KARVY STOCK BROKING

Ref: No. KSBL/Proj/2018-19 Date: 23rd April .2018

CERTIFICATE

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Ms. Navyashree D** - bearing Reg. No: **1AZ16MBA43** an MBA student of Acharya Institute of Technology, Soldevanahalli, Hesaraghatta Main Road, Bangalore - 560107, had done a Internship / Project Report a study on **"Construction of Equity Portfolio Using Single Index Model with reference to Karvy Stock Broking Ltd."** during the period from 15th January 2018 to 24th March 2018 in our Yelhanka Branch under the guidance of Mr. Natesh K, Senior Manager, Broking Dvn. Bangalore.

She has completed the project work and submitted the report on the same. We wish her success in all her future endeavors.

For KARVY STOCK BROKING LIMITED

AUTHORISED SIGNATORY

Karvy Stock Broking Limited

Corporate Office: 'Karvy Millennium', Plot No. 31, Nanakramguda, Financial District, Gachibowli, Hyderabad - 500 032, Telangana. T: +91 40 3321 1500 | F: +91 40 2331 1968

Registered Office: 'Karvy House', 46, Avenue 4, Street No.1, Banjara Hills, Hyderabad - 500 034, Telangana. T: +91 40 2331 2454 / 4467 7400 | F: +91 40 23311968 | service@karvy.com | www.karvy.com

SEBI Registration No.: NSE: INB/INF/INE 230770138; BSE: INB 010770131 ; MCX-SX: INE 260770138; NSDL: IN-DP-NSDL-247-2005; CDSL: IN-DP-CDSL-305-2005. IGC e-mail: Stock Broking: igksbisb@karvy.com; DP: igksbidp@karvy.com

Compliance Officer : V Murali Govind Conact No. : +91 40 23388769 Email : muraligovind.v@karvy.com. CIN: U67120TG1995PLC019877

ACHARYA INSTITUTE OF TECHNOLOGY
(Affiliated to Visvesvaraya Technological University, Belagavi, Approved by AICTE, New Delhi and Accredited by NBA and NAAC)

Date: 14/05/2018

CERTIFICATE

This is to certify that **Ms. Navyashree D** bearing **USN 1AZ16MBA43** is a bonafide student of Master of Business Administration course of the Institute 2016-18 batch, affiliated to Visvesvaraya Technological University, Belgaum. Project report on "**A Study on Construction of Optimal Portfolio Using Single Index Model" at Karvy Stock Broking Ltd, Bangalore** is prepared by her under the guidance of **Prof. Mallika B K** in partial fulfillment of the requirements for the award of the degree of Master of Business Administration, Visvesvaraya Technological University, Belgaum, Karnataka.

14/5/2018

Signature of Internal Guide

14/5/2018

Signature of HOD

Head of the Department
Department of MBA
Acharya Institute of Technology
Soldevanahilli, Bangalore-560 107

21 May 18

Signature of Principal/Dean Academics

PRINCIPAL
ACHARYA INSTITUTE OF TECHNOLOGY
Soldevanahalli Bangalore-560 107

DECLARATION

I, NAVYASHREE D, hereby declare that the project report entitled "Construction of Equity Portfolio Using Single Index Model" with reference to "Karvy Stock Broking Ltd" prepared by me under the guidance of Prof. Mallika. B K, faculty of M.B.A Department, Acharya Institute of Technology and external assistance by Mr. Natesh K, Senior Manager, Karvy Stock Broking Ltd. I also declare that this project work is towards the partial fulfillment of the university Regulations for the award of degree of Master of Business Administration by Visvesvaraya Technological University, Belgaum. I have undergone a summer project for a period of ten 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

Signature of the Student

Date: 22-05-18

ACKNOWLEDGEMENT

I would like to thank my people who have helped and supported me while doing my Project report and work.

There is not enough word to offer vote of thanks to Dr. **Nijaguna G**, Head of the Department of MBA, AIT Bengaluru for his help in initiating the project report in advance for the regular motivation, my guide Prof. Mallika B K faculty of MBA Department, AIT Bengaluru and Mr. Natesh K, Senior Manager at Karvy Stock Broking Ltd for their admirable help, suggestions and opinions on the contribution during and after the project report period. I would also like to thank Mr. Paramesh, HR Manager, Karvy Stock Broking Ltd for giving me the permission to carry my project work.

Thanks a lot appreciation to helping nature of employees at Karvy Stock Broking Ltd for their supports.

Place: Bengaluru **Navyashree D**

Date: 22-05-2018 **USN: 1AZ16MBA43**

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EXECUTIVE SUMMARY

This study has made with the intension of constructing an efficient optimal equity portfolio using the effective and very more popular utility of Sharpe's Single Index Model. In order to get more knowledge about the Indian securities market the Internship was done in one of the stock broking agency called Karvy Stock Broking Ltd. As an Investor and the fund managers know Indian Securities market is high volatile, risky and highly sensitive. The portfolio construction with the help of Single Index model became necessity to minimize the risk and to maximize the return on investment.

This study is targeted to create awareness in the minds of investors. Here for the study out of 50 companies only 8 companies were selected for the portfolio construction. The selection of securities is made based on the return and excess return to beta ratio. Excess return to beta ratio is identified by comparing the excess return in to the particular stock's beta. Standard deviation is the process where it is used to measure the variability of the securities and the relationship of the mean variable of the securities for the selected stock.

Cut-off rate helps the author to select securities in a scientific way. Here all the securities selected whose excess return to beta ratio is more than the cut-off rate. Cut-off rate helped to identify the securities and the investment proportion to be made on those securities.

Findings and suggestions will give more clarity of this study and it will help the fund managers and the professional investors to make wise decision on their investment. Hope this study and constructed portfolio will help the investors, fund managers and other institutional investors to make appropriate investment.

CHAPTER 1

INTRODUCTION

1.1 Introduction

A Project is an experience designed to enable students working towards rewards, knowledge, certificates and to associate in Stock broking in financial services with an opportunity to acquire and also to develop insight knowledge into practical component and application of those academic knowledge. Through observing the working activities of brokers, clients, professionals of the stock broking agency and by working under their guidance and supervision, the students will be able to assess their own strength and potential for a career in stock broking agencies. The student's practical learning experience will be up most beneficial if the student has a general knowledge at the stock broking area.

The main purpose of project is to enrich academic classroom learning via exhibition to related on-the-job experiences, and also to assist in determination of career objectives and goals. The students must also realize that this successful internship program experience is not only a PLUS point to their academics and job resume, along with that the experience it creates the student's roadmap of getting employment opportunity with the stock agency later.

1.2 Industry Profile

Financial Services

The Indian Financial services have undergone a complete magical since 19th century. Before the Financial services emerged Commercial banks and other financial organization henpecked the area. They found financial requirement of the industries in India. Only after economic liberalization financial services sector has acquired some prominence. Now this financial services sector has grown into an emerging industry, in fact the present world's largest industry.

Financial services may be explained as the services and products rendered by Institutions i.e. banks of different kind for the aspiration of financial transactions, other finance associated activities in Finance world such as Insurance, loans, credit cards, money management furthermore investment opportunities to provide knowledge on this stock market and upcoming trends in the Market.

The financial service industry is explained as "The accumulation of organizations where its main focus to facilitate and intermediate financial transactions of individuals, banks, other institutional investors to result from allocation of their activities through time".

Financial services consist of various types, they are

1. Wholesale financial services
2. Retail financial services

Wholesale financial services: Here services are availed by financial industry and businessmen, which are utilized for transition into ultimate final retail products through directly or indirectly.

Retail financial services: Here the services are offered to the individuals, directly thrown to consumption needs.

It is categorized into following:

- Traditional activities and
- Modern activities

Traditional activities

Here the financial institutions and intermediaries have been offering variety of financial services consisting of both money market & capital market activities. Traditional activities are further grouped as fund based and non-fund based activities.

ASSET/ FUND BASED FINANCIAL SERVICES

- Hire Purchasing
- Forfeiting
- Mutual fund
- Exchange Traded Funds
- Consumer finance/credit
- Housing Finance

FEE-BASED FINANCIAL SERVICES

- Merchant banking
- Letter of credit
- Bank guarantee
- Credit rating
- Securitization of debts
- Stock broking

Modern Activities

Modern activities consists of subsequent services

1. Offering project and forecast advisory services straight from the formulation of financial project report till the budgeting of funds for beginning the project with the essential government approvals.
2. Rendering Planning service for Merger and acquisition and assistance for their smooth carrying of business.
3. Acting as trustee and advisors to the debenture holders.
4. Projecting and constructing financial collaborations with the joint ventures through selecting acceptable joint venture partner firms, composing joint venture agreements.

In this services Stock broking financial services is captured to the detailed study of my research.

FINANCIAL MARKET

It is also described as any market where the sellers and buyers of financial securities participate in trade of equities, bonds, currencies with that of derivatives. This market is transparent in evaluating, basic regulation on selling and buying, fees and costs and also the market forces determine the securities price that trade in market. The market means the aggregation of available sellers and buyers of a various certain goods, services and also the transaction of actives between therm. They deal with Stocks, Bonds, Commodities which include agricultural products & precious metals.

Types in financial market

- Money market
- Capital market

MONEY MARKET

Money market is a financial market. Its main role is to deal with financial securities whose maturity period was up to one year, it is a market for short term funds. This MM instrument is replacement of money, because it does not manage with money. It just offers credit instrument facilities like commercial papers, treasury bills, promissory note, certificate of deposit and bills of exchange. These instruments are beneficiary to the government, to the

various units and organizations to borrow funds accessible in this market to accomplish their short term needs and requirement. The financial urge in money market instrument is generally low default risk, high marketability and maturity within one year.

Money market instruments:

a. Commercial papers
b. Certificate of deposits
c. Promissory notes
d. Bill of exchange
e. Treasury bill

Treasury bills:

Treasury bill is a sort of financial bills, that are similar character of promissory notes, it is basically issued and offered by government for fixed period of time under some discount but not abundant of one year, favoring to pay stated amount to the bearer of Treasury bill instrument. It is also called by T-bills or Trade bills

Bills of exchange:

It is a kind of instrument in written format, containing and unconditional order, specifying a definite person for paying money or to the order of mentioned person, or to the holder of bills of exchange. It is only valid if it is underwrite by the maker of the particular instrument.

Commercial papers:

Commercial papers is popular in corporate industry to finance their working capital requirements, it is unsecured promissory note in nature issued by very well-known companies (blue chip companies). This is issued in time range that lies between 15 days - one year.

Certificate of deposit:

Certificate of deposits is generally furnished by some commercial banks or other related financial institutions, which is very easily transferable in nature from one person to the other. Its maturity ranges between 91 days - one year; it can be provided to any co-operatives, individuals and organizations.

Promissory notes:

It is a signed document which contains a written promise for paying certain amount of money to specified person or the bearer of that document at mentioned date or on demand.

CAPITAL MARKET

Capital market mentions the kind of financial market, there we can generate funds from various market instruments for company's growth, and sometime for national growth. These are generally used by professional investors to gain more profit out of their market condition. Its main character is to deal with both medium and long term funds; it is an arrangement to marketing and buying, selling securities in market. It can be known as Securities market.

This security market is mainly categorized into two major segments called Primary market and secondary market.

1. **Primary market**

   It is a place where the investors buy securities that are directly issued by the company. New securities are furnished in this kind of market.

2. **Secondary market**

   Another name of this market is aftermarket, follow on public offering. In this market bonds, stocks, options and futures which are previously issued can be bought and sold. After the initial issuance, investors have the right to purchase from other investors.

STOCK MARKET OVERVIEW

They play a very important role in economy. Stock market enables to trade in shares which are of public company. If a firm wants to raise its business they can raise funds through stock market. They help in funding new projects or for business which have expansion plans. The stocks and securities of various companies are traded by the registered members so it is called as Standardized association. There are 23 recognized stock exchanges in India.

Bombay Stock Exchange (BSE) is oldest in the world, which is famous for the large number of companies that are listed; recently they have also come up with screen-based trading system with prologue of the Bombay online trading system.

Alternative name for BSE was "The Native Share & Stock Brokers Association" 1875. They were the first to get the permanent recognition from government through Securities Contracts Regulation Act 1956. In addition with demutualization, Detutsche Borse, Singapore Exchange were the best World's Exchange.

Today, BSE is ranked no 1 stock exchange with respect to companies which are listed and 5th according to World. An investor has option to choose from more than 4700 listed companies.

It is the first stock exchange to enjoy iconic status and is worldwide. It consists of 30 stocks which constitute 12 major sectors. "SPICE" was the first Exchange Trade Fund which assist investors a trading tool for the purpose of investment, trading, arbitrage and hedging which is very easy to handle.

BSE was the first to receive Information Security management System Standard BS7799-2002 certification, Online Trading System (BOLT). It was designed for safeguard market integrity through enhancing transparency in their working.

Vision

"Emerge as a best prime stock exchange through providing excellence in class global practice in various technologies, innovations, projects and finally customer services"

NATIONAL STOCK EXCHANGE

The NSE established in November 1992, with the capital of 25crs they started. They took the helping hand of the International Securities Consultancy (ISC) of Hong Kong. Financial institutions, insurances companies Ltd and stock Holding Corporation were the promotions for NSE. They focus on providing nationwide securities trading facilities to investors to add on they strengthen the move toward professionalization towards the capital market.

Different players are follows:

- Trading members
- Participants

.

They provide a automated which is fully screen-based trading mechanism that consists principle of order-driven market. Investors have option to stay at their office and execute the trading by linking with communication network. Then all the shares prices are displayed at which the buyers and sellers are willing to transact. When such prices are matched the transaction will be complete and the final step is to get the confirmation slip.

The advantages of NSE with that of Traditional trading:

- From anywhere in the country investor can trade.
- With the use of computerized network one can avoid the communication delays, malpractice, payments which are made later.
- Providing finance for the long term.

Vision

Sustaining as market leader, establishing and maintaining the global present and facilitating the people to financially well-being.

SECURITIES AND EXCHANGE BOARD OF INDIA (SEBI)

SEBI was setup for protecting interest of investors by government of India 1988. SEBI act, 1992 and Securities Contract Regulation Act, 1956 empowered SEBI. Protecting rights the investors and regulating capital market are primary functions of SEBI. It headquarters is situated at Mumbai, Maharastra.

The companies of nifty 50 are shown below:

Table no 2.1: Showing Nifty 50 Companies

SL no	**Company Name**

1	Reliance Industries LTD
2	TATA Consultancy Services LTD
3	HDFC bank Ltd
4	ITC Ltd
5	Housing Development Finance Corporation Ltd
6	Hindustan Unilever Ltd
7	Maruti Suzuki India Ltd
8	Infosys Ltd
9	Oil & Natural Gas Corporation Ltd
10	State Bank Of India
11	ICICI Bank Ltd
12	Kotak Mahindra Bank Ltd
13	Coal India Ltd
14	Larsen & Turbo Ltd
15	Indian Oil Corporation Ltd
16	BhartiAirtel Ltd
17	Sun Pharmaceutical Industries Ltd
18	Axis bank Ltd
19	NTPC Ltd
20	Wipro Ltd
21	HCL Technologies Ltd
22	Vedanta Ltd
23	Ultratech Cement Ltd
24	Asian Paints Ltd
25	Tata Motors Ltd
26	Power Grid Corporation Of India Ltd
27	Bharat Petroleum Corporation Ltd
28	IndusInd Bank Ltd
29	Bajaj Finance Ltd
30	Mahindra & Mahindra Ltd
31	Bajaj Auto Ltd
32	AdaniPorts And Special Economic Zone Ltd

33	Tata Steel Ltd
34	GAIL (India) Ltd
35	Eicher Motors Ltd
36	Yes Bank Ltd
37	Hero MotoCorp Ltd
38	BhartiInfratel Ltd
39	Bosch Ltd
40	Hindustan Petroleum Corporation Ltd
41	Tech Mahindra Ltd
42	Hindalco Industries Ltd
43	Zee Entertainment Enterprises Ltd
44	Indiabulls Housing Finance Ltd
45	Ambuja Cements Ltd
46	Cipla Ltd
47	Lupin Ltd
48	Dr.Reddys Laboratories Ltd
49	UPL Ltd
50	AurobindoPharma Ltd

1.3 COMPANY PROFILE

- **Company Overview**

The KARVY group was formed in 1982 and now it is headed by Mr C Parthasarathy, at Hyderabad, India. It's a well established conglomerate business. They started with financial services to data processing. As an outcome the idea of business expansion in term of skills in transaction was imperative. They offer both financial & non-financial services.

KARVY :

K – Mr Krishna Prasad

A – Mr Arun

R – Mr Radha Krishna

V – Mr Venkat Krishna

Y – Mr Yogendra

- **Historical Background**

This was the idea of 5 young men who had a evening discussion in the summer of 1982. They had worked for the charted accountancy agency and that was a time to take a serious step of creating their own enterprise.

They motivation was "Never say die". They strongly believed that one day their business would be successful. They had two assets with them education and a strong desire to succeed in life. Against all the odds their dream company was started as registry business at initial stages later on to broking business. It has expansion in 400 cities with about 900 offices. Now Karvy is aiming to achieve 100crs revenue by 2020.

- **Promoters**

Table no 2.2: Showing Promoters of Karvy

S/ No	**Names of the director**	**Category of the directors**
1.	Mr.C. Parthasarathy	Chairman & Managing Director
2.	Mr.M. Yugandhar	Managing Director
3.	Mr.M. S. Ramakrishna	Director

Management Team

Table no 2.3: Showing Management team of Karvy

S/No	**Names**	**Category of the members**	**Operations**
1.	Mr. V. Mahesh	Managing Director	Karvy Data Management
2.	Mr. V. Ganesh	CEO	Karvy Computershare

3.	Mr. SushilSinha	Whole time Director	Karvy Comtrade
4.	Mr. P .B. Ramapriyan	CEO	Distribution & Allied Businesses
5.	Mr. Rajiv R. Singh	CEO	Stock Broking
6.	MR. J. Ramaswamy	Group Head	Corporate Affairs
7.	Mr. Deepak Gupta	Group Head	H R
8.	MR. KrishnaHari	Group Head	Finance

1.4 Vision

To achieve & sustain market leadership, KARVY aim for complete customer satisfaction, by combining its human and technological resources, to provide world class quality service. In the process KARVY shall attempt to meet and exceed customer's satisfaction and set industry standards.

Mission

"Our mission is to be a leading and preferred service provider to customers, and we aim to achieve leadership position by building an innovative, enterprising, and technology driven organization, which will set the highest standards of service and business ethics."

Quality Policy

To achieve and retain leadership, KARVY shall aim for complete customer satisfaction, by combining its human and technological resources, to provide superior quality financial services.

Quality Objectives:

- Build in-house processes that will ensure the transparent and harmonious relationship with their clients and investors to provide high quality services.
- Establish a partner relationship with its investor service agents and vendors that will help to keep up its commitments to the customers.
- High quality of work life for the entire staff and equip them with adequate knowledge and skills so as to respond to customer needs.

- Continue to up hold the values of honesty and integrity and attempt to establish unparalleled standards in business ethics.
- Strive to be a reliable source of value-added financial products and services and continuously guide the individuals and institutions in making judicious choices. Aspire to keep all stake-holders proud and satisfied.

1.5 Product and Service Profile

Financial Services:

a. Currency Derivatives
b. Equity Broking
c. Wealth management
d. Commodity Broking
e. Depository Participant Services
f. Investment Banking services
g. Forex & currencies
h. Commodity Broking
i. Non-Banking Financial services
j. Reality Services

Non – Financial Services:

a. Market Research
b. Data Management
c. International Business
d. Data analytics

1.6 Area of Operations

- Chennai
- Bengaluru
- Pune
- Telangana

- Delhi
- Mumbai
- Patna
- Uttar Pradesh
- Lucknow

Karvy Group has spread across 20 renowned entities which are as follows:

I. Karvy Stock Broking LTD – services like Equity Broking, Depository Participant, Wealth Management, Portfolio Management, Currency derivatives.
II. Karvy Comtrade LTD – deals with Commodity Broking.
III. Karvy Financial Services LTD – Non-banking Financial services.
IV. Karvy Realty (INDIA) LTD – Reality Services
V. Karvy Computershare (Pvt) LTD – they as an agent for share transfer services and carry out registrar business
VI. Karvy Global Service LTD – within India they do Business Process Outsourcing
VII. Karvy Data Management Service LTD – Data Management Services
VIII. Karvy Consultants LTD – they provide Advisory Services and Consultancy
IX. Karvy Mutual Fund Service LTD – deal with Mutual funds
X. Karvy Analytics – Data Analytics

1.7 Swot Analysis

Strengths

- They are blessed with strong online platform
- Dedicated employees with good research team
- Ample of Human resource
- Have a strong customer relationship
- Huge customer base
- They are widely spread across with huge brokers network

Weakness

- Lack of advertisement
- Technology needs to be upgraded

- People always like to invest on gold, land and building instead on shares
- Rural areas has less penetration

Opportunity

- Offers multiple products under one platform
- High expansion power
- Increase in income and spending power
- Growing customer awareness about stock market
- Untapped market

Threats

- Huge competition from other brokers
- Stiff competition from existing players in market
- Market uncertainty
- Broad economic factors like inflation
- Government rules and regulations

1.8 Competitors

- India Bulls monetory offerings Ltd
- Motilal Oswal Securities
- Share khan Ltd
- Bonanza Securities
- Kotak securities
- CIL securities
- IIFL
- Reliance Money
- Shriram Insight

1.9 Future Growth Prospects

- To strengthen their market reach in personal finance sector.

- Focus more on small loan market.
- Launch new mutual fund schemes in pension plan segment.
- Open up more Karvy branches in Tier-1 and Tier-2 cities.

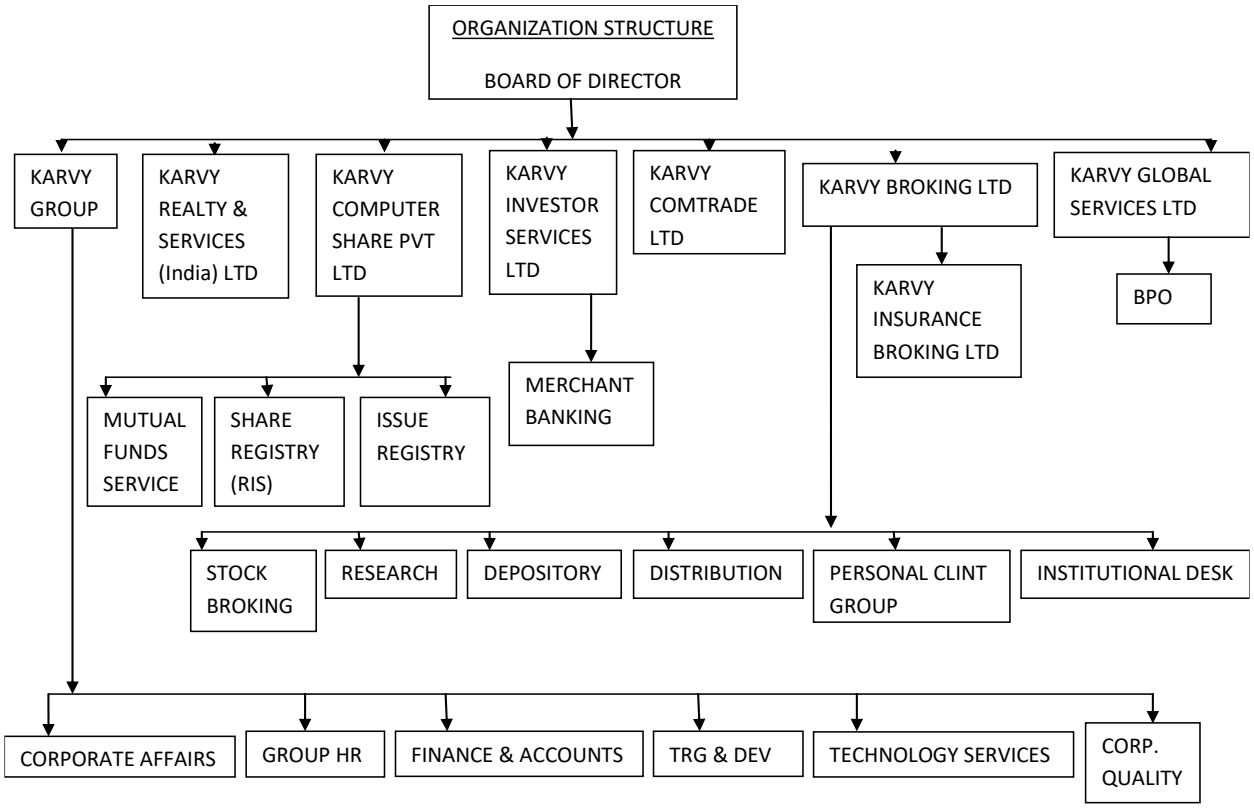
Special Awards

Karvy group has won many awards for its finest services. It has been a recipient of many certificates from the prestigious institutions and organization.

The awards won by Karvy group are as follows:

- In the year 2017, Karvy Comtrade limited has won the "Krishi prgati Award" and Karvy Commodities has won" Derivative House of the year".
- In the year 2016, Karvy Comtrade limited has won the "Market Excellence Award, Commodities- Metal.
- In the year 2014, Karvy Stock Broking Limited has won the "NSDL Star Performer Award".
- In the year 2011, Karvy Comtrade Limited has won the Broker with "Best Corporate Desk for Commodity Broking" and "Best Analyst in Base Metal Category".
- In the year 2010, Karvy Stock Broking Limited has won the "Largest E-Broking House in India".
- In the year 2007, Karvy Stock Broking Limited has won the "Amity Corporate Excellence Award".
- In the year 2006, Karvy Stock Broking Limited has won the "Vivekananda National Award".
- In the year 2006, Karvy Stock Broking Limited has won the "Best Depository Participant in the Country"

1.10 Organizational structure



1.11 Financial Performance of Karvy Stock Broking Ltd

Karvy Stock Broking Ltd Profit And Loss A/C Statement in Indian rupees

INCOME	**As on 31 Mar 2017**	**As on 31 Mar 2016**
Total revenue	**3,52,03,65,793**	**3,57,97,87,839**
EXPENSES		
Operating Expenses	18,31,10,197	19,95,09,616

Employee benefits	40,47,84,405	35,50,13,826
Finance costs	2,33,81,48,652	2,09,33,17,852
Depreciation and amortization	2,63,20,626	3,59,40,504
other expenses	38,71,26,733	30,79,60,750
Total expenses	**3,33,94,90,613**	**2,99,17,42,548**
Profit and loss before tax	**18,08,75,180**	**58,80,45,291**
Current tax	9,69,88,960	21,24,35,733
Deferred tax	-3,21,21,917	-1,04,35,408
Profit or loss for the period	**11,60,08,137**	**38,60,44,966**

Karvy Stock Broking Ltd Balance sheet

Particulars	**As on 31 Mar 2017**	**As on 31 Mar 2016**
Equity share capital	62,19,97,117	99,61,43,600
Reserve and Surplus	3,46,36,92,412	2,53,92,41,649
Total Shareholders' Funds	**4,08,56,89,529**	**3,53,53,85,249**
Non-Current liabilities		
Long term borrowings	11,37,85,86,523	8,76,25,97,606
Other long term liabilities	3,06,860	98,28,122

Long term provisions	5,65,20,512	4,21,31,076
Total Non Current liabilities	**11,43,54,13,895**	**8,81,45,56,804**
Current Liabilities		
Short term borrowings	3,98,97,17,431	4,93,54,87,284
Trade payables	5,13,11,710	1,76,32,738
Other current liabilities	5,09,73,50,005	4,84,03,36,464
Short term provisions	10,12,39,496	8,60,32,502
Total Current liabilities	9,23,96,18,642	9,87,94,88,988
Total Capital and Liabilities	**24,76,07,22,066**	**22,22,94,31,041**
ASSETS **Noncurrent Assets**		
Fixed assets		
Non Current Investments	1,06,552	1,06,552
Long term Loans and Advances	16,21,38,48,986	14,26,99,55,972
Other noncurrent assets	10,35,731	8,75,368
Total Non Current Assets	**16,21,49,91,269**	**14,27,09,37,892**
Current Assets		
Current Investments		90,70,101
Cash and Cash Equivalents	73,52,40,767	22,87,55,553
Short term Loans and Advances	6,73,01,88,681	6,77,45,09,796
Other current assets	1,08,03,01,349	94,61,57,699
Total Current Assets	**8,54,57,30,797**	**7,95,84,93,149**

Total Assets	**24,76,07,22,066**	**22,22,94,31,041**

Ratio Analysis

It is a financial statement analysis where quick indication of company's financial performance. It gives information about profit and loss of the company. This ratio analysis will be done based on the P/L account and balance sheet of the company. This will helps to determine the company position in the market.

1. Current Ratio

It is liquidity ratios which measure the company's ability to pay short term and long term obligations. It includes cash, marketable securities, inventory, accounts receivables.

Current Ratio = Current Assets / Current liabilities

Table no 1.11.1: Shows current ratio of the company

Year	**Current Assets in rupees**	**Current Liabilities in rupees**	**Current ratio**
2017	8545730797	9239618642	0.92
2016	7958493149	9879488988	0.81

Interpretation

The above graph shows the current ratio of 2016 & 2017. In the year 2016 the ratio has decreased. In the year 2017 it has increased to 0.92. We can get the idea from the above table that current ratio has a good liquidity position.

2. Return on Assets

Is an indicator of how gainful a company is relative to its entire assets. It gives a clear idea about the company how efficient management is at using its assets to generate earnings.

Return on Assets = Net profit after Tax/ Total Assets *100

Table no 1.11.2: Shows return on assets of the company

Year	**NPAT in rupees**	**Total Assets in rupees**	**Return on Assets Ratio**
2017	116008137	24760722066	0.47
2016	386044966	22229431041	1.74

Interpretation

The above graph shows the change in the return on assets for the year 2016 was 1.74, for year 2017 it was 0.47. In the year 2016 company is in a better position in its efficient management of assets.

3. Expense Ratio

It includes expenses on staff, allowances, rent, insurance, tax, postage, audit fee, stationary and other expenses. It is calculated with the help of total percentage of fund assets used by the company for expenses of various types.

Expense Ratio = Total Expenses/Total income

Table no 1.11.3: Shows expenses ratio of the company

Year	**Total Expense in rupees**	**Total Income in rupees**	**Expense Ratio**
2017	339490613	3520365793	0.95
2016	2991742548	3579787839	0.84

Interpretation

In the year 2016 to 2017 the expense ratio has increased to 0.95 from 0.84. In the year 2017 the expense ratio was higher it should reduce for the better management of the firm.

4. **Net Profit Ratio**

   It is the measurement of the amount of profit that a business can extract from its total sales.

   Formula:

Net profit margin = profit before tax / Revenue

   Table no: 1.11.4 shows net profit ratio of the company

Year	**Profit before tax in rupees**	**Revenue in rupees**	**Net profit Ratio**
2017	180875180	3520365793	0.05
2016	588045291	3579787839	0.16

Interpretation:

In the year 2016 the net profit was 0.16 and the 2017 it was 0.05 here we can analyse that net profit ratio has been decreased.

CHAPTER 2

CONCEPTUAL BACKGROUND AND LITERATURE REVIEW

2.1 Introduction to Optimal Portfolio

The Investor constantly likes to buy a pair or combination of stocks which will provide high return with low risk. The investors want to just maintain a satisfactory income with reward to risk ratio. In ancient time the stock analyst always tend to have attention more on return aspect of the company's stock. In the recent times risk have received and pulled a more attention, for that analyst. Are providing both risk as well as return estimates to investors.

While making a investment decision, risk and return plays a very important role to generate returns. These decisions will help investors to know whether he should invest or not and also it helps in a portfolio which stock to include in order to balance investors investment. To make a proper decision on investment and to manage the proper portfolio is very important. An investor always tries to maximize his return with risk.

In a traditional approach the investors' objectives in terms of return, appreciation in capital from the selected stock is just to satisfy their needs and wants. Another famous approach is modern approach. In this Markowitz model is built to select a stock based on the analysis of risk and return. Markowitz constructed a model as a foundation to quantify the risk and his contribution to the portfolio segment on popularly called as 'Modern Portfolio Theory'. He contributed an analytical tool making analysis, to select optimal portfolio to the investors. For this he won Nobel Prize and later he was called as 'Father of Modern Portfolio Theory'.

According to Markowitz, meaningful measure of selecting optimal portfolio is to calculate variance of the rate of return of the selected stocks, if the sample size is take for 50 companies then according to the Markowitz model there as to find out correlation between the each 50 stocks. Earlier it was find to the investor to make a satisfactory profit, but later there comes a problems in data to analysis it, Markowitz tried several times to identify the solution for that problem.

One of the student of Markowitz called William Sharpe helped Markowitz in solving the issue that he had. William Sharp introduced a model called 'Sharpe Single index model' which constituently reduce its data calculation. A well simplify model where the fluctuations in the stock price e of a company in the market are equally inter collected to the fluctuation in

the market index. William Sharpe just connected the individual stock behavior to market index behavior this resulted in reduce paper work and well organized optimal portfolio sharp model is consider as best model investments.

2.2 Elaborate information about the topic

Meaning of Portfolio

Portfolio is the process where the investor gets the clear idea of risk and return by constructing the Optimum portfolio. The portfolio is combination of the return and risk for the securities in the stock market.

Return

Returns that investor gets in stock market.

Risk

Risk is the possible outcomes of the stock that occurs from the actual outcomes and the expected returns.

There are 2 kinds of risk:

- Systematic risk
- Unsystematic risk

Systematic risk - the individual securities where the returns are caused by affecting the market as whole like inflation & market rate changes.

Unsystematic risk - risk which is caused unique to company & company strikes.

2.3 Introduction to Sharpe single index model

An attempt made here is to get a clear view & insight idea which is included in Sharpe's Single index model and to study how to construct optimum portfolio by using this model. NSE nifty is the main indicator of NSE India & it is most be broadly traded exchange in India. NSE nifty is taken as a market performance index and daily closing price is considered in order to comparing with the daily closing price of selected securities, and the closing price is taken from 1st April 2012 to 31st March 2017. This Sharpe index model is formulated here

by using the daily closing price of nifty 50 companies and the daily closing price of nifty index closing price.

Here in this proposed form of calculation formulates a variety of unique cut off rates and helps to select those securities to construct efficient optimal portfolio those securities is having an excess returns to beta ratio is more than that of cut off rate. After this a well proportionate of investment in each securities selected is calculated on the basis of securities beta value, excess return to beta ration, unsystematic risk and cut off rate of each of the assets or securities concerned.

2.4 Steps involved in construction of optimal portfolio

Step 1: Calculation on year on year return.

Step 2: Calculation on expected return and various risk.

Step 3: Examine the best performing stock on various securities raised on their returns & risk and ranking those securities accordingly.

Step 4: Constructing the best performing stocks in portfolio.

Step 5: Determine the cut-off point of stock to choose the best securities.

Step 6: Identifying the best performing securities which results optimum portfolio.

Step 7: Determining securities for the proportion of investment for the identical securities.

2.5 REVIEW OF LITERATURE

Gopalakrishna, Muthu (2014) explains the rational investors about the alternatives in the investment. He tries to compare the traditional and modern portfolio theory. This study aims to test whether SIM provides an explanation of stock return of IT sector. Data was collected from 2004-2008. He used regression on market return and investigated 4 stocks.

Nithya.J (2014) for the large cap companies he constructed an effective portfolio. He calculated the risk and return by using Sharpe index model. He selected 8 stocks from Pharma sector.

Dileep and Rao, Kesava (2013) analyzed applicability, utility of SIM in Indian context. In terms of rate of return he evaluated the performance of the portfolio. He took 30 companies and collected all the necessary data by using secondary sources. As a result only 4 companies were selected for the optimal construction.

Mandal, Niranjan (2013) used 21 stocks from 10 years i.e April - March 2011 the daily prices was collected. Cut-off rate was determined the stocks which was greater than the cut-off rates were selected. The he used different statistical tools, charts and diagram for the better interpretation of the results.

Kumar, Arun and Manjunatha (2013) constructed portfolio using SIM. The data was collected from S&P CNX Nifty for the time period of 5 years. He selected 6 securities out of fifty companies for the optimal portfolio construction. He stated that market index and stock prices move in the same direction.

Nanda, Mahanty and Tiwari (2012) selected some random stocks to build a portfolio, he compared the return with that of the bench mark.

Saravana and Natarajan (2012) calculated the portfolio was 4 companies from NSE and used NSE Nift as market index. He aimed at minimizing the portfolio risk.

Meenakshi and Sarita (2012) stated that Sharpe Single index model is very simple and was easy for the construction of the portfolio.

Debasish, Sataswaroop and Khan, Jakki Samir (2012) a 14^{th} stocks were selected from manufacturing sector like automobile, cement, paints, textiles etc which are traded in NSE. The daily prices of these stocks were collected from Jan 2003 to Nov 2012. He calculated

beta, variance, unsystematic risk and return of each stock. Among 14 selected stocks only 3 stocks were taken for consideration.

Woo Gon Kim, Jun Zhong, Ming-Hsiang Chen &ErsemKaradag (2009) analyzed between 1st Jan 1998 & 31st Dec 2004 the risk adjustment concert of three restaurant segments. As an analytical structure the Jenson, the Treynor and Sharpe index were used. The findings have are not entirely consistent with quick service segment out performs other two segments. As a result restaurants are having much unsystematic risk.

Markus Ebner& Thorsten Neumann (2008) examined differences correlation in derive variance- covariance and stock returns in US by time-varying factor model. The problem can be answered by three approaches, 1. Random walk model, 2. Flexible least squares and 3. Moving window least square model. This study result suggests that time variant estimation is carrying low weight than time-varying estimate and it increases the efficiency and effectiveness of portfolio selection.

Fikriyah Abdullah, Taufiq Hassan and Shamsher Mohamed (2007) analyzed the difference between conventional and Islamic mutual fund performance in Malaysian financial market. In order to achieve the objectives Sharpe's Index, Jenson test and adjusted Sharpe index were used. In the result findings they observed two different performances. In Bullish trend Islamic funds low performed than conventional funds and in bearish market Islamic funds are better than conventional funds.

Kwok Wai Yu, Xiaoqiyang and Hung Wong (2007) analyzed the portfolio management and measures in application with the Sharpe rule. They stated tat for the improvement investment should be made in some other assets. With the help of rule they satisfy the condition stating that the old portfolio can be added with new stocks, where return can be multiplied by the sum of Elasticity of the value of risk.

David Moreno, Paulina Marco and Ignaciolmeda (2005) analyzed investor of portfolio seek to evaluate the portfolio return. This study specially investigates weather Markowitz model is less efficient that Arch-type risk adjusted return model. The same examination is carried down with replica based on Lower Partial Moment (LPM) which takes into account that irregularity in the sharing of takings. No model is efficient in finding out effective average performance. Reward to semi-variance ratio is effective than other variance based replica of portfolio performance.

Zopounidis (1998) examines that study is concerned for the analysis multi criteria in which portfolio selection done accordingly a methodological background: is a conglomerate objective for mathematical programming, heterogeneous attribute.

Doumpos (2000) examines that research study is classified into four basic classes, models which is focusing on perception for securities and for the analysis. For behavior of this study, the models which focuses on rapid spot for the security. The evaluation of securities based on various investor performances in an portfolio.

Ross (1976) studied on the alternative pricing of asset theorem which is called as Arbitrage Pricing Theory (APT). The theory is mainly based on less restrictive assumptions. Under arbitrage condition theory explains that return on any one of the stocks will be related to assets of systematic or risk factor. The portfolio which is having the same risk factor cannot expect the same returns for stocks. Basically APT theory fails to advise the nature of the stock and the number of the factors.

Sahalia& Brandt (2001) explained about the asset allocation of problem in which conditional movements of the portfolio returns are partly predictable. They both explained how the weights of the optimal portfolio depend on predictive variable. optimal portfolio weights they both combine the predictive weights in to Sharpe's single index model. So, that the best time captures differential in the investment decisions.

Detemple, Garcia &Rindisscher (2003) analyzed that the new simulation is based on approach for the construction with allocation of realistic environment of complex dynamic situations for variable state. They also examined for the stocks where the returns of the stocks are predicted with dividend yields, where the investors will be having relative risk on their wealth. They examined the analysis by using BSE Sensex, S&P 500 index as an empirical data for evidence.

Beliakov & Bagirov (2006) studied performance of numeric on various methods for the calculations for the Conditional Values at Risk (CVR) this will carry out evaluation of optimum portfolio for the measurement of risk. They executed that this method for the purpose of the smooth construction of portfolio with efficiently getting the portfolio returns and they also analyzed parallel execution computer based cluster for the method.

Brandt & Clara (2005) studied an approach to dynamic portfolio for selection of that easy for the implementation of the Markowitz paradigm. They widened assets and statistically they optimized the portfolio for space of extent. They reviewed the conditional portfolio and portfolios which are for timing. They decided that portfolio which is managed by static in their choice and the horizons which were for up to five years is for dynamic strategy.

Schaerf (2002) studied the problems related to portfolio selected. Optimum portfolio gives clear picture of returns and gives clear picture of how to balance to investors while investing in various securities. He also determines the constraints for additional cardinality of portfolio and for quantity of individual assets for Markowitz model of seminal mean-variance.

Merton (1980) examines the difficulties which are precisely expected while constructing optimum portfolio for returns of the investors. The investor can assign on the various stocks where the investor gets the maximum returns for their investments with less risk in optimal portfolio, which is governed by government for rate of interest and for risky stocks.

Nawrocki (1990) studied to reward for semi variability ratio to construct, allocation and demonstration of heuristics which could improve the complexity of optimum portfolio for organization to solve the problem which is related to portfolio in an organization. After this study he attempted lot of many approaches for the heuristic techniques drastically none of approaches would match for this portfolio to get maximum and best results for the portfolios.

Eltonetal (1976) he tried to develop successfully an optimum portfolio of heuristic by defining single average correlation coefficient of all correlation coefficients. He always use to manage and obtain the optimized portfolio thus this answer was computationally intensive while satisfying while substituting the portfolios.

Irwin &Landa (1987) they examined that the mixed benefits of portfolio is an alternative class. The very significant justification of portfolio commodity is provides an inflation hedge. Thus the hedging function may be excellent source of diversification portfolio. The situation of inflationary can be characterized with purposeful increase in price of the commodity, the value during such periods will be offered for duration and usually stocks will perform very poorly at the increased inflationary situations.

Finnerty (2000) analyzed that study is related to the high inflationary situation for portfolios in 1970's based on risk, returns of traditional portfolio. Portfolio consists of bonds, securities and stocks with an increased inclusion of the commodities for the allocation of the assets.

Maller, Durand, Jafarpour& Tobin(1958) examined about the Mean- Variance of optimization. Markowitz model presents that the solution for the "black box" is for maximizing the returns for period of risk given. Usually risk is calculated on standard deviation of portfolio where the result is efficient in the frontier for the possible portfolios hyperbola, the portfolio is calculated on each security and result is given for each of the security regarding their risk and other aspects in the construction of portfolio. It is calculated for the risky assets in the optimum portfolio. Portfolio which is having the tangency is expected to get maximum returns for their portfolios in Sharpe's SIM.

TanjaMago.C (2009) this was a technique to solve the issues that are arise on optimum portfolio in constructing the values. The problems that are arise to solve that the new kind of approach were been used to decide the market setting. The theoretically the paper was been done with the experiment, they measures the intervals with the values. By the share ratio to trade off the assessment. It is been estimated that the share ratio developed the approach for the portfolio that maximum ideal ratios was been developed. Thus, the sample distribution was possible in the optimum risk for the trade-off that is constructed from data analysis.

Seegopaul, Hamish, Gupta, Francis, Prestbo and Johan (2005) the researcher analyzed that the greatest arrangements for single index for large cap in the domestic so that the equities are marginal in the difference for the performance that the long period in single index are the significant in its value for the overall plan in the study.

CHAPTER 3

REAEARCH DESIGN

3.1 Topic for the research study

"An Empirical study on constructing optimal equity portfolio using Sharpe's Single Index Model"

3.2 Statement of problem

An investor has faced many problems while choosing the securities from the large number of securities. They do not know how much to invest or at what proportion they need to allocate their investments in different securities. So by using Sharpe Single Index Model Investors get an clear picture of which Stocks is doing well and at what proportion they can invest. The present study entitles "Optimal Portfolio Construction using Sharpe's Single Index Model" for this top 50 stocks from NSE was taken for calculation.

3.3 Need for the study

Every investor goes to confusion as how much to invest and to which stocks to select for his portfolio. To avoid such confusions and difficulties, Sharpe index model is constructed to minimize those attributes by helping investors to build strong portfolio keeping into account of their needs which suits them best. This topic was selected to prove by using SIM investors can easily construct optimal portfolio which has high return with less risk.

3.4 Objective of the study

- To gain knowledge about concept of Single Index Model empirically.
- To get the practical knowledge as to idea embedded in SIM.
- To construct an optimal portfolio of stocks those are listed in NIFTY 50.
- To calculate the risk and return of all stocks.
- To calculate respective proportion for each selected stock to be invested in portfolio.

3.5 Scope of the study

The companies which are restricted are only for top 50 stocks in Nifty. Based on their performance 50 companies are selected from the NSE. The other factors are not for the analysis only the share price of the companies, index values, government securities, rate of return and beta value, residual values and cutoff point are calculated for the analysis of optimal portfolio construction.

3.6 Research methodology

Secondary data is used for study. www.nseindia.com and www.yahoofinance.com were websites in which data was collected. For the current study, Nifty 50 index is considered as Market Index. Weekly NSE indices and prices of all the 50 stocks of Nifty 50 are taken for the period between April 1, 2012 to March 31, 2017.

The steps followed are:

Step 1: Framework for Y-o-Y return on various stocks

Year on year stock is calculated on the selected stocks in financial industry by analyzing the current price divided by the preceding previous years to estimate the percentage of the return for the current financial year.

$$R_i = \frac{P_t - P_{t-1}}{P_{t-1}}$$

R_i=i ᵗ security of stock

P_t=stock of current period

P_{t-1}=stock of preceding period

Step 2: Calculation of the Excess Return to Beta

The relationship between the potential risk and reward ratio is known as excess return. The stocks of expected return and riskless of stocks difference is known as excess return. Based on these excess returns of stocks beta is ranked.

$$\text{Excess return to Beta} = \frac{R_i - R_f}{\beta_i}$$

Ri = return expected for stock i

R_f = 365 days T-bills

β_i = un-diversifiable risk of stock i

Step 3: Calculation of cut-off point

Cut off point is calculated to get the clear picture about the stocks which stock is preferable to invest.

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

$\boldsymbol{\sigma_{ei}^2}$ = residual variance

β = beta value of individual security i

σ_m = risk of market

$R_i - R_f$ = excess return

Step 4: Calculation of Absolute Proportion on Investment

Absolute Proportion helps the investors to determine about the financial performance and the valuation of business. Absolute value tries to know the companies intrinsic worth for the projected flows of the cash.

$$Z_i = \frac{\beta_i}{\sigma_{ei}^2}\left(\left(\frac{R_i - R_f}{\beta_i}\right) - C^*\right)$$

β_i = beta value of individual security

σ_{ei} = residual variance / unsystematic risk

R_i = rate of return

R_f =365 days T-bills

Step 5: Calculation of Relative Proportion on Investment

Constant mix of investments means bringing the portfolios which are deviated away from the allocation of asset from the line. This process is usually done like buying the assets which are underweight and selling the assets which are overweight is known as relative proportion.

$$X_i = \frac{Z_i}{\sum_{i=1}^{N} Z_i}$$

Z_i = Absolute proportion

$\sum_{i=1}^{N} Z_i$ = Total of selected variance

3.7 Limitations of the study

- This study is not appropriate for short term investors.
- The data collected is secondary data, which may include lack of accurate information.
- Only Risk and Return calculation done for the future outcomes.
- The data closing price of the securities is considered only for 5 years, which may not give exact impact.
- All the calculations could not be brought into the report.

CHAPTER 4

DATA ANAYSIS AND INTERPRETATION

Table 4.1 : Shows descriptive statistics of top 50 nifty stocks

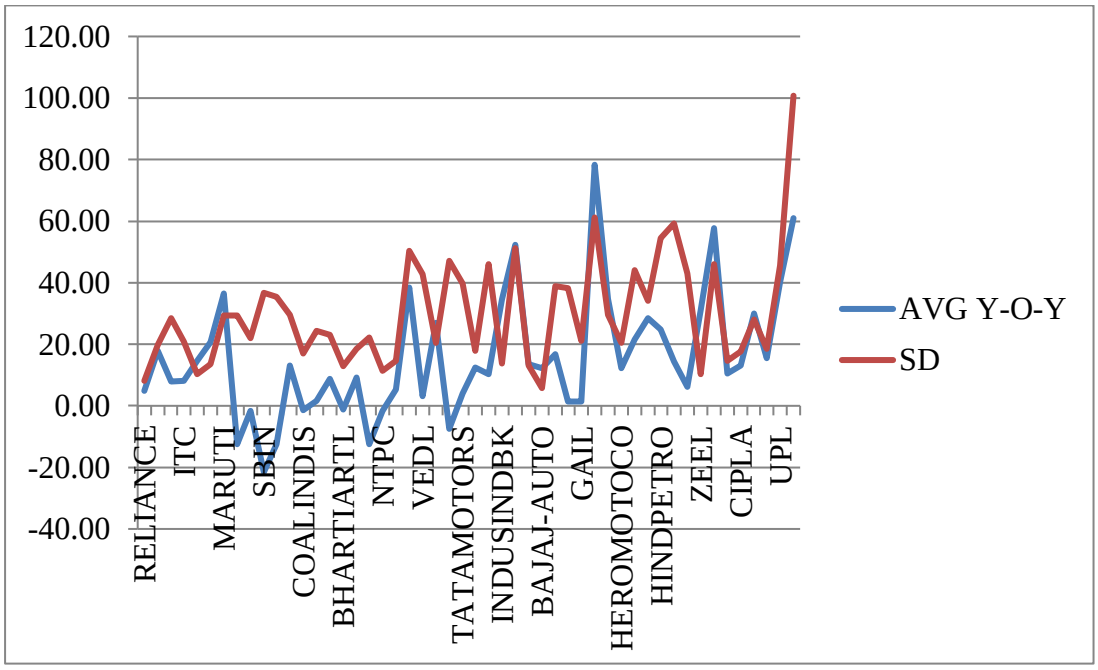
CO CODE	AVG Y-O-Y	SD	BETA	σ^2_{ei}
RELIANCE	4.86	8.08	0.42	37.13
TCS	17.94	19.92	0.82	287.19
HDFCBANK	7.82	28.44	1.08	618.57
ITC	8.02	20.9	0.81	431.61
HDFCBANK	14.59	10.2	0.75	13.64
HINDUNILVR	20.66	13.47	0.31	166.15
MARUTI	36.43	29.36	1.97	234.53
INFY	-12.38	29.4	1.03	694.25
ONGC	-1.66	21.91	1.5	114.11
SBIN	-21.55	36.63	1.12	1140.15
ICICIBANK	-12.52	35.41	1.33	966.47
KOTAKBANK	13.11	29.57	1.92	278.88
COALINDIS	-1.43	17.01	1.1	94.63
LT	1.69	24.47	1.62	171.4
IOC	8.81	23.05	1.3	257.61
BHARTIARTL	-1.20	12.79	0.71	81.66
SUNPHARMA	9.29	18.47	0.05	340.86

AXISBANK	-12.40	22.23	-0.25	484.11
NTPC	-1.63	11.38	0.14	126.26
WIPRO	5.41	14.53	0.86	90.60
HCLTECH	38.49	50.29	1.32	2248.40
VEDL	3.05	42.76	1.96	1204.98
ULTRACEMCO	27.00	20.57	0.66	352.30
ASIANPAINT	-7.44	47.15	-2.91	854.53
TATAMOTORS	4.04	39.72	2.11	856.34
POWERGRID	12.34	17.77	0.83	204.50
BPCL	10.22	46.01	2.57	1049.47
INDUSINDBK	34.54	13.73	0.82	78.69
BAJFINANCE	52.35	51.22	1.74	2131.60
M&M	13.54	13.03	1.01	5.93
BAJAJ-AUTO	12.16	5.76	0.27	21.12
ADANIPORTS	16.75	38.99	2.88	177.58
TATSTEEL	1.47	38.19	1.81	929.44
GAIL	1.32	21.15	1.30	173.42
EICHERMOT	78.32	61.24	4.51	446.10
YESBANK	34.78	29.49	1.33	583.26
HEROMOTOCO	12.13	20.53	1.35	125.77

INFRATEL	21.58	44.17	2.09	1245.49
BOSCHLTD	28.52	34.04	2.30	298.87
HINDPETRO	24.75	54.49	2.88	1626.35
TECHM	14.34	59.24	2.97	2077.21
HINDALCO	6.10	43.04	1.95	1237.49
ZEEL	31.02	10.20	0.00	103.97
IBULHSGFIN	57.77	46.07	2.17	1357.36
AMBUJACEM	10.54	14.57	0.70	133.71
CIPLA	13.21	17.73	0.97	162.93
LUPIN	29.99	28.08	1.10	591.20
DRREDDY	15.50	18.47	0.55	291.59
UPL	40.08	45.63	2.94	685.19
AUROPHARAM	61.03	100.75	7.46	1132.26

Source: Compiled from scholars own calculation.

Graph 4.1: shows the descriptive statistics of the stocks.



INTERPRETATION:

1. By above data, we can say that company that yields the highest return is EICHER Ltd and company with lowest return is STATE BANK OF INDIA.
2. Beta value of an industry indicates the relationship of company with that of market. Securities whose beta values are greater than 1 are highly sensitive. Higher Beta value of AUROBINDO PHARMA Ltd indicate a greater volatility than the index while on the other side negative Beta value of ASIAN PAINTS Ltd indicates an inverse relationship of the company with the market.
3. Standard deviation measures risk of the stock. From the above calculation, the risk associated with AUROBINDO PHARMA Ltd is higher than any other companies while BAJAJ AUTO Ltd has the lowest risk associated.
4. Residual variance shows difference between return companies and market, HCL TECHNOLOGIES Ltd has highest residual variance indicating that return of the company and the market is highest for company. While on the other side, MAHINDRA AND MAHINDRA Ltd has lowest indicating that it least deviates from the market.

Table 4.2: Determination of excess return and ranking the stocks.

CO CODE	**AVG Y-O-Y**	**365 DAYS T-BILLS**	**EXCESS RETURN**	**EXCESS RETURN TO BETA**	**RANK**
RELIANCE	4.86	7.86	-3.00	-7.14	44
TCS	17.94	7.86	10.08	12.29	16
HDFCBANK	7.82	7.86	-0.04	-0.04	35
ITC	8.02	7.86	0.16	0.20	34
HDFCBANK	14.59	7.86	6.73	8.97	18
HINDUNILVR	20.66	7.86	12.80	41.29	3
MARUTI	36.43	7.86	28.57	14.50	14
INFY	-12.38	7.86	-20.24	-19.65	48
ONGC	-1.66	7.86	-9.52	-6.35	43
SBIN	-21.55	7.86	-29.41	-26.26	49
ICICIBANK	-12.52	7.86	-20.38	-15.32	47
KOTAKBANK	13.11	7.86	5.25	2.73	30

COALINDIS	-1.43	7.86	-9.29	-8.45	45
LT	1.69	7.86	-6.17	-3.81	41
IOC	8.81	7.86	0.95	0.73	33
BHARTIARTL	-1.20	7.86	-9.06	-12.75	46
SUNPHARMA	9.29	7.86	1.43	31.81	5
AXISBANK	-12.40	7.86	-20.26	81.58	2
NTPC	-1.63	7.86	-9.49	-67.93	50
WIPRO	5.41	7.86	-2.45	-2.85	39
HCLTECH	38.49	7.86	30.63	23.28	8
VEDL	3.05	7.86	-4.81	-2.45	38
ULTRACEMCO	27.00	7.86	19.14	28.95	6
ASIANPAINT	-7.44	7.86	-15.30	5.27	26
TATAMOTORS	4.04	7.86	-3.82	-1.81	37
POWERGRID	12.34	7.86	4.48	5.41	25

BPCL	10.22	7.86	2.36	0.92	32
INDUSINDBK	34.54	7.86	26.68	32.43	4
BAJFINANCE	52.35	7.86	44.49	25.55	7
M&M	13.54	7.86	5.68	5.65	23
BAJAJ-AUTO	12.16	7.86	4.30	15.75	12
ADANIPORTS	16.75	7.86	8.89	3.09	29
TATSTEEL	1.47	7.86	-6.39	-3.54	40
GAIL	1.32	7.86	-6.54	-5.03	42
EICHERMOT	78.32	7.86	70.46	15.61	13
YESBANK	34.78	7.86	26.92	20.25	10
HEROMOTOCO	12.13	7.86	4.27	3.16	28
INFRATEL	21.58	7.86	13.72	6.58	21
BOSCHLTD	28.52	7.86	20.66	8.97	19
HINDPETRO	24.75	7.86	16.89	5.87	22

TECHM	14.34	7.86	6.48	2.18	31
HINDALCO	6.10	7.86	-1.76	-0.91	36
ZEEL	31.02	7.86	23.16	21267.12	1
IBULHSGFIN	57.77	7.86	49.91	22.97	9
AMBUJACEM	10.54	7.86	2.68	3.85	27
CIPLA	13.21	7.86	5.35	5.53	24
LUPIN	29.99	7.86	22.13	20.05	11
DRREDDY	15.50	7.86	7.64	13.82	15
UPL	40.08	7.86	32.22	10.98	17
AUROPHARAM	61.03	7.86	53.17	7.13	20

Source: compiled from scholars own calculation.

INTERPRETATION:

From above calculation, the 365 days T-bills for the above calculation is 7.86 and it remains constant for all companies. The company that yields the highest return is EICHER MOTORS Ltd and company with lowest return is STATE BANK OF INDIA Ltd. Based on Excess return to Beta ZEE ENTERTAINMENT ENTERPRISES Ltd takes the first rank, followed by AXIS BANK Ltd which takes the second rank, HINDUSTAN UNILEVER Ltd in the third rank, INDUSIND BANK Ltd which takes fourth rank, SUN PHARMACEUTICAL INDUSTRIES Ltd in the fifth rank, followed by all the other companies. INFOSYS Ltd takes

forty eighth ranks, followed by STATE BANK OF INDIA Ltd in the forty ninth rank and the last rank that is fifty ranks goes to NTPC ltd.

Table 4.3: Determination of the Cut-off point.

Ranked companies	**$((R_i-R_f)*b)/RV$**	**Cum.**	**B^2/RV**	**Cum.**	**Cut-off Point**
ZEEL	0.0002	0.0002	0.00	0.00	0.03611
AXISBANK	0.0100	0.0103	0.0001	0.0001	1.63298
HINDUNILVR	0.0239	0.0341	0.0006	0.0007	4.97370
INDUSINDBK	0.0002	0.0343	0.0000	0.0007	4.99478
SUNPHARMA	0.2787	0.3130	0.0086	0.0093	20.24842
ULTRACEMCO	0.0358	0.3488	0.0012	0.0105	20.89614
BAJFINANCE	0.0363	0.3851	0.0014	0.0119	21.26247
HCLTECH	0.0179	0.4031	0.0008	0.0127	21.34516
IBULHSGFIN	0.0799	0.4829	0.0035	0.0162	21.59907
YESBANK	0.0609	0.5438	0.0030	0.0192	21.45659
LUPIN	0.0413	0.5851	0.0021	0.0212	21.35187
BAJAJ-AUTO	0.0554	0.6405	0.0035	0.0247	20.72241

EICHERMOT	0.7130	1.3534	0.0457	0.0704	17.67265
MARUTI	0.2400	1.5934	0.0165	0.0870	17.10938
DRREDDY	0.0145	1.6079	0.0010	0.0880	17.07280
TCS	0.0288	1.6367	0.0023	0.0904	16.95678
UPL	0.1378	1.7745	0.0125	0.1029	16.27214
HDFCBANK	0.1592	1.9336	0.0177	0.1206	15.25182
BOSCHLTD	0.3701	2.3037	0.0412	0.1619	13.71083
AUROPHARAM	0.3498	2.6535	0.0490	0.2109	12.22593
INFRATEL	0.0230	2.6765	0.0035	0.2144	12.13646
HINDPETRO	0.0298	2.7063	0.0051	0.2194	11.99608
M&M	0.9588	3.6651	0.1687	0.3881	9.29493
CIPLA	0.0317	3.6968	0.0057	0.3939	9.24109
POWERGRID	0.0182	3.7150	0.0034	0.3972	9.20929
ASIANPAINT	0.0520	3.7670	0.0099	0.4071	9.11508
AMBUJACEM	0.0139	3.7809	0.0036	0.4107	9.06948

HEROMOTOCO	0.0458	3.8267	0.0145	0.4252	8.87106
ADANIPORTS	0.1440	3.9707	0.0466	0.4718	8.30719
KOTAKBANK	0.0361	4.0068	0.0132	0.4850	8.15722
TECHM	0.0093	4.0161	0.0043	0.4893	8.10593
BPCL	0.0058	4.0219	0.0062	0.4955	8.01652
IOC	0.0048	4.0267	0.0066	0.5021	7.92248
ITC	0.0003	4.0270	0.0015	0.5036	7.89944
HDFCBANK	-0.0001	4.0269	0.0019	0.5055	7.87020
HINDALCO	-0.0028	4.0241	0.0030	0.5085	7.81832
TATAMOTORS	-0.0094	4.0148	0.0051	0.5137	7.72285
VEDL	-0.0078	4.0069	0.0032	0.5169	7.66076
WIPRO	-0.0233	3.9837	0.0082	0.5250	7.49919
TATSTEEL	-0.0124	3.9712	0.0035	0.5285	7.42681
LT	-0.0583	3.9129	0.0153	0.5439	7.11404
GAIL	-0.0490	3.8639	0.0097	0.5536	6.90261

ONGC	-0.1251	3.7388	0.0197	0.5733	6.45179
RELIANCE	-0.0339	3.7048	0.0048	0.5781	6.34126
COALINDIS	-0.1080	3.5968	0.0128	0.5909	6.02457
BHARTIARTL	-0.0788	3.5181	0.0062	0.5970	5.83234
ICICIBANK	-0.0280	3.4900	0.0018	0.5989	5.76834
INFY	-0.0300	3.4600	0.0015	0.6004	5.70430
SBIN	-0.0289	3.4311	0.0011	0.6015	5.64643
NTPC	-0.0098	3.4213	0.0001	0.6016	5.62911

Source: Compiled from scholars own calculation.

INTERPRETATION

From above calculation we derive certain conclusions

Firstly calculation of absolute return of all fifty companies was done from which cumulative value of absolute return was drawn. In the next stage we calculated for all fifty companies from which cumulative values were derived. Lastly with help of above calculations cutoff point was derived which helped us in knowing the most eligible companies.

The Ci value is 21.59907 the stocks which are above the cut-off rate are taken for calculation and below it are not considered.

Table 4.4: identification of stocks Constitutes Optimum Portfolio

SL.NO	**Company Name**
1	ZEEL

2	AXIS BANK
3	HINDUNILVR
4	INDUSINDBK
5	SUNPHARMA
6	ULTRACEMCO
7	BAJFINANCE
8	HCLTECH
9	IBULHSGFIN

Source: Compiled from Scholars own calculation.

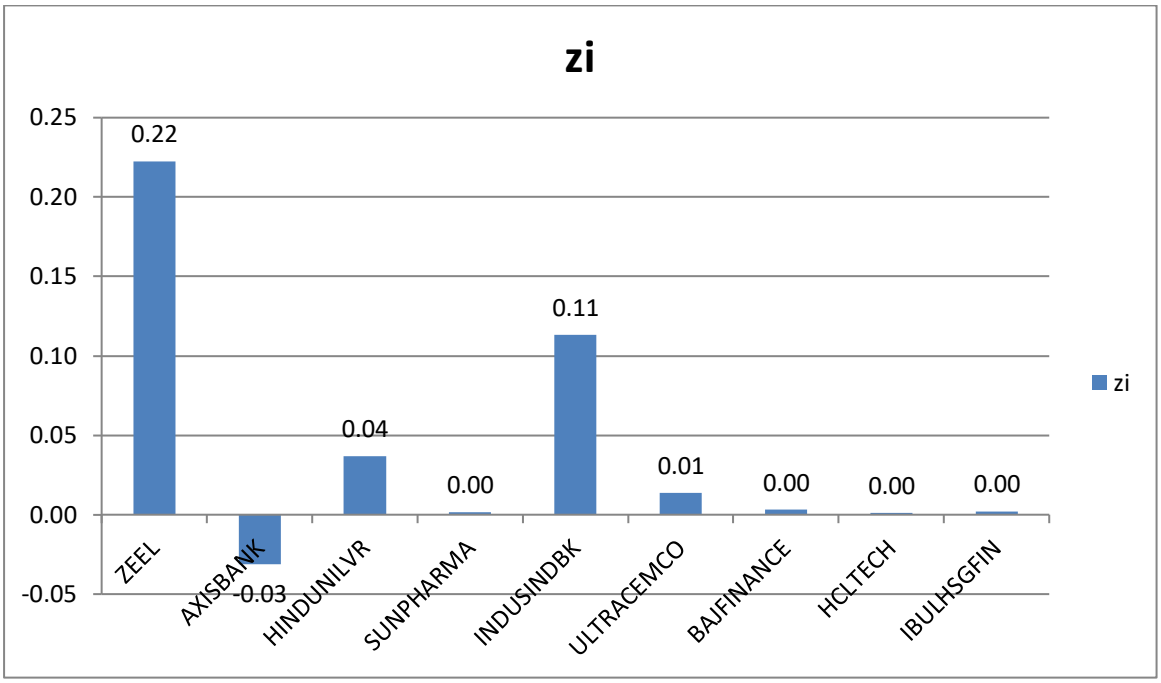
From table shows the list of nine companies eligible for the Construction of optimal portfolio. The nine companies are selected with the help of return and risk.

Table 4.5: Determination on Absolute Proportion on Investment.

Sl no	Company name	Zi
1	ZEEL	0.22
2	AXISBANK	-0.03
3	HINDUNILVR	0.04
4	SUNPHARMA	0.00
5	INDUSINDBK	0.11
6	ULTRACEMCO	0.01
7	BAJFINANCE	0.00
8	HCLTECH	0.00
9	IBULHSGFIN	0.00

Source: Compiled from scholar own calculation.

Graph 4.5: Graph showing the Absolute proportion



The table shows a list of nine companies for which absolute proportion on investment has been calculated. Absolute proportion helps investors to estimate performance of various stocks which are selected for construction of portfolio. Usually absolute proportion tries to vary with the companies intrinsic values of cash. Zee Entertainment Enterprises Ltd has got highest proportion for the stock of 0.2226 followed by IndusInd Bank Ltd which has 0.11, Hindustan Unilever Ltd with 0.04, Ultracemco has got 0.01 subsequent to sunpharma, bajajfinance, Hcltech, India bulls housing finance. Axis bank ltd has got least proportion of stock in selected portfolios i.e -0.03.

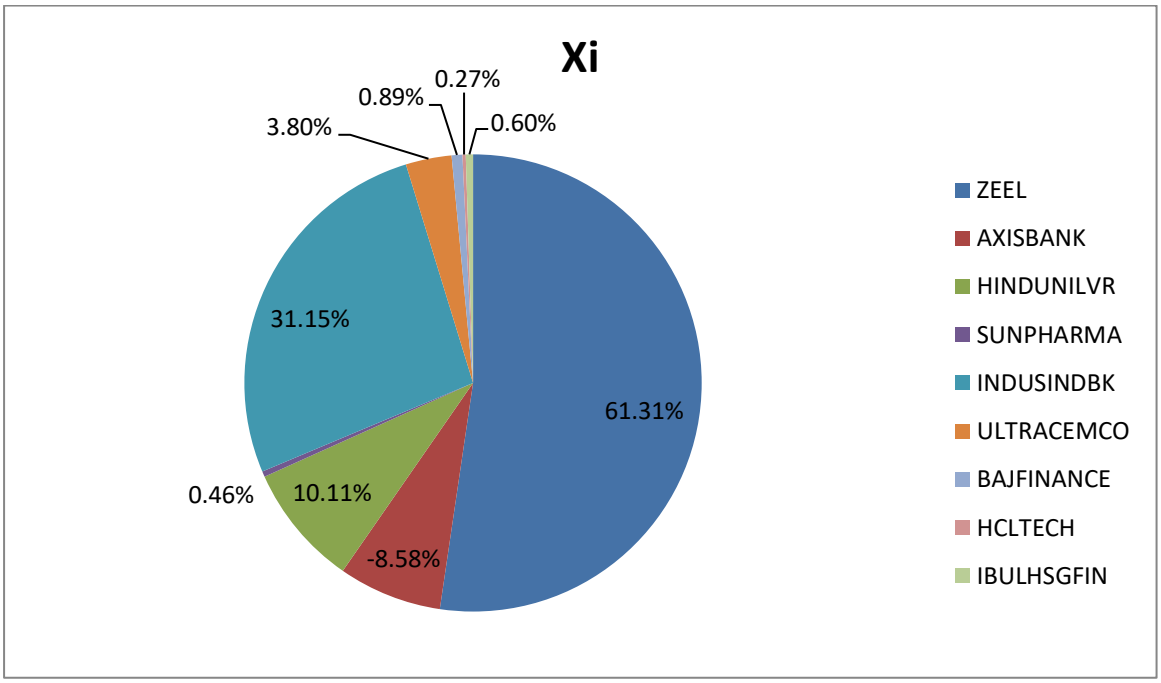
Table 4.6: Determination on Relative Proportion on Investment

Sl no	Company name	xi
1	ZEEL	61.31%
2	AXISBANK	-8.58%
3	HINDUNILVR	10.11%
4	SUNPHARMA	0.46%

5	INDUSINDBK	31.15%
6	ULTRACEMCO	3.80%
7	BAJFINANCE	0.89%
8	HCLTECH	0.27%
9	IBULHSGFIN	0.60%

Source: Compiled from Scholars own calculation.

Graph4.6: Graph showing relative proportion of investment.



The above graph contains a list of nine companies and its Relative proportion on Investment. Zee Entertainment Enterprises Ltd has highest volatility of relative proportion on investment i.e 61.31% followed by IndusInd Bank Ltd with 31.15% and the investments proportion to be made in HUL, Ultra Cements, Bajaj Finace, Indiabulls, Sunpharma are 10.11%, 3.80%, 0.89%, 0.60%, 0.46%, 0.27%. Since Axis bank Ltd has got less volatility of relative proportion on investment it is suggested not to make investment on this stock.

CHAPTER 5

FINDINGS, SUGGESTIONS AND CONCLUSIONS

5.1 FINDINGS

- It is estimated that the EICHER MOTORS Ltd has got highest return of 78.31 compared to all other 50 companies which are selected from NSE Nifty for Construction of Portfolio.
- AUROBINDO PHARMA Ltd has highest volatile of stock due to systematic risk β=7.45, say ASIAN PAINTS Ltd has low volatile of stock due to systematic risk β<1.
- HCL TECHNOLOGIES Ltd which comes under IT software has highest risk 2248.483 and MAHINDRA & MAHINDRA Ltd has lowest risk of 5.927.
- Standard deviation measures the investors volatility of annual stock of returns AUROBINDO PHARMA Ltd has high volatility of stock SD=100.75 comparatively low volatility of stock SD=5.76 of BAJAJ AUTO Ltd.
- The 365 days T-Bills are selected from Reserve Bank of India i.e 7.86% for calculating excess return of stock.
- In present study we found that ZEE ENTERTAINMENT ENTERPRISES Ltd, AXIS BANK Ltd and HINDUSTAN UNILEVER Ltd are stocks which have high positive excess return to beta ratio. It defines that these are the good companies to track investment.
- For construction of optimal portfolio 50 companies was taken from NSE website and Zee Entertainment Ltd as ranked the first rank to invest.
- For optimal portfolio construction 50 companies are selected from NSE website and 9 companies are preferable for construction of the portfolio.
- The absolute proportion on investment of preferable stock for construction of portfolio which has highest volatility is Zee Entertainment Enterprises Ltd 0.2226.
- In relative proportion of investment Zee Entertainment yields the highest rate of percent 61.31% for investing followed by the IndusInd Bank ltd 10.11%.

5.2 SUGGESTIONS

- According to the study ZEE ENTERTAINMENT ENTERPRISES Ltd has a highest proportion of investment in the constructed portfolio i.e 61.31%. in order to earn maximum return the investors can invest maximum money in the ZEE ENTERTAINMENT stock.
- During this study period investors are asked to ignore INFOSYS, ONGC, SBIN, ICICIBANK, COAL INDIA, BHARTI AIRTEL, AXIS BANK, NTPC, ASIAN PAINT as it yields negative returns.
- The suggestions and recommendations are purely based on Sharps Single Index Model where to advise for the investors which one is preferable to purchase or sell the securities.

5.3 CONCLUSIONS

Study adopts an empirical research design to build optimal portfolio with leverage of Sharpe Single Index Model, preliminarily the stocks or companies are selected from the constituents of Nifty 50.

Portfolio Management helps investor to get clear picture about return and risk it also helps investors to know which stock is preferable and which stock is having less risk.

Based on this 9 companies were selected for construction of optimal portfolio says that Zee Entertainment, Hindustan Unilever, Sun Pharma, IndusInd bank, Ultra Cements, Bajaj Finance, HCL Technologies and India Bulls Housing Finance.

This diversification of investment helps the investors to achieve highest portfolio return at the low risk and Sharpe Index Model helps the investors to select securities for Construction of Optimal Portfolio.

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ANNEXURE

Yearly Returns of top Nifty Fifty Companies

SL NO	COMPANY NAME	2012-13	2013-14	2014-15	2015-16	2016-17
	NIFTY	5.29	8.86	32.58	0.21	5.48
1	RELIANCE	-5.70	7.32	13.25	-1.33	10.77
2	TCS	15.46	44.71	30.90	0.59	-1.97
3	HDFCBANK	-40.16	9.06	35.05	17.03	18.10
4	ITC	34.96	21.80	7.55	-8.77	-15.43
5	HDFCBANK	10.92	9.99	32.55	12.21	7.26
6	HINDUNILVR	38.65	20.56	26.93	14.56	2.63
7	MARUTI	15.44	18.26	86.22	39.51	22.72
8	INFY	-8.94	22.87	-1.04	-57.69	-17.11
9	ONGC	2.61	4.81	27.68	-31.58	-11.82
10	SBIN	1.43	-16.79	-7.76	-85.70	1.08
11	ICICIBANK	8.41	4.68	5.16	-75.16	-5.69
12	KOTAKBANK	28.88	16.08	52.16	-20.49	-11.09
13	COALINDIS	-1.96	-17.55	26.62	-2.36	-11.89
14	LT	-1.18	-23.93	42.38	-5.24	-3.57
15	IOC	-10.09	-12.83	43.97	16.47	6.52
16	BHARTIARTL	-19.01	4.75	15.16	-0.03	-6.86
17	SUNPHARMA	36.53	5.25	11.00	8.97	-15.28
18	AXISBANK	3.48	3.26	-26.51	-44.87	2.63
19	NTPC	-8.43	-11.88	2.01	-6.41	16.54

20	WIPRO	-3.16	18.71	22.98	-1.48	-10.02
21	HCLTECH	29.76	80.79	48.71	-43.36	76.54
22	VEDL	-23.11	-4.27	40.43	-49.75	51.94
23	ULTRACEMCO	53.05	4.86	42.53	10.46	24.08
24	ASIANPAINT	33.86	-52.38	-64.87	24.40	21.79
25	TATAMOTORS	-52.13	24.22	46.85	-20.50	21.76
26	POWERGRID	9.86	-10.07	32.90	1.81	27.22
27	BPCL	-24.63	-23.59	80.26	34.08	-15.01
28	INDUSINDBK	35.43	18.21	56.02	33.30	29.73
29	BAJFINANCE	66.08	22.67	104.90	88.78	-20.69
30	M&M	12.16	12.60	35.32	1.28	6.36
31	BAJAJ-AUTO	15.42	7.57	17.80	4.53	15.48
32	ADANIPORTS	-11.66	17.89	83.00	5.08	-10.58
33	TATSTEEL	-17.44	-19.56	39.13	-39.90	45.10
34	GAIL	-15.82	-5.19	29.16	-19.07	17.53
35	EICHERMOT	58.82	70.15	183.09	57.10	22.42
36	YESBANK	33.73	-5.48	68.73	20.04	56.85
37	HEROMOTOCO	-1.83	0.77	42.43	-5.05	24.33
38	INFRATEL		-15.73	76.73	37.78	-12.45
39	BOSCHLTD	24.91	1.52	86.25	24.79	5.16
40	HINDPETRO	-8.29	-22.83	105.47	56.35	-6.97
41	TECHM	31.69	65.50	61.47	-76.73	-10.22
42	HINDALCO	-25.34	-6.81	45.15	-39.81	57.29

43	ZEEL	42.01	41.05	27.42	18.44	26.18
44	IBULHSGFIN			105.47	54.32	13.52
45	AMBUJACEM	24.73	-2.95	26.07	-4.39	9.23
46	CIPLA	15.65	11.14	36.98	15.11	-12.84
47	LUPIN	25.83	47.22	55.65	37.38	-16.13
48	DRREDDY	9.89	35.21	26.83	18.51	-12.92
49	UPL	-16.15	30.47	111.14	40.01	34.96
50	AUROPHARAM	5.42	91.13	224.52	5.32	-21.27

ACHARYA

ACHARYA INSTITUE OF TECHNOLOGY

DEPARTMENT OF MBA

PROJECT WORK WEEKLY REPORT

Name of the Student : Navyashree D

Internal guide : Mallika B K

USN No : 1AZ16MBA43

Specialization : Finance and Marketing

Title of the Project: A study on "Construction of Optimal Portfolio Using Single Index Model"

Company Name: Karvy Stock Broking Ltd

Week	Work Undertaken	External Guide Signature	Internal Guide Signature
15-01-18 to 19-01-18	Introduction about Karvy Stock Broking Ltd and its operations		
22-01-18 to 26-01-18	Learning about different operations and products by Karvy		
29-01-18 to 02-02-18	Orientation and gathering information about the growth of Karvy		
05-02-18 to 09-02-18	Analysis of market position of the Karvy		
12-02-18 to	Research problem		

KARVY STOCK BROKING LTD

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16-02-18	identification		
19-02-20 to 23-02-18	Preparation of the research instrument for data collection		
26-02-18 to 02-03-18	Theoretical background of the study		
05-03-18 to 09-03-18	Data collection and data analysis		
12-03-18 to 16-03-18	Interpretation of the data gathered during the survey		
19-03-18 to 24-03-18	Final report preparation and submission		

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