COMPARATIVE STUDY OF RISK AND RETURN IN MANUFACTURING AND TELECOM SECTOR

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Abstract

This paper analyses the impact of risk and return on portfolio management and evaluated the relationship of individual average return and risks. The paper focuses on Markowitz model to find risk and return trade off. This paper describes the portfolio return and risk of various sectors.

Keywords: Risk and Return, Portfolio Management, Morkowitz model.

INTRODUCTION

Security market is very volatile in nature. The slightest change in any part of the economy affects the trading of securities in the stock market. This is due to the varying level of risk perception of the people. So, while going for investment in shares, people try to make proper trade-offs between risk and return, given that investment in risk free instrument includes bank deposits, postal deposits, insurance etc. Moreover, people are generally risk averse. They like to invest in such instruments, which give higher return for same amount of risk, or same return for less amount of risk.

Risk perception is the subjective judgment that people make about the characteristics and severity of a risk. Risk perception examines the opinions of people when they are asked to evaluate risky activities, substances and technologies. Perceptions of risk plays a prominent role in the decisions people make, in the sense that differences in risk perception lie at the heart of disagreements about the best course of action between technical experts and members of the general public etc. Both individual and group differences in preference for risky decision alternatives and situational differences in risk preference have been shown to be associated with differences in perceptions of the relative risk of choice options, rather than with differences in attitude towards risk.

Return is obviously important though, and the ultimate objective of portfolio manager is to achieve a chosen level of return by incurring the least possible risk.

A portfolio refers to a collection of investment tools such as stocks, shares, mutual funds, bonds, and cash and so on depending on the investor's income, budget and convenient time frame.

It is essential for every individual to save some part of his/her income and put into something which would benefit him in the future. A combination of various financial products where an individual invests his money is called a portfolio.

Following are the two types of Portfolio:

1. Market Portfolio

2. Zero Investment Portfolio

The art of selecting the right investment policy for the individuals in terms of minimum risk and maximum return is called as portfolio management.

Portfolio management refers to managing an individual's investments in the form of bonds, shares, cash, mutual funds etc. so that he earns the maximum profits within the stipulated time frame.

Risk includes the possibility of losing some or all of the original investment. Different versions of risk are usually measured by calculating the standard deviation of the historical returns or average returns of a specific investment. A high standard deviation indicates a high degree of risk.

Many companies now allocate large amounts of money and time in developing risk management strategies to help manage risks associated with their business and investment dealings. A key component of the risk management process is risk assessment, which involves the determination of the risks surrounding a business or investment.

A fundamental idea in finance is the relationship between risk and return. The greater the amount of risk that an investor is willing to take on, the greater the potential return. Risk consists of two components, the systematic risk and unsystematic risk. The systematic risk is caused by factors external to the particular company and uncontrollable by the company. It affects the entire market. It classified into Market risk, Interest rate risk, and Purchasing power risk. In case of unsystematic risk the factors are specific, unique and related to the particular industry or company. It classified into Business risk and financial risk.

Problem Statement:

Investment decisions mainly depend upon the investor's attitude towards risk and return of each of the avenues of investment. Planning and advisory services play an important role in facilitating investors in investing process. For advising an investor for investment knowing the currency volatility in the market is necessary. Portfolio Management concerns the construction and maintenance of a collection of investment. Return is obviously important

though and the ultimate objective of portfolio manager is to achieve a chosen level of return by incurring the least possible risk.

One finds it difficult to take decision on investment. This is primarily, because investments are risky in nature and investors have to consider various factors before investing in investment avenues. Therefore the study aims to evaluate the performance of companies closing share price and return on the basis of **"Markowitz Model".** Withthe result of "Markowitz Model" we are able to find the company which gives higher return for same amount of risk, or same return for less amount of risk.

Objectives of the study:

1. To analyse the impact of risk and return on portfolio management.
2. To find out the risk of different securities.
3. To evaluate the relationship of individual average return and risk.
4. To understand the Markowitz model, to find risk and return trade off.
5. To Identify the portfolio return and risk of various sectors

Need for the study

1. Portfolio management presents the best investment plan to the individuals as per their income, budget, age and ability to undertake risks.
2. Portfolio management minimizes the risks involved in investing and also increases the chance of making profits.
3. Portfolio managers understand the client's financial needs and suggest the best and unique investment policy for them with minimum risks involved.
4. Portfolio management enables the portfolio managers to provide customized investment solutions to clients as per their needs and requirements.

Research Methodology

The task of collecting data begins after a research problem has been defined and for this study data is collected mainly from secondary sources. Secondary data has been extracted through journals, internet, textbooks and study reports. Samples are taken from Nifty companies for the purpose of this study. Sample size is 4. Sampling technique is simple random sampling. I have taken Markowitz model for the calculation of risk and return of the portfolio.

The formula for the calculation of risk and return are:

Risk= $\sigma_p = \sqrt{w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2\,cov_{xy}\,w_1\,w_2}$

Where, w_1^2= weight of stock one, σ_1^2= standard deviation of stock one,

W_2^2= weight of stock two, σ_2^2= standard deviation of stock two,

Cov_{xy}= co-variance of x and y.

Return= $R_p = w_1 R_1 + W_2 R_2$

Limitations of the study

1. Data obtained and analysed for a short period.
2. Time constraint.
3. Conclusions may not be perfect as market fluctuations are unpredictable.
4. Different assumptions lead to different results.

Company profile

Manufacturing Sector:

Bharat Heavy Electricals Limited:

Bharat Heavy Electricals Limited(BHEL) established in the mid-fifties (1956) is the largest engineering and manufacturing enterprise in India in the energy–related/infrastructure sector, today. BHEL was established more than 40 years ago, ushering in the indigenous Heavy Electrical Equipment industry in India – a dream that has been more than realized with a well–recognized track record of performance. The company has been earning profits continuously since 1971–72 and paying dividends since 1976–77.

BHEL has diversified its product base over the years and today caters to the needs of almost all the key sectors of the economy. In addition to the power generation equipment , BHEL products cater to a wide spectrum of customers encompassing various fields of operation, like Fertilizers & Petrochemicals,Refineries,Oil Exploration and production, steel and metals, cement ,sugar and paper plants, transportation and non–conventional energy sources etc.

With a massive network of 15 manufacturing Units located at various important centres all over India, BHEL manufactures almost all critical high technology products required for power sector like Gas Turbines, Steam Turbines, Turbo generators, Boilers, Pumps and Heat exchangers, Pulverisers and electrical switch gears.

BHEL manufactures over 180 products under 30 major product groups and caters to core sectors of the Indian Economy viz., Power Generation & Transmission, Industry, Transportation, Telecommunication, Renewable Energy, etc. The wide network of BHEL's 15 manufacturing divisions, four Power Sector regional centres, over 100 project sites, eight service centres and 18 regional offices, enables the Company to promptly serve its customers and provide them with suitable products, systems and services –– efficiently and at competitive prices. The high level of quality & reliability of its products is due to the emphasis on design, engineering and manufacturing to international standards by acquiring and adapting some of the best technologies from leading companies in the world, together with technologies developed in its own R&D centres

BHEL's operations are organised around three business sectors, namely Power, Industry – including Transmission, Transportation, Telecommunication & Renewable Energy – and

Overseas Business. This enables BHEL to have a strong customer orientation, to be sensitive to his needs and respond quickly to the changes in the market.

The greatest strength of BHEL is its highly skilled and committed 42,600 employees. Every employee is given an equal opportunity to develop himself and grow in his career. Continuous training and retraining, career planning, a positive work culture and participative style of management? All these have engendered development of a committed and motivated workforce setting new benchmarks in terms of productivity, quality and responsiveness.

Larsen & Toubro

Larsen & Toubro (L&T) is a technology, engineering, construction and manufacturing company. It is one of the largest and most respected companies in India's private sector.

Larsen & Toubro Limited is the biggest legacy of two Danish Engineers, who built a world-class organization that is professionally managed and a leader in India's engineering and construction industry. It was the business of cement that brought the young Henning Holck-Larsen and S.K. Toubro into India. They arrived on Indian shores as representatives of the Danish engineering firm F L Smidth & Co in connection with the merger of cement companies that later grouped into the Associated Cement Companies.

Together, Holck-Larsen and Toubro, founded the partnership firm of L&T in 1938, which was converted into a limited company on February 7, 1946. Today, this has metamorphosed into one of India's biggest success stories. The company has grown from humble origins to a large conglomerate spanning engineering and construction. ECC was conceived as Engineering Construction Corporation Limited in April 1944 and was incorporated as wholly owned subsidiary of Larsen & Toubro Limited. L&T's founders Holck - Larsen and Toubro laid the foundation for ECC.

It has today emerged as India's leading construction organization. Their first office in Mumbai (Bombay) was so small that only one of the partners could use the office at a time. In the early years, they represented Danish manufacturers of dairy equipment for a modest retainer. But with the start of the Second World War in 1939, imports were restricted, compelling them to start a small work-shop to undertake jobs and provide service facilities.

Telecom Sector

Bharti Airtel

Bharti Airtel, incorporated on July 7, 1995 is the flagship company of Bharti Enterprises. The Bharti Group has a diverse business portfolio and has created global brands in the telecommunication sector. Bharti Airtel, is Asia's leading integrated telecom services provider with operations in India and Sri Lanka. Bharti Airtel has been at the forefront of the telecom revolution and has transformed the sector with its world-class services built on leading edge technologies.

Bharti Enterprises is one of India's leading business groups with interests in telecom, retail, manufacturing, agri business and financial services. Bharti has recently forayed into retail business as Bharti Retail Pvt. Ltd. under a MoU with Wal-Mart for the cash & carry business. It has successfully launched an international venture with EL Rothschild Group to export fresh agri products exclusively to markets in Europe and USA and has launched Bharti AXA Life Insurance Company Ltd under a joint venture with AXA, world leader in financial protection and wealth management.

Bharti Airtel is India's largest integrated and the first private telecom services provider with a footprint in all the 23 telecom circles. Bharti Airtel since its inception has been at the forefront of technology and has steered the course of the telecom sector in the country with its world class products and services.

The businesses at Bharti Airtel have been structured into three individual strategic business units (SBU's) - Mobile Services, Airtel Telemedia Services & Enterprise Services. The mobile business provides mobile & fixed wireless services using GSM technology across 23 telecom circles while the Airtel Telemedia Services business offers broadband & telephone services in 95 cities and has recently launched India's best Direct-to-Home (DTH) service, Airtel digital TV. The Enterprise services provide end-to-end telecom solutions to corporate customers and national & international long distance services to carriers. All these services are provided under the Airtel brand. Airtel's high-speed optic fibre network currently spans over 90,205 kms covering all the major cities in the country.

The company has two international landing stations in Chennai that connects two submarine cable systems - i2i to Singapore and SEA-ME-WE-4 to Europe.

Reliance Communications:

Reliance Communications is the flagship company of the Anil Dhirubhai Ambani Group (ADAG) of companies. Listed on the National Stock Exchange and the Bombay Stock Exchange, it is India's leading integrated telecommunication company with over 85 million customers.

The Late Dhirubhai Ambani dreamt of a digital India - an India where the common man would have access to affordable means of information and communication. Dhirubhai, who single-handedly builtIndia's largest private sector company virtually from scratch, had stated as early as 1999: "Make the tools of information and communication available to people at an affordable cost. They will overcome the handicaps of illiteracy and lack of mobility."

It was with this belief in mind that Reliance Communications (formerly Reliance Infocomm) started laying 60,000 route kilometres of a pan-India fibre optic backbone. This

backbone was commissioned on 28 December 2002, the auspicious occasion of Dhirubhai's 70th birthday, though sadly after his unexpected demise on 6 July 2002.

RCom's business encompasses a complete range of telecom services covering mobile and fixed line telephony. It includes broadband, national and international long distance services and data services along with an exhaustive range of value-added services and applications. The company's constant endeavour is to achieve customer delight by enhancing the productivity of the enterprises and individuals it serve.

Reliance Mobile (formerly Reliance India Mobile), launched on December 28, 2002, coinciding with the joyous occasion of the late Dhirubhai Ambani's 70th birthday, was among the initial initiatives of Reliance Communications. It marked the auspicious beginning of Dhirubhai's dream of ushering in a digital revolution in India. Today, we can proudly claim that we were instrumental in harnessing the true power of information and communication, by bestowing it in the hands of the common man at affordable rates.

DATA ANALYSIS AND INTERPRETATION

Analysis of individual risk and return of sample companies (sector wise)

Manufacturing sector

TABLE 1: Individual Average Return of Bharat Heavy Electricals Ltd (2010 – 2014)

Year	Closing share price	Return (R)	$(R - R_1)$	$(R - R_1)^2$
2009	480.66	-------	------	-------
2010	464.74	- 3.31	2.47	6.10
2011	238.85	- 48.61	- 42.82	1833.88
2012	228.25	- 4.44	1.34	1.81
2013	176.90	- 22.50	-16.72	279.40
2014	265.25	49.94	55.73	3105.32
		-28.91 ($\sum$R)		5226.50 $\sum(R - R_1)^2$

$R_1 = \sum R/n = -28.91/5$

$= - 5.78$

Calculation Of Risk (SD)

Formula $(\sigma_1) = \sqrt{\sum(R-R_1)^2 / n}$

$= \sqrt{5226.50 / 5}$

$= \sqrt{1045.3}$

$= 32.33$

TABLE 2 : Average Return of L and T ltd (2010 to 2014)

Year	Closing share price	Return (R)	$(R - R_1)$	$(R - R_1)^2$
2009	1677.60	-----	----	----
201	1979.25	17.98	10.77	115.96
2011	994.65	-49.75	-56.96	3244.27
2012	1607.15	61.58	54.37	2955.78
2013	1070.25	-33.41	- 40.62	1649.93
2014	1497.65	39.65	32.44	1052.48
		36.06 ($\sum$R)		9018.42 $\sum(R - R_1)^2$

$R_1 = \sum R/n = 36.06/5 = 7.21$

Calculation Of Risk (SD)

Formula $(\sigma_2) = \sqrt{\sum(R-R_1)^2 / n}$

$= \sqrt{9018.42 / 5}$

$= \sqrt{1803.68}$

$= 42.47$

TABLE 3: Average Return and Risk of sample companies

Sl.No	Companies	Average Return	Risk
1.	Bharat Heavy Electricals Ltd	-5.78	32.33
2.	L and T Ltd	7.21	42.47

The above table shows that the average return earned by the BHEL is negative that is – 5.78, whereas L and T average is positive that is 7.21. so, average return of BHEL is lower than the L and T ltd.

Risk of both the company that is BHEL and L and T ltd is positive, that is 32.33 and 42.47 respectively. This indicates that the risk of BHEL is less than the L and T ltd.

Telecom sector

TABLE 4: Average Return of Bharti Airtel Ltd

(2010 – 2014)

Year	Closing share price	Return (R)	$(R-R_1)$	$(R-R_1)^2$
2009	329.75	-----	----	----
2010	358.80	8.81	7.25	52.54
2011	343.50	- 4.26	- 5.83	33.93
2012	317.10	-7.69	-9.25	85.50
2013	330.25	4.15	2.59	6.69
2014	352.7	6.80	5.24	27.43
		7.80($\sum$R)		206.09 $\sum(R-R_1)^2$

$R_1 = \sum R/n = 7.80/5$

$= 1.56$

Calculation ofRisk (SD)

Formula $(\sigma_1) = \sqrt{\sum(R-R_1)^2 / n}$

$= \sqrt{206.09 / 5}$

$= \sqrt{41.22}$

$= 6.42$

TABLE 5: Average Return of Reliance communications ltd (2010 to 2014)

Year	Closing share price	Return (R)	$(R-R_1)$	$(R-R_1)^2$
2009	172.35	-----	----	----
2010	145.35	- 15.67	- 10.77	115.97
2011	70.05	-51.81	-46.91	2200.45
2012	73.90	5.50	10.39	108.02
2013	130.00	75.91	80.81	6530.33
2014	80.05	-38.42	-33.53	1123.99
		-24.49 ($\sum$R)		10078.75 $\sum(R-R_1)^2$

$R_1 = \sum R/n = -24.49/5$

$= -4.90$

Calculation of Risk (SD)

Formula $(\sigma_2) = \sqrt{\sum(R-R_1)^2 / n}$

$= \sqrt{10078.75 / 5}$

$= \sqrt{2015.75}$

$= 44.90$

Manufacturing sector

TABLE 7: Co-variance of BHEL and L and T Ltd

BHEL $(R-R_1)$	L and T $(R-R_1)$	$(R-R_1)$ x $(R-R_1)$
2.47	10.77	26.60
-42.82	-56.96	2439.03
1.34	54.37	72.86
-16.72	- 40.62	679.17
55.73	32.44	1807.88
		5025.53 $\sum(R-R_1)$ x $(R-R_1)$

Co-variance = $\sum(R-R_1)$ x $(R-R_1)$ / n

$= 5025.53/5$

$= 1005.11$

Calculation of Correlation (r):

$r = $ Co-variance$/ \sqrt{1}$ x $\sqrt{2}$

$= 1005.11/ 32.33$ x 42.47

$= 1005.11/ 1373.05$

$r = 0.73$

Calculation of portfolio Return and portfolio Risk

Portfolio Return of BHEL and L and T ltd

$R_p = W_1R_1 + W_2R_2$

$\quad = 0.5(-5.78) + 0.5(7.21)$

$\quad = -2.89 + 3.61$

$\quad = 0.72$

Portfolio Risk of BHEL and L and T ltd

$\sigma_p = \sqrt{w_1^2\ \sigma_1^2 + w_2^2\ \sigma_2^2 + 2\ cov_{xy}\ w_1\ w_2}$

$\quad = \sqrt{(0.5)^2(32.33)^2 + (0.5)^2\ (42.47)^2 + 2\ (1005.11)\ (0.5)\ (0.5)}$

$\quad = \sqrt{0.25\ (1045.23) + 0.25\ (1803.70) + 502.55}$

$\quad = \sqrt{261.31 + 450.93 + 502.55}$

$\quad = \sqrt{1214.79}$

$\quad = 34.85$

Telecom sector

TABLE 8 : Co-variance of BhartiAirtel Ltd and Reliance Communications Ltd

Bharti Airtel Ltd (R-R$_1$)	Reliance Communication Ltd (R-R$_1$)	(R-R$_1$) x (R-R$_1$)
7.25	-10.77	-78.08
- 5.83	-46.91	273.49
-9.25	10.39	-96.11
2.59	80.81	209.30
5.24	-33.53	-175.70
		132.90 $\sum$(R-R$_1$) x (R-R$_1$)

Co-variance = $\sum$(R-R$_1$) x (R-R$_1$) / n

$\qquad = 132.90/5$

$\qquad = 26.58$

Calculation of Correlation (r):

$\qquad r = $ Co-variance$/ \sqrt{1}$ x $\sqrt{2}$

$\qquad = 26.58/6.42$ x 44.90

$\qquad = 26.58/ 288.26$

$\qquad r = 0.09$

Portfolio Return of Bharti Airtel ltd and Reliance Communication ltd

$R_p = W_1R_1 + W_2R_2$

$\quad = 0.5(1.56) + 0.5(-4.90)$

= 0.78 – 2.45

= - 1.67

Portfolio Risk of BhartiAirtel ltd and Reliance Communication ltd

$\sigma_p = \sqrt{w_1^2\ \sigma_1^2 + w_2^2\ \sigma_2^2 + 2\ cov_{xy}\ w_1\ w_2}$

$= \sqrt{(0.5)^2(6.42)^2 + (0.5)^2\ (44.90)^2 + 2\ (26.58)\ (0.5)\ (0.5)}$

$= \sqrt{0.25\ (41.22) + 0.25\ (2016.01) + 13.29}$

$= \sqrt{10.31 + 504.00 + 13.29}$

$= \sqrt{527.60}$

= 22.97

TABLE 9 : Showing Co-variance, Correlation, Portfolio Risk and Return of sample companies (sector wise)

Sl. No	Sample co.'s / Sector	Co-variance	Correlation	Portfolio Return	Portfolio Risk
1.	Manufacturing	1005.11	0.73	0.72	34.85
2.	Telecom	26.58	0.09	- 1.67	22.97

The above table shows clearly the Co-variance, Correlation, Portfolio Risk and Portfolio Return of sample companies. The result indicates that the Co-variance of Manufacturing sector has very high Co-variance when compare to other sector mention in the table.

The Portfolio Risk is the highest in the Manufacturing sector , that is Portfolio Risk is 34.85 and telecom is 22.97.

TABLE 10: Markowitz Efficient Frontier (sector wise)

Sl. No	Sectors (portfolio)	Portfolio Return	Portfolio Risk
1.	Manufacturing Sector (A)	0.72	34.85
2.	Telecom Sector (B)	-1.67	22.97

FINDINGS

IN MANUFACTURING SECTOR. (A)

1. L&T ltd., has a highest return on individual average of 7.21 and BHEL has a lowest

2. Returnona individual average of -5.78

3. L&T ltd., has a highest individual risk factor of 42.47 and BHEL has the lowestindividual risk factor of 32.33

4. The covariance and correlation of BHEL and L&T ltd., is 1005.11 and 0.73; whereas portfolio return is 0.72& portfolio risk is 34.85

IN TELECOM SECTOR (B)   The

individual average return of The Bharti airtel ltd. and Reliance Communications Ltd has 1.56 and -4.90 respectively.

1. Reliance Communication Ltd., has a highest individual risk factor of 44.90 and Bharti Airtel Ltd., has the lowest individual risk factor of 6.42

2. The co-variance & correlation of Bharti Airtel Ltd., & Reliance communication Ltd., is 26.58 and 0.09 whereas portfolio return is – 1.67& portfolio risk is 22.97.

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CONCLUSIONSAND SUGGESTIONS

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CONCLUSIONS:

The study endeavoured to give a look on Risk and return of portfolio management. Though investment behaviour of individual are expected to be differentaccording to the personal taste fancy and perception. The Investment behaviour of individualsis the preference for dividend. In thechoice of market, mostly service people prefer primary market whereasbusiness people's preference is towards the secondary market. Portfolio management concerns the constructions and maintenance of a collection of investment. It is investment of funds in different securities in which the total risk of the portfolio is minimized, while expecting maximum return from it. It primarily involves reducing risk rather than increasing return. Return is obviously important though, and the ultimate objective of portfolio manager is to achieve a chosen level of return by incurring the least possible risk.

The overall study reveals that the Manufacturing sector. The Telecom sector has got a inefficient portfolio due to negative quadrant that is individual average return as well as portfolio return is negative (loss) with a same level of risk.

SUGGESTIONS:

1. Before investing in the company, the investors have to analysis the overall factors of the company.

2. At the same time, the investors should not invest in the particular or in the same stocks.

3. With the high risk and high return of the portfolio , the investors can invest in that company.

4. With the high risk and no return of the portfolio, the investors do not invest in that company.

5. In Telecom sector, the individual average return of BhartiAirtel Ltd and Reliance Communication Ltd has a negative (loss) and also portfolio return is also negative (loss) with a same level of risk. So it is better not to invest in this sector.

6. when compare to other sectors, that is Manufacturing, Telecom sector has a moderate portfolio return of very high portfolio risk, so, it is difficult to invest in this sector.

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