

Project Report (17MBAPR407)
on
**“Construction of Optimal Portfolio of Selected Stocks Using Sharpe’s Single
Index Model” at Anandrathi Financial Services Pvt Ltd. Bengaluru**

BY

**AKARSH M
1AY17MBA02**

Submitted to

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI



In partial fulfillment of the requirements for the award of the degree of
MASTER OF BUSINESS ADMINISTRATION
Under the guidance of

INTERNAL GUIDE

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March 2019

ANANDRATHI

Date: 03-04-2019

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Mr. AKARSH M** a student of Acharya institute of technology, Bengaluru (affiliated to Visvesvaraya Technology Belgaum) has done his Project report at **"ANANDRATHI FINANCIAL SERVICES PVT LTD."** From **3rd January 2019 TO 22nd February 2019** under the Guidance of **Mr. Chandrashekar K**

During the period he has shown keen interest in his work and his conduct was found good.

We take the opportunity to wish his all success in his future endeavors.

For Anandrathi Financial Services


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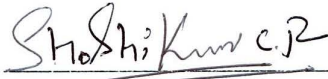
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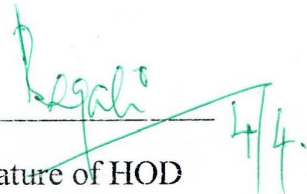
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CERTIFICATE

This is to certify that **Mr. Akarsh M** bearing USN **1AY17MBA02** is a bonafide student of Master of Business Administration course of the Institute 2017-19 batch, affiliated to Visvesvaraya Technological University, Belagavi. Project report on **“A Study on Construction of Optimal Portfolio of Selected Stocks using Sharpe s Single Index Model”** at **Anandrathi Financial Services Ltd, Bengaluru** is prepared by him under the guidance of **Prof. Shashi Kumar C R.** in partial fulfillment of the requirements for the award of the degree of Master of Business Administration, Visvesvaraya Technological University, Belagavi, Karnataka.



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DECLARATION

I, **Akarsh M**, hereby declare that the Project report entitled “Risk and Return Analysis of Equity Shares of Selected Banks in BSE” with reference to “Anandrathi Financial Services Ltd, Bengaluru” prepared by me under the guidance of Prof. Shashi Kumar C.R, Assistant Professor, Department of M.B.A, Acharya Institute of Technology, Bengaluru and external assistance by **Mr. Chandrashekar K, Assistant Manager, Anandrathi Financial Services Pvt Ltd, Bengaluru**. I also declare that this Project work is towards the partial fulfilment of the university regulations for the award of degree of Master of Business Administration by Visvesvaraya Technological University, Belagavi. I have undergone a summer project for a period of six weeks. I further declare that this Project is based on the original study undertaken by me and has not been submitted for the award of any degree/diploma from any other University / Institution.

Place: Bengaluru
Date: 8/04/2019


Signature of the student

ACKNOWLEDGEMENTS

I wish to express my sincere thanks to our respected Principal, **Dr. Prakash M R**, beloved Dean-Academics, **Dr.Devarajaiah R M**, and deep sense of gratitude to **Dr. M MBagali**, HOD, Acharya Institute of Technology, Bengaluru for their kind support and encouragement in completion of the project Report.

I would like to thank **Prof.Shashi kumar C.R**, Asst. Professor, Department of MBA, Acharya Institute of Technology, Bengaluru and external guide **Mr. Chandrashekar K**, Assistant Manager, **ANANDRATHI Financial Services PvtLtd**, Bengaluru who gave me golden opportunity to do this wonderful Project in the esteemed organization, which helped me to learn various concepts.

Finally, I express my sincere thanks to my parents, friends and all the Staff of MBA department of AIT for their valuable suggestions in completing this Project Report.

Place: Bengaluru

Akarsh m

Date: 8/04/2019

1AY17MBA02

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EXECUTIVE SUMMARY

The project work entitled “Study on Construction of Optimal portfolio of selected stocks using Sharpe’s single index Model” was carried at ANANDRATHI FINANCIAL SERVICES LTD.

Since there are 1000’s of equities, bonds, mutual funds and derivatives traded on major stock exchanges, selecting and creating right portfolio to meet investment objective is a difficult task. Most of the investors choose their investment based on recommendation of the equity brokers, friends, reports of newspapers, magazines, websites etc.

To overcome the above problem different techniques such as “Markowitz portfolio model”, “Sharpe’s optimal portfolio model”, “Portfolio construction through security valuation” etc., are available. “Portfolio construction through Sharpe’s single index model” was opted because it was effective to the study.

The study conducted, mainly focused on constructing portfolios from 25 stocks (5 stocks from 5 different sectors) for various classes of investors based on Sharpe’s single index model.

The main objectives of the study are:

To identify stocks and proportion of stocks to be included in the portfolio and to measure constructed portfolio’s performance in terms and comparing it with benchmark Sensex return. With this it is observed that investment can be made in those companies which have excess return to beta as it diversifies risk so good to invest.

CHAPTER-1

INTRODUCTION

The internship in the Anandrathi financial services ltd helped me in understanding the practically knowing the working of the stock market with respect to investments decision, mutual funds, derivative market, commodity market and how much proportion to be invested in each risky as well as risk free assets and also preparing a financial plan for clients based on their income.

Financial management refers to the efficient and effective use of funds or money to accomplish the objectives of organizations as a whole which is handled by the top-level management people in the organization which includes how to raise capital and to allocate those capital in proper proportion to maximize in terms of goodwill and also in terms of profit.

Stock market refers to the place where an individual can trade in stocks of the listed companies in the stock exchanges this activity makes a trade liquid and more attractive to the investors in return.

Portfolio is a mixed basket of different and diversified stocks and shares, bonds, securities and other money market instruments. The risks associated in investing in a single stock etc. can be minimized if the process of investment follows portfolio construction consisting of varied and diversified financial instruments. After all, the aim of any Investor may not be to lose his investment but to gain decent returns and attain growth in its volume and value with minimum risk.

A portfolio exactly is the best solution to achieve all this. It is all about investing in a range of financial products. It calls for analytical knowledge about various financial investment products and skill in working out the optimum level of returns along with retaining robust capital fund.

INDUSTRY PROFILE

1.2 STOCK MARKET.

The Stock Exchange is the commercial center where the speculators exchange recorded organizations shares and securities. The exchanging the recorded shares is called Secondary market. There are two principle stock trades in India. They are BSE (Bombay stock Exchange) and NSE (National stock Exchange).

1.3 HISTORY OF INDIAN STOCK MARKET

It is the old securities exchange in Asia; the Indian stock exchanges have two hundred years of history.

18th century-East India organization was the predominant establishment and by end of the century, business in its advance securities increased full force.

1830's-Business on corporate stocks and partakes in Bank and Cotton presses began in Bombay. Exchanging list before the finish of 1839 got more extensive.

1850's-Rapid improvement of business endeavor saw financier business pulling in more individuals into the business.

1862-63-The quantity of intermediaries expanded to around 200 to 250.

1875-The Bombay Stock Exchange was set up in Bombay.

1908-The Calcutta Stock Exchange Association was set up.

1940-Uttar Pradesh Stock Exchange Ltd was set up.

1944- Establishment of Hyderabad Stock Exchange Ltd.

1957-Bangalore Stock Exchange Ltd was enrolled and got acknowledgment just by 1963.

1993 - NSE famous as a stock trade.

2000 -Starting of web exchanging at NSE.

2001 - NSE starts subordinates exchanging.

1.4 OBJECTIVES OF STOCK MARKET:

- To provide a market place for trading in shares and securities.
- To develop market capitalization for companies.
- To regulate share markets.
- To enable stock broking services.
- To enable a healthy distribution of securities.

1.5 FUNCTIONS OF THE STOCK EXCHANGE

- Provides place for buyers & sellers to meet
- Regulations of the market
- It provides efficient allocation of capital resources
- Market surveillance to monitor the prices of securities
- Education role
- Secondary market function
- Handling complaints and grievances

1.6 EXCHANGES OF STOCK MARKET

- ✓ **NSE**
- ✓ **BSE**

NATIONAL STOCK EXCHANGE (NSE)

The National Stock Exchange of India Limited has causes in the description of the elevated mechanical Study Group on Establishment of New Stock Exchanges, which suggested development of a National Stock Exchange by currency related foundations (FII's) to give access to monetary specialist from the whole way across the country on an equal balance. In light of the proposal, NSE was sophisticated by driving Financial Institutions at the command of the Government of India and was merged in November 1992 as an assessment paying organization not at all like other stock trades in the nation

On its appreciation as a stock trade under the Securities Contracts (Regulation) Act, 1956 in April 1993, NSE started its operations in the Wholesale Debt Market (WDM) section in June 1994. The Capital Market section started its operations in November 1994 and Derivative portion initiated in June 2000.

NSE presented without precedent for India, completely computerized screen based exchanging. It utilizes a completely modernized exchanging framework that offers speculators over the length and broadness of the nation a sheltered and simple approach to contribute.

The NSE exchanging framework called National Exchange for Automated Trading' (NEAT) is a completely computerized exchanging framework, which embraces the standard of a request driven market.

BOMBAY STOCK EXCHANGE (BSE)

Bombay Stock Exchange Limited is the most settled stock exchange Asia with a rich legacy. Predominantly known as "BSE", it was developed as "The Native Share and Stock Brokers Association" in 1875. It is the essential stock exchange the country to get invariable affirmation in 1956 from the Government of India under the Securities Contracts (Regulation) Act, 1956.

The Exchange's fundamental and pre-popular part in the headway of the Indian capital market is comprehensively seen and its document, SENSEX, is chased after the world. With Demutualization, the trading rights and proprietorship rights have been de-associated reasonably tending to worries as to saw and bona fide hopeless conditions.

The Exchange is professionally regulated under the general heading of the Board of Directors. The Board contains noticeable specialists, agents of Trading Members and the Managing Director of the Exchange.

OVER-THE-COUNTER-EXCHANGE OF INDIA

A well-developed securities market ensures easy and quick marketability to the securities, which imparts liquidity to them. With the object of liquidity is to be ensured, all the securities, good or bad, have to have a market for trading and dealings. This market can be fostered and

develop by proper marketing strategies and provision of infrastructure for the purpose. On such strategy is to have a multi-tier market to suit the various types of securities.

Over-The-Counter Market is a market where buyers seek out sellers and sellers seek out the buyers, and then endeavor to arrange the terms and conditions for purchase or sale. It is a negotiate market place that exists everywhere as opposed to the auction market place, represented by activity on the Security Exchanges.

The OTC relates to a type of security trading in which the market caters to some basic objectives like,

- ✓ Quicker liquidity
- ✓ Dealing in fair price
- ✓ Liquidity for a less traded security
- ✓ Easy process of buying and selling
- ✓ Creation of public interest in risky but viable ventures
- ✓ Easier and cheapest means of making public sale of new issues

ADVANTAGES OF OTC

Briefly, specific advantages of OTC are discussed below:

- ✓ The OTC allows smaller companies and less liquid companies to be listed, as they are not entitled for listing.
- ✓ Lowers the costs incurred in new issues.
- ✓ Competition as between the dealers exists better than on the regular stock exchange and the larger the number of the dealers, the better is the market.
- ✓ Dealers can operate both in new as well as secondary market.
- ✓ Better choice for companies those who prefer shares by dealers for money making in either of the market.
- ✓ Information flow is free and short from market makers to customers due to close contacts between firms and market makers.

SEBI (SECURITIES AND EXCHANGE BOARD OF INDIA)

The Government of India established the Securities and Exchange Board of India (SEBI) in 1992 which is an independent statutory body to regulate the working of stock exchanges and control the stock market, in India. SEBI provides License's to stock brokers and intermediaries. All the listed companies and the intermediaries involved in stock market activities, have to be registered with SEBI. It also strives for fair dealings in the stock market activities and enables the end investors to have transparent dealing in stocks and also safeguard their interest.

Securities and Exchange Board of India (SEBI) has its head office at Mumbai and also has its other branch offices in Calcutta, Chennai, and Delhi. It regulates the stock market in India. The composition of SEBI consists of members from stock exchange, Central government, RBI and other financial experts across India.

The functions of the Board:

- ✓ To control the operations of stock market.
- ✓ To plan certain duties and responsibilities for stock brokers.
- ✓ To make sure that the activities are not carried in an unethical manner and which also restricts the unfair trade practices.
- ✓ To protect the interest of end investor.
- ✓ To promote and develop stock market.
- ✓ To promote investors education and intermediaries training in stock market.
- ✓ To prohibit the insider trading activities in stock.

COMPANY PROFILE

ANANDRATHI GROUP.

Established in 1994, AnandRathi is one of India's leading financial services firm offering Wealth Management, Investment Banking, Corporate Finance & Advisory, Brokerage & Distribution services in the areas of equities, commodities, mutual funds, structured products, insurance, corporate deposits, bonds & loans to institutions, corporations, high-net worth individuals and families.

The firm has a vast footprint across India and also in select international locations such as Dubai, with presence across 1200 locations through its own branches, sub-brokers and remises and representative offices/associate companies. The group today employs over 2,500 professionals.

Citigroup Venture Capital International, the well-known global private equity and Venture Capital Company holds a sizeable stake in the firm. All the offerings are supported by powerful research teams and each unit is clearly positioned to cater to the most diverse financial needs of our clients.

The Anand Rathi Group is member of the Bombay Stock Exchange (BSE), National Stock Exchange (NSE), Multi-Commodity Exchange (MCX), National Commodity Exchange (NCDEX), United Stock Exchange (USE), Central Depository Services Ltd. (CDSL), National Securities Depository Limited (NSDL) and ARN holder.

Anandrathi group is a member of Bombay stock exchange national stock exchange multi commodity exchange national commodity exchange central depository service ltd national securities depository ltd.

Mr. AnandRathi Is a founder of anandrathi group. He is one of the leading financial & investment expert in India & south East Asia. He became president of BSE in 1999.

- In year 2006, it was ranked amongst south Asia top five wealth managers for ultra-rich according to Asia money poll.
- In 2010 anandrathi awarded for his contribution towards India's capital market by zee business.

- In 2011 it was awarded for Anandrathi has awarded as “best contribution in investor education” in category enhancement of the year by Bloomberg UTV financial leader award.
- In 2012 it was awarded as best Agriculture commodities analyst by commodity participant association of India.
- In 2012 it was awarded as “Asia’s best analyst- Banking” by Wall Street journals.
- In 2013 it was recognized as “one of the top performers of the equity segments by Bombay stock exchange.
- In 2014 it was awarded with “excellence award” by institute of economic studies.
- In 2015 it was awarded with wealth manger India award by capital finance international.

1.7 Promoters of the Company:

Anand Rathi - Founder & Chairman

- ✓ Mr. Anand Rathi is one of the well-known financial and investment experts in India. He has more than 40 years of experience, in the financial filed. He is a gold medallist Chartered Accountant.

Further in the year 1999, he became President of BSE (Bombay Stock Exchange). He is one of the driving forces for the various changes in BSE which helped in growth and to bring more transparency of the system.

- ✓ Pradeep Gupta – Co-founder & Vice Chairman

He started his career with family business. Later his interest drew his towards financial service sectors. He started working with broking firm. Later he joined hand with Mr. Anand Rathi and established a new company.

He has more than 20 year of experience in the field of financial services. And is one of the active members of Rotary Club of Bombay.

- ✓ Amit Rathi - Managing Director
- ✓ Priti Gupta - Executive Director, Commodities and Currencies, Anand Rathi Commodities Ltd.
- ✓ Supriya Rathi - Director, Anand Rathi Insurance Brokers Pvt Ltd

Tagline

“Behind Every Successful Investor”

1.8 AREA OF OPERATIONS:

AnandRathi group comprises the holding company, Anandrathi Financial Services Ltd., and its wholly owned subsidiaries, occupy the entire financial services space by offering a range of services in equities, derivatives and commodities. The company operates its business transactions across all the Indian markets and has business tie ups with NSDL, SEBI, SENSEX, NIFTY, NSE, and BSE.

ANANDRATHI BRANCHES IN INDIA

ESTABLISHMENT YEAR	BRANCH
1994	MUMBAI
2001	ALLAHABAD
2007	BANGALORE
2007	CHENNAI
2007	NEW DELHI
2007	HYDERABAD
2008	SURAT
2009	PUNE
2010	COIMBATORE
2013	TRICHY
2014	SECUNDRABAD

1.9 AnandRathi Financial Services ltd unique features:

- ❖ AR is a depository participant of National Securities Depository Limited and offers lifetime AMC free De-mat account.
- ❖ Wide range of financial products available including Equities, Commodities, Currency, Mutual Funds, Bonds & Corporate FD's.
- ❖ In Intraday only selling side brokerage.
- ❖ AR provides door step service.
- ❖ AR provides free seminars to existing clients.
- ❖ AR provides online demo for remote clients.
- ❖ AR provides exposure for 7 trading days.

Vision:

“TO BE A SHINING EXAMPLE AS A LEADER IN INNOVATION AND THE FIRST CHOICE FOR CLIENTS AND EMPLOYEES”

Mission:

“Providing integrated financial care driven by the relationship of trust and confidence.”

1.10 PRODUCTS AND SERVICE PROFILE:

❖ BROKERAGE AND DISTRBUSTION SERVICES :

Anand rathi are well versed in providing equity solutions to traders and help them in trading by giving quality advice regarding the stocks of particular sector. It provides online service to trade on NSE & BSE for equities and derivatives. Designated dealers handle the queries of the traders by providing wide range of investment strategy with the help of setting a reliable research unit across the India.

A. Mutual funds:

Anandrathi is reaching the height of success by consistently providing the wide range of services extended to best suitable and appropriate asset allocation based on the risk appetite of customer profile.

B. Depository services:

anandrathi provides depository services i.e., holding the securities of investors safe and secure with CDSL & NSDL. anandrathi provides the service of holding securities in electronic form i.e., dematerialised form.

C. Commodities:

One of booming sector in emerging economy anadrathi is into providing different services regarding the trading of commodities. It provides investment strategy to investors about hedging the risk in return getting superior returns for the investors. Commodity broking is done through NCDEX and MCX. The majorly traded commodities are wheat, chana, guar, guar gum, and spices, in addition with providing arbitrage opportunity to the investors.

D. Insurance broking:

Aanandrathi acting as insurance broker by providing a unique service of risk management of business as well as individual informs. It includes assessing the risk measuring it and handling the risk of which insurance is an integral part, by providing the client to cover optimal level of risk at minimum possible cost.

E. IPO's:

IPO refers to initial public offer where company raises the funds from the public. Anandrathi is one of the dominant players in primary market distribution. It has vast experience and has a dedicated research team due to which it consistently ranked among top 10 distributor of IPO.

F. NRI:

Anandrathi has dedicated desk for NRI services. They are expertise in the field of NRI service. They maintain good customer relationship. The services provided by NRI desk of Anandrathi are as follows:

- 1) Superior understanding of Indian economy
- 2) Wide product range.
- 3) Dedicated relationship team.

❖ **Institutional services:**

1. **Institutional equities:** Anandrathi have well equipped experienced and reputed team of equity analysts which provide all relevant data of market and investment opportunities to clients. A separate research team focusing on the trend of market, companies, macro economy and Indian equity market.

❖ **Managed investment services:**

- I. **Portfolio management services:** Anandrathi helps to manage the portfolio of investors. The portfolio is designed to capture opportunities across the market spectrum. Further based on the customer requirements portfolio is constructed considering the risk appetite of the customers.
- II. **Real estate opportunity fund service:** it is private equity for high net worth corporate individual and institutions. This involves investment in equity linked instruments. A team of professionals are dedicated to provide this service to the clients.

❖ **Corporate:**

- a. **Institutional wealth management:** as corporate and institutions are associated with risk factor they require more sophisticated advice which is backed by detailed research. It provides integrated wealth management solution across the worldwide.

❖ **Investment banking and corporate finance:**

- I. **Investment banking:** investment bankers provides the services like raising funds, merger and acquisitions, strategic alliance, debt financing and restructuring advices to company.

- II. **Corporate finance:** corporate financing refers to managing the debt finance of the company. It's alternative source of funding in comprehensive manner. Anandrathi team has built an impressive track record in debt restructuring based on expertise services provided by them to its clients.
- III. **Merchant banking:** it has highly experienced equity capital market team. They are best in the industry because of its professionalized service and vast experience in capital market. It has managed many successful IPO.
- IV. **Mergers and acquisition, private equity:** merger and acquisition refers to combination of two or more company based on synergy. Anandrathi has specialized team for mergers and acquisitions.

❖ **Corporate advisory services:**

It provides specialized service for business strategy and re-engineering, along with business turnaround strategy and helps in performance improvement and cost reduction. Further it helps for maintaining management system i.e., management review and control mechanism.

Online Services:

- ❖ Trade Lite
- ❖ Trade X'PRESS
- ❖ Trade X'PRO
- ❖ Trade X'PRO+
- ❖ Trade MOBI

1.11 COMPERTITORS:

- ❖ India Infoline: Nirmal Jain and R. Venkatraman Jain co-founded on 17th of October 1995 an Indian financial services company headquartered at Mumbai. Indian Info line was early founded as probity research and service private limited. It provides wide range of services like research on the Indian economy, businesses and corporates.
- ❖ Kotak securities: Uday Raj Kotak started the stock broking in 1994 headquartered at Mumbai as Kotak securities. Kotak securities Limited's business is mainly from stock brokerage from investors and traders.
- ❖ ICICI direct:
- ❖ HDFC securities: a subsidiary of HDFC bank is one of most popular stock broking firm founded in 2000 and headquartered at Mumbai. HDFC securities are not only stock broking firm but also financial products distributor.
- ❖ J M financial: An integrated financial service group provides wide range of services. They share group's belief of trust being the most important factor for the organization. It provides services to corporations, financial institutions, high net worth individuals and retail investors.
- ❖ Share khan: one of the online trading investment and stop marketing. Share khan was founded in 2002 February by Shripal Morakhia. It is the second largest top broking firm in India spreading it branches in 575 cities across India.
- ❖ Mothilal Oswal: the founder of mothilal financial services ltd was mothilal oswal cofounded with ramdeo Agarwal in 1987.it provides equity in investment solutions many across the India spreading its branches in 375 cities and 24 states.
- ❖ Karvey securities: karvey group was founded in 1985 by Abhijit bhabe. It is headquarter at Mumbai. It is namely into financial planning along with the stock broking IPO marketing depository participants insurance and commodity broking
- ❖ Angel investment

❖ **Infrastructural Facilities**

AnandRathi Financial Services Ltd has a good infrastructure to carry on its technical and the fundamental activities and its business operations. Proper facilities like comfortable work stations, telecommunication network and laptop are given to each and every employee to carry on its activities smoothly and efficiently. Through this the employees can easily reach their clients immediately through their positive responses and contacts through email, SMS and through telephone networks.

1.12 FUTURE GROWTH & PROSPECTS:

- ❖ Creating good faith with clients.
- ❖ AR has planned to open still more branches in rural and semi urban area in India.
- ❖ AR future prospect is to create more awareness about derivate segment.

1.13 SWOT Analysis

Strengths:

- The brokerage charges of the Anandrathi Securities are lower compared to other stock broking companies.
- It is having a team of good professionals who are ready to solve customer problems.
- It has a good research department.
- It gives all the types of products and services to an end investor under one single roof.
- Anandrathi Group is having a good brand image in the industry.

Weakness:

- Some of the products that are held by the Anandrathi securities are very high and even the maintenance cost is also high.
- Its rules, regulations and procedures are too high that it sometimes makes delay in processing the data and documents of the new customers.
- Stiff competition by others in the market.
- Lack of Publicity
- Lack of Skilled & professional Employees

Opportunities:

- Target customers are large in number.
- Customer is ready to purchase the product if right approach is taken
- Increase in the number of management trainees who help the companies to tie up with reputed business schools for trainees at the less salary and with lower commission

Threats:

- Growing market with lots of competitors
- Promotion scheme of competitors
- Changes in the policies of government will have a great impact on the revenues of the Group companies

1.14 FINANCIAL STATEMENT

Balance sheet of Anandrathi for the year 2015, 2016, 2017 in Crore

Particulars	2015	2016	2017
Liabilities			
Share capital	95.3	95.3	102.5
Reserves and Surplus	2339.8	2530.9	3192.8
Minority interest	69.2	75	80
Long term borrowings	1931	1940	1556.4
Other Non-Current liabilities	59.8	61.8	63.8
Total Liabilities	4495.1	4703.8	4995.5

Assets	2015	2016	2017
Gross block	4671.2	4771.2	4871.2
less Acc depreciation	1869.3	2141.2	2423.7
Net block	2802	2630	2447.5
Work in progress	60.4	100	50
Tax assets	7.3	16	22
Non-Current investments	65	70	75
Other Non-current assets	452	483	519
Net current assets	1108.4	1402.8	1882
Total assets	4495.1	4703.8	4995.5

**Profit and loss account of Ventura securities ltd for the year 2015,
2016, 2017**

Particulars	2015	2016	2017
Net sales	6291.6	7200.9	8260
Less expenses	5475.2	6217.9	7066.4
Gross income	816.4	983	1193.6
Add other income	41.3	57.6	49.6
Net income	857.7	1040.6	1243.2
Less depreciation	263.6	272	282.5
Less interest	476.9	449.4	389.2
Less exceptional items	20.6	30	30
PBT	96.6	289.2	541.5
Less Tax provisions	10.9	69.4	131
Reported PAT	85.7	219.8	410.5
Add Minority interest	0.3	0	0
Add Share of associate	2.7	0	0
PAT	88.7	219.8	410.5

Key ratios

1. Current ratio

2013	2014	2015
18.53	22.69	29.49

2. Operating profit ratio

Operating profit ratio = EBIT/Sales

2013	2014	2015
13.63	14.45	15.05

3. Net profitability ratio

Net profitability ratio = sales/profit

2013	2014	2015
70.93	32.76	20.12

CHAPTER-2

THEORETICAL BACKGROUND OF THE STUDY

2.1 INTRODUCTION:

Portfolio implies a gathering or blend of money related resources or securities for example shares, debentures and government securities and it is not surprising to characterize a portfolio in such terms since the institutional portfolios (insurance agencies, benefits stores, common assets, banks, and so forth.) do, indeed, comprise of such resources.

Notwithstanding, in more broad sense the term portfolio might be utilized synonymously with the expression accumulation of advantages which can even incorporate physical resources (gold, silver, land, and so on.). The primary motivation behind making portfolio is to boost return and decrease the variable and expansion of monetary securities is done to adjust the arrival regardless of the possibility that the stocks are not performing up to the check.

Diversification is a risk supervision method that mix large array of funds within a portfolio to reduce the impact that any one security will have on the overall performance of the portfolio. Diversification lowers the risk of portfolio.

Diversification is a risk supervision method that mix large array of funds within a portfolio to reduce the impact that any one security will have on the overall performance of the portfolio. Diversification lowers the risk of portfolio.

The same return at a lower risk are:

- 1) The same risk at a lower return
- 2) The higher return at a lower risk.

The portfolio managers have diversified their funds over a variety of various securities to strike a balance between return and risk. This was however done on the intuition without understanding the magnitude of risk reduction. The 1950's saw a knowledge being developed which measures the expected rate of return and risk associated with combining assets which was came to be known as portfolio theory.

The portfolio theories have been developed by

- Harry M. Markowitz
- William Sharpe

PORTFOLIO

Finance deals with the study of investment by including the assets and liabilities over the time under different degrees of risk and un-certainment. In other words, it is a science of money management which describes how to manage and utilize the money in best possible ways to overcome the risk or uncertainty with maximizing the actual outcome.

Financial management refers to the efficient and effective use of funds or money to accomplish the objectives of organizations as a whole which is handled by the top-level management people in the organization which includes how to raise capital and to allocate those capitals in proper proportion to maximize in terms of goodwill and also in terms of profit.

2.2 MANAGING THE PORTFOLIO

After the establishment of allocation of assets, the investor can decide how to manage the portfolio over the time by adapting to the passive approach or active approach towards the portfolio management. In the passive approach the investor have the purchase the securities and hold it for a long duration so that by selling it at a future date the investor can make a profit. In active approach it is not the case as the investor need not hold it for a long duration he can buy and sell as and when need for the short period so that he can endlessly measure the risk and return of securities with in the asset module and change them consequently. He would be studying the risks

- ✓ Market related
- ✓ Group related
- ✓ Specific security and change the components of the portfolio to suit his objectives.

2.3 Harry Markowitz model: Introduction

Dr. Harry Markowitz is credited with building up the primary present day portfolio examination show since the essential components of current portfolio hypothesis radiate from

a progression of recommendations concerning objective financial specialist conduct put forward by Markowitz, then of the Rand Corporation, in 1952, and later in a more entire monograph supported by the Cowles Foundation. It was this work has pulled in everybody's point of view with respect to portfolio administration. Markowitz utilized scientific programming and measurable examination to mastermind the ideal allotment of benefits with portfolio.

At the end of the day, he considered the fluctuation in the normal comes back from speculations and their relationship to each other in developing portfolios. In so coordinating the concentration, Markowitz, and others taking after a similar thinking, perceived the capacity of portfolio administration as one of synthesis, and not singular security choice as it is more regularly honed. Choices as to individual security increases to and cancellations from a current portfolio are then predicated on the impact such a move has on the sensitive broadening equalization. Basically, Markowitz's model is a hypothetical structure for the examination of risk return decisions.

A portfolio is productive when it is relied upon to yield the exceptional yield with the base hazard acknowledged or, on the other hand, the littlest portfolio chance for a predefined level of normal return. To manufacture an effective portfolio a normal return level is picked, and resources are substituted until the portfolio mix with the littlest fluctuation at return level is found. As this procedure is rehashed for other expected returns, an arrangement of proficient portfolios is created.

Assumptions

The Markowitz model is based on several assumptions regarding investor behavior

- 1) Investors believe each investment alternative as being represented by a probability distribution of expected returns over some holding period.
- 2) Investors maximize one period's expected utility and progress along the utility curve, which demonstrates diminishing marginal utility of wealth.
- 3) Individuals estimate risk on the basis of the variability of expected returns.

Demerits of HM model:

- 1) The data required is huge then for this an investor need to obtain the variance of return, covariance of return and estimates of return for all the securities in a portfolio.
- 2) The variance and expected return have to be computed for each security.
- 3) The calculations involved in this model is too complicated because from a given set of securities, a very large
- 4) Number of portfolio combination can be made.

2.4 Sharpe's single index model: Introduction

Sharpe accepted that, for effortlessness, the arrival on a security could be viewed as being straightly identified with a solitary list like the market list. Hypothetically, the market file ought to comprise of the considerable number of securities exchanging available. Be that as it may, a prevalent normal can be dealt with as a surrogate for the market record. The acknowledgment of the possibility of a market between individual securities is on the grounds that any developments in securities could be ascribed to developments in the single hidden element being measured by the market list. The rearrangements of the Markowitz demonstrate has come to be known as the market model or single index model (SIM).

In an attempt to capture the relative contribution of each stock towards portfolio risk, William Sharpe has developed a simple but elegant model called as "Market Model". His argument is like this, we appreciate that the portfolio risk declines as the number of stocks increases but to an extent. That part of the risk which cannot be further reduced even when we add few more stocks into a portfolio is called systematic risk. That undiversifiable risk is attributed to the influence of systematic factors principally operated at a given market.

If one includes all traded securities in a market in his portfolio, that portfolio reduces the risk to the extent of the market influences. In such a case, one can easily capture every individual stock contribution to portfolio risk by simple relating its returns with that of the market index. Such a relationship is expected to give us the market sensitivity of the given scrip. This is exactly the relationship that William Sharpe has estimated with a simple regression equation considering the returns or market index, such as SENSEX, ET Index, NSE Index or RBI Index as independent variable and returns on individual stocks as dependent.

$$R_i = \alpha_i + \beta_i R_m + e_i$$

R_i = Expected return on security

α_i = Alpha Co-efficient

β_i = Beta Co-efficient

R_m = Rate of return on market index.

Since the regression coefficient (Beta) indicates the manner in which a security's return changes thoroughly with the changes in market, this linear line is also called Characteristic line. The slope of the line is called Beta. It gained lot of popularity in security analysis as a measure of relative market risk. Beta is one for such a stock, which is said to have the risk exactly equal to that of the market. On the other hand, the stock with Beta greater than one indicates the aggressiveness of the stock in the market and less than one indicates the slow response in the price of the stock

Sharpe's Optimal Portfolio:

Sharpe has provided a model in which the selection of appropriate securities in a portfolio can be made and the selection of any stock is related to its excess return beta ration

$$(R_i - R_f) / \beta_i$$

R_i = expected return on security

R_f = risk free rate of return

β_i = expected changes in the rate of return on stock I associated with one-unit changes in the market return

The expected return is the differentiation between the return of the stock and the risk free rate of return such as Treasury bill, government bonds etc. The excess return to beta measures additional return on security per unit of systematic risk or non-diversifiable risk. This ratio provides a relationship between potential risk and reward.

Positioning is done in view of the abundance come back to beta of a stock. Portfolio supervisor might want to incorporate stocks with higher proportions and the determination of stocks relies on upon a remarkable cut-off to such an extent that every one of the loads of higher proportions are incorporated and the stock with lower proportions is left and the cut-off point is indicated by C^* .

The steps for finding out the stock to be included in the optimal portfolio are given below:

- 1) Calculate the excess return to beta for every stock.
- 2) Position them from highest to lowest.
- 3) Proceed to compute cut-off for all stocks according to the ranked order using the following formula.

$$C_i = \frac{\sigma_m^2 \sum_{i=1}^N (R_i - R_f) / \beta_i}{1 + \sigma_m^2 \sum_{i=1}^N (\beta_i^2 / \sigma_{e_i}^2)}$$

$$1 + \sigma_m^2 \sum_{i=1}^N (\beta_i^2 / \sigma_{e_i}^2)$$

Where σ_m^2 = variance of the market index

And $\sigma_{e_i}^2$ = unsystematic risk

- 4) The cumulative values of C_i start declining after a particular C_i and that point is taken as the cut-off point and that stock ratio is the cut-off ratio C .

Merits of Sharpe's single index model

- This model is simple and easy for computation
- It provides an approximation of security return as well as of the index value.
- It helps to obtain the expected return, variance of the return, covariance of the return between each pair of securities.
- It helps for either addition or deletions of various securities in construction of optimal portfolio.

2.5 Elements of risk

The risk refers to the option that the actual result of an outlay will deviate from its expected outcome or in other words it is defined as ups and downs of return. Long term reward and risk are generally related to each other and risk is the chance that the actual return will be less than your expectation.

2.6 Types of risk

- ❖ Systematic risk
- ❖ Unsystematic risk

2.6.1 Systematic risk

It is a risk brought about by variables outside to the organization and held by the organization and it is likewise the danger of crumple of a whole money related framework or whole market, rather than risk related with any one individual element, gathering or part of a framework. Loan costs, subsidence and wars all speak to wellsprings of deliberate hazard since they influence the whole market and can't be stayed away from through broadening. While this hazard influences a wide scope of securities, unsystematic hazard influences a particular gathering of securities or an individual security. Deliberate risk can be alleviated just by being supported.

2.6.2 Unsystematic risk

The risk that is particular, special and identified with the specific business or organization. Organization or industry particular hazard that is characteristic in every speculation. The measure of hazard can be diminished through suitable and legitimate expansion. Otherwise called "particular risk", "diversifiable risk" or "lingering risk". Cases of unsystematic risk are vacillations in deals level, misfortunes created by the workers, climate condition, absence of appropriate R&D, absence of staff administration and so forth.

2.6.3 Beta

Beta of a store measures its past value unpredictability with respect to a specific securities exchange record. It is a measure of hazard that gives valuable factual data especially when

connected to portfolios. At the end of the day it speaks to how touchy the arrival of a value portfolio is to the arrival of the general market. It can be measured by relapsing the authentic returns of a portfolio against the verifiable returns of a file the subsequent slant of this relapse line would be the chronicled beta. This can be helpful for crediting relative execution to different sources or for clarifying dynamic hazard over a specific timeframe. A beta of less than 1 show that the security will be less unpredictable than the market, beta more prominent than 1 demonstrates that the security cost will be more unstable than the market.

2.6.4 Alpha coefficient

Alpha measures the extra return earned on a scheme on a risk adjusted basis and it also indicates that the stock return is independent of the market return. A positive alpha indicates the strong performance and a negative alpha indicates the weak performance. If the alpha is positive then the portfolio manager has diversified the stock in appropriate proportion and if the alpha is negative then the portfolio manager has not diversified the stocks in the proper ratios.

2.6.5 Standard deviation

The standard deviation of returns, a measure of dispersion, is the square root of the mean of the square of deviations around the arithmetic average and it also measures the total risk associated with stocks, where total risk is the combination of systematic and unsystematic risk. If the stocks are more volatile than the risk involved is more so to reduce the risk the investors need to invest in different sector so that the risk will get diversified and the standard deviation can be controlled only in the form of collection of different sectors.

2.6.6 Correlation coefficient

It determines the degree to which two variables movements associated and it measures the extent of relationship between stock return and market return and if r value is more than 0.5 than there will be strong relationship between the factors and if it is below 0.5 then there will be minimal relationship between the factors and also if the r value is negative it indicates there is no relationship between the stock return and index return and if the r value is more than zero than there is a relationship between the stock return and index return.

2.6.7 Risk free rate of return It refers to not taking any kind of risk and the rate at which an investor can get from his risk-free investment and the rate will be fixed by RBI. It has zero variance or standard deviation and there is an absence of risk of default. Certain time even the safest mode of investments also carry a small amount of risk. The example for this is as best as bonds and Treasury bills. The 364 days T-bills rate of return is taken in consideration for calculation purpose. The 364 days T-bills of 5 years from Jan 2012 to Dec 2016 is taken for calculation and shown in the table below

Year	R _f (weighted average)
2012	8.197
2013	2.731
2014	7.037
2015	8.308
2016	5.309

Therefore, the risk-free rate of return for five years is 6.316%

2.7 LITERATURE REVIEW:

❖ Chintan A shah (April-June 2015)

Here the objective is to construct a portfolio using Sharpe's and CAPM model and to analyze the portfolio risk and return of listed stocks at BSE. Here the secondary data has been gathered which is obtained on a monthly basis of top 15 securities of BSE and the time period is from Jan 2000 to March 2015, the tools used are standard deviation, expected return, residual variance. At last the research concludes by saying that Sharpe's model gives precise number of securities along with proper weight age for investors which is impossible in CAPM model which only suggests the investor to invest in different securities without proper portfolio.

❖ J Francis Mary, G.Rathika (Jan 2015)

The authors have considered the ten stocks of NSE of CNX Pharma to construct an optimum portfolio and also to calculate the cut-off rate and to select the stock which yields more than cut-off rate. The tools such as expected return on security and index, alpha, beta have been used and lastly the authors have told that the study objectives at

analyzing the opportunity which are existing for investors to invest in the securities which yields more return with minimum risk.

❖ **Dr S Poornima, Aruna P Ramesh (Dec 2015)**

An optimal portfolio was constructed taking into consideration the 10 companies from banking and 10 companies from IT sector from Jan 2 to Dec 2015. Here the cut-off rate, beta, market return have taken for optimal portfolio construction.

❖ **M Sathayapriya (August 2016)**

The researcher study the asset value of 20 different stocks listed in NSE selected from Infrastructure and Pharmaceutical Industry and found out the excess return to beta, ranked the stocks and evaluated the cut-off point; tools used are beta coefficient, return correlation, risk free return. The pharmaceutical industry performs well when compared to infrastructural industry.

❖ **NiranjanMandal (March 2013)**

The researcher here determines the risk and return of the portfolio using Sharpe's model and to get an insight of the idea embedded in this model. Secondary data have been gathered from the websites and the daily prices of 21 securities have been taken from BSE from April to March to find out the daily market return and the tools used are excess return to beta and cut-off point. This model shows how risky a security is if the security is not held in a proper well diversified manner.

❖ **Dr R Nalini(12 Dec 2014)**

The researcher used Sharpe's model and calculated the amount of investment to be made into all of the stock among the portfolio. The tools used are beta, return of market and individual stock, mean of market and individual stock. Finally only four companies are taken out of 15 companies for selection of optimal portfolio.

❖ **P Varadharajan, Ganesh (Aug2012)**

Portfolio for the selected companies in power, shipping, and textile sectors are studied. Tools such as beta, market and residual variance, index and stock price have been used. Portfolio of stocks of five have been considered with utmost return for a given risk which show how much amount of money is to be invested in each and every security.

❖ **Mokta Rani Sarker (Nov 2013)**

The study is to allocate investment in different stocks considering risk return criteria and assist investors in portfolio selection process to make the right choice. The data have been collected from Dhaka stock exchange from Jul 2007- June 2012 and also consists of secondary data because it pertains to historical analysis. He studied the

opportunity obtainable for investors as per return is concerned and the risk involved in equity of firms listed in Dhaka stock exchange

❖ **Ms. Apurva A Chauhan (10 Oct 2014)**

The study involves construction of portfolio of CNX Nifty by using Sharpe's Index model. Tools used are excess return to beta ratio, cutoff rates. At last the author analyses that the Sharpe method takes only less number of variables compared to Markowitz method and here only four stocks have been considered out of 10 stocks for optimal portfolio.

❖ **Dr S Poornima, Aruna P Ramesh (March 2016)**

An optimal portfolio using risk return analysis of automobile and pharmaceutical sector by using Sharpe's model was done to determine the proportion of investment to be made on selected stock. Tools used are cut off rate, beta, and market return. 20 companies listed in BSE is considered. After calculating the cut off rate only the 5 companies were selected for portfolio construction.

❖ **Dr SatyaSwaroopDebasish, Jakki Samir Khan (Dec-2012)**

In the present study a review of earlier work relating to portfolio construction and study and how to calculate the proportion of investment to be made in every stock are presented. The data has been gathered from NSE. Authors say that among 14 stocks only 11 companies' stocks have been considered for portfolio construction as other 3 stocks were showing the negative returns.

❖ **Dr. R. Thirugnanasoundari (2016)**

To ascertain the return from the equity shares for the selected study period. To know the risk through standard deviation of selected company share prices. To offer suitable suggestions to make optimum portfolio for investor. A period of 31st December 2015 to 29 December 2017.

❖ **Sharma, Satya Pal and Kumar, Ravi (2013)**

"Analysis of the risk and return relationship of equity based mutual funds in India". The objective of the study is toward carry out a evaluation between the performance of equity based mutual funds of public and private sectors in India. A period of study is 1999-2013.

CHAPTER –3

3.1 STATEMENT OF THE PROBLEM:

Generally investors construct a portfolio of various securities to take the advantage of diversification. As risk and returns are inherent in any investment, where returns are high and risk is huge, the need for construction of a portfolio arises. Sharpe's model is used to construct an optimal portfolio for obtaining a practical combination of higher returns associated with lower risk. As portfolio is considered to be the best in the types of investment made in all the types of assets such as risky, risk neutral and risk-free in a proportioned way to yield the better return with lower risk

TOPIC CHOSEN FOR THE STUDY

“Study on Construction of Optimal Portfolio of selected stocks using Sharpe's single index model.”

3.2 SCOPE OF THE STUDY:

The stock market place a very important role in the economy as the price of the shares fluctuates daily in the market. The investor will not ignore the risk while taking investment decisions. The investor will try to invest in different group of securities in order to diversify the risk. There are different investment avenues to invest some are risky, while some are risk averse, while some are risk free. Therefore it is essential to educate the investors about the investment alternatives and risk, return from that investment.

The scope of the present study is to selection of companies registered to Sensex index, analysis of companies based on past five year performance and it includes only five sectors namely Banking, Cement, Pharmaceuticals, IT and Tyre sectors. The study also covers the brief profile of stock market and the profile of venture securities limited along with its performance in the Indian stock market with detailed coverage of portfolio construction and evaluation.

3.3 OBJECTIVES OF THE STUDY:

- ❖ To select the stocks for the construction of optimal portfolio.
- ❖ To construct the stocks using Sharpe's single index model.
- ❖ To evaluate the portfolio performance in terms of return and comparing it with bench mark indices.

3.4 RESEARCH METHODOLOGY:

This study is pragmatic in nature. The study conducted is based on secondary sources and the data required for this study is collected from websites and brochures of Anandrathi Financial services Ltd and from the journals like money today, DALAL street etc. and the tools used are expected return, market return, beta, alpha, cut-off points etc. for this study.

3.5 LIMITATION OF THE STUDY:

- ❖ The period of study is limited to five years.
- ❖ Stock has been selected randomly based on EPS which was listed in SENSEX.
- ❖ Only five sectors are taken namely Banking, IT, Cement, Pharmaceutical and Tyre
Primary data is not been considered for the study

3.6 Chapter scheme

Chapter 1: Introduction

The first chapter gives the information about introduction about the NSE and about the brief description about Anandrathi Financial Services Ltd which consists of company profile, company promoters, vision mission and quality policy, products or service profile, infrastructure facility. Even it provides competitors information, SWOT analysis and future growth and prospectus of company.

Chapter 2: Conceptual Background and Literature Review

This chapter gives information of theoretical background of Construction of optimal portfolio and about the literature review.

Chapter 3: Research Design

This chapter consists of the information about the research methodology that is about the statement of the problem, need of the study, main objectives of the learning and scope of the study, sources of information like data sources, research methodology and limits of the study.

Chapter 4: Analysis and Interpretation

This chapter consists of data of standard deviation (risk), return, beta and alpha their interpretation.

Chapter 5: Findings, Conclusion and Suggestions

This chapter explains about summary of findings and suggestion of the report.

CHAPTER – 4

DATA ANALYSIS AND INTERPRETATION

1. BANKING SECTOR

Table 4.1:

Table showing rank, excess return to beta, cut-off points, correlation, alpha, standard deviation, beta, systematic risk, and unsystematic risk

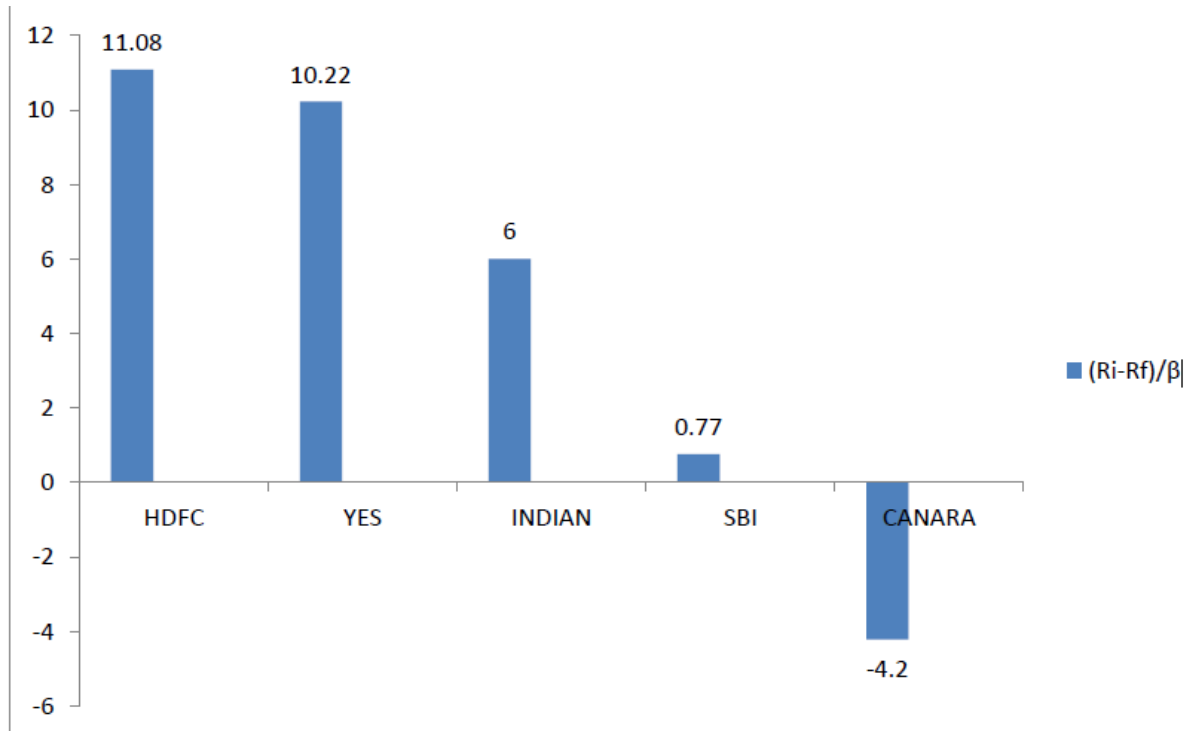
Security	Rank	$(R_i - R_f)/\beta$	C_i	Correlation	Alpha
HDFC	1	11.08	9.64	0.73	8.25
YES	2	10.22	9.83	0.72	9.91
INDIAN	3	6	9.15	0.53	-1.82
SBI	4	0.77	5.35	0.87	-16.63
CANARA	5	-4.2	3.41	0.79	-28.68

Security	Standard Deviation	Beta	Systematic Risk	Unsystematic risk	Xi %
HDFC	16.36	0.92	193.53	165.48	29.3%
YES	42.87	2.85	1851.74	1740.19	70.7%
INDIAN	52.31	2.75	1724.16	4303.89	49.5%
SBI	33.5	2.81	1793.77	596.75	69.7%
CANARA	5.38	2.66	1613.6	953.88	45.3%

$C^* = 9.83$

Graph 4.1.1:

Graph showing excess return to beta

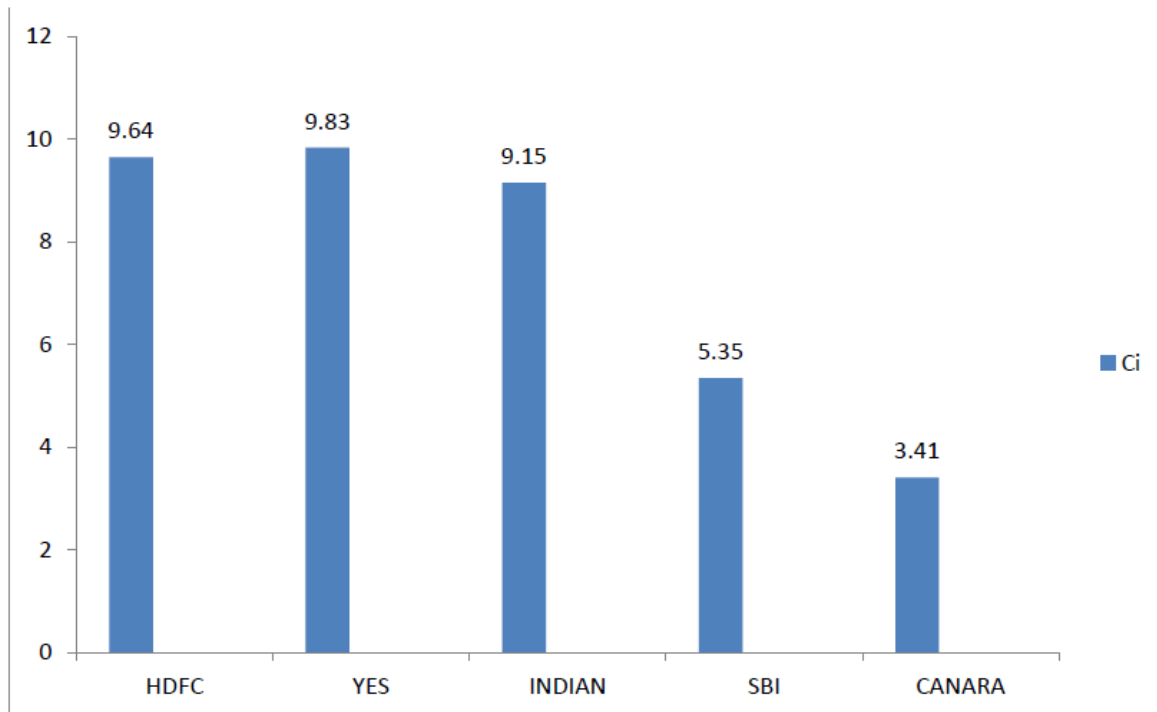


INTERPRETATION

The above graph shows that the excess return to beta which is said to be return more than risk so from the above graph the HDFC BANK has the highest return 11.08 to beta compared to other banks and the CANARA BANK has the negative return -4.2.

Graph 4.1.2:

Graph showing cut-off points

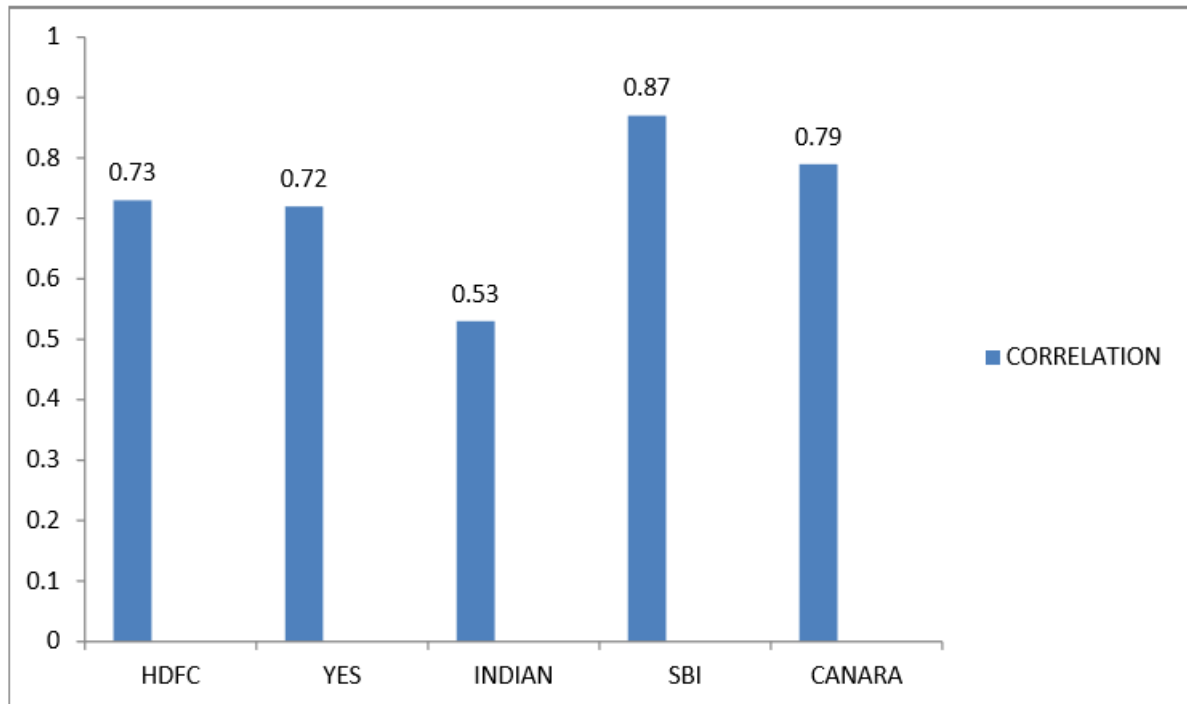


INTERPRETATION

Above graph depicts the cut-off points of the five banking companies the highest cut-off points is of YES BANK 9.83 and the lowest cut-off points is of CANARA BANK 3.41. It indicates that the companies having highest cut-off points should be taken into consideration and invests accordingly.

Graph 4.1.3:

Graph showing correlation values

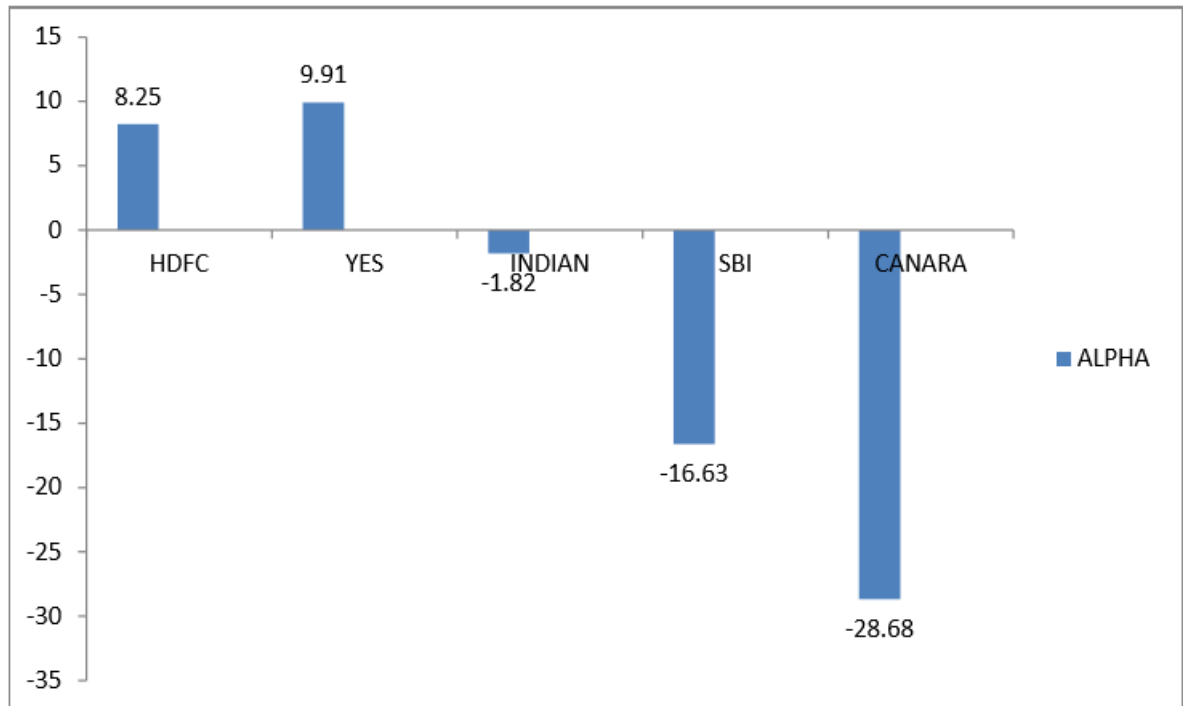


INTERPRETATION

Above graph shows the relationship between the BSE index and the values of the banking companies selected for the study. SBI and CANARA BANKS have the highest correlation among the banking companies ie 0.87 and 0.79 and the INDIAN BANK has the lowest correlation of 0.53.

Graph 4.1.4:

Graph showing alpha values

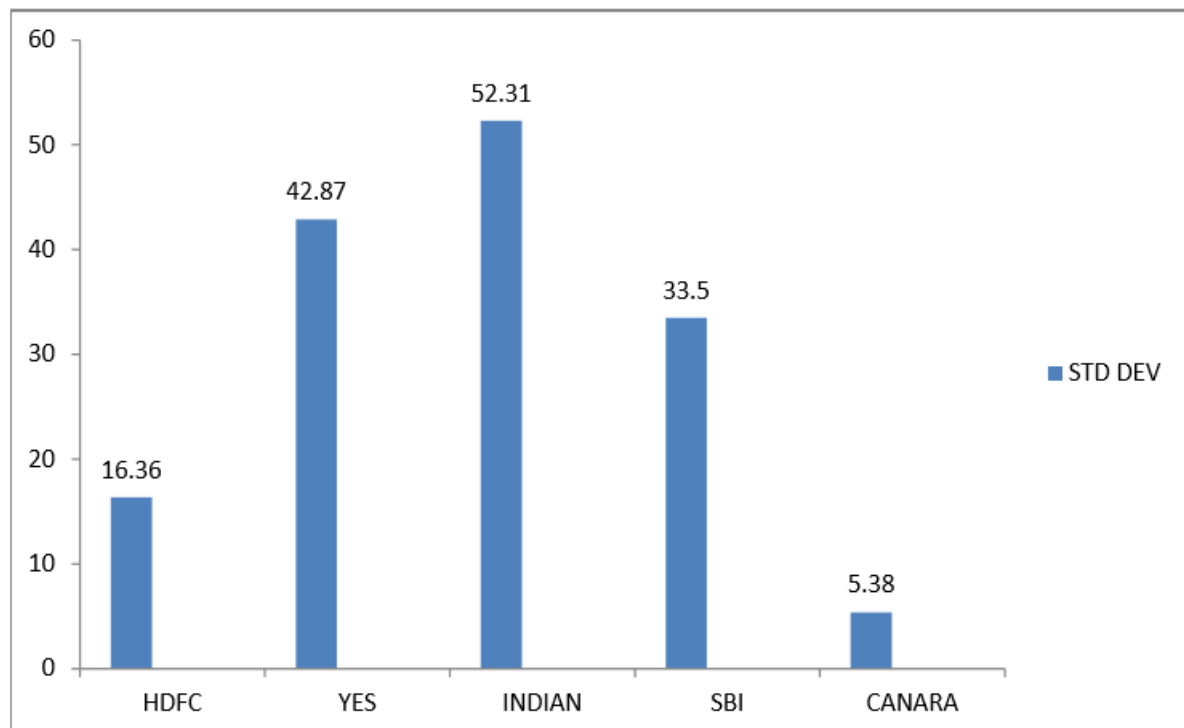


INTERPERTATION

The above shows the alpha values of the banking companies, positive alpha value indicates the good performance in the market and the negative value shows the not well performance. Here YES and HDFC BANKS are showing positive alpha values 9.91 and 8.25 and other three banks are showing the negative values and among that CANARA BANK as the lowest alpha value -28.68.

Graph 4.1.5:

Graph showing standard deviation

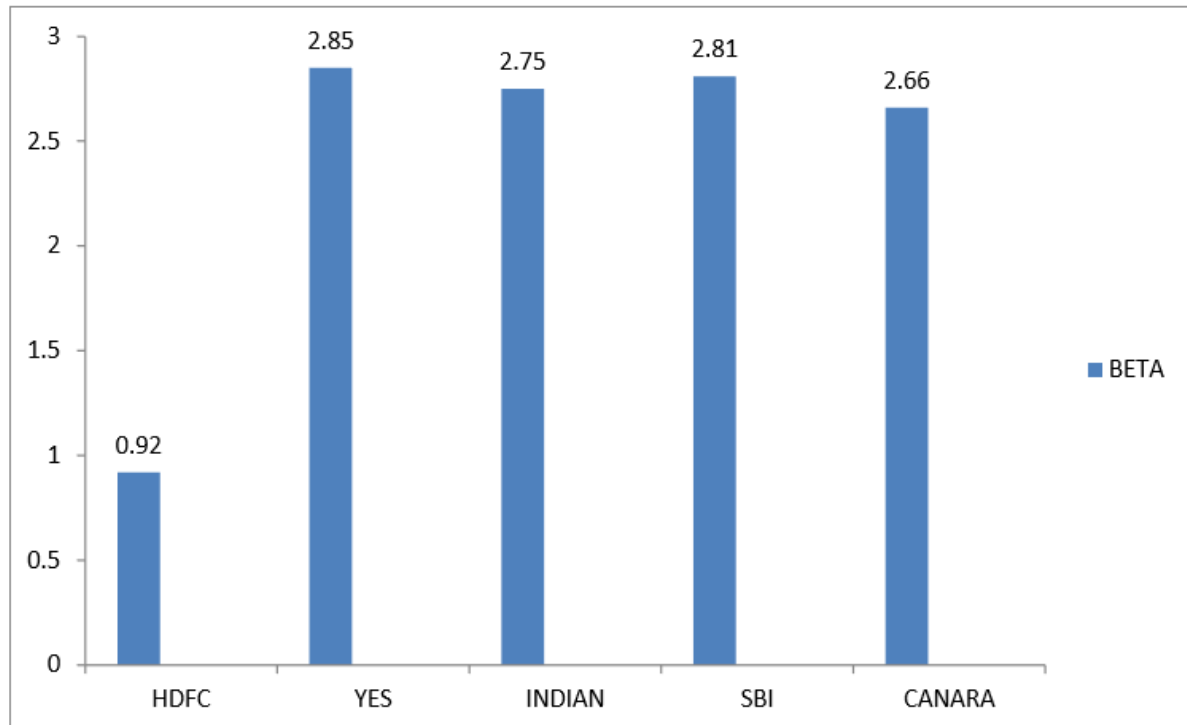


INTERPRETATION

The above graph depicts the standard deviations values of the banking companies which means the company having highest standard deviation value as high risk with low return and the company having lowest standard deviation value as lowest risk with high return. INDIAN BANK has the highest standard deviation value of 52.31 and CANARA BANK has the lowest standard deviation value of 5.38.

Graph 4.1.6:

Graph showing beta values



INTERPRETATION

The above graph shows the beta values which says that less beta value has less risk and more beta value have more risk. Here the YES BANK has high beta value of 2.85 which is said to be the aggressive stock and HDFC BANK has 0.92 and it is said to be defensive stock.

2. IT SECTOR

Table 4. 2:

Table showing rank, excess return to beta, cut-off points, correlation, alpha, standard deviation, beta, systematic risk, unsystematic risk

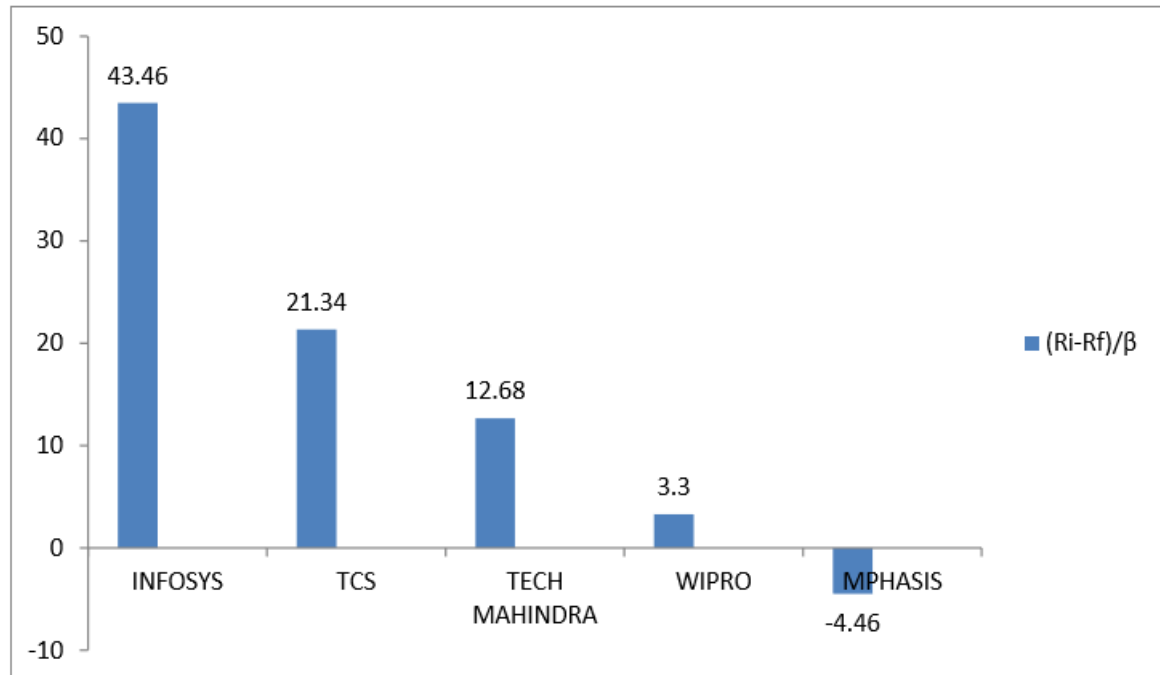
Security	Rank	$(R_i - R_f)/\beta$	C_i	Correlation	Alpha
INFOSYS	1	43.46	0.95	0.15	14.57
TCS	2	21.34	2.52	0.28	14.62
TECH MAHINDRA	3	12.68	4.78	0.49	12.7
WIPRO	4	3.3	4.77	0.066	5.68
MPHASIS	5	-4.46	-3.82	-0.97	21.2

Security	Standard deviation	Beta	Systematic risk	Unsystematic risk	$X_i\%$
INFOSYS	19.29	0.24	13.55	586.59	41.61%
TCS	26.33	0.67	102.19	1197.03	31.41%
TECH MAHINDRA	37.47	1.72	676.63	2126.57	26.98%
WIPRO	18.89	0.1	2.61	598.93	51.3%
MPHASIS	15.01	-1.11	279.99	14.6	71.5%

$C^* = 4.78$

Graph 4.2.1:

Graph showing excess return to beta

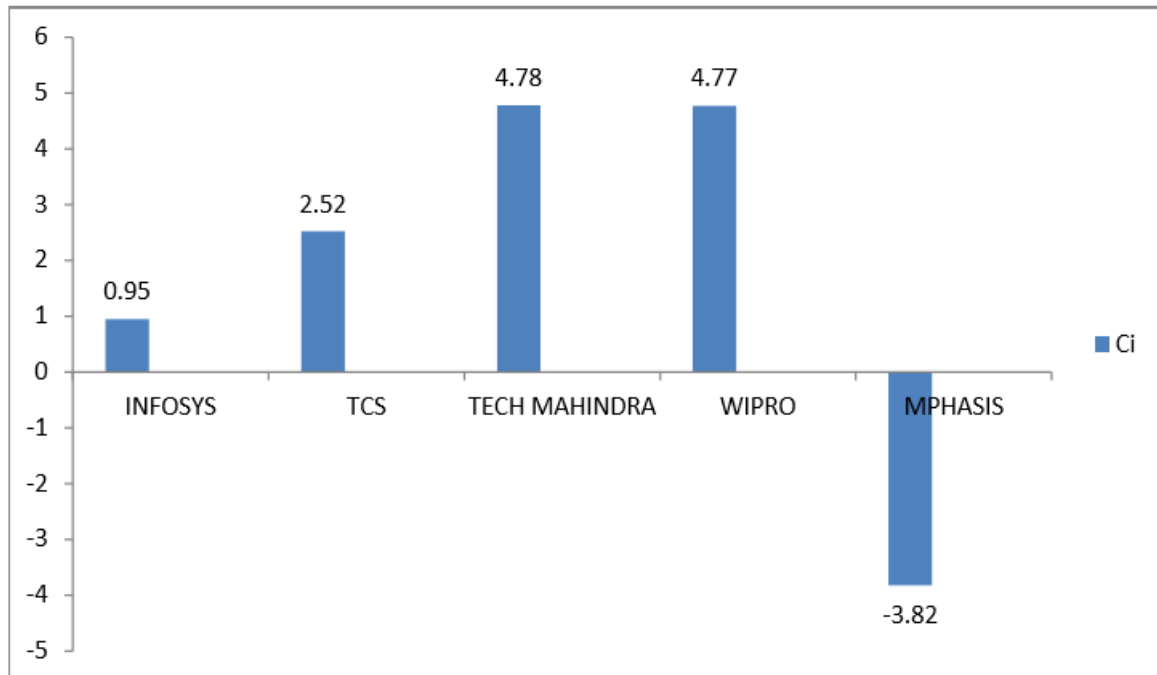


INTERPRETATION

The above graph shows that the excess return to beta which is said to be return more than risk so from the above graph the INFOSYS has the highest return 43.46 to beta compared to other companies and the MPHASIS has the negative return -4.46 .

Graph 4.2.2:

Graph showing cut-off points

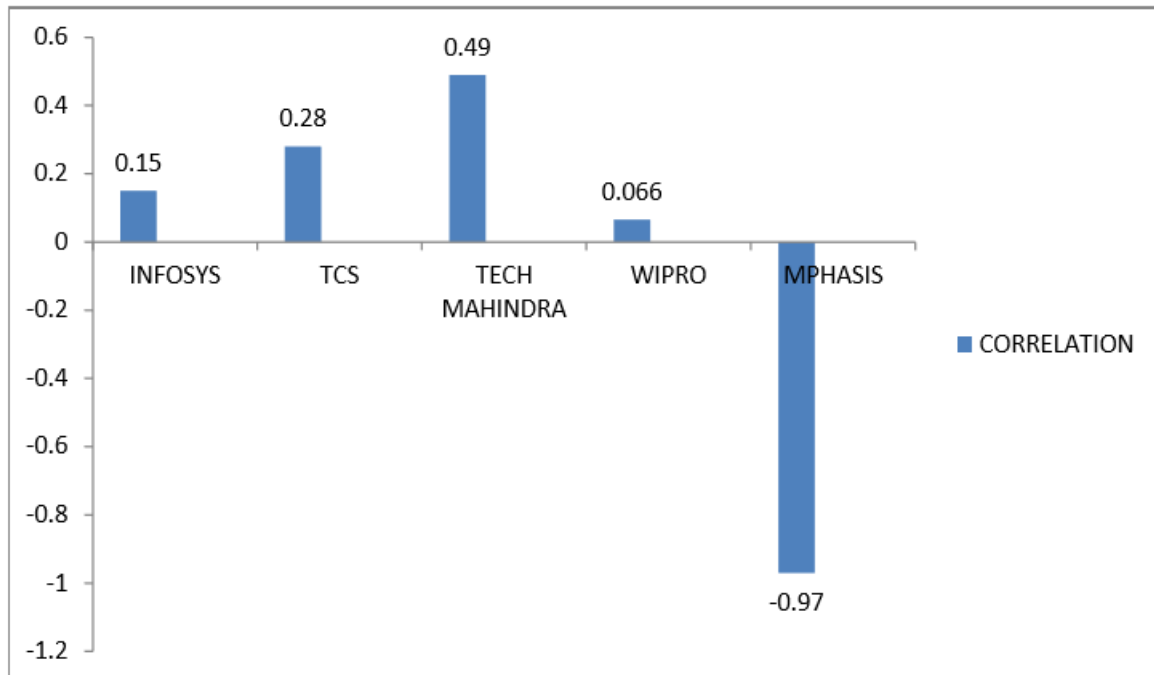


INTERPRETATION

Above graph depicts the cut-off points of the five IT companies the highest cut-off points is of TECH MAHINDRA 4.78 and the lowest cut-off points is of MPHASIS -3.82. It indicates that the companies having highest cut-off points should be taken into consideration and invest accordingly.

Graph 4.2.3:

Graph showing correlation

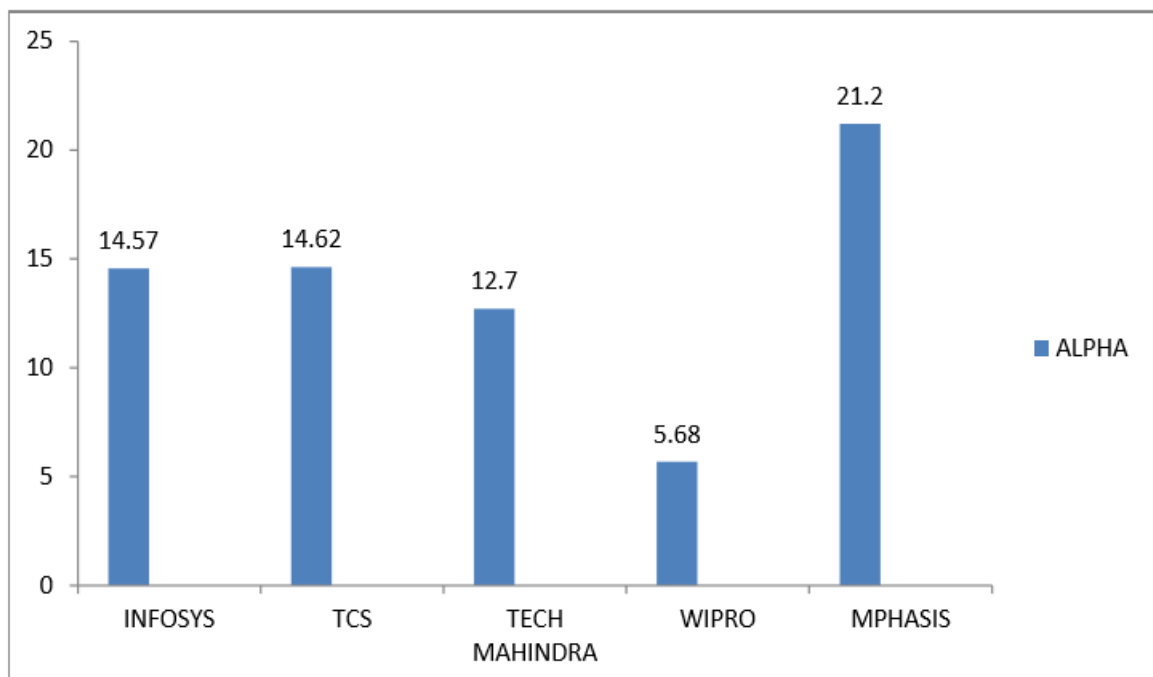


INTERPRETATION

Above graph shows the relationship between the BSE index and the values of the IT companies selected for the study. TECH MAHINDRA have the highest correlation among the IT companies ie0.49 and the MPHASIS has the lowest correlation of -0.97.

Graph 4.2.4:

Graph showing alpha values

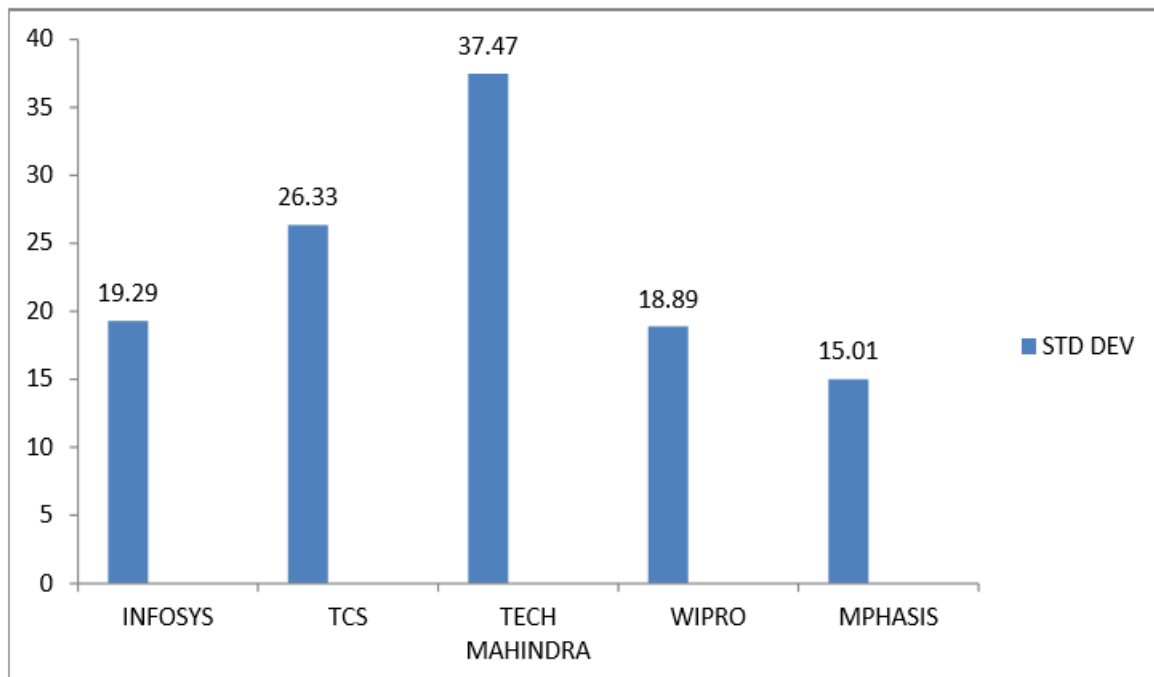


INTERPERTATION

The above shows the alpha values of the IT companies, positive alpha value indicates the good performance in the market and the negative value shows the not well performance. Here MPHASIS is showing highest positive alpha value 21.2 and WIPRO is showing the lowest value of 5.68.

Graph 4.2.5:

Graph showing standard deviation

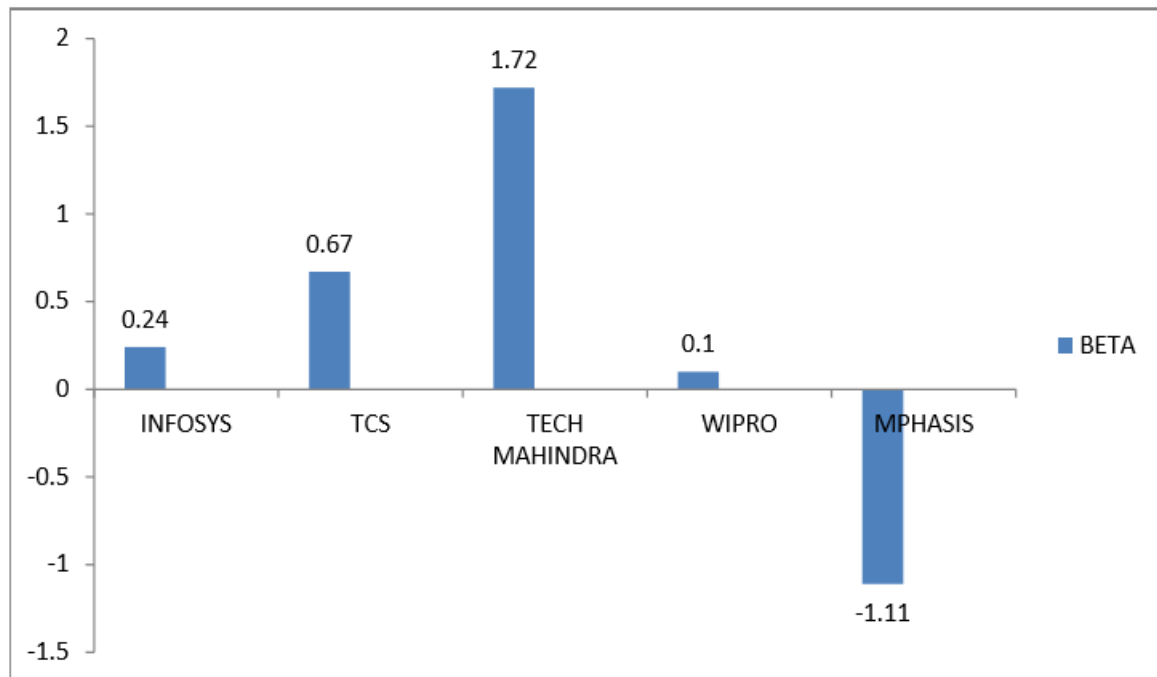


INTERPRETATION

The above graph depicts the standard deviations values of the IT companies which means the company having highest standard deviation value as high risk with low return and the company having lowest standard deviation value as lowest risk with high return. TECH MAHINDRA has the highest standard deviation value of 37.47 and MPHASIS has the lowest standard deviation value of 15.01.

Graph 4.2.6:

Graph showing beta values



INTERPRETATION

The above graph shows the beta values which says that less beta value have less risk and more beta value have more risk. Here the TECH MAHINDRA has high beta value of 1.72 which is said to be the aggressive stock and MPHASIS has -1.11 and it is said to be defensive stock and considered as lowest.

3. PHARMACEUTICAL SECTOR

Table 4. 3:

Table showing rank, excess return to beta, cut-off points, correlation, alpha, standard deviation, beta, systematic risk, unsystematic risk

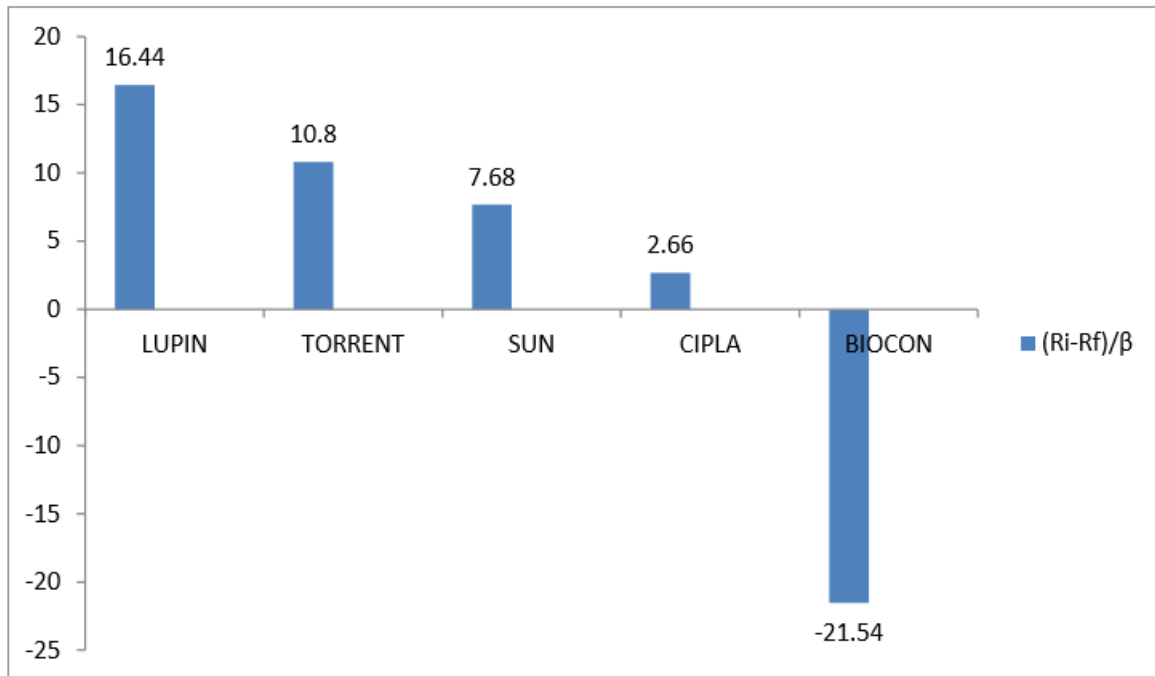
Security	Rank	$(R_i - R_f)/\beta$	Ci	Correlation	Alpha
LUPIN	1	16.44	5.99	0.6	16.49
TORRENT	2	10.8	9.40	0.89	13.31
SUN	3	7.68	9.17	0.67	4.21
CIPLA	4	2.66	7.02	0.87	-4.82
BIOCON	5	-21.54	5.60	-0.57	53.54

Security	Standard deviation	Beta	Systematic Risk	Unsystematic risk	Xi%
LUPIN	26.59	1.36	422.93	739.27	21.04%
TORRENT	47.49	3.77	3230.52	838.35	78.96%
SUN	26.75	1.65	620.55	754.66	68.5%
CIPLA	22.51	1.78	717.26	234.4	55.8%
BIOCON	32.87	-1.55	543.42	1119.53	11.6%

C*=9.40

Graph 4.3.1:

Graph showing excess return to beta

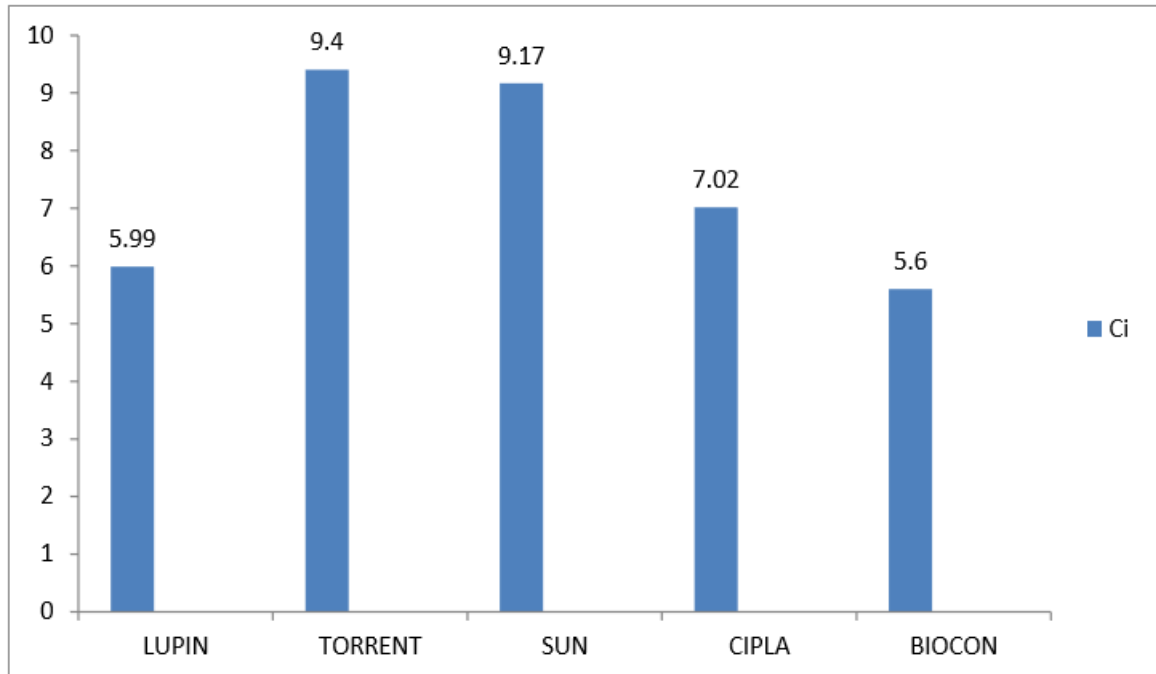


INTERPRETATION

The above graph shows that the excess return to beta which is said to be return more than risk so from the above graph the LUPIN has the highest return 16.44 to beta compared to other companies and the BIOCON has the negative return -21.54 .

Graph 4.3.2:

Graph showing cut-off points

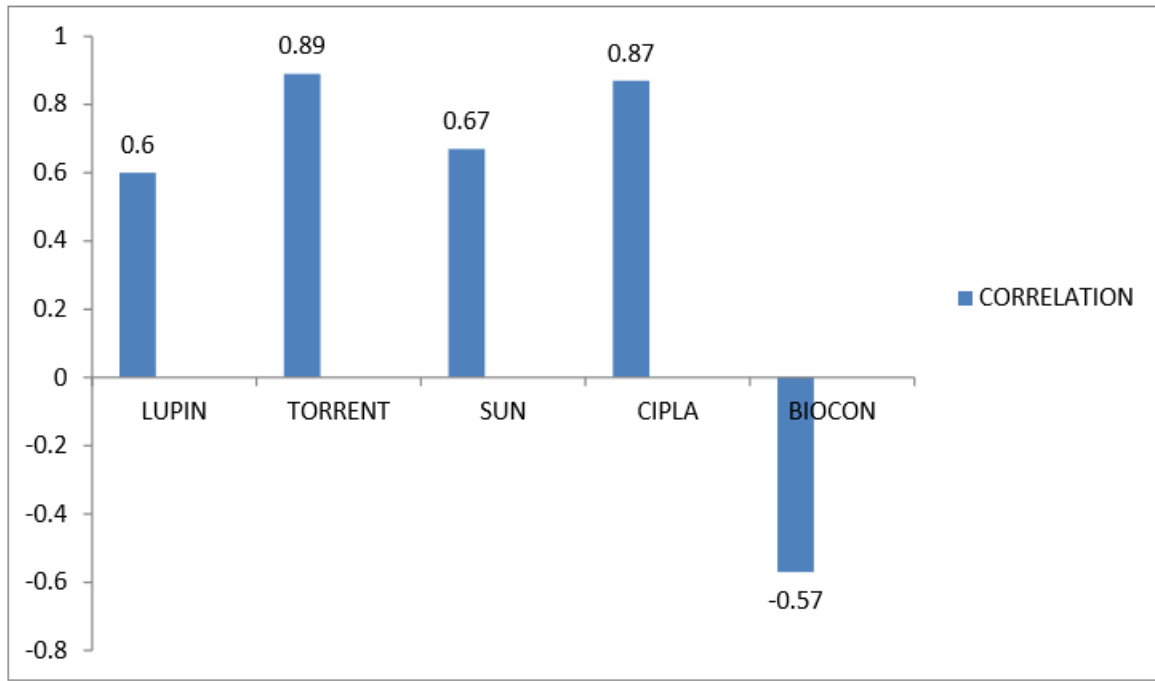


INTERPRETATION

Above graph depicts the cut-off points of the five Pharma companies the highest cut-off points is of TORRENT 9.4 and the lowest cut-off points is of BIOCON 5.6. It indicates that the companies having highest cut-off points should be taken into consideration and invest accordingly.

Graph 4.3.3:

Graph showing correlation

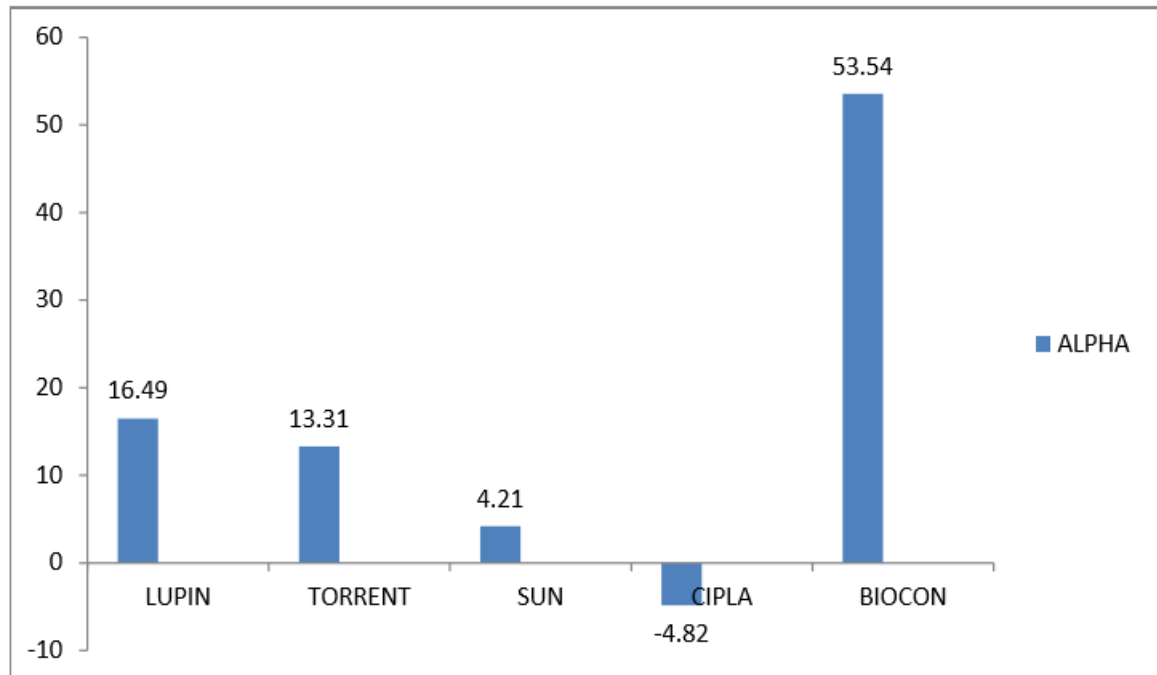


INTERPRETATION

Above graph shows the relationship between the BSE index and the values of the pharma companies selected for the study. TORRENT have the highest correlation among the banking companies i.e., 0.89 and the BIOCON has the lowest correlation of -0.57.

Graph 4.3.4:

Graph showing alpha values

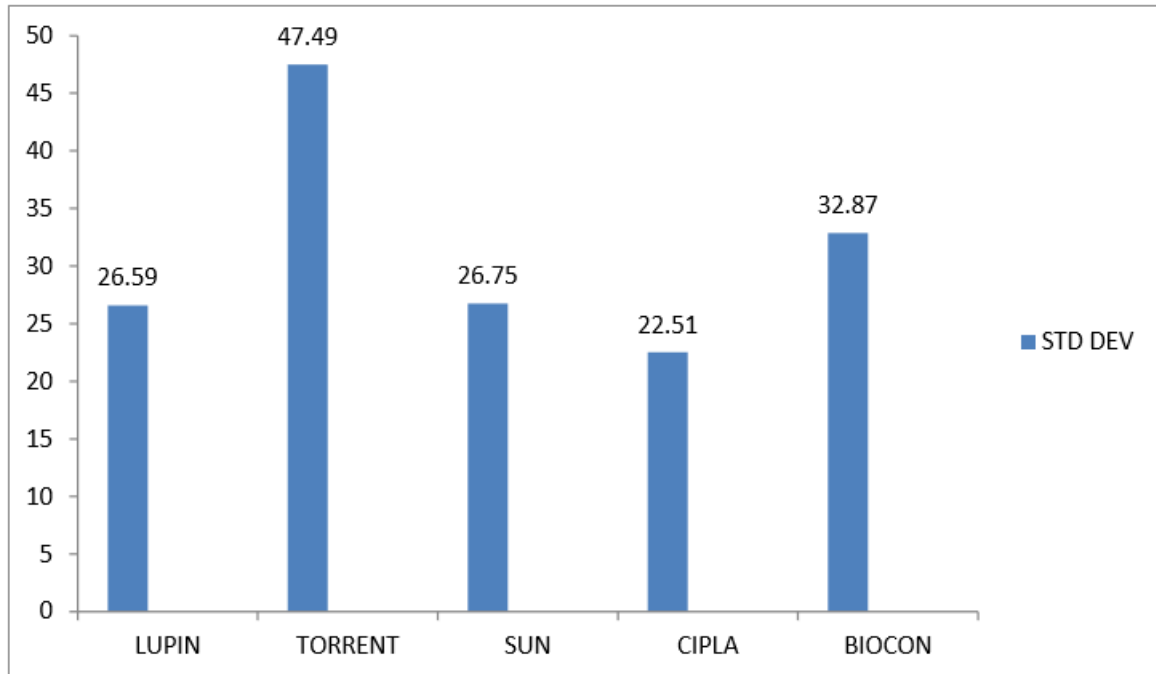


INTERPERTATION

The above shows the alpha values of the Pharma companies, positive alpha value indicates the good performance in the market and the negative value shows the not well performance. Here BIOCON is showing highest positive alpha value 53.53 and CIPLA is showing the negative value of -4.82.

Graph 4.3.5:

Graph showing standard deviation



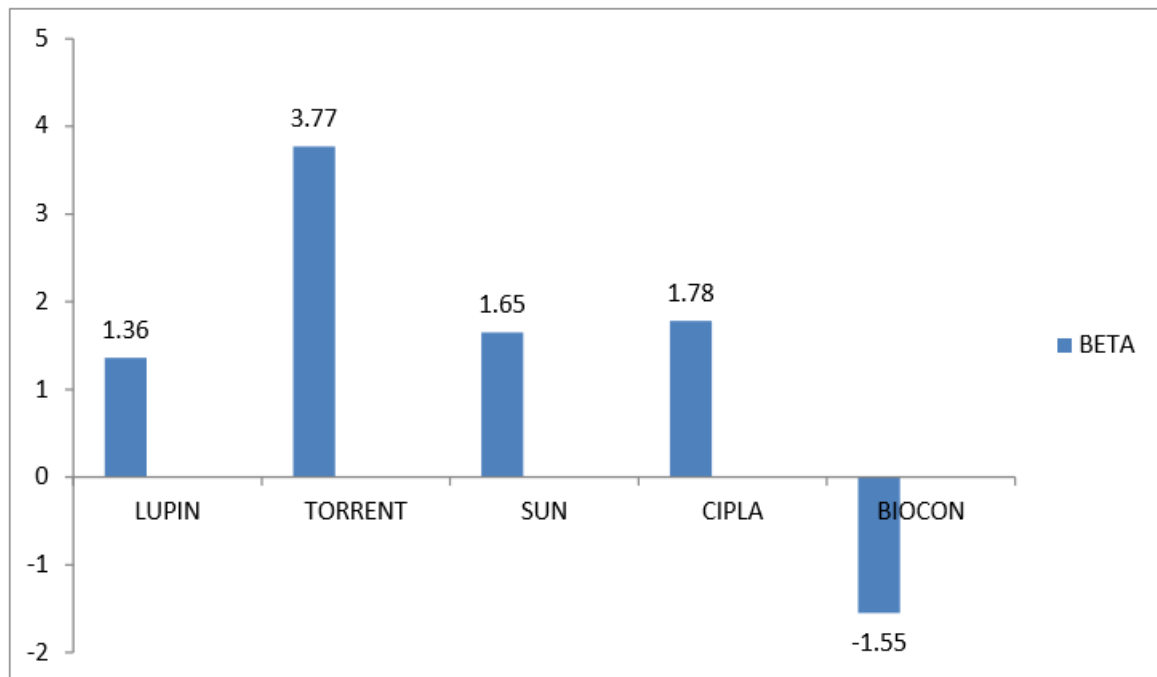
INTERPRETATION

The above graph depicts the standard deviations values of the pharma companies which means the company having highest standard deviation value as high risk with low return and the company having lowest standard deviation value as lowest risk with high return.

TORRENT has the highest standard deviation value of 47.49 and CIPLA has the lowest standard deviation value of 22.51.

Graph 4.3.6:

Graph showing beta values



INTERPRETATION

The above graph shows the beta values which says that less beta value have less risk and more beta value have more risk. Here the TORRENT has high beta value of 3.77 which is said to be the aggressive stock and BIOCON has -1.55 and it is said to be defensive stock and considered as lowest.

4. CEMENT SECTOR

Table 4.4:

Table showing rank, excess return to beta, cut-off points, correlation, alpha, standard deviation, beta, systematic risk, unsystematic risk

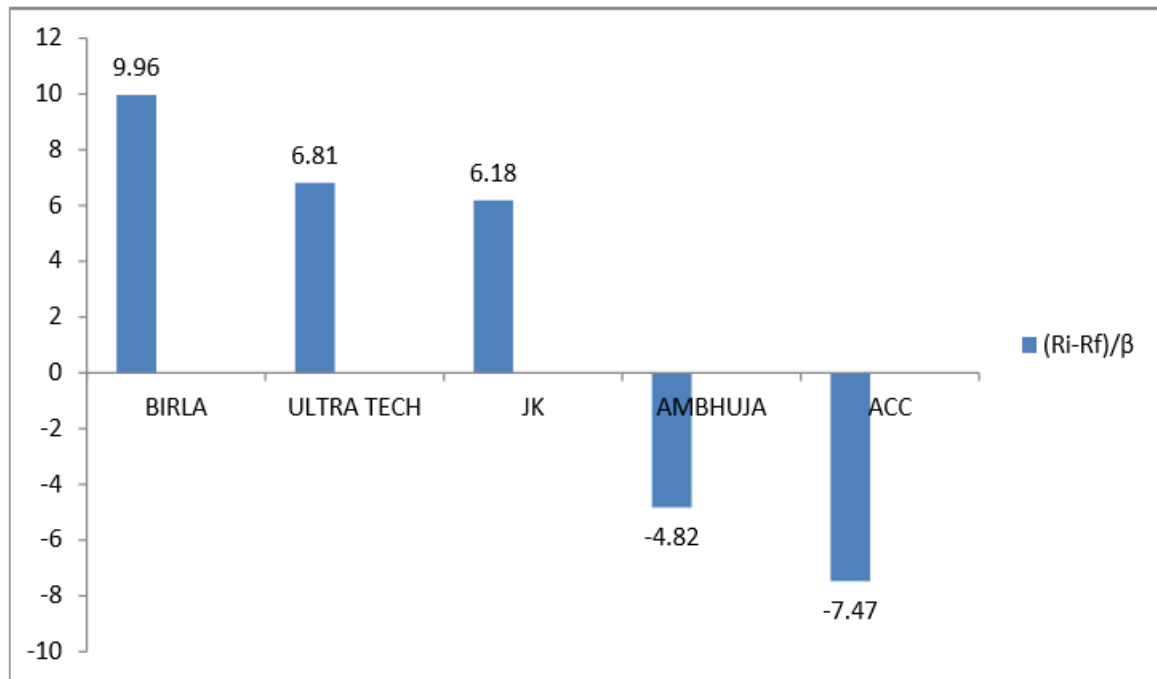
Security	Rank	$(R_i - R_f)/\beta$	C_i	Correlation	Alpha
BIRLA	1	9.96	4.84	0.7	8.22
ULTRA TECH	2	6.81	5.62	0.75	3.48
JK	3	6.18	5.87	0.85	-12.91
AMBHUJA	4	-4.82	1.62	0.89	-7.19
ACC	5	-7.47	0.93	0.67	-8.26

Security	Standard deviation	Beta	Systematic risk	Unsystematic risk	$X_i\%$
BIRLA	30.12	1.91	833.998	876.53	18.5%
ULTRA TECH	20.32	1.32	397.27	311.64	60%
JK	83.99	6.95	11002.37	4144.78	21.5%
AMBHUJA	15.21	0.98	219.98	56.47	31.5%
ACC	17.16	0.89	178.7	224.06	55.5%

$C^* = 5.87$

Graph 4.4.1

Graph showing excess return to beta

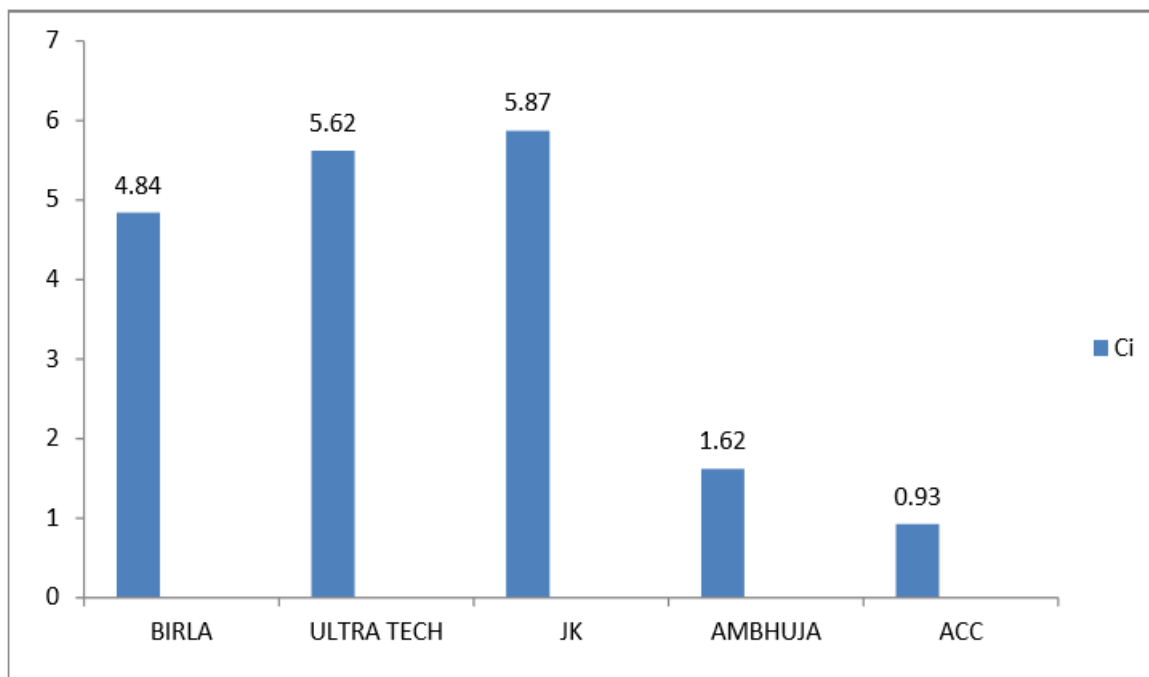


INTERPRETATION

The above graph shows that the excess return to beta which is said to be return more than risk so from the above graph the BIRLA has the highest return 9.96 to beta compared to other companies and the ACC has the negative return – 7.47.

Graph 4.4.2:

Graph showing cut-off points

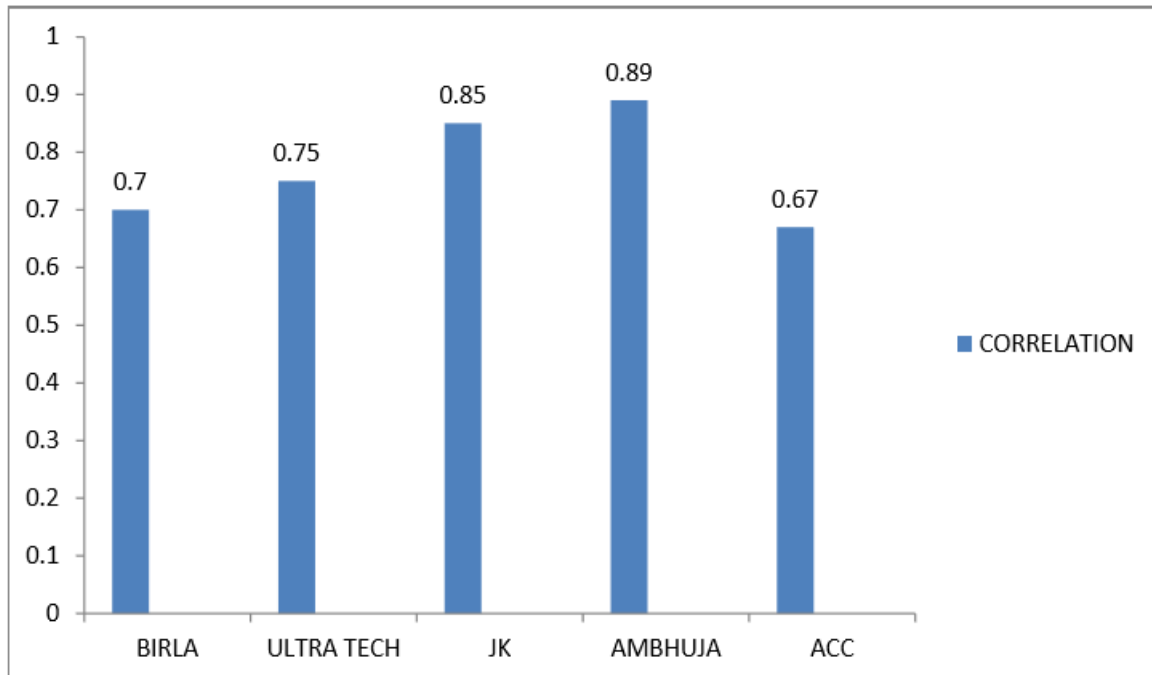


INTERPRETATION

Above graph depicts the cut-off points of the five cement companies the highest cut-off points is of JK CEMENT 5.87 and the lowest cut-off points is of ACC CEMENT 0.93. It indicates that the companies having highest cut-off points should be taken into consideration and invest accordingly.

Graph 4.4.3:

Graph showing correlation

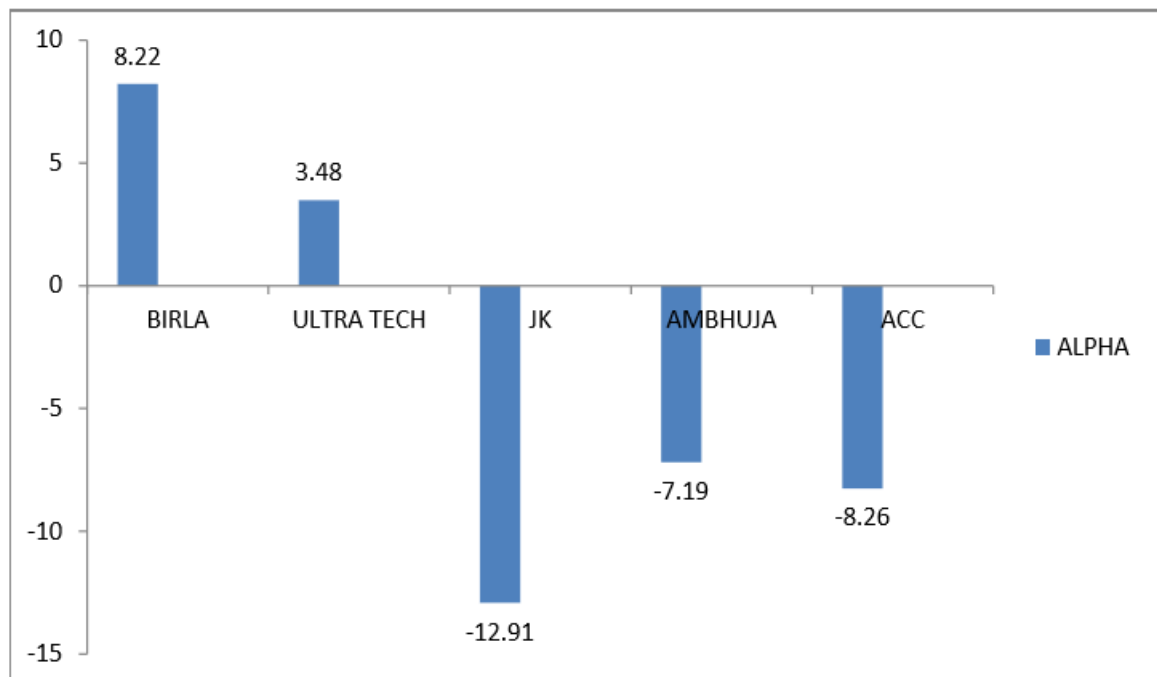


INTERPRETATION

Above graph shows the relationship between the BSE index and the values of the cement companies selected for the study. AMBHUJA have the highest correlation among the cement companies i.e. 0.89 and the ACC has the lowest correlation of 0.67.

Graph 4.4.4

Graph showing alpha values

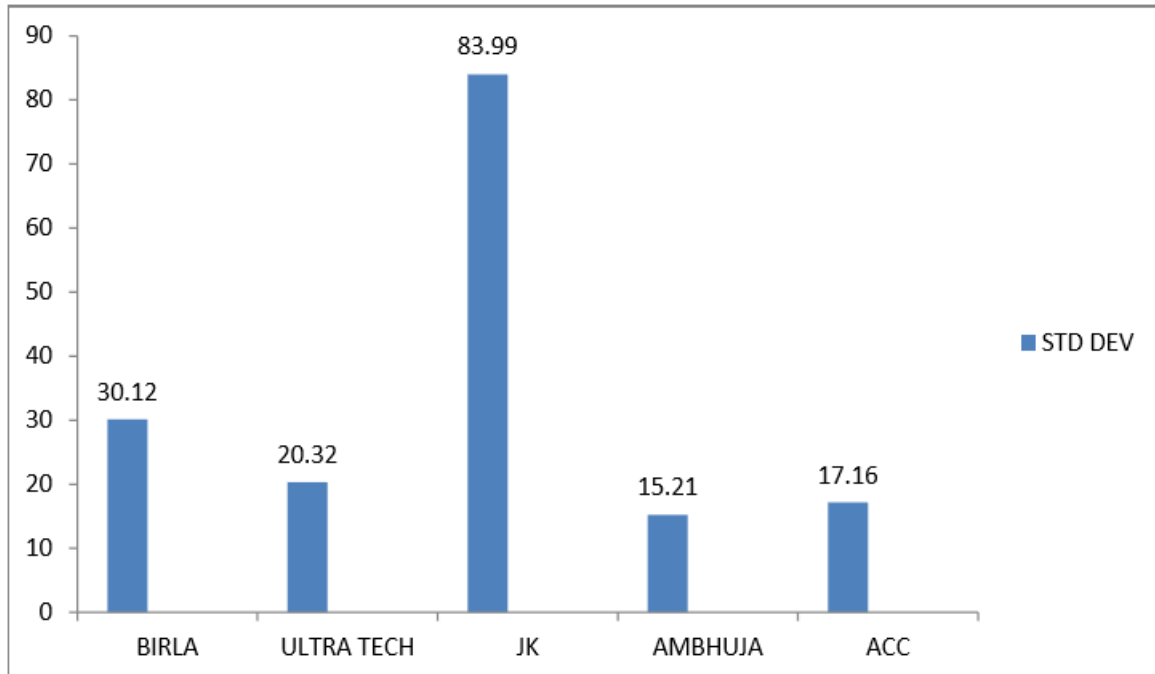


INTERPERTATION

The above shows the alpha values of the cement companies, positive alpha value indicates the good performance in the market and the negative value shows the not well performance. Here BIRLA is showing highest positive alpha value 8.22 and JK CEMENT is showing the negative value of -12.91.

Graph 4.4.5:

Graph showing standard deviation

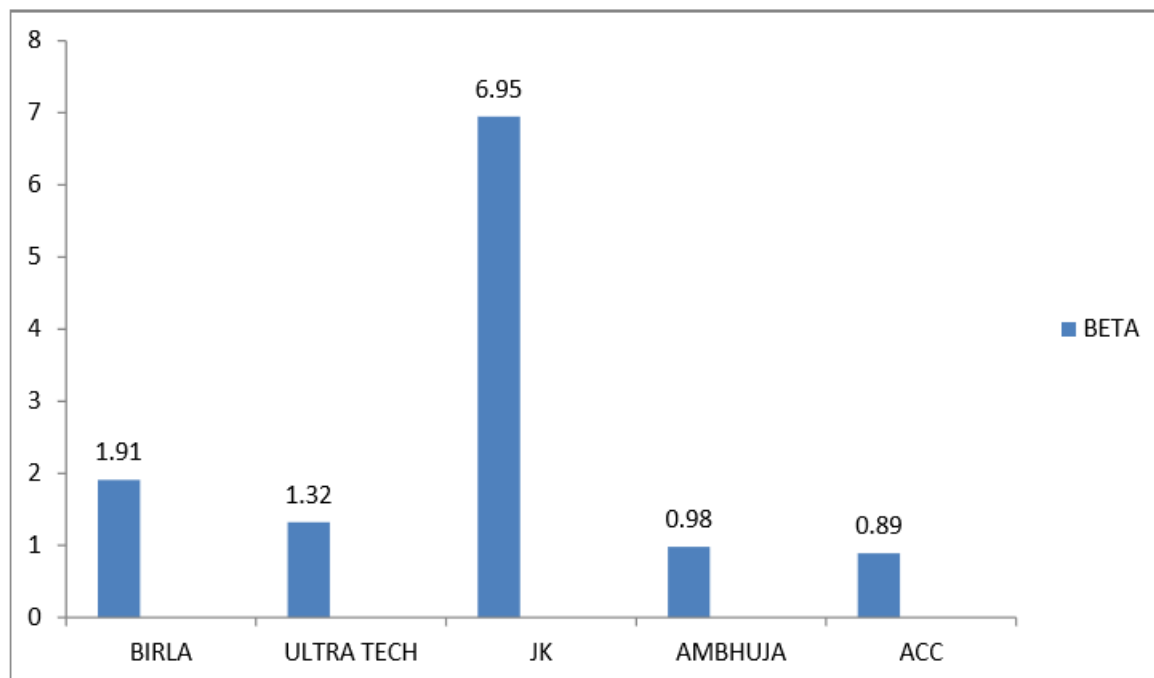


INTERPRETATION

The above graph depicts the standard deviations values of the cement companies which means the company having highest standard deviation value as high risk with low return and the company having lowest standard deviation value as lowest risk with high return. JK CEMENT has the highest standard deviation value of 83.99 and AMBHUJA CEMENT has the lowest standard deviation value of 15.21.

Graph 4.4.6:

Graph showing beta values



INTERPRETATION

The above graph shows the beta values which says that less beta value has less risk and more beta value have more risk. Here the JK CEMENT has high beta value of 6.95 which is said to be the aggressive stock and ACC CEMENT has 0.89 and it is said to be defensive stock and considered as lowest.

5. TYRE SECTOR

Table 4.5:

Table showing rank, excess return to beta, cut-off points, correlation, alpha, standard deviation, beta, systematic risk, unsystematic risk

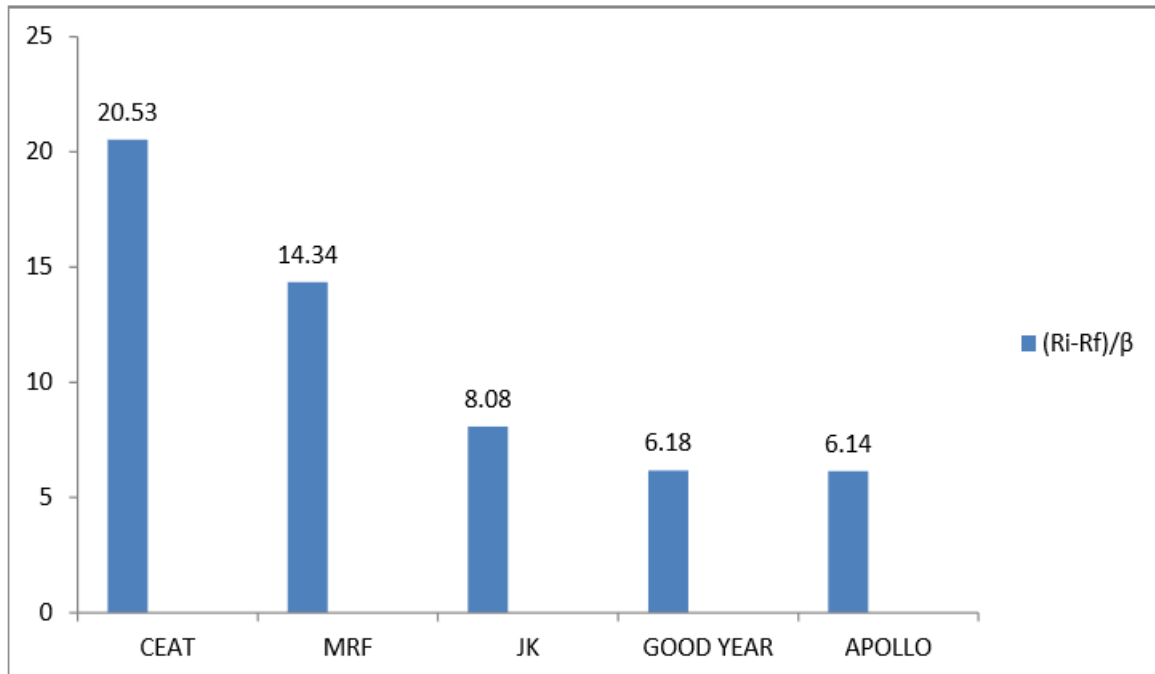
Security	Rank	$(R_i - R_f)/\beta$	C_i	Correlation	Alpha
CEAT	1	20.53	10.11	0.7	60.04
MRF	2	14.34	14.20	0.99	20.36
JK	3	8.08	11.96	0.98	0.28
GOOD YEAR	4	6.18	11.60	0.93	0.4
APOLLO	5	6.14	10.48	0.98	-4.21

Security	Standard deviation	Beta	Systematic risk	Unsystematic risk	$X_i\%$
CEAT	82.51	4.64	4897.14	5044.91	1%
MRF	33.31	2.6	1534.23	26.48	99%
JK	75.09	6.87	10757.22	310.32	75%
GOOD YEAR	25.53	2.15	1048.43	169.92	84%
APOLLO	40.44	3.74	3191.19	121.99	55%

$C^*=14.2$

Graph 4.5.1:

Graph showing excess return to beta

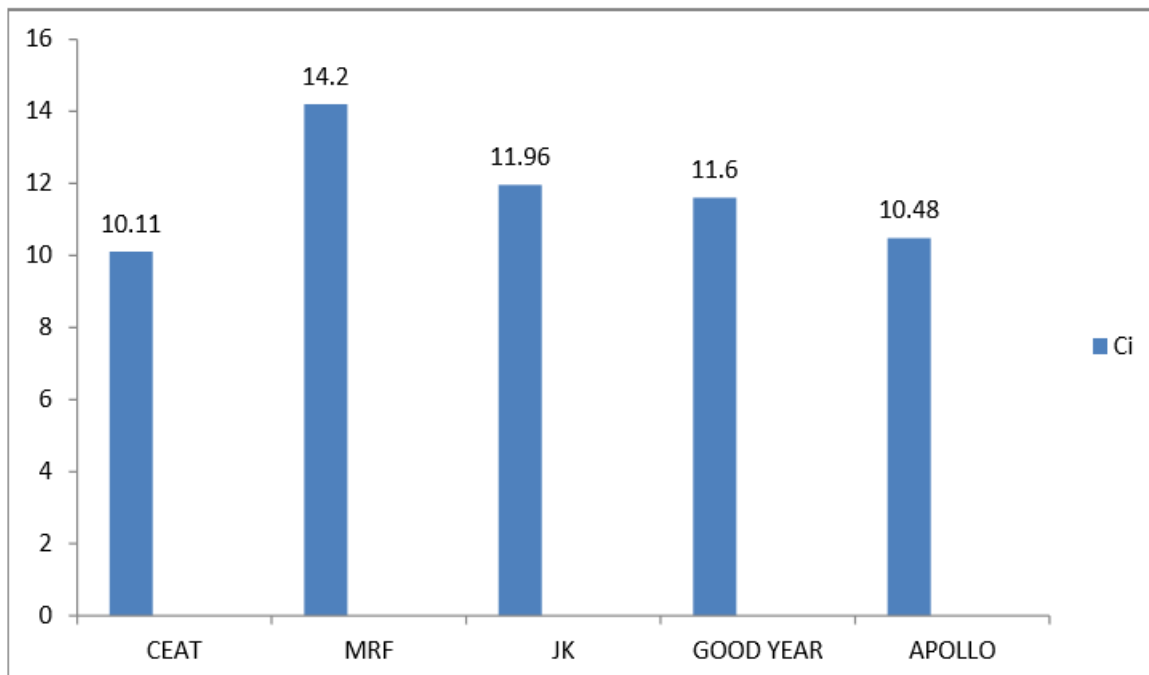


INTERPRETATION

The above graph shows that the excess return to beta which is said to be return more than risk so from the above graph the CEAT has the highest return 20.53 to beta compared to other companies and the APOLLO has the lowest return 6.14.

Graph 4.5.2:

Graph showing cut-off points

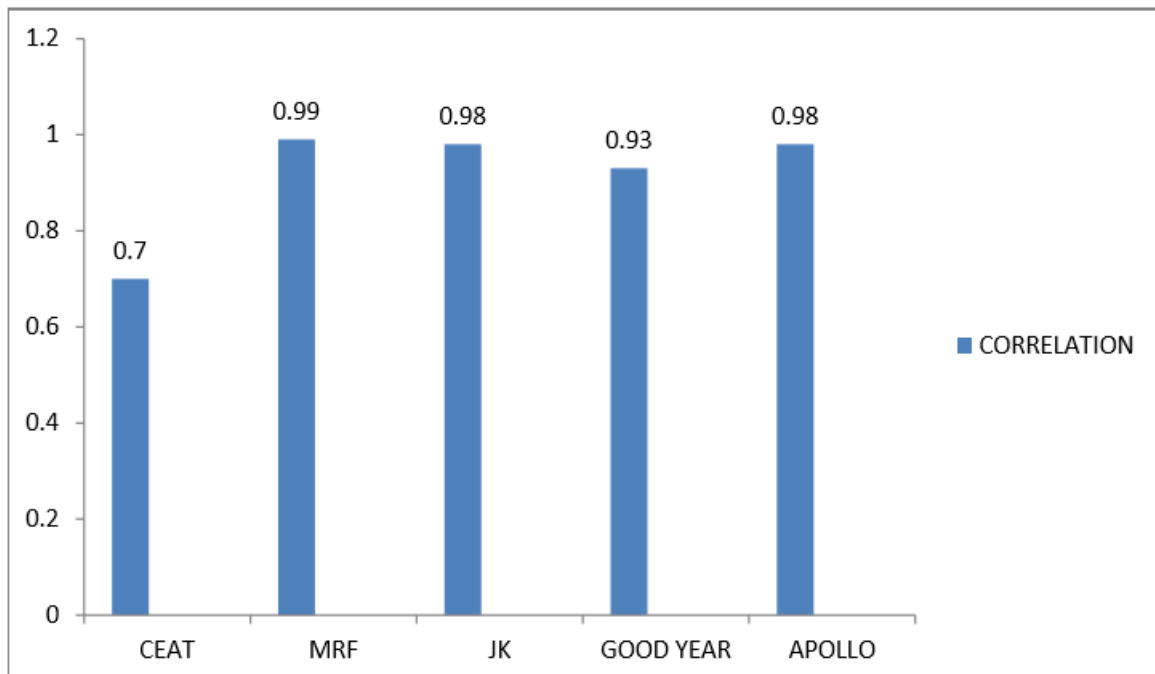


INTERPRETATION

Above graph depicts the cut-off points of the five cement companies the highest cut-off points is of MRF 14.2 and the lowest cut-off points is of CEAT 10.11. It indicates that the companies having highest cut-off points should be taken into consideration and invest accordingly.

Graph 4.5.3:

Graph showing correlation

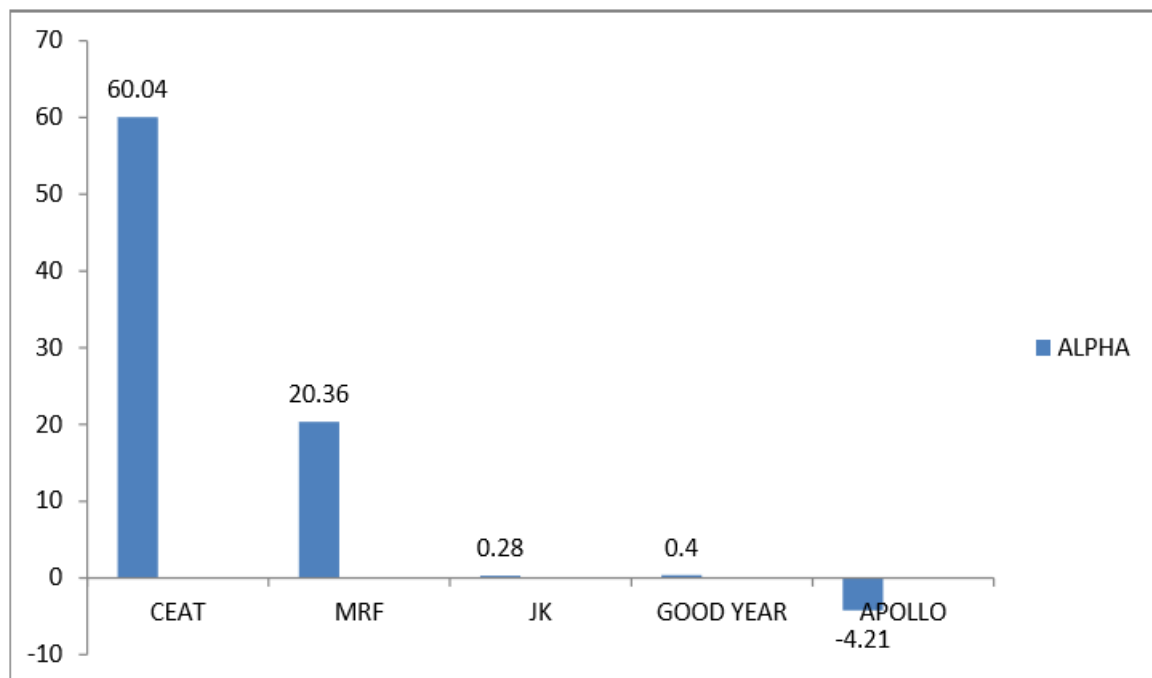


INTERPRETATION

Above graph shows the relationship between the BSE index and the values of the tyre companies selected for the study. MRF have the highest correlation among the cement companies i.e. 0.99 and the CEAT has the lowest correlation of 0.7.

Graph 4.5.4:

Graph showing alpha values

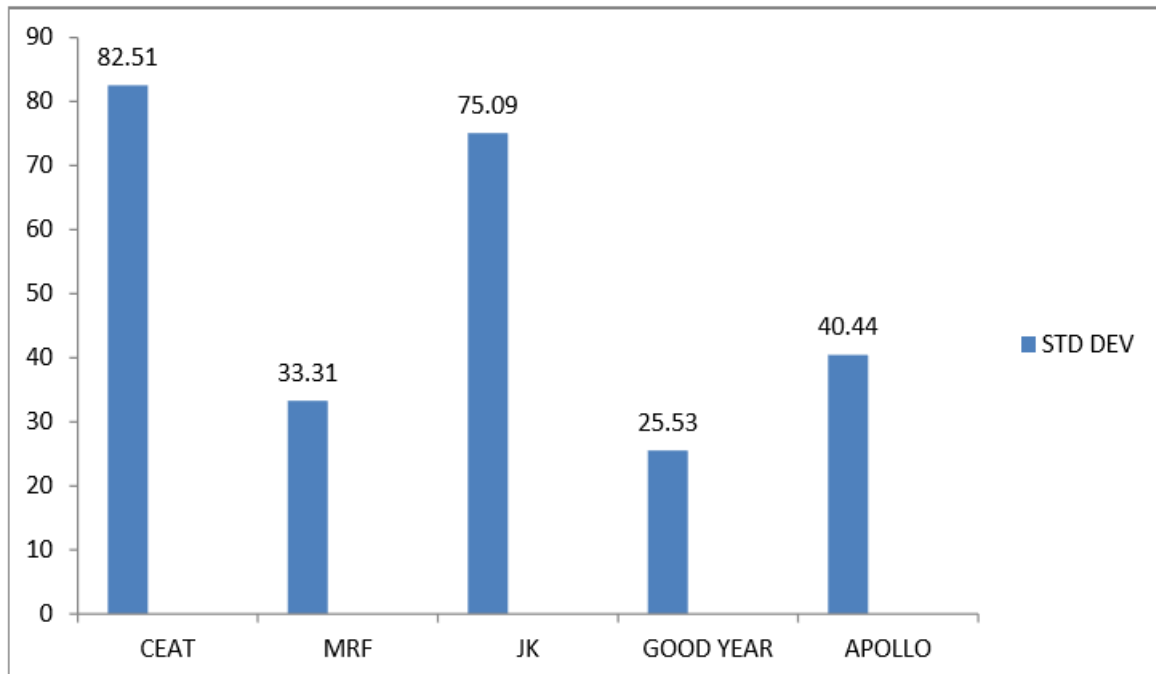


INTERPERTATION

The above shows the alpha values of the TYRE companies, positive alpha value indicates the good performance in the market and the negative value shows the not well performance. Here CEAT is showing highest positive alpha value 60.04 and APOLLO is showing the negative value of -4.21.

Graph 4.5.5:

Graph showing standard deviation

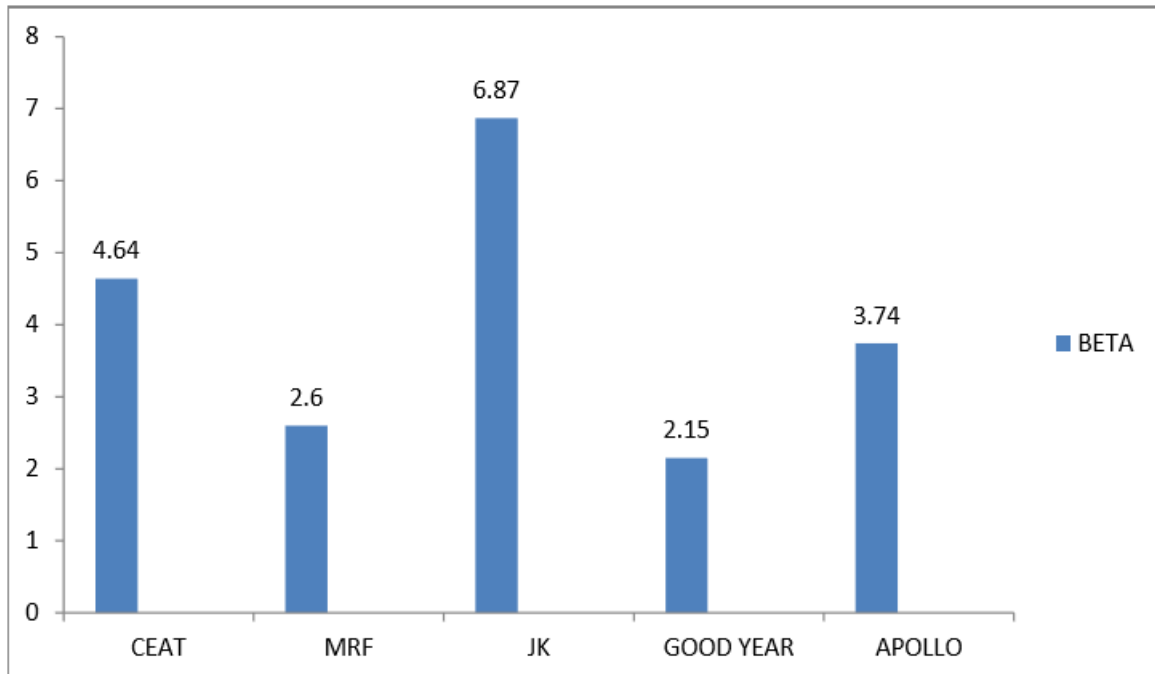


INTERPRETATION

The above graph depicts the standard deviations values of the TYRE companies which means the company having highest standard deviation value as high risk with low return and the company having lowest standard deviation value as lowest risk with high return. CEAT has the highest standard deviation value of 82.51 and GOOD YEAR has the lowest standard deviation value of 25.53.

Graph 4.5.6:

Graph showing beta values



INTERPRETATION

The above graph shows the beta values which says that less beta value has less risk and more beta value have more risk. Here the JK TYRES has high beta value of 6.87 which is said to be the aggressive stock and GOOD YEAR has 2.15.

Table 4.6:

Table showing portfolio construction with selected securities based on risk and return.

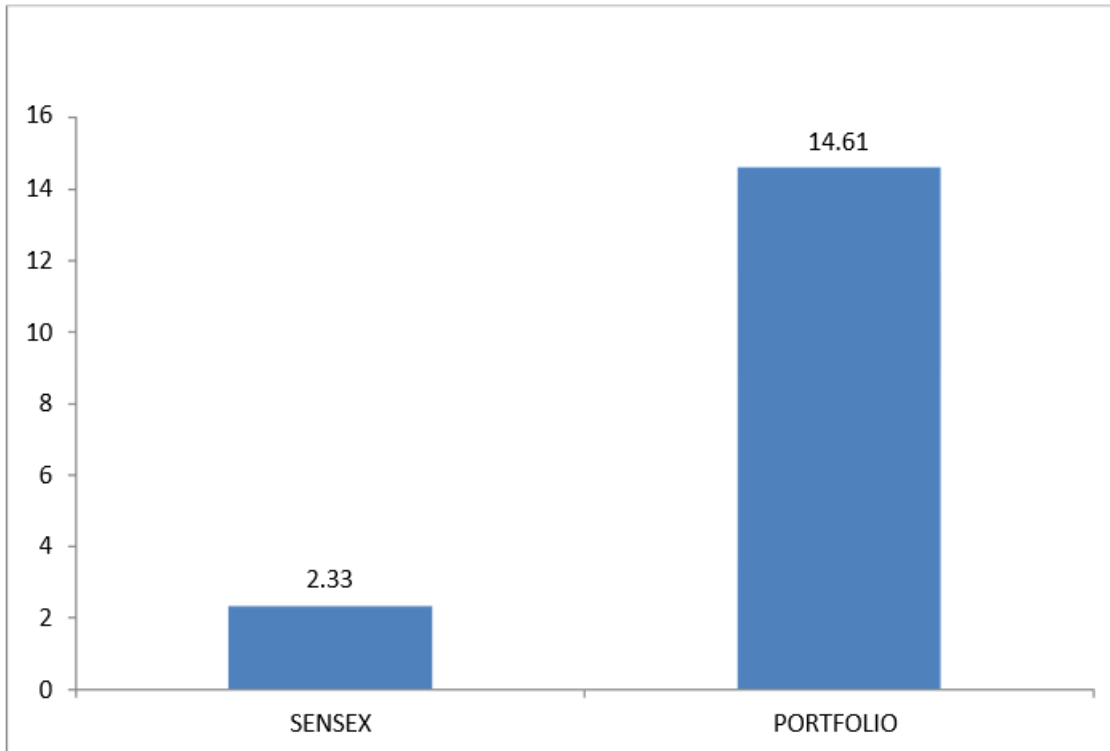
STOCKS	AMOUNT	WEIGHTA GE	WEIGHTA GE (Rs)	MPS ON 31/1/2017	SHARES
BANKING SECTOR	100000				
HDFC		0.293	29300	1286.95	23
YES		0.707	70700	1395.50	51
IT SECTOR	100000				
INFOSYS		0.4161	41610	929.30	45
TCS		0.3141	31410	2229.90	14
TECH MAHINDRA		0.2698	26980	451.75	60
PHARMA SECTOR	100000				
LUPIN		0.2104	21040	1474.25	14
TORRENT		0.7896	78960	1299.00	61
CEMENT SECTOR	100000				
BIRLA		0.185	18500	737.15	25
ULTRA TECH		0.6	60000	3693.75	16
JK		0.215	21500	723.15	30
TYRE SECTOR	100000				
CEAT		0.1	10000	1167.85	8
MRF		0.9	90000	50555.30	1

SHARES	AMOUNT AS ON 31/1/2017	MPS ON 16/2/2017	AMOUNT AS ON 16/2/2017
23	29600.00	1327.35	30529.05
51	71170.50	1436.20	73246.20
45	41818.50	1011.90	45535.50
14	31218.60	2446.90	34256.60
60	27105.00	504.10	30246.00
14	20639.50	1440.15	20162.10
61	79239.00	1256.00	76616.00
25	18428.75	705.45	17636.25
16	59100.00	3718.30	59492.80
30	21694.50	843.75	25312.50
8	9342.80	1127.10	9016.80
1	50555.30	51677.45	51677.45
TOTAL	459912.45		473727.25

RETURN ON PORTFOLIO	14.61
SENSEX	
ON 31/1/2017	27655.96
ON 16/2/2017	28301.27
RETURN ON SENSEX	2.33

Graph 4.6.1:

Graph showing market and portfolio return



INTERPRETATION

From the above table and graph it is clear that return on the portfolio is 14.61% during the period 31/1/2017 to 16/2/2017. Therefore, the above portfolio has outperformed Sensex in terms of returns.

CHAPTER – 5

SUMMARY OF FINDINGS, SUGGESTIONS AND CONCLUSION

FINDINGS:

BANKING SECTOR

- The beta values for YES, INDIAN, SBI and CANARA Banks are having more than 1 which is said to be aggressive stock and have a high volatility with respect to the market index and only HDFC Bank is having less than 1 which is said to be defensive stock and have low volatility with respect to market index.
- The coefficient of correlation of securities is positively correlated in relation to Sensex so there is a positive relationship between market index and the banking companies.
- Alpha values of HDFC and YES Bank is showing positive value which indicates that these stocks have outperformed the Sensex.
- INDIAN BANK is having high standard deviation as compared to other companies which indicates that it is having high risk with respect to the return.
- 29.3% can be invested in HDFC BANK and 70.7% can be invested in YES BANK

IT SECTOR

- The beta value of TECH MAHINDRA is having more than 1 which is said to be aggressive stock and have a high volatility with respect to the market index and remaining companies like INFOSYS, TCS, WIPRO, MPHASIS are having less than 1 which is said to be defensive stock and have low volatility with respect to market index.
- The coefficient of correlation of securities except MPHASIS is positively correlated in relation to Sensex so there is a positive relationship between market index and the IT companies.
- Alpha values for all the IT SECTOR companies are having positive values which indicates that the IT companies have outperformed market index.

- TECH MAHINDRA is having high standard deviation as compared to other companies which indicates that it is having high risk with respect to the return.
- 41.61% can be invested in INFOSYS, 31.41% can be invested in TCS and 26.98% can be invested in TECH MAHINDRA.

PHARMACEUTICAL SECTOR.

- The beta values for LUPIN, TORRENT, SUN, CIPLA are having more than 1 which is said to be aggressive stock and have a high precariousness with respect to the market index and only BIOCON is having less than 1 which is said to be defensive stock and have low volatility with respect to market index.
- The coefficient of correlation of securities except BIOCON is positively correlated in relation to Sensex so there is a positive relationship between market index and the Pharmaceutical companies.
- Alpha values are all positive except for CIPLA which indicates other companies outperformed the market index.
- TORRENT pharma is having high standard deviation as compared to other companies which indicates that it is having high risk with respect to the return.
- 21.04% can be invested in LUPIN and 78.96% can be invested in TORRANT pharma.

CEMENT SECTOR

- The beta values for BIRLA, ULTRATECH, JK cements are having more than 1 which is said to be aggressive stock and have a high unpredictability with respect to the market index AMBHUJA and ACC cements are having less than 1 which is said to be defensive stock and have low volatility with respect to market index.
- The coefficient of correlation of securities is positively correlated in relation to Sensex so there is a positive relationship between market index and the cement companies.
- Alpha values for all the CEMENT SECTOR companies are having positive values which indicates that the Cement companies have outperformed market index.
- JK cement is having high standard deviation as compared to other companies which indicates that it is having high risk with respect to the return.

- 18.5% can be invested in BIRLA, 60% can be invested in ULTRA TECH, and 21.5% can be invested in JK cement.

TYRE SECTOR

- The beta value is greater than 1 for all the stocks selected so it is said to be aggressive in nature and which have more precariousness with respect to the market index.
- The coefficient of correlation of securities is positively correlated in relation to Sensex so there is a positive relationship between market index and the cement companies.
- Alpha values for all the TYRE SECTOR companies are having positive values which indicates that the Tyre companies have outperformed market index.
- CEAT tyre is having high standard deviation as compared to other companies which indicates that it is having high risk with respect to the return.
- 1% can be invested in CEAT and 99% can be invested in MRF tyres.

CONCLUSION

The project entitled “Study on Construction of Optimal Portfolio of selected stocks using Sharpe’s Single Index Model” provides a better and good basis to select various stocks and build optimal portfolio to reduce the risk and maximize the returns. An investor should regularly monitor the present and future market conditions and should accordingly construct the portfolio.

Since the portfolio (period 1/1/2012 to 31/12/2016) has outperformed the Sensex and the portfolio is performing well. Hence there is no changes in the percentage allocation of securities and the portfolio can be continued.

This project work will be of great advantage to those who are seeking to develop their own portfolios and provide basis how to build optimal portfolio.

SUGGESTIONS:

THE FOLLOWING SUGGESSTIONS CAN BE CONSIDERED

- Investor should do the company analysis before investing.
- Investor should clearly see the risk appetite and investment objective before investing.
- Always prefer to invest for the long term to yield a good return.
- Do not invest a whole lot of money in one company or in one sector try to diversify the risk.
- The investor can invest in each and every stock where there is an excess return to beta, where beta value is less, where alpha is positive according the above-mentioned ratio.
- The investors who are risk takers can go for the companies where the beta values are more than one i.e., YES BANK, TECH MAHINDRA, LUPIN PHARMA, TORRENT PHARMA, BIRLA CEMENT, ULTRA TECH CEMENT, JK CEMENT, CEAT and MRF TYRES.
- Among the above selected stocks, the majority investment can be made in top five companies according to the graph 4.6.1 i.e., TORRENT PHARMA, YES BANK, ULTRATECH CEMENT, MRF TYRES AND INFOSYS.

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**ACHARYA INSTITUTE OF TECHNOLOGY
DEPARTMENT OF MBA**

PROJECT (17MBAPR407) -WEEKLY REPORT

NAME OF THE STUDENT: AKARSH M

INTERNAL GUIDE: PROF. SHASHI KUMAR C.R

USN: 1AY17MBA02

COMPANY NAME: ANANDRATHI FINANCIAL SERVICES LTD.

WEEK	WORK UNDERTAKEN	EXTERNAL GUIDE SIGNATURE	INTERNAL GUIDE SIGNATURE
3 rd Jan 2019 – 9 th Jan 2019	Industry Profile and Company Profile		
10 th Jan 2019 – 17 th Jan 2019	Preparation of Research instrument for data collection		
18 th Jan 2019 – 25 th Jan 2019	Data collection		
26 th Jan 2019 – 2 nd Feb 2019	Analysis and finalization of report		
3 rd Feb 2019 – 9 th Feb 2019	Findings and Suggestions		
10 th Feb 2019 – 16 th Feb 2019	Conclusion and Final Report		



College Seal

Company Seal

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