context of JSE.

The validity of CAPM was also brought to test in Greek stock markets, by Grigoris and Stravos (2006), where the results of their study didn't support the concept of high risk and high return. For the sake of further investigation and testing, the CAPM, was tested in two different setups, US and Japan, at the same time, where the results showed the inability of CAPM to explain returns when applied to the stock markets of both countries (Hui and Christopher, 2008).Similarly, to test the validity of CAPM, different studies have been conducted in Pakistan, which involved KSE, Karachi Stock Exchange by Eatzaz and Attiya, (2008), where the results of their study supported the traditional CAPM in explaining the risk and return relationship, but their results were satisfying only for few years. Later on, another study conducted by Hanif, (2009), showed the in applicability of the CAPM, in his study, which had taken the tobacco industry into account for four years of time.

On the whole the empirical results regarding CAPM discussed in this section lead to mixed conclusions. Some the advocate multifactor models due to failure of market beta alone to explain cross-sectional variation in security returns and others highlighted the methodological issues in testing CAPM.

Research Objective

- Test whether CAPM holds in the Indian stock market for selected company by applying the test for the intercept and the slope for the standard form of CAPM.
- To know expected return with level of risk.
- To make comparison between return and risk of three sectors (IT, TELECOM AND AUTOMOBILE) using CAPM model.

CAPITAL ASSETS PRICING MODEL (CAPM)

The Capital Assets Pricing Model was developed in mid – 1960s by three researchers – William Sharpe, John Lintner and Jam Mossin independently. Consequently, the model is often referred to as Sharpe - Lintner - Mossin capital assets pricing model. The Capital Assets Pricing Model or CAPM is really an extension of the portfolio theory of Markowitz. The portfolio theory is a description of how rational investors should build efficient portfolios and selects the optimal portfolio; the capital asset pricing model drives the relationship between the expected return and risk of individual securities and portfolios in the capitals markets if everyone behaved in the way the portfolio theory suggested.

The CAPM model states that the return to investors has to be equal to:
• The risk-free rate
• Plus a premium for the stocks as a whole that is higher than the risk-free rate.
• Multiplied by the risk factor for the individual company.

This can be expressed mathematically as

$E[Ri] = Rf + \beta i(E[Rm] – Rf)$ 1
Where
$E[Ri]$ = Expected Return
Rf = Risk-free rate
βi = Beta of the security i
$E[Rm]$ = Expected Return on the market
$E[Rm] – Rf$ = Market premium

EQUATION one (1) shows that the expected return on security i is a linear combination of the risk-free return and the return on portfolio M. This relationship is a consequence of efficient set mathematics. The coefficient Beta, β measures the risk of security i, and is related to the covariance of security i with the tangency portfolio, M. Therefore, as mentioned earlier, the expected return will equal the risk-free asset plus a risk premium, where the risk premium depends on the risk of the security. The equation describing the expected return for security I is referred to as the security market line (SML).

In the SML equation, expected returns are linear and the coefficient beta is:
$\beta i = \sigma im / \sigma 2\ m$ 2

The security market line, SML is sometimes called the Capital Asset Pricing Model (CAPM) equation. It states the relationships that must be satisfied among the security's return, the security's beta and the return from portfolio M. The CAPM model introduces simple mechanism for investors and corporate managers to evaluate their investments. The model indicates that all investors and managers need to do is an evaluation and comparison between expected return and

required return. If the expected result is otherwise unfavorable, it
is necessary to abort intentions for potential investment in the particular security.

Implications of the Theory

The CAPM is associated with a set of important implications which is often the basis for establishing the validity of the model. They are as follows:
   • Investors calculating the required rate of return of a share will only consider systematic risk to be relevant.
   • Share that exhibit high levels of systematic risk are expected to yield a higher rate of return.
   • On average there is a linear relationship between systematic risk and return, securities that are correctly priced should plot on the SML.

Research Methodology

In this study, research design is analytical research. Several hypotheses have been advanced to test the adequacy of the CAPM in describing asset return. These include:

   • Stock return bears a linear relation with its betas (ß).
   • Higher return is associated with higher risk.
   • Investment ensures a fair game model in a general equilibrium framework.
   • Firm-specific risk is uncorrected to average return.

If the result supports any of these hypotheses, then the CAPM is considered as a valid in describing asset return. All the above mentioned hypotheses, either directly or indirectly attempts to establish that the variation of stock return is only due to variation in the stock market index. Sample Size selected is 15 Companies. The Sensex consisted of 15 companies which are from three different sectors. Companies from each sector are:

TELECOM SECTOR	AUTOMOBILE SECTOR	INFORMATION TECHNOLOGY SECTOR
Bharti Airtel	Bajaj auto	Financial Technologies
Idea cellular	Eicher motors ltd	HCL
MTNL	Mahindra and Mahindra	Infosys
Reliance Communication	Maruti Suzuki	Tech Mahindra
Tata Communication	Tata Motors	Wipro

Secondary data is information that has already been collected for a purpose other than your current research project but has some relevance and utility for your research. You can break the sources of secondary data into internal sources and external sources. The study is based on NSE

companies that were part of the index from the beginning – 1st January, 2012 to 31st December, 2012.

The researcher followed non probability sampling techniques (Random sampling) for define the samples. Here researcher will take three sectors with five companies from each of the sectors. There was number of companies in respective sectors, so selection based on random sampling. The companies which are part of NSE, 15 companies selected for study.

DATA ANALYSIS AND INTERPRETATION

The currently study was undertaken with the objectives of empirically testing the validity of CAPM for selected companies during the upward trends in the Indian Stock market. The final list of 15 companies was drawn up based on two conditions:
(a) The companies selected should have been constituents of NSE Sensex;
(b) They should have traded for a minimum of one week in the six months in a year during the study period.

$$R_{it} = \left(\frac{P_t}{P_{t-1}}\right) * 100$$

Where,
R_{IT}= Return on stock
t = Time period
P_T= Opening price

The same method has been used for calculating the return on market index (NSE). Symbolically, it can be written as:

$$X_t = \left(\frac{I_t}{I_{t-1}}\right) * 100 \quad \dots\dots\dots\dots (2)$$

Where,
X_T =Return on stock
 I_T = Closing number

I_{T-1}=Opening number

The CAPM asserts that return on security ith, R_{IT} in time period t is a linear function of market return X_T and independent factor unique to security i.e. symbolically, it can be written as: To conduct the test of camp, beta for each the securities was calculated by regression weekly return of these securities on the corresponding return of market index (first pass regression over the six month period by using the following market model).

Equation relates to the expected return of ith security to two principal factors viz., market independent Factor α_i and the market related factor β_i. The independent factor is unique to ith security while β_i exhibits the systematic influence of general market movement on ith security. By Alpha α (is a constant intercept a minimum level of return is expected from security i, if market Remains flat (neither going up nor coming down), is calculated in this way:

$$\alpha i = Y - \beta i\ X \dots\dots\dots\dots..(3)$$

The Equation formulates that the expected return on the ith security is equal to return on risk asset Rf plus proportional market risk premium (the difference between market index E (Rm) and riskless return (Rf). This equation is popularly referred to as Capital Asset Pricing Model (CAPM) or otherwise, security market line. It gives the expected return for all assets in the economy and is applicable to both efficient and non-efficient portfolios, Where, α_i is a constant intercept of security i, Y is mean return of security i, X market return of index, and β is the slope of security i, R is the correlation of coefficient.
Equation may be rewritten as:

$$E\ (Ri) = Rf + \beta[E\ Rm - Rf] \dots\dots\dots.. (4)$$

Where
Ri = Required rate of return on security i
Rf = Risk free rate of return
β = Beta of the security (measure of systematic risk
Rm = Average return on market portfolio.

The stock price or the share prices of the companies, considered for this study, have been taken from the website of NSE. Then the return was calculated by taking the closing prices, subtracting the closing price from the opening price and dividing it by the opening price. Similarly, the formula was applied to the market index, for calculating the returns. Beta was calculated by applying slope β = slope(y, x), where the 'y' represents the company returns and 'x' represents the market returns. The risk free rate used in the analysis was the rate of national saving certificate IN INDIAN POST OFFICE.

The intercept of the characteristics regression line is alpha i.e. the distance between the intersection and horizontal axis. It indicates that the stock return is independent of the market return. A positive value of alpha is a healthy sign. Positive alpha value would yield profitable return. According to the portfolio theory, in a well-diversified portfolio, the average value of alpha of all stock turns out to be zero. This study shows scrips of MAHINDRA AND MAHINDRA, INFOSYS, BHARTI AIRTEL, MTNL, RELIANCE COMMUNICATION having negative alpha which indicates unhealthy sign for efficient portfolio.

	BETA	alpha		Ri	Rm	Rf	CAPM
BAJAJ AUTO	2.78	0.06		0.01	0.03	0.09	-0.16
EICHER MOTORS LTD	0.62	0.03		0.05	0.03	0.09	0.06
MAHINDRA AND MAHINDRA	0.93	-0.01		0.02	0.03	0.09	0.05

MARUTI SUZUKI	0.78	0.01	0.04	0.03	0.09	0.05
TATA MOTORS	-1.75	0.11	0.06	0.03	0.09	0.02
FINANCIAL TECHNOLOGIES	0.19	0.05	0.06	0.08	0.09	0.06
HCL	0.25	0.04	0.06	0.08	0.09	0.06
INFOSYS	0.32	-0.04	-0.01	0.08	0.09	0.06
TECH MAHINDRA	0.20	0.02	0.04	0.08	0.09	0.07
WIPRO	0.48	0.01	0.05	0.08	0.09	0.03
BHARTI AIRTEL	1.00	-2.74	-0.90	1.85	0.09	3.13
IDEA CELLULAR	0.61	1.14	2.26	1.85	0.09	4.55
MTNL	0.12	-1.86	-1.63	1.85	0.09	4.71
RELIANCE COMMINICATION	1.12	-0.71	1.37	1.85	0.09	-6.04
TATA COMMUNICATION	0.38	0.35	1.06	1.85	0.09	4.84

The risk inherent to the entire market or an entire market segment. Systematic risk, also known as "undiversifiable risk," "volatility" or "market risk," affects the overall market, not just a particular stock or industry. This type of risk is both unpredictable and impossible to completely avoid. The ideal situation for any company is stock with beta value between 0 to1. Here in this research paper the companies like BAJAJ AUTO, RELIANCE COMMUNICATION have more than 1 beta value for period of 1 year so the level of systematic risk is very high. While the value of beta for TATA MOTORS lies below 1 which reveals that low risk is associated with this scrip.

Company return:-
The general rule is that the more risk you take, the greater the potential for higher return – and loss. Here in this research paper the some company like IDEA CELLULAR, RELIANCE COMMUNICATION and TATA COMMUNICATION perform very well in the 1 year period and some companies perform the average and give the normal return and the company Like INFOSYS, BHARTI AIRTEL, MTNL performs very low and give very low return to the investors.

Market return:-
The market return means the return on the market portfolio. Because a market portfolio is completely diversified, it is subject only to systematic risk (risk that affects the market as a whole) and not to unsystematic risk (the risk inherent to a particular asset class). Here in this case the market return is same for all the company.

Risk free return:-
The risk-free rate is the minimum return an investor expects for any investment because he or she will not accept additional risk unless the potential rate of return is greater than the risk-free rate. The risk free return is decided by the RBI in each year and in current year the rate is 9.00%.

The Capital Asset Pricing Model drives the relationship between the expected return and risk of individual securities and portfolios. The higher the value of beta, higher would be the risk of the security and therefore, large would be the return expected by the investors. Here in this research paper the companies like SBI and DLF the value of beta is very high i.e. the level of systematic risk is very high and also the expected return is more compare to other companies.

Conclusion

This study has been established to investigate the applicability of CAPM. It uses yearly stock returns from 15 Companies of three different sector listed on the National Stock Exchange ranging from 2012-01-01 to 2012-12-31. The stocks used in the study are considered the most traded on the National Stock Exchange.

The purpose of this paper has been to examine whether the model, CAPM holds truly on the Stockholm Stock Exchange by testing:

1. If higher **beta yields higher expected return**
2. If there exist linearity between the stock beta and the expected return.

Using stocks beta estimates, the findings still appear inconsistent with the theory's basic hypothesis that higher beta yields higher return and vice versa. The hypothesis and implications of CAPM predicts that there exist no linear relationship between expected return and beta. It occurred that the findings from the test are not consistent with the implications and do not provide evidence in favour of CAPM.

The results of the tests conducted on sample data for the period of January2012 to December 2012 do not appear to clearly reject the CAPM. In the light of above findings, it can be concluded that beta is not sufficient to determine the expected returns on securities/portfolios.
As second objective is to make comparison among three in terms of return and risk. After calculating and analyzing the data in the particular period it is revealed that AUTOMOBILE SECTOR ranks high in return and risk in comparison to other IT and telecom sector .During such period Automobile sector remained higher risky and generated higher returns.

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