INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, ECONOMICS AND MANAGEMENT

CONTENTS

CALL FOR MANUSCRIPTS

We invite unpublished novel, original, empirical and high quality research work pertaining to recent developments & practices in the area of Computer, Business, Finance, Marketing, Human Resource Management, General Management, Banking, Insurance, Corporate Governance and emerging paradigms in allied subjects like Accounting Education; Accounting Information Systems; Accounting Theory & Practice; Auditing; Behavioral Accounting; Behavioral Economics; Corporate Finance; Cost Accounting; Econometrics; Economic Development; Economic History; Financial Institutions & Markets; Financial Services; Fiscal Policy; Government & Non Profit Accounting; Industrial Organization; International Economics & Trade; International Finance; Macro Economics; Micro Economics; Monetary Policy; Portfolio & Security Analysis; Public Policy Economics; Real Estate; Regional Economics; Tax Accounting; Advertising & Promotion Management; Business Education; Business Information Systems (MIS); Business Law, Public Responsibility & Ethics; Communication; Direct Marketing; E-Commerce; Global Business; Health Care Administration; Labor Relations & Human Resource Management; Marketing Research; Marketing Theory & Applications; Non-Profit Organizations; Office Administration/Management; Operations Research/Statistics; Organizational Behavior & Theory; Organizational Development; Production/Operations; Public Administration; Purchasing/Materials Management; Retailing; Sales/Selling; Services; Small Business Entrepreneurship; Strategic Management Policy; Technology/Innovation; Tourism, Hospitality & Leisure; Transportation/Physical Distribution; Algorithms; Artificial Intelligence; Compilers & Translation; Computer Aided Design (CAD); Computer Aided Manufacturing; Computer Graphics; Computer Organization & Architecture; Database Structures & Systems; Digital Logic; Discrete Structures; Internet; Management Information Systems; Modeling & Simulation; Multimedia; Neural Systems/Neural Networks; Numerical Analysis/Scientific Computing; Object Oriented Programming; Operating Systems; Programming Languages; Robotics; Symbolic & Formal Logic; Web Design. The above mentioned tracks are only indicative, and not exhaustive.

Anybody can submit the soft copy of his/her manuscript **anytime** in M.S. Word format after preparing the same as per our submission guidelines duly available on our website under the heading guidelines for submission, at the email addresses, infoijrcm@gmail.com or info@ijrcm.org.in.

GUIDELINES FOR SUBMISSION OF MANUSCRIPT

1. **COVERING LETTER FOR SUBMISSION:**

DATED: _____

THE EDITOR

IJRCM

Subject: **SUBMISSION OF MANUSCRIPT IN THE AREA OF** _____.

(e.g. Computer/IT/Finance/Marketing/HRM/General Management/other, please specify).

DEAR SIR/MADAM

Please find my submission of manuscript titled '_____' for possible publication in your journal.

I hereby affirm that the contents of this manuscript are original. Furthermore it has neither been published elsewhere in any language fully or partly, nor is it under review for publication anywhere.

I affirm that all author (s) have seen and agreed to the submitted version of the manuscript and their inclusion of name (s) as co-author (s).

Also, if our/my manuscript is accepted, I/We agree to comply with the formalities as given on the website of journal & you are free to publish our contribution to any of your journals.

NAME OF CORRESPONDING AUTHOR:

Designation:

Affiliation with full address & Pin Code:

Residential address with Pin Code:

Mobile Number (s):

Landline Number (s):

E-mail Address:

Alternate E-mail Address:

2. **INTRODUCTION:** Manuscript must be in British English prepared on a standard A4 size paper setting. It must be prepared on a single space and single column with 1" margin set for top, bottom, left and right. It should be typed in 8 point Calibri Font with page numbers at the bottom and centre of the every page.
3. **MANUSCRIPT TITLE:** The title of the paper should be in a 12 point Calibri Font. It should be bold typed, centered and fully capitalised.
4. **AUTHOR NAME(S) & AFFILIATIONS:** The author (s) full name, designation, affiliation (s), address, mobile/landline numbers, and email/alternate email address should be in italic & 11-point Calibri Font. It must be centered underneath the title.
5. **ABSTRACT:** Abstract should be in fully italicized text, not exceeding 250 words. The abstract must be informative and explain the background, aims, methods, results & conclusion in a single para.
6. **KEYWORDS:** Abstract must be followed by list of keywords, subject to the maximum of five. These should be arranged in alphabetic order separated by commas and full stops at the end.
7. **HEADINGS:** All the headings should be in a 10 point Calibri Font. These must be bold-faced, aligned left and fully capitalised. Leave a blank line before each heading.
8. **SUB-HEADINGS:** All the sub-headings should be in a 8 point Calibri Font. These must be bold-faced, aligned left and fully capitalised.
9. **MAIN TEXT:** The main text should be in a 8 point Calibri Font, single spaced and justified.
10. **FIGURES &TABLES:** These should be simple, centered, separately numbered & self explained, and titles must be above the tables/figures. Sources of data should be mentioned below the table/figure. It should be ensured that the tables/figures are referred to from the main text.
11. **EQUATIONS:** These should be consecutively numbered in parentheses, horizontally centered with equation number placed at the right.
12. **REFERENCES:** The list of all references should be alphabetically arranged. It must be single spaced, and at the end of the manuscript. The author (s) should mention only the actually utilised references in the preparation of manuscript and they are supposed to follow **Harvard Style of Referencing**. The author (s) are supposed to follow the references as per following:

- All works cited in the text (including sources for tables and figures) should be listed alphabetically.
- Use (**ed.**) for one editor, and (**ed.s)** for multiple editors.
- When listing two or more works by one author, use --- (20xx), such as after Kohl (1997), use --- (2001), etc, in chronologically ascending order.
- Indicate (opening and closing) page numbers for articles in journals and for chapters in books.
- The title of books and journals should be in italics. Double quotation marks are used for titles of journal articles, book chapters, dissertations, reports, working papers, unpublished material, etc.
- For titles in a language other than English, provide an English translation in parentheses.
- The location of endnotes within the text should be indicated by superscript numbers.

PLEASE USE THE FOLLOWING FOR STYLE AND PUNCTUATION IN REFERENCES:

BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio," Ohio State University.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

UNPUBLISHED DISSERTATIONS AND THESES

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

ONLINE RESOURCES

- Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

WEBSITE

- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Economic and Political Weekly, Viewed on July 05, 2011 http://epw.in/user/viewabstract.jsp

TESTING THE CAPITAL ASSET PRICING MODEL (CAPM) – A STUDY OF INDIAN STOCK MARKET

DR. G. SUDARSANA REDDY
PROFESSOR
SESHADRIPURAM INSTITUTE OF MANAGEMENT STUDIES
BANGALORE - 560 106

ABSTRACT

Investor tires to know the risk and return of the select security or asset on which they are planning to invest. They will be ready to invest even on risky assets when it appears to pay premium return for accepting the risk. Therefore, investors demand a higher expected return for investments in riskier securities. However, it's still unclear how investors assess the riskiness of the cash flow on a security or on a project and how they determine what risk premium to demand. Investors' uses Capital Asset Pricing Model to study the risk and return of the securities and market. It provides how a risky security is priced in competitive capital market. It postulates a positive and linear relationship between risk and return. This paper is aimed at examining the validity of the Capital Asset pricing Model in the Indian Stock Market. The study examines historical monthly average stock prices of 80 companies and historical monthly average values of market index of BSE 100 for the period June 2000 to May 2007, and the data collected from NSE and BSE websites. Data analysed in three steps: one, calculation of beta, alpha and expected return, two, calculation of relationship between risk and return of the selected Securities by using Spearmen's correlation coefficient, and third, testing hypothesis using Z-test. From the study we can say that there is significant relationship between risk and return, investors have realised higher return by opting for higher risky securities, and the validity of CAPM coefficients signifies the implication of the CAPM in the Indian stock market in determining the required rate of return of risky securities.

KEY WORDS
CAPM, Investor, Return, Risk, Stock market.

INTRODUCATION

Today's environment provides investors with a good number of investment opportunities. They are financial assets and non-financial assets. Before investing in any of the assets or securities, investors' tries to know the risk attached with the asset and return that can be expected from it. They try to know the risk and return of the select asset or security on which they are planning to invest. They will be ready to invest on risky assets when it appears to pay premium for accepting the risk. Therefore, investors demand a higher expected return for investments in riskier securities. However, it's still unclear how investors assess the riskiness of the cash flow on a security or on a project and how they determine what risk premium to demand!

In an emerging equity markets around the globe, the large and in some cases-extraordinary return performance shown by these markets and the necessity for investors to base their portfolio selection on a scientific bases and attempting to evaluate the exposure to risk over many different assets, Sharpe [1964][1], Lintner [1965][2] and Mossin [1966][3] have developed the Capital Asset Pricing Model.

The CAPM model is based on the idea that the highly expected stocks' returns will always be accompanied with high levels of risks.

The CAPM model predicts that the component of the expected return exceeding the risk-free rate will be linearly related to the characteristic risk which is in this case measured by the asset's beta. The fact that this model which has been existent in the modern economics research and the modern portfolio theory for the past five decades, academics and practitioner have been always questioning the ability of this model to explain the actual movements of assets' returns.

Since the introduction of CAPM in the 1960's, the model has been one of the most controversial topics in the field of financial economics. In fact, managers use CAPM as one of the techniques in evaluating and undertaking a project. The application of the CAPM model was and has been always prompted by the need of investors to be able to calculate the return they are seeking on the proposed projects.

The CAPM model helps in measuring the riskiness of the cash flows on these projects, the estimation of the cost of the capital and projecting the expected rate of return. This model was primarily developed to provide a reasonable explanation behind the differences in the risk premiums across different assets.

THE CAPM

The CAPM describes the relationship between risk and expected return and is used in the pricing of risky securities. This relationship was first proposed independently by John Lintner, William F. Sharpe and Mossin, J, which can be represented by the following linear equation:

$E [Ri] = R f + \beta i (E [Rm] - Rf)$

Where: *Rf* = Risk free rate of return
Bi = Beta of the security *i*
E [Rm] = Expected return on market
(Rm –Rf) = Market premium

According to the CAPM, the expected return of a security or a portfolio equals the rate of return on a risk-free rate plus a risk premium (Ross, Westerfield and Jaffe 2005)[4]. CAPM is a simple tool available for investors to evaluate their investments. If this expected return does not meet or beat the required return, then the investment should not be undertaken.

The CAPM is valid within a special set of assumptions. They are (Bodie, Kane, and Marcu, 2005)[5]:

- All the investors are risk averse; they will maximize the expected utility at the end of period wealth.
- That is referred to as homogenous expectations (beliefs) about asset returns. All the investors use the same information at the same time on expected return and covariance matrix of stock return to form the optimal risky portfolio.
- A fixed risk-free rate exists, and allows the investors to borrow or lend unlimited amounts to the same interest rate.
- There are a definite number of stocks and their quantities are fixed within the one period world.
- All stocks are perfectly divisible and priced in a perfectly competitive market.
- There are no market imperfections (there are no taxes, regulations, or trading costs).

These assumptions are all hard to fulfill in reality, but as a financial theory, it may still describe reality in a reasonably way.

LITERATURE REVIEW

The researcher has reviewed three categories of literature. One, literature supporting the theory; two, literature challenged or criticised the theory; and three, academic continuous debate.

SUPPORT OF CAPM VALIDITY

As stated in the introduction, the CAPM model was developed in the early 1960s by, Sharpe [1964][6], Lintner [1965][7] and Mossin [1966][8].

'The Capital Asset Pricing Model: Some Empirical Tests. Studies in the Theory of Capital Markets' is one of the earliest experimental studies that found supportive evidence for CAPM is that of Black, Jensen and Scholes (1972)[9]. They used monthly portfolio return rather than individual stocks and tested whether the cross-section of expected returns is linearly related to the portfolio betas. They have combined securities into portfolios to diversify firm-specific returns to enhance the accuracy of the beta estimates and the expected portfolio return. This approach alleviates the statistical problems that arise from measurement errors while estimating beta. Authors found that there is relation between the average return and beta is very close to linear and that portfolios with high/low betas have high/low average returns. Therefore, the data are dependable with the prediction of the CAPM.

Another classic empirical study, that wires the CAPM is the Fama and MacBeth (1973)[10]. They examined whether there is a positive linear relation between average return and beta. Furthermore, they studied whether the squared value of beta, the volatility of asset returns can explain the residual variation in average return across assets that are not explained by beta alone.

CHALLENGES OR CRITICS ON CAPM VALIDITY

In the early 1980s, several research studies that were deeply examined whether there was a serious discussion from the linear CAPM risk-return trade-off due to other variable that affect this trade-off. A good number of empirical studies found that there is same contribution to the CAPM, such as the Banz (1981)[11] tested the CAPM model by studying whether the size of firms can explain the residual variation in average return across assets that remain unexplained by the CAPM's beta. Banz challenged the model by demonstrating the firm size does explain the cross sectional-variations in average return on a particular collection of assets better than beta. It states that over the long-periods of time, small firms (with low market value of equity) tend to generate larger return than large company stocks. This finding has become to be known as the 'size effect'.

There were several studies, that found risk return trade-off influenced by various factors, in particular, the earnings yield (Basu 1977)[12]; leverage and the ratio of firm's book value to equity to its market value (Stattman 1980)[13]; Rosenberg, raid and Lanstein (1985)[14]; and Cham, Hamao, Lakonishok (1991)[15] have all been utilised by testing the validity of CAPM.

The general reaction to Banz's (1981)[16] findings, that the CAPM may be missing some aspects of reality, was to support the view that although the data may suggest deviation from CAPM these deviations are not so important as to reject the theory.

However, this idea has been challenged by Fama and French (1992)[17], used the same method as reached to vary different conclusion. Fama and MacBeth found a positive relation between return and risk while Fama and French found the CAPM could not fully prove the relation between each other. Balck[18] argued that data are too noisy to invalidate the CAPM.

Ning and Liu[19] used time series testing and cross-sectional regression testing in the Shanghai Stock Exchange during 01.01.1996 to 31.12.2002; they establish that there is no linear relationship between the expected rate of return and beta. However, the non-systematic risk has significant effect on the return. Xue and Zhou[20] have applied the same methods to test CAPM from 01.06.1995 to 02.06.2001, and found that the CAPM did not hold true in the first three periods (the first period from 09.06.1995 to 05.06.1998); second period (from 07.06.1996 to 04.06.1999); and the third period (from 06.06.1997 to 02.06.2000) but holds true in the fourth period (from 05.06.1998 to 02.06.2001). They argued that this is because; the investors are becoming more and more rational.

Xi Yang and Donghui Xu, (2006)[21], tested CAPM model by taking 100 companies' stock in Shanghai Stock Exchange from 01.01.2000 to 31.12.2005, they say that the CAPM predicts that the stocks with higher/lower risk will yield high/low expected rate of return is not supported. However, beta return relationship is linear with each other and the non-systematic risk has no effect on the return during the test period, which is consistent with CAPM. Hence, when take 2000 to 2005 as whole period CAPM is not fully invalid.

ACADEMIC DEBATE - CONTINUES

If we recollect from the above, Fama and French were criticised for their own research findings, which were published in 1992. Kothari, Shaken, and Sloan (1995)[22] argue that Fama and French (1992)[23] findings depend basically on how the statistical findings are interpreted.

Amihud, Christensen and Mendelson (1992)[24], and Black (1993)[25] support the view that data are too noisy to nullify the CAPM. In reality, they suggested a more efficient way of improving methodology used by Fama and French, which depends particularly upon using an efficient statistical method, saying that the estimated relation between average return and beta is positive and significant.

Jagannathan and Wang (1993)[26] argue that the failure of the empirical findings to support the CAPM was mainly due to the basic assumptions, which were made to facilitate the empirical studies. One of those assumptions is the consideration of the return on the market indices as a very close proxy for the return on the market portfolio containing all the assets which exist in the national economy. One could argue that these market indices can not capture the whole assets in the economy.

STATEMENT OF THE PROBLEM

In the present scenario investors are hesitant to invest in risky assets. There has always been a fear of burning hands of oneself in this volatile stock market. The Capital Asset Pricing Model (CAPM) explains that risky assets give high returns. From above literature review we can also say that there are variations in the findings and applicability of CAPM to the select stock market for the select period. To understand the significant relationship between risk and return of securities, and examine the implication of Capital Asset Pricing Model in the Indian stock market in determining the required rate of return of risky securities.

PURPOSE OF THE STUDY

The purpose of this paper is to test whether the CAPM holds true in (BSE100) Indian stock market. Nevertheless, the following are the other objectives:

- Whether a higher/lower risk will yield higher/lower expected rate of return
- Whether the expected rate of return is linearly related with the stock's beta, i.e. its systematic risk.
- Whether the non-systematic risk affects the stocks' returns. (CAPM predicts that only the systematic risk has the explanation power on the rate of return).

SCOPE OF THE STUDY

The present study attempts to test the whether CAPM holds true in (BSE100) Indian stock market and covers a period of eight year from June 2000 to May 2007. Therefore, the study may not fully apply to other markets.

HYPOTHESIS

H_0: The slope beta is not significantly different from zero.

H_1: The slope beta is significantly different from zero.

RESEARCH PHILOSOPHY AND APPROACH

RESEARCH PHILOSOPHY

There are two kinds of research philosophy: positivism, and phenomenology.

The Positivists believe that reality is stable and can be observed and described from an objective viewpoint (Levin, 1988)[27], i.e. without interfering with the phenomena being. Put it simple, positivism is the subject that can not affect the researcher and the researcher is independent. The research assumes the role of an objective analyzer; the methods used are highly structured and end in quantifiable that can be statically.

The phenomenologist argues for the reality situation of the research subject; they prefer working in an observable social reality.[28] The present study is positivism.

RESEARCH APPROACH

There are two broad methods of research: ***deductive*** and ***induction***.

The induction approach is building theory through the research process. Particularly, it concerns affairs that have happened. Hereby, it is better to study a small sample of subjects, get a feel of what is going on and comprehend the problem.[29]

The deduction approach is going to test or develop the theory. There are three major characteristics of deduction approaches. First, the researchers will explain causal relationships of variables data. Second, the researches are independent. Third, it usually uses quantitative data.[30] The present study is deductive approach, because the general aim of the present study is to verify the CAPM model, whether it is relevant to Indian stock market or not during the period June 2000 to May 2007.

The study type is analytical, quantitative and historical. Analytical because facts and existing information is used for the analysis, Quantitative as relationship is examined by expressing variables in measurable terms and also Historical as the historical information is used for analysis and interpretation.

SAMPLE DESIGN

The population of the study consists of stocks listed at the BSE100. The list includes 100 companies, but due to the non-availability of data for 20 companies, the researcher has covered the remaining 80 companies as final sample size. - ABB Ltd, ITC Ltd, Associated Cement (ACC) Companies, J & K Bank, Arvind Mills, Kochi Refinery, Ashok Leyland, Kotak Mahindra Bank, Asian Paints, L & T, Bajaj Auto, M& M, Bank of Baroda, Matrix Lab, Bank of India, Moser Baer, Bharat Electronics, MRPL, Bharat Forge, Mahanagar Telephone Nigam Ltd. (MTNL), Bharati Shipping, National Alum, Bharat Heavy Electricals Ltd.(BHEL), Neyveli Lignite, Bharat Petroleum Corporation Ltd (BPCL), Nicolas Pirmal, Biocon, Nestle India, Cadila Health Care, Oil and Natural Gas Corporation (ONGC), Chennai Petroleum, Patni Computers, Cipla Ltd, Pfizer Ltd, Colgate Palmolive, Punjab National Bank, Container Corporation, Polaris Software, Corporation Bank, Ranbaxy Lab, Cummins Inc., Raymond Ltd, Dr. Reddy Lab, Reliance Energy, GAIL India, Reliance Capital, GE Shipping Co., Steel Authority of India Ltd. (SAIL), Grasim Industries, Satyam Computers, HCL Infosystem, State Bank of India, HCL Technology, Shipping Corporation of India (SCI), HDFC Bank, Siemens Ltd, HDFC, Sun Pharmaceutical, Hero Honda Motors, Tata Motors, Hindustan Unilever Ltd (HUL), Tata Chemical, Hindustan Petroleum, Tata Power, ICICI Bank, TVS Motors, Industrial Development Bank of India (IDBI), Tata Tea Ltd, Indian Hotels, Tata Steel, Indian Overseas, Bank, Vijaya Bank, Infosys Technology, Vides Sanchaar Nigam Ltd (VSNL), Indian Oil Corporation, Wipro, Indian Petrochemical, Wockhardt, Indian Rayon, and UTI Bank. These stocks represent different categories of different sectors (Oil & Gas; Capital goods; Housing related; Transport equipments; Chemical & Petrochemical; Finance; Telecom; Healthcare; Information Technology; Metal, Metal Products & Mining; FMCG; Tourism; Power; Agriculture and Media & Publishing) in the India Stock market.

SOURCES OF DATA

Historical monthly average stock prices of sample companies and historical monthly average values of market index of BSE 100 are collected from NSE and BSE websites. The secondary data for the study collected for eight years starting from June 2000 to May 2007.

METHODOLOGY

Data analysed in three steps:

Step one, calculation of beta (β), alpha (α) and expected return [E (R)],

*Step two, calculation of r*elationship between risk and return of the selected Securities by using Spearmen's correlation coefficient (ρ), and

Third step, statistical testing, in order to test the hypothesis Z test was used.

Therefore, in the present study, researcher analysed the data by using beta (β), alpha (α) and expected return [E (R)], Spearmen's correlation coefficient (ρ), and *Z*-test

Analysis part starts with the calculation of individual stock returns by taking opening and closing prices of stocks and return on market index by taking opening and closing prices of market index of BSE 100 by using stock return, return on market index, beta and expected returns of the select securities.

Beta (β) = Cov (Ra, Rp) / σ_m^2

Where: R_a = Measures the rate of return of the asset,

R_p = Measures the rate of return of the portfolio

Cov (R_a, R_p) = Covariance between the rates of return.

σ_m^2 = Covariance of the return on market portfolio

Alpha (α) = A– Rf – β (Rmf – Rf)

Where: A = Actual return on the asset,

R_f = Risk free return

Rmf = Index return

Stock Return: $Rit = Log_e (P_t / P_{t-1})*100$

Where: Rit = Return on stock i in time period t

Log_e = Natural logarithm

P_t = Closing price

P_{t-1} = Opening price.

Return on Market Index (BSE 100): $X_t = Log_e (I_t / I_{t-1})*100$

Where: X_t = Return on index

I_t = Closing number

I_{t-1} = Opening number

Beta (Slope): $\beta_i = (n \sum XR - \sum X \sum R) / (n \sum X^2 - (\sum X)^2)$

Alpha (Intercept) $\alpha_i = R_{mean} - \beta_i X_{mean}$

Where: α_i = Constant intercept of security i

R_{mean} = Mean return of security i

X_{mean} = Mean market return of index

β_i = Slope of security i.

Expected Return on Security: $E (R) = \alpha_i + \beta_i X_t$

RISK AND EXPECTED RETURN OF INDIVIDUAL SECURITIES

TABLE - 1 BETA AND EXPECTED RETURN OF SELECT SECURITIES

S. No	Name of the Company	β (Beta)	α (Alpha)	E (R)
1.	ABB Ltd	0.05411	0.003991	2.319098
2.	Associated Cement Companies	0.032034	-0.14572	3.244477
3.	Arvind Mills	0.021857	-0.59434	1.718811
4.	Ashok Leyland	0.037938	-0.52127	3.493751
5.	Asian Paints	0.007512	-0.01442	0.780628
6.	Bajaj Auto	0.059101	0.129237	6.383966
7.	Bank of Baroda	0.031639	-0.35784	2.990502
8.	Bank of India	0.032678	-0.32928	3.129035
9.	Bharat Electronics	0.02753	-0.26769	2.034415
10.	Bharat Forge	0.017839	-0.24238	1.645579
11.	Bharati Shipping	0.019858	-0.46605	0.87965
12.	Bharat Heavy Electricals Ltd.	0.062869	-0.19885	1.371799
13.	Bharat Petroleum Corporation Ltd	0.025336	-0.20137	2.479958
14.	Biocon	0.021345	-0.21534	2.1235
15.	Cadila Health Care	0.009399	-0.27932	0.715372
16.	Chennai Petroleum	0.060611	0.902431	6.495869
17.	Cipla Ltd	0.016942	-0.21219	1.580836
18.	Colgate Palmolive	0.019378	-0.15621	1.89464
19.	Container Corporation	0.0133542	2.166293	3.59942
20.	Corporation Bank	0.023386	-0.3369	2.138087
21.	Cummins Inc.	0.012341	-0.2189	1.78922
22.	Dr.Reddy's lab	0.024511	0.211101	0.252211
23.	GAIL India	0.026943	0.207514	0.24146
24.	GE Shipping Co.,	0.01902	-0.26645	1.519716
25.	Grasim Industries	0.038789	-0.00208	4.103003
26.	HCL Infosystem	0.043999	-0.377532	4.27894
27.	HCL Technologies	0.034541	-0.28058	3.37493
28.	HDFC Bank	0.014642	-0.08837	1.461251
29.	HDFC	0.032351	0.026822	3.450547
30.	Hero Honda Motors	0.0117	-0.12468	1.113517
31.	Hindustan Unilever Ltd	0.038142	-0.1435	3.14356
32.	Hindustan Petroleum	0.028868	-0.27082	2.78435
33.	ICICI Bank	0.023923	-0.18674	2.345021
34.	Industrial Development Bank of India	0.032139	-0.62121	0.07589
35.	Indian Hotels	0.045859	-0.14099	4.71227
36.	Indian Overseas Bank	0.024567	-0.07812	2.134521
37.	Infosys Technologies	0.022606	-0.15116	2.2441239
38.	Indian Oil Corporation	0.021336	-0.22517	2.032802
39.	Indian Petrochemical	0.04382	0.799443	5.437018
40.	Indian Rayon	0.041213	-0.17823	3.1234
41.	ITC Ltd	0.02941	-0.14172	2.970781
42.	J&K Bank	0.014346	-0.22563	1.292635
43.	Kochi Refinery	0.016593	0.566468	2.057481
44.	Kotak Mahindra Bank	0.021875	-0.24561	2.10021
45.	Larsen & Toubro Limited	0.01232	-0.21346	1.23467
46.	Mahindra & Mahindra	0.0361	-0.29592	3.524566
47.	Matrix Lab	0.056936	-0.63483	5.055961
48.	Moser Baer	0.013631	-0.37401	1.068562
49.	Mangalore Refinery &Petrochemicals Ltd	0.025341	-0.2912	1.7123
50.	Mahanagar Telephone Nigam Ltd.	0.033159	-0..46968	3.039521
51.	National Alum	0.05432	-0.26541	1.234
52.	Neyveli Lignite	0.009367	-0.57153	-1.43597
53.	Nicolas Pirmal	0.012883	-0.311	1.052425
54.	Nestle India	0.05217	0.1234	2.14526
55.	Oil and Natural Gas Corporation	0.013947	-0.14801	0.372489
56.	Patni Computers	0.017245	-0.23456	0.542371
57.	Pfizer Ltd	0.012957	-0.44029	0.043243
58.	Punjab National Bank	0.098156	-0.167221	2.00012
59.	Polaris Software	0.070777	-0.62385	2.07372
60.	Ranbaxy Lab	0.005442	-0.0891	0.070751
61.	Raymond Ltd	0.018983	-0.2061	0.502346
62.	Reliance Energy	0.004366	-0.15735	-0.0291
63.	Reliance Capital	0.04526	-0.75165	0.403542
64.	Steel Authority of India Ltd	0.058008	-0.04534	6.09376
65.	Satyam Computers	0.038212	-0.1903	3.853768
66.	State Bank of India	0.037	-0.11467	1.436323
67.	Shipping Corporation of India	0.037113	-0.48973	3.437957
68.	Siemens Ltd	0.025788	-0.10072	2.628417
69.	Sun Pharmaceutical	0.008899	-0.0424	0.899376
70.	Tata Motors	0.02134	-0.2345	1.9872
71.	Tata Chemical	0.024501	-0.35925	2.233697
72.	Tata Power	0.041141	-0.27718	4.076874
73.	TVS Motors	0.02345	-0.32456	3.123345
74.	Tata Tea Ltd	0.041019	-0.32015	4.020951
75.	Tata Steel	0.031452	-0.18987	3.12334
76.	Vijaya Bank	0.041518	-0.58788	4.176664
77.	Videsh Sanchaar Nigam Ltd.	0.039456	-0.40394	3.771771
78.	Wipro	0.040677	-0.238	4.066915
79.	Wockhardt	0.027994	-0.40058	2.562104
80.	UTI Bank	0.261775	-0.24672	2.908952

RELATIONSHIP BETWEEN RISK AND RETURN OF THE SELECTED SECURITIES

Spearmen's correlation coefficient has been calculated to determine the significant relationship between risk and return of the selected securities.

Spearman's correlation coefficient is $\rho = 1- [(6\sum D^2 / (n^3-n)]$

The computed value of correlation coefficient is given in Table-2

TABLE – 2 SPEARMAN'S CORRELATION COEFFICIENT

Sl. No.	Name of the Company	B	E	D = B ~ E	D^2
1.	ABB Ltd	0.045259	2.319098	-2.27384	5.170346
2.	Associated Cement Companies	0.004366	3.244477	-3.24011	10.49831
3.	Arvind Mills	0.005442	1.718811	-1.71337	2.935633
4.	Ashok Leyland	0.0077512	3.493751	-3.48624	12.15386
5.	Asian Paints	0.008899	0.780628	-0.77173	0.595566
6.	Bajaj Auto	0.009367	6.383966	-6.3746	40.63551
7.	Bank of Baroda	0.009399	2.990502	-2.9811	8.886973
8.	Bank of India	0.0117	3.129035	-3.11734	9.717778
9.	Bharat Electronics	0.01232	2.034415	-2.02209	4.088866
10.	Bharat Forge	0.012341	1.645579	-1.63324	2.667465
11.	Bharati Shipping	0.012883	0.87965	-0.86677	0.751286
12.	Bharat Heavy Electricals Ltd.	0.012957	1.371799	-1.35884	1.846452
13.	Bharat Petroleum Corporation Ltd	0.013542	2.479958	-2.46642	6.083209
14.	Biocon	0.013631	2.1235	-2.10987	4.451548
15.	Cadila Health Care	0.013947	0.715372	-0.70142	0.491997
16.	Chennai Petroleum	0.014346	6.495869	-6.48152	42.01014
17.	Cipla Ltd	0.014642	1.580836	-1.56619	2.452962
18.	Colgate Palmolive	0.01593	1.89464	-1.87805	3.527061
19.	Container Corporation	0.016942	3.59942	-3.58248	12.82415
20.	Corporation Bank	0.017245	2.138087	-2.12084	4.49797
21.	Cummins Inc.	0.017839	1.78922	-1.77138	3.13779
22.	Dr.Reddy's lab	0.018983	0.252211	-.23323	0.054395
23.	GAIL India	0.01902	0.24146	-.22244	0.049479
24.	GE Shipping Co.,	0.019378	1.519716	-1.50034	2.251013
25.	Grasim Industries	0.019858	4.103003	-4.08314	16.67207
26.	HCL Infosystem	0.021336	4.27894	-4.2576	18.12719
27.	HCL Technologies	0.02134	3.37493	-3.35359	11.24657
28.	HDFC Bank	0.021345	1.461251	-1.43991	2.073328
29.	HDFC	0.021753	3.450547	-3.42879	11.75663
30.	Hero Honda Motors	0.021857	1.113517	-1.09166	1.191721
31.	Hindustan Unilever Ltd	0.021875	3.14356	-3.12168	9.744915
32.	Hindustan Petroleum	0.022606	2.78435	-2.76174	7.62723
33.	ICICI Bank	0.023386	2.345021	-2.32163	5.389986
34.	Industrial Development Bank of India	0.02345	0.07589	-0.05244	0.00275
35.	Indian Hotels	0.023923	4.71227	-4.68835	21.9806
36.	Indian Overseas Bank	0.0244501	2.134521	-2.11002	4.452185
37.	Infosys Technologies	0.024511	2.24239	-2.21673	4.913884
38.	Indian Oil Corporation	0.024567	2.032802	-2.00823	4.0333007
39.	Indian Petrochemical	0.025336	5.437018	-5.41168	29.2863
40.	Indian Rayon	0.025341	3.1234	-3.09806	9.59797
41.	ITC Ltd	0.025788	2.970781	-2.94499	8.672986
42.	J&K Bank	0.026943	1.292635	-1.26569	1.601974
43.	Kochi Refinery	0.027994	2.057481	-2.02949	4.118816
44.	Kotak Mahindra Bank	0.028868	2.10021	-2.07134	4.290456
45.	Larsen & Toubro Limited	0.02941	1.2346	-1.20526	1.45651
46.	Mahindra & Mahindra	0.031452	3.524566	-3.49311	12.20184
47.	Matrix Lab	0.031639	5.055961	-5.02432	25.24382
48.	Moser Baer	0.032034	1.068562	-1.03653	1.074391
49.	Mangalore Refinery and Petrochemicals Ltd	0.032139	1.7123	-.168016	2.822941
50.	Mahanagar Telephone Nigam Ltd.	0.032351	3.039521	-3.00717	9.043075
51.	National Alum	0.032678	1.234	-1.20132	1.443175
52.	Neyveli Lignite	0.033159	-1.43597	1.469124	2.158324
53.	Nicolas Pirmal	0.034541	1.052425	-1.01788	1.036089
54.	Nestle India	0.0361	2.14526	-2.10916	4.448557
55.	Oil and Natural Gas Corporation	0.037	0.372489	-0.33549	0.112553
56.	Patni Computers	0.037113	0.542371	-0.50526	0.255286
57.	Pfizer Ltd	0.037938	0.043243	-0.00531	281E-05
58.	Punjab National Bank	0.038142	2.00012	-1.96198	3.849358
59.	Polaris Software	0.038212	2.070372	-2.03216	4.129671
60.	Ranbaxy Lab	0.038789	0.070751	-0.03196	0.001022
61.	Raymond Ltd	0.039456	0.502346	-0.46289	0.214267
62.	Reliance Energy	0.040677	-0.0291	0.069776	0.004869
63.	Reliance Capital	0.041019	0.403542	-0.36252	0.131423
64.	Steel Authority of India Ltd	0.041141	6.09376	-6.05262	36.63419
65.	Satyam Computers	0.041213	3.853768	-3.81256	14.53558
66.	State Bank of India	0.041518	1.46323	-1.39481	1.945482
67.	Shipping Corporation of India	0.04382	3.437957	-3.39414	11.52016
68.	Siemens Ltd	0.043999	2.628417	-2.58442	6.679219
69.	Sun Pharmaceutical	0.045859	0.899373	-0.85352	0.728491
70.	Tata Motors	0.05217	1.9872	-1.93503	3.744341
71.	Tata Chemical	0.05411	2.233697	-2.17959	4.750599
72.	Tata Power	0.05432	4.076874	-4.02255	16.18094
73.	TVS Motors	0.056936	3.123345	-3.06641	9.402865
74.	Tata Tea Ltd	0.058008	4.020951	-3.96294	15.70491
75.	Tata Steel	0.059101	3.12334	-3.06424	9.389561
76.	Vijaya Bank	0.060611	4.176664	-4.11605	16.94189
77.	Videsh Sanchaar Nigam Ltd.	0.062869	3.771771	-3.7089	13.75596
78.	Wipro	0.070777	4.066915	-3.99614	15.96912
79.	Wockhardt	0.098156	2.562104	-2.46395	6.07104
80.	UTI Bank	0.216775	2.908952	-2.64718	7.007545

$\sum D^2 = 619.1556$
$\rho = 0.992$
From the Table- 2 the calculated value of correlation coefficient between the stock beta and expected return (0.992) shows high degree of relationship between risk and stock return. We can also observe that risky assets are giving high returns. This shows the relevance of CAPM to Indian stock market.

HYPOTHESIS TESTING

H_0: The slope beta is not significantly different from zero.
H_1: The slope beta is significantly different from zero.
To test above hypothesis z-test has been used between calculated values of beta and expected returns of securities.
The Z-test is a statistical test used in inference which determines if the difference between a sample mean and the population mean is large enough to be statistically significant. In order for the Z-test to be reliable, certain conditions must be met. The most important is that since the Z-test uses the population mean and population standard deviation, these must be known.
The formula for calculating the z- score for the Z-test is as follows
$| Z | = (\beta - E) / SE$
Where: SE = Standard Error
The Z- test is depicted in Table- 3

TABLE - 3 Z – TEST FOR BETA AND EXPECTED RETURN

	Beta (β)	Expected Return : E (R)
Mean	0.033067	2.350803
Known Variance	0.001025	2.402
Observations	80	80
Hypothesized Mean Difference	0	0
z	13.737	
P (Z<=z) One-tail	0	
Z Critical one-tail	1.644854	
P (Z<=z) Two-tail	0	
Z Critical Two-tail	1.959964	

From the Table - 3 the calculated Z value (13.373) is greater than the critical value of Z. Therefore, according to Z-test the null hypothesis is rejected and alternative hypothesis is accepted. Hence, the slope beta is significantly different from zero

FINDINGS

From the foregoing analysis and interpretation the following findings have been extracted:
- There is significant relationship between risk and return.
- Investors have realised higher return by opting and investing for higher risky securities.
- The statistical validity of CAPM coefficients signifies the implication of the CAPM in the Indian stock market in determining the required rate of return of risky securities.

CONCLUSION

The present research reveals that there is high degree of relationship between risk and expected return. This shows the high degree of relevance of CAPM in calculation of required rate of return in Indian stock market. Therefore, investors can integrate the performance of their portfolio to the market developments, investors can opt for risky securities to get high returns, and investors can establish trade-off between their risks and return preferences by applying the CAPM.

REFERENCES

Amihud Yakov, Christensen Bent and Mendelson Haim, (1992). *Further evidence on the risk relationship*. Working paper S-93-11. Salomon Brother Center for the Study of the Financial Institutions, Graduate School of Business Administration, New York University.
Banz, R. (1981). *Op.cit.* 9: 3-18.
Banz, R. (1981). The Relationship between Returns and Market Value of Common Stock. *Journal of Financial Economics* 9: 3-18.
Basu Sanjoy. (1977). Investment Performance of Common Stocks in relation to their Price Earnings Ratios: A Test of the Efficient Market Hypothesis. *Journal of Finance* 32:663-82.
Black, F., Jensen, M. C., & Scholes, M. (1972). *Op.cit*. 79-121.
Black, F., Jensen, M. C., & Scholes, M. (1972). *The Capital Asset Pricing Model: Some Empirical Tests. Studies in the Theory of Capital Markets.* pp.79-121. New York: Praeger.
Black, Fischer. (1993). Beta and Return. *Journal of Portfolio Management* 20: 8-18.
Bodie, Z., Kane, A., & Marcus, A.J. (2005). Investment, McGraw-Hill/Irwin series in CAPM: Theory, Advantages, and Disadvantages, *Student Accountant*, June/July 2008.
Chan L., Hamao, Y., & Lakonishok, J. (1991). Fundamentals and Stock Returns in Japan .*Journal of Finance* 46 :1739-64.
Fama, E. F., & MacBeth, J. (1973). Risk, Return and Equilibrium: Empirical tests. *Journal of Political Economy* 81: 607-636.
Fama, E., & K. French. (1992). *Op.cit.* 47: 427-465.
Fama, E., & K. French. (1992). The Cross-section of Expected Stock Returns. *Journal of Finance* 47: 427-465.
Ibid, p.98-99).
Jagannathan, R., & Wang, Z. (1996). The conditional CAPM and the Cross-section of Expected Returns. *Journal of Finance* 51: 3-53.
Kothari, S.P., Shaken Jay and Sloan Richard G. (1995). Another look at the Cross section of Expected Stock Returns. *Journal of Finance* 50: 185-224.
Levin, D. M. (1988). *The Opening of Vision: Nihilism and the Postmodern Situation*. London: Rutledge.
Lintner, J. (1965). *Op.cit.* 47: 13-37.
Lintner, J. (1965). The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets. *Review of Economics and Statistics,* 47: 13-37.
Mossin, J. (1966). Equilibrium in a Capital Asset Market. *Econometrica,* 34: 768-783.
Mossin, J. (1966). *Op.cit.* 34: 768-783.
Ning, G.R., & Liu, P. (2004). Empirical Test of CAPM in Shanghai Stock Market. *Journal of Shijiazhuang University of Economics* Vol.27 2:194-197.
Remenyi, D., Williams, B., Money, A., & Swartz, E. (1998). *Doing Resource in Business and Management: an International to Process and Method,* London: Sage. 94.
Rosenberg, B., Reid K., & Lanstein, R. (1985). Persuasive evidence of Market Inefficiency. *Journal of Portfolio Management* 11: 9-17.

Ross, S. A., Westerfield, R. W., & Jaffe, J. (2005). *Corporate finance*, McGraw-Hill/Irwin. p.285
Saunders, M., Lewis, P., & Thornhill, T. (2000). *Research Methods for Business Students*, 2nd edition. 92-93.
Sharpe, W. (1964). Capital Asset Prices: A Theory of Market Equilibrium under conditions of Risk. *Journal of Finance,* 33:885-901
Sharpe, W. (1964). *Op.cit.* 33:885-901
Statman Dennis. (1980). Book Values and Stock Returns, Chicago MBA: A *Journal of Selected Papers* 4:25-45.
Xi, Yand., & Donghui, Xu. (2006). *Testing the CAPM Model – A Study of the Chinese Stock Market.* (unpublished master's thesis) UMEA University, USBE,1-44.
Xue, H., & Zhou, H. (2001). Empirical Test of CAPM in Shanghai Stock Exchange. *Research on the Financial and Economics Issues* 11: 33-37.

REQUEST FOR FEEDBACK

Dear Readers

At the very outset, International Journal of Research in Commerce, Economics & Management (IJRCM) acknowledges & appreciates your efforts in showing interest in our present issue under your kind perusal.

I would like to request you to supply your critical comments and suggestions about the material published in this issue as well as on the journal as a whole, on our E-mails i.e. **infoijrcm@gmail.com** or **info@ijrcm.org.in** for further improvements in the interest of research.

If you have any queries please feel free to contact us on our E-mail **infoijrcm@gmail.com**.

I am sure that your feedback and deliberations would make future issues better – a result of our joint effort.

Looking forward an appropriate consideration.

With sincere regards

Thanking you profoundly

Academically yours

Sd/-

Co-ordinator