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CONTRIBUTIONS TO BOOKS

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JOURNAL AND OTHER ARTICLES

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

CONFERENCE PAPERS

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AN EMPIRICAL STUDY ON CONSTRUCTION OF OPTIMUM PORTFOLIO USING HARRY MARKOWITZ MODEL: A CASE STUDY WITH SPECIAL REFERENCE TO S&P CNX NIFTY COMPANIES

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ABSTRACT

A Portfolio is a combination of different investment assets mixed and matched for the purpose of achieving an investor's goal. A portfolio is a professional way to display projects and prevents them from getting lost, dirty or damaged. The key to creating an efficient portfolio is reaching desired goal by using as little resources as possible. The ideal investment is to pick a low risk stock in hopes of big returns. That is nearly impossible. In the game of investing, high risk equals high return and vice versa. Harry Markowitz's Modern Portfolio Theory explains that by diversification the potential risk can be dispersed throughout portfolio. This means balance a high risk stock with a low risk stock, as well as investing in different sectors. The paper is to empirically study An Empirical Study on construction of Optimum portfolio using Harry Markowitz Model. The study is analytical in nature and used secondary data analysis to attain its objectives. The secondary data consists of the annual reports of S&P CNX Nifty of 50 companies covering the last five years from 2008-09 to 2012-13. Various other reports like magazines, journals, published books and official websites are also referred to for the present study. The statistical tools applied for data analysis in the present study are Percentages, Simple Average, Weighted Averages, Variance, Standard Deviation, Covariance, Coefficient of Variation, ratios, portfolio return and portfolio variance. The result depicts that optimum portfolio containing Asian Paints, Bajaj Auto, Dr. Reddy' Lab., HUL, TCS, and BPCL can be built.

KEYWORDS

EVA (Economic Value Added), MVA (Market Value Added), ROE (Return on Equity).

INTRODUCTION

Portfolio is a combination of different investment assets mixed and matched for the purpose of achieving an investor's goal. A portfolio is a professional way to display projects and prevents them from getting lost, dirty or damaged. The key to creating an efficient portfolio is reaching desired goal by using as little resources as possible. The ideal investment is to pick a low risk stock in hopes of big returns. That is nearly impossible. In the game of investing, high risk equals high return and vice versa. Harry Markowitz's Modern Portfolio Theory explains that by diversification the potential risk can be dispersed throughout portfolio. This means balance a high risk stock with a low risk stock, as well as investing in different sectors.

Here is a right way and a wrong way to build a securities portfolio. Like horse racing, where you may do well short term by picking horses by the color of their silks. Share market is an arena which fascinates each and every individual who is craving for more money. Trading in stocks is quiet simple; an investor has to possess some basic knowledge of the security that he will be trading.

Building a portfolio is not as simple as putting random pieces of work into a folder, and requires time, thought and organization. Building a stock portfolio is very difficult to do because it takes a lot of study. But, in the end, the ability of the stock market to grow over time will most likely lead to reaching goals. This ensures people who view portfolio can see talents instantly and are more likely to be impressed by what they see.

CONCEPTUAL FRAMEWORK OF PORTFOLIO

Globalization of the financial market has led to a manifold increase in investment. New markets have been opened; new instruments have been developed and new services have been launched. India has a well-established capital market mechanism where in effective and efficient transfer of money capital or financial resources from the investing class to the entrepreneur class in the private and public sector of the economy occurs. The numbers of acts are passed to boost the revolutionary change.

Investment means buying securities or other monetary or paper (financial) assets in the money markets or capital markets, or in fairly liquid real assets, such as gold as an investment, real estate, or collectibles. Valuation is the method for assessing whether a potential investment is worth its price. These investments assets are then expected to provide income or positive future cash flows, but may increase or decrease in value giving the investor capital gains or losses.

"Portfolio is a combination of securities such as stocks, bonds and money market instruments. The process of blending together the broad asset classes so as to obtain optimum return with minimum risk is called portfolio construction". A Large numbers of portfolios can be formed from a given set of assets. Each portfolio has risk return characteristics of its own. Portfolio theory originally developed by Harry Markowitz shows that portfolio risk, unlike portfolio return, is more than a simple aggregation of the risk of individual assets. This depends on the interplay between the returns on assets comprising the portfolio. As investors construct a portfolio of investment rather than invest in a single asset. This section extends the analysis of risk and return associated with portfolio investments.

Diversification of investments helps to spread risk over many assets. A diversification of securities gives the assurance of obtaining the anticipated return on the portfolio. In a diversified portfolio some securities may not perform as expected, but others may exceed the expectation and making the actual return of the portfolio reasonably close to the anticipated one. Keeping a portfolio of a single security may lead to a greater likelihood of the actual return somewhat different from that of the expected return. Hence, it is a common practice to diversify securities in the portfolio.

RISK AND RETURN OF PORTFOLIO

PORTFOLIO EXPECTED RETURN

The expected rate of return on a portfolio is the weighted average of the expected/average rates of return on assets comprising the portfolio. The weights, which add up to 1, reflect the fraction of total rate of return on each assets and the relative share of each asset in the portfolio. Symbolically the expected return for an-asset portfolio is defined by

$$E(rp) = \sum w_i E(ri) \text{ or } AR(rp) = \sum w_i AR(ri)$$

Where

$$E(rp) \text{ or } AR(rp) = \text{Expected/ average return from portfolio}$$

$$w_i = \text{Proportion invested in asset}$$

$E(r_i)/AR(r_i)$ = Expected/ average return for asset

PORTFOLIO RISK (TWO ASSETS PORTFOLIO)

Total risk is measured in terms of variance (σ^2 pronounced sigma square) or standard deviation (σ pronounced sigma) of returns. Unlike portfolios expected return, portfolio variance (or standard deviation) is not the weighted average of variance (or standard deviation) of returns on individual assets (securities) in the portfolio. The overall risk of the portfolio includes the interactive risk of an asset relative to the others, measured by the covariance of returns. The covariance, in turn, depends on the **correlations** between returns on assets in the portfolio. The minimum Variance portfolio is also called the **optimum portfolio**. However, investors do not necessarily strive for the minimum variance portfolio. A risk-averse investor will have a trade-off between risk and return. The choice of a particular portfolio will depend on risk preference. General formula for estimating optimum weights of two securities X and Y so that the portfolio variance is minimum:

$$W^* = \frac{\sigma_y^2 - \text{COV}_{xy}}{\sigma_x^2 + \sigma_y^2 - 2\text{COV}_{xy}}$$

Where W^* is the optimum portion of investment in security X. Investment in Y will be:

$$1 - W^*$$

The total risk of a portfolio made up of two assets:

$$\sigma_p^2 = (w_1 \cdot \sigma_1)^2 + (w_2 \cdot \sigma_2)^2 + 2 w_1 \cdot w_2 (r_{12} \cdot \sigma_1 \sigma_2)$$

The total risk of a portfolio made up of six assets:

$$\sigma_p^2 = (w_1 \cdot \sigma_1)^2 + (w_2 \cdot \sigma_2)^2 + (w_3 \cdot \sigma_3)^2 + (w_4 \cdot \sigma_4)^2 + (w_5 \cdot \sigma_5)^2 + (w_6 \cdot \sigma_6)^2 + 2 w_1 \cdot w_2 (\text{Cov}_{.12}) + 2 w_1 \cdot w_3 (\text{Cov}_{.13}) + 2 w_1 \cdot w_4 (\text{Cov}_{.14}) + 2 w_1 \cdot w_5 (\text{Cov}_{.15}) + 2 w_1 \cdot w_6 (\text{Cov}_{.16}) + 2 w_2 \cdot w_3 (\text{Cov}_{.23}) + 2 w_2 \cdot w_4 (\text{Cov}_{.24}) + 2 w_2 \cdot w_5 (\text{Cov}_{.25}) + 2 w_2 \cdot w_6 (\text{Cov}_{.26}) + 2 w_3 \cdot w_4 (\text{Cov}_{.34}) + 2 w_3 \cdot w_5 (\text{Cov}_{.35}) + 2 w_4 \cdot w_5 (\text{Cov}_{.45}) + 2 w_4 \cdot w_6 (\text{Cov}_{.46})$$

STATEMENT OF THE PROBLEM

One aspect of financial engineering is the development of portfolio management strategies. Portfolio Construction is one of the important components of Portfolio management. It is vital task which requires skill of analytical bent of mind with adequate knowledge. It is a complex process passing through various phases, the most important being selection of securities. While selecting securities, the various parameters are considered, the most significance is objectives of investors. Keeping in view adequate diversification in portfolio, principle of dominance – maximum return with given level of risk and minimum risk with given level of return – is followed. Obviously, diversification/the asset allocation process refers to the process of investing money in different financial assets. Different stages of the asset allocation process, e.g., strategic and tactical asset allocation are described. Asset allocation process is an iterative process since a continuous monitoring of the portfolio characteristics is essential. There is no generally accepted methodology for this problem.

The first step of the elaboration of an asset allocation strategy is the definition of the risk measure. However, not all risk measures are well suited for the derivation of optimal asset allocation strategies. Following lack of time, unsound knowledge, insufficient diversification, and quick reaction to market sentiments, investors burnt their fingers in their investment.

The investment decisions are derived from the portfolio optimization. A portfolio optimization is only possible once a model of the portfolio return and risk is built. Various models have been developed namely Harry Markowitz, William F. Sharpe and Arbitrage Pricing Theory. Based on these models, portfolio return and risk and its characteristics are computed.

Hence, an attempt is made to “An Empirical Study on Construction of Optimum Portfolio using Harry Markowitz Model”. The findings of this undoubtedly help investors, academicians, and budding mutual fund/ portfolio managers.

OBJECTIVES OF THE STUDY

1. To analyse securities for selection from each sector based on aggregate weighted average of Return on Equity, Economic Value Added, Market Value Added and Retention Ratio;
2. To construct the optimal portfolio computing portfolio return and risk using what if analysis for Harry Markowitz Model;
3. To provide findings/ results based on analysis.

RESEARCH DESIGN

In view of the objectives of the study listed above, exploratory research design has been adopted. Exploratory research is one, which largely interprets the already available information, and it lays particular emphasis on analysis and interpretation of the existing and available information and it makes use of secondary data.

RESEARCH METHODOLOGY

The study is based on secondary data and discussions with concerned personnel. The secondary data consists of the annual reports of S&P CNX Nifty of 50 companies covering the last five years from 2008-09 to 2012-13. Various other reports like magazines, journals, published books and official websites are also referred to for the present study. While calculating weighted averages, recent years are given more weightages and distant years are given the least weightages. Only one security having the highest ranking based on those parameters from each sector is chosen to maintain portfolio diversification. The criterion for awarding marks/points depends on the higher the rank, the higher the marks/points. While considering risk and return of selected securities based on said parameters, those securities are further filtered having coefficient of variation of maximum two. Cost of equity capital is calculated using dividend growth model for calculation of weighted average cost of capital to find out economic value added. Ninety eight scenarios of weights are used to arrive at optimum weightage fixing minimum of 5% and maximum of 75% of total investment to be allocated in each security. Finally, the optimum portfolio is built using Markowitz model.

SOURCES OF DATA

TOOLS OF ANALYSIS: The data collected for the study is analysed logically and meaningfully to arrive at meaningful conclusions. The statistical tools applied for data analysis in the present study are Percentages, Simple Average, Weighted Averages, Variance, Standard Deviation, Covariance, Coefficient of Variation, ratios, portfolio return and portfolio variance.

FINDINGS

1. Hindustan Unilever stands first in the ranking of Weighted Average ROE of 90.318%. It is followed far away by two companies Hero Motors and Bajaj-Auto in the range of 50%-55% of ROE, five companies including TCS and Asian Paints in the range of 30% - 40%; nine companies in the range of 20% - 30%, twenty companies covering Dr. Reddy's Lab. in the range of 10% -20%, and rest of eight companies consisting of BPCL below 10%.
2. Coal India Limited has the highest Weighted Average MVA of Rs. 4177.393crore. There are Asian paint of Rs. 3088.418crs., Infosys of Rs. 2307.995crs, Grasim of Rs. 1628.417, Hero Motors of Rs. 1505.804 crs., Bajaj-Auto of Rs. 1433.811crs., BHEL of Rs. 1193.423crs., Dr. Reddy's Lab. of Rs. 1192.811, TCS of Rs. 1085.455 crs., and L&T of Rs. 1004.383. Twelve companies are in the group of Rs. 500crs – 1000crs. Twenty four companies including HUL and BPCL are below Rs. 500 crs. Four companies have negative Weighted Average MVA.
3. ONGC leads in Weighted Average ranking of EVA of Rs26198.882 crore following by Reliance Ind. of Rs. 22265.133, HDFC of Rs. 14464.835NTPC of Rs. 11621.961crs., SBI of Rs.11248.017 crs., nine companies including TCS in the range of Rs. 10000 – 5000 crs., thirty two companies comprising BPCL, Bajaj Auto, HUL and Dr. Reddy's Lab. in the group of Rs. 5000 – 1000 crs., three companies including Asian Paints below Rs 1000 crs and only one negative Weighted Average EVA.

4. The highest weighted Average Retention Ratio of 94.891% is achieved by Kotak Mahindra Bank which is followed by Bharati Airtel with 93.135%, Jindal Steel 92.057, Ultra Tech Cement with 89.313%, Maruti Suzuki with 87.997%, Sesa Goa with 86.901%, Reliance Ind. with 85.003%, Reliance Infra with 83.175%, Cipla with 82.365% , Indus ind. Bank 81.584%, Grasim with 80.992%, Bank of Baroda with 80.70%, Axis bank with 80.309 and Tata Steel with 80.094% , eleven Companies having Dr. Reddy's Lab. with range of 80%-70%, nine companies including BPCL with range of 60%-70%, eight companies containing Asian Paint, TCS and Bajaj Auto encompassing with range of 50%-60%. Rest eight companies comprising HUL below 50%.

5. In view of selection of each company from one industry, ONGC from Oil Exploration/production industry stands the first ranking in terms of weighted Average totals of all parameters of EVA, MVA, ROE and Retention Ratio. It is followed by Reliance Ind. from refineries industry, HDFC from housing Financial Institution industry, SBI from Banking industry, NTPC from Power industry, TCS from Computer Software, Coal India from Mining, Bharati Airtel from Telecom industry, Tata Steel from Steel industry, L&T from Engineering industry, BHEL from electronics industry, ITC from Cigarette industry, IDFC from Financial Institution industry, Bajaj-Auto from two wheelers Automobile industry, Asian paints from Paints industry, GAIL from Gas industry, Mahindra & Mahindra from Automobile-4 wheelers, Grasim from Cement Industry, HUL from diversified industry, Jai Prakash Associates from construction Industry, Hindalco from Aluminium industry and Dr Reddy from Pharmaceuticals industry respectively have been chosen.

6. Again, while choosing from selected companies of one industry, the criterion of coefficient of variation having maximum of two are considered for portfolio selection.

A. ONGC from Oil Exploration/production industry, Reliance Ind. from refineries industry, NTPC from Power industry, Coal India from Mining, Bharati Airtel from Telecom industry, BHEL from electronics industry and Jai Prakash Associates from construction Industry have been eliminated since they have negative returns.

B. HDFC from housing Financial Institution industry, SBI from Banking industry, Tata Steel from Steel industry, L&T from Engineering industry, ITC from Cigarette industry, IDFC from Financial Institution industry, GAIL from Gas industry, Mahindra & Mahindra from Automobile- 4 wheelers, Grasim from Cement Industry, and Hindalco from Aluminium industry have been dropped from selected companies since their co-efficient of Variation is more than two.

C. HDFC from housing Financial Institution industry, SBI from Banking industry, TCS from Computer Software, Tata Steel from Steel industry, L&T from Engineering industry, ITC from Cigarette industry, IDFC from Financial Institution industry, Bajaj-Auto from two wheelers Automobile industry, Asian paints from Paints industry, GAIL from Gas industry, Mahindra & Mahindra from Automobile- 4 wheelers, Grasim from Cement Industry, HUL from diversified industry, Hindalco from Aluminium industry and Dr Reddy from Pharmaceuticals industry have been continued from selected companies.

D. TCS from Computer Software, Bajaj-Auto from two wheelers Automobile industry, Asian paints from Paints industry and Dr Reddy, Lab. from Pharmaceuticals industry and HUL from diversified industry, have been continued to find a place in optimum portfolio construction. However, only BPCL from refineries industry, have maximum returns with minimum risk having less than one coefficient of variation. Hence, it has been accommodated in portfolio construction.

7. Covariance of Asian Paints and BPCL, Asian Paints and HUL , Bajaj Auto and BPCL, , Bajaj Auto and HUL, BPCL and TCS, BPCL and HUL, Dr Reddy's Lab. And HUL and TCS are negative. Rest is positive.

8. Among various scenarios, **the least portfolio risk** of 0.144153 at which proportion or weight of 5% (0.05) of total investment in Asian paints, 5% in Bajaj Auto, 5% in BPCL, 5% in Dr.Reddy'Lab., 5% in TCS and 75% in HUL.

9. Among various scenarios, **the least Coefficient of Variation** of 0.579013 at which proportion or weight of 10% (0.10) of total investment in Asian paints, 5% in Bajaj Auto, 70% in BPCL, 5% in Dr.Reddy'Lab., 5% in TCS and 5% in HUL. Rests of them are not that much consistent as the first one. Hence, this is the best portfolio.

10. Optimum weight of 10:5:70:5:5:5 ratio of investment in Asian paints, Bajaj Auto, BPCL, Dr. Reddy' Lab, TCS and HUL respectively is considered optimum portfolio by achieving the minimum variance portfolio using all alternative scenarios.

CONCLUSION

Portfolio construction is a complex and lengthy process. Once optimum portfolio is built, it does not mean that it comes to an end process. It is beginning for implementation and keeps under continuous monitoring and evaluation. Meanwhile there are hiccups in portfolio following sudden and unexpected shocks from external forces. Hence, it has to keep a long way for its success.

REFERENCES

BOOKS

1. Aswath Damodaran (2005), "Corporate Finance: Theory and Practice", John Wiley India private Limited, Second Edition.
2. Bhattacharya AK and Phani BV (2004) 'Economic Value Added-A General perspective', [http:// papers. Ssm.com/so13/paperscfm](http://papers.ssm.com/so13/paperscfm)
3. Bhattacharya AK and Phani BV (2004) 'Economic Value Added-A General perspective', [http:// papers. Ssm.com/so13/paperscfm](http://papers.ssm.com/so13/paperscfm).
4. Biddle GC, Bowen MR and Wallace SJ (1997), "Does EVA beat earnings? Evidence on association with stock returns and firm value", Journal of Accounting and Economics, Vol. 24, No.3 (December)
5. Chen S Dodd JL (1997) "Economic Value Added (EVA): An empirical Examination of New Corporate performance Measure", Journal management Issue, (fall)
6. I.M. Pandey (2005), "Financial Management", Vikas Publishing House, Ninth Edition.
7. M. Y. Khan & P.K. Jain (2012), "Financial Management", TataMc Graw Hill Education Pvt. Ltd., sixth Edition.
8. Prasanna Chandra (2008) "Investment Analysis and Portfolio management", Tata McGraw Hill Education Private Limited, New Delhi, Third Edition.
9. ZviBodie, Alex Kane, Alan J Marcus and Pitabas Mohanty (2009), "Investments", Tata McGraw Hill Education Private Limited, New Delhi, eighth Edition,

WEBSITES

10. www.capitaline.com
11. www.economicstimes.com
12. www.investopedia.com
13. www.moneycontrol.com
14. www.nseindia.com
15. www.wikipedia.com

APPENDIX

APPENDIX-1: RETURN ON EQUITY (ROE) OF S&P CNX NIFTY COMPANIES

Companies Name	Industry	2008-09	2009-10	2010-11	2011-12	2012-13	Wt. Avg.
ACC	cement and cement products	24.61	26.7	17.31	18.42	14.37	18.365
Ambuja Cements	cement and cement products	24.73	18.83	17.24	15.28	14.73	16.592
Asian Paints	paints	33.1	49.73	39.24	38.52	34.74	38.537
Axis Bank	banks	17.77	15.67	17.83	18.59	15.64	17.011
Bajaj Auto	automobiles - 2 and 3 wheelers	38.92	58.14	68.01	49.72	38.51	50.044
Bank of Baroda	banks	17.35	20.24	20.2	18.22	14.01	17.424
BhartiAirtel	telecommunication - services	28.13	25.79	17.6	11.6	9.41	15.064
BHEL	electrical equipment	26.53	24.25	27.08	29.82	27.74	27.617
BPCL	refineries	13.53	6.06	11.74	11	8.79	9.921
Cairn India.	oil exploration/production	0.16	-0.21	-0.66	0.13	13.35	4.335
Cipla	pharmaceuticals	17.89	18.31	14.54	14.9	16.99	16.179
Coal India	mining	18.35	21.62	22.15	24.3	41.22	28.756
DLF	construction	12.5	5.96	9.19	7.18	3.43	6.524
Dr. Reddy's Lab.	pharmaceuticals	10.66	14.3	14.84	13.58	16.25	14.623
GAIL (India)	gas	20	18.98	18.69	18.49	16.89	18.163
Grasim Industries	cement and cement products	17.39	29.31	14.54	12.93	12.11	15.46
HCL Technologies	computers - software	24.29	28.59	21.41	20.45	29.53	25.01
HDFC	finance - housing	17.37	18.59	20.41	21.67	19.39	19.961
HDFC Bank.	banks	15.32	13.7	15.47	17.26	18.57	16.735
Hero Motors	automobiles - 2 and 3 wheelers	32.41	33.72	64.41	65.21	55.43	55.405
Hindalco Ind.	aluminium	9.38	6.86	7.19	7.1	5.08	6.565
HUL	diversified	122.97	121.34	85.25	87.57	76.62	90.319
I T C	cigarettes	23.85	28.98	31.36	32.88	33.28	31.587
ICICI Bank	banks	7.58	7.79	9.35	10.7	12.48	10.427
IDFC	financial institution	12.2	14.84	12.17	12.84	13.11	13.02
IndusInd Bank	banks	10.39	16.19	15.12	17.79	13.92	15.259
Infosys	computers - software	25.2807	28.46389	26.29688	26.33418	32.67449	28.654
Jaiprakash Associates.	construction	15.66	14.5	20.84	12.7	8.34	13.312
Jindal Steel & Power	steel and steel products	32.95	28.38	21.94	23.76	19.46	23.191
Kotak Mahindra Bank	banks	7.06	12.35	11.97	13.59	14.37	12.925
Larsen & Toubro	engineering	27.99	23.95	18.44	17.68	16.85	19.079
Lupin	pharmaceuticals	30.31	25.64	25.69	21.53	26	24.985
Mahindra & Mahindra	automobiles - 4 wheelers	16.03	26.74	25.92	23.8	22.87	23.788
Maruti Suzuki India	automobiles - 4 wheelers	13.04	21.1	16.5	10.76	12.87	14.142
NMDC	mining	52.3655	50.2049	31.03991	45.02194	29.76	38.319
NTPC	power	13.9	13.69	13.31	12.58	15.69	13.999
ONGC	oil exploration/production	23.87	20.65	19.39	19.56	22.24	20.852
PGCI	power	10.53	12.49	12.92	12.71	13.57	12.864
PNB	banks	23.52	24.06	22.12	18.52	14.52	18.979
Ranbaxy Lab.	pharmaceuticals	-29.5	14.44	22.41	-158.61	-8.45	-40.672
Reliance Ind.	refineries	13.36	12.64	13.88	12.29	11.66	12.516
Reliance Infra.	power	10.81	8.18	6.28	10.78	9.88	9.235
SBI	banks	15.74	13.89	12.71	13.94	14.26	13.914
Sesa Goa	mining	42.99	29.38	29.62	13	0.92	16.481
Sun Pharma.	pharmaceuticals	24.09	24.56	15.71	20.71	54.75833	31.798
Tata Motors	automobiles - 4 wheelers	8.09	15.15	9.06	6.42	1.57	6.607
Tata Power	power	10.66	8.99	8.42	9.94	8.35	9.027
Tata Steel	steel and steel products	21.1	13.45	14.22	12.82	9.17	12.519
TCS	computers - software	35.13	37.3	38.8	44.24	39.32	39.979
UltraTech Cement	cement and cement products	37.37	27.13	23.73	13.16	19.02	20.704

APPENDIX-2: MARKET VALUE ADDED (MVA) OF S&P CNX NIFTY COMPANIES

Companies Name	Industry	2008-09	2009-10	2010-11	2011-12	2012-13	Wt. Avg.
ACC	cement and cement products	217.59	552	731.01	753.81	1038.97	781.647
Ambuja Cements	cement and cement products	32.79	61.78	95.3	102.97	143.91	104.912
Asian Paints	paints	672.25	1876.5	2319.87	2982.64	4602.17	3088.418
Axis Bank	banks	130.45	772.26	941.08	594.21	593.2	656.07
Bajaj Auto	automobiles - 2 and 3 wheelers	489.22	1812.4	1293.56	1470.03	1526.47	1433.811
Bank of Baroda	banks	-118.02	224.34	428.69	127.81	-83.51	114.028
BhartiAirtel	telecommunication - services	480.74	216.31	241.98	207.74	149.17	214.407
BHEL	electrical equipment	1841.25	1246.23	2065.49	1650.94	153.48	1193.423
BPCL	refineries	85.58	40.6	156.08	223.03	287.74	197.723
Cairn India .	oil exploration/production	15.64	137.54	183.67	166.55	94.37	131.985
Cipla	pharmaceuticals	164.19	264.8	239.4	211.18	269.28	240.207
Coal India	mining	8230.19	10322.68	10319.79	316.33	312.13	4177.393
DLF	construction	94.39	233.31	187.2	116.4	148.67	155.437
Dr. Reddy's Lab.	pharmaceuticals	177.49	924.65	1283.36	1368.56	1308.21	1192.811
GAIL (India)	gas	271.66	129.16	278.17	312.22	205.77	242.815
Grasim Industries	cement and cement products	548.69	2036.54	1570.98	1634.86	1710.42	1628.417
HCL Technologies	computers - software	205.03	50.01	285.71	392.89	388	311.583
HDFC	finance - housing	950.35	2187.87	583.15	544.54	664.58	838.44
HDFC Bank.	banks	628.96	1463.31	1800.42	392.33	473.15	859.461
Hero Motors	automobiles - 2 and 3 wheelers	545	880.82	1770.88	1441.42	1840.42	1505.804
Hindalco Ind.	aluminium	-87.66	35.4	54.03	-35.08	-82.96	-27.326
HUL	diversified	222.19	228.05	227.71	274.91	393.8	295.337
I T C	cigarettes	148.61	226.36	161.55	202.93	281.24	220.26
ICICI Bank	banks	-112.14	489.49	637.89	366.19	466.99	438.681
IDFC	financial institution	7.55	108.49	84.6	54.73	54.76	64.737
IndusInd Bank	banks	-8.11	117.39	181.65	225.15	258.92	197.788
Infosys	computers - software	1013	2231.93	2814.57	2348.09	2261.4	2307.995
Jaiprakash Associates.	construction	193.33	31.83	110.97	49.56	23.84	60.489
Jindal Steel & Power	steel and steel products	575.32	-117.31	1162.36	823.31	605.44	676.548
Kotak Mahindra Bank	banks	169.22	617.75	365.11	437.6	526.23	458.773
Larsen & Toubro	engineering	459.08	1327.57	1299.5	897.47	892.63	1004.383
Lupin	pharmaceuticals	518.49	1342.84	345.99	445.89	520.25	575.13
Mahindra & Mahindra	automobiles - 4 wheelers	191.74	403.33	525.5	487.72	612.98	506.045
Maruti Suzuki India	automobiles - 4 wheelers	456.4	1008.3	785.01	824.82	666.17	763.877
NMDC	mining	9737.59	126.45	258.4	236.04	99.44	813.803
NTPC	power	108.3	129.97	110.16	73.86	44.46	81.097
ONGC	oil exploration/production	650.39	412.08	690.62	177.33	136.32	329.155
PGCI	power	62.92	74.99	64.37	62.34	54	61.691
PNB	banks	-5.29	497.98	580.22	147.61	-206.55	152.601
Ranbaxy Lab.	pharmaceuticals	168.11	422.94	476.91	359.3	457.58	411.321
Reliance Ind.	refineries	797.09	681.74	-3393.15	252.39	215.41	-395.485
Reliance Infra.	power	49.48	424.24	47.3	-117.75	-445	-110.409
SBI	banks	154.37	1039.44	1741.9	845.3	627.15	931.727
Sesa Goa	mining	42.21	383.7	158.01	46.12	5.65	99.758
Sun Pharma.	pharmaceuticals	1026.2	862.73	1515.92	377.99	491.65	751.309
Tata Motors	automobiles - 4 wheelers	-60.34	498.67	933.42	214.3	209.17	376.021
Tata Power	power	378.24	929.82	864.22	51.41	44.83	350.689
Tata Steel	steel and steel products	-125.78	213.11	119.06	-224.79	-255.61	-101.306
TCS	computers - software	402.17	703.93	1084.37	1042.31	1409.89	1085.455
UltraTech Cement	cement and cement products	567.96	262.13	784.8	742.29	1045.33	776.162

APPENDIX-3: ECONOMIC VALUE ADDED (EVA) OF S&P CNX NIFTY COMPANIES

Companies Name	Industry	2008-09	2009-10	2010-11	2011-12	2012-13	Wt. Avg.
ACC	cement and cement products	1217.36	1673.63	992.87	1094.28	1201.3	1195.124
Ambuja Cements	cement and cement products	1424.8	1223.17	1252.62	1212.07	1371.52	1288.993
Asian Paints	paints	374.67	786.46	787.41	984.18	1080.71	910.006
Axis Bank	banks	1817.78	2544.7	3425.55	4274.77	5225.06	4027.215
Bajaj Auto	automobiles - 2 and 3 wheelers	658.58	1697.6	3299.97	2982.21	3044.71	2740.405
Bank of Baroda	banks	2231.47	3085.85	4282.34	5053.23	4536.93	4276.517
BhartiAirtel	telecommunication - services	6790.73	7003.13	8634.79	10074.88	8428.88	8609.685
BHEL	electrical equipment	2907.45	3075.72	4401.43	6007.27	7006.62	5421.689
BPCL	refineries	2906.12	2626.99	2416.25	3124.9	3009.84	2863.844
Cairn India .	oil exploration/production	7810.98	1616.89	28.31	2493.3	1542.12	1920.9
Cipla	pharmaceuticals	829.55	1097.98	974.28	1136.1	1547.31	1215.286
Coal India	mining	2962.87	3965.58	4053.06	4753.38	8528.27	5647.203
DLF	construction	2393.48	1664.01	2586.98	2603.23	2220.55	2333.208
Dr. Reddy's Lab.	pharmaceuticals	608.96	884.76	938.71	1027.98	1334.28	1065.196
GAIL (India)	gas	2673.75	2916.58	3226.91	3721.12	4096.81	3570.409
Grasim Industries	cement and cement products	1742.91	2161.71	1173.86	1212.34	1267.48	1384.977
HCL Technologies	computers - software	805.59	1033.42	1156.28	1301.38	2048.73	1452.695
HDFC	finance - housing	9953.52	9896.05	11085.89	15062.44	18743.89	14464.835
HDFC Bank.	banks	2248.22	2988.96	3974.56	5209.77	6774.54	4990.773
Hero Motors	automobiles - 2 and 3 wheelers	981.54	1295.32	2243.21	1958.45	2413.85	2013.657
Hindalco Ind.	aluminium	2388.25	2390.01	2734.8	2579.46	2261.27	2466.457
HUL	diversified	1949.24	2473.14	2165.07	2309.29	2685.04	2403.542
I T C	cigarettes	3233.73	4104.4	5032.34	6248.88	7506.46	5937.827
ICICI Bank	banks	3767.1	4100.07	5243.17	6553.31	8417.28	6399.76
IDFC	financial institution	2763.1	2960.18	3638.39	5030.41	6434.55	4792.868
IndusInd Bank	banks	148.41	350.75	577.51	802.46	1060.51	739.656
Infosys	computers - software	9397.45	8715.62	6664.74	6007.54	5969.7	6713.439
Jaiprakash Associates.	construction	993.99	1497.41	2893.44	2674.66	2806.73	2493.428
Jindal Steel & Power	steel and steel products	1492.41	1800.52	1818.53	2559.21	2666.4	2274.527
Kotak Mahindra Bank	banks	276.79	568.35	828.77	1094.72	1372.06	1009.265
Larsen & Toubro	engineering	4294.14	5452.74	5234.7	6150.54	5912.01	5671.063
Lupin	pharmaceuticals	466.61	687.04	862.82	866.8	1294.92	958.062
Mahindra & Mahindra	automobiles - 4 wheelers	926.64	2175.8	2737.78	3047.31	3550.09	2895.416
Maruti Suzuki India	automobiles - 4 wheelers	1305.07	2570.79	2426.85	1742.92	2587.86	2242.545
NMDC	mining	7283.86	6521.71	3481.1	4386.63	3297.59	4320.337
NTPC	power	8679.63	10026.01	10137.36	10829.74	14373.34	11621.961
ONGC	oil exploration/production	21125.49	23554.68	27825.03	29650.74	24534.07	26198.882
PGCI	power	3478.59	5132.18	3732.23	4478.57	5237.97	4602.918
PNB	banks	3090.54	3901.14	4427.66	4878.72	4740.87	4493
Ranbaxy Lab.	pharmaceuticals	-910.79	506.48	1196.52	-2980.67	136.21	-503.326
Reliance Ind.	refineries	17106.5	18352.96	22745.3	22817.45	24131.77	22265.133
Reliance Infra.	power	1345.33	1330.68	1196.49	2602.42	2891.16	2164.109
SBI	banks	9137.44	9273.27	7492.71	11817.98	14257.25	11248.017
Sesa Goa	mining	2491.32	2837.45	4150.29	2465.48	603.3	2233.033
Sun Pharma.	pharmaceuticals	1019.14	1268.4	897.98	1384.81	1928.34	1428.723
Tata Motors	automobiles - 4 wheelers	1758.13	3640.25	3314.4	2468.2	1696.66	2489.195
Tata Power	power	1241.53	1394.37	1392.57	1693.47	1709.1	1568.489
Tata Steel	steel and steel products	6693.43	6921.93	8586.6	8648.93	6965.9	7714.821
TCS	computers - software	4806.79	5642.64	7590.75	11122.78	12818.22	9829.767
UltraTech Cement	cement and cement products	1089.7	1112.73	1218.92	1571.67	2623.85	1758.523

APPENDIX -4: RETENTION RATIO OF S&P CNX NIFTY COMPANIES

Companies	Industry	2008-09	2009-10	2010-11	2011-12	2012-13	Wt. Avg.
ACC	cement and cement products	61.35	68.11	31.22	53.9	53.13	51.499
Ambuja Cements	cement and cement products	70.81	71.21	69.2	66.42	69.89	69.064
Asian Paints	paints	47	54.64	53.54	53.21	50.91	52.286
Axis Bank	banks	76.94	77.47	80.22	81.85	80.94	80.309
Bajaj Auto	automobiles - 2 and 3 wheelers	53.79	62.55	46.73	47.81	49.95	50.671
Bank of Baroda	banks	82.78	82.08	82.24	83.78	76.36	80.705
BHEL	electrical equipment	67.63	68.88	70.49	74.21	76.67	73.137
BPCL	refineries	88.7	72.27	62.68	65.32	65.09	67.201
BhartiAirtel	telecommunication - services	95.22	94.78	94.3	92.3	92.57	93.315
Cairn India.	oil exploration/production	100	0	0	100	60.61	53.537
Cipla	pharmaceuticals	81.93	81.97	72.77	83.4	87.54	82.365
Coal India	mining	50.97	39.63	47.55	21.68	9.72	27.213
DLF	construction	76.19	53.3	70.06	62.12	17.43	48.573
Dr. Reddy's Lab.	pharmaceuticals	79.43	71.35	65.74	76.86	76.45	73.936
GAIL (India)	gas	63.65	64.72	68.93	64.9	64.68	65.525
Grasim Industries	cement and cement products	79.99	81.95	83.33	81.45	78.83	80.922
HCL Technologies	computers - software	48.4	71.14	50.03	50.51	73	60.521
HDFC Bank.	banks	77.79	78.25	77.28	77.31	77.24	77.438
Hero Motors	automobiles - 2 and 3 wheelers	60.01	-25.86	-34.38	50.59	34.98	18.827
Hindalco Ind.	aluminium	79.29	62.72	68.05	79.17	83.36	76.157
HUL	diversified	18.5	21.25	21.79	26.77	-46.02	0.223
HDFC	finance - housing	51.94	57.48	56.6	54.2	53.36	54.687
I T C	cigarettes	48.67	-12.31	17.06	31.98	34.58	25.070
ICICI Bank	banks	63.23	61.4	64.77	67.18	68.78	66.197
IDFC	financial institution	77.54	64.01	68.61	75.01	74.12	72.135
IndusInd Bank	banks	70.78	77.59	81.33	85.09	82.69	81.584
Infosys	computers - software	74.6	70.67	37.72	60.72	68.84	61.079
Jaiprakash Associates.	construction	84.36	45.03	71.87	87.89	73.79	74.036
Jindal Steel & Power	steel and steel products	94.9	91.89	93.03	92.77	90.4	92.057
Kotak Mahindra Bank	banks	89.92	94.75	94.96	95.24	95.62	94.891
Larsen & Toubro	engineering	72.84	71.91	72.54	74.74	73.71	73.453
Lupin	pharmaceuticals	70.25	79.29	80.78	75.28	83.39	79.283
Mahindra & Mahindra	automobiles - 4 wheelers	67.67	69.55	68.46	68.65	72.69	70.013
Maruti Suzuki India	automobiles - 4 wheelers	90.44	91.59	89	84.61	88.18	87.997
NMDC	mining	76.49	76.43	76.61	71.67	48.94	66.037
NTPC	power	51.75	54.8	51.13	57.06	49.36	52.652
ONGC	oil exploration/production	48.6	49.54	54.1	56.03	55.06	53.960
PGCI	power	69.34	65.41	64.71	65.37	64.81	65.321
PNB	banks	76.12	79.25	81.73	82.25	76.49	79.417
Ranbaxy Lab.	pharmaceuticals	0	100	86.64	0	0	30.661
Reliance Ind.	refineries	85.92	84.16	85.87	84.21	85.36	85.033
Reliance Infra.	power	73.77	81.25	75.88	88.94	85.59	83.175
Sesa Goa	mining	90.03	83.38	89.04	79.64	92.21	86.901
SBI	banks	77.11	76.67	73.97	77.41	77.21	76.537
Sun Pharma.	pharmaceuticals	73.11	64.28	69.56	74.4	-17.27	41.440
TCS	computers - software	70.74	19.37	57.79	48.06	60.7	51.906
Tata Motors	automobiles - 4 wheelers	62.49	30.22	25.12	19.91	0.48	18.689
Tata Power	power	40.16	63.82	61.97	67.19	70.56	65.018
Tata Steel	steel and steel products	71.16	79.66	78.97	78.23	84.22	80.094
UltraTech Cement	cement and cement products	92.73	91.88	86.4	89.59	89.13	89.313

APPENDIX-5: RANK-WISE DISTRIBUTION OF S&P CNX NIFTY COMPANIES BASED ON PARAMETERS

Companies Name	Industry	Rank-wise				
		MVA	EVA	ROE	Retention Ratio	Grand Average
ONGC	oil exploration/production	329.16	26198.88	20.85	53.96	6650.713
Reliance Ind.	refineries	-395.48	22265.13	12.52	85.032667	5491.801
HDFC	finance - housing	838.44	14464.83	19.96	77.438	3850.167
SBI	banks	931.73	11248.02	13.91	86.901333	3070.140
NTPC	power	81.1	11621.96	14	52.652	2942.428
TCS	computers - software	1085.46	9829.77	39.98	80.094	2758.826
Coal India	mining	4177.39	5647.2	28.76	27.213333	2470.141
Infosys	computers - software	2308	6713.44	28.65	61.078667	2277.792
BhartiAirtel	telecommunication - services	214.41	8609.69	15.06	73.136667	2228.074
Tata Steel	steel and steel products	-101.31	7714.82	12.52	65.018	1922.762
ICICI Bank	banks	438.68	6399.76	10.43	66.197333	1728.767
Larsen & Toubro	engineering	1004.38	5671.06	19.08	73.452667	1691.993
BHEL	electrical equipment	1193.42	5421.69	27.62	67.200667	1677.483
I T C	cigarettes	220.26	5937.83	31.59	25.07	1553.688
HDFC Bank.	banks	859.46	4990.77	16.73	18.827333	1471.447
NMDC	mining	813.8	4320.34	38.32	66.037333	1309.624
IDFC	financial institution	64.74	4792.87	13.02	72.135333	1235.691
Axis Bank	banks	656.07	4027.21	17.01	80.309333	1195.150
PNB	banks	152.6	4493	18.98	79.417333	1185.999
PGCI	power	61.69	4602.92	12.86	65.321333	1185.698
Bank of Baroda	banks	114.03	4276.52	17.42	80.705333	1122.169
Bajaj Auto	automobiles - 2 and 3 wheelers	1433.81	2740.41	50.04	50.671333	1068.733
Asian Paints	paints	3088.42	910.01	38.54	52.286	1022.314
GAIL (India)	gas	242.81	3570.41	18.16	65.525333	974.226
Hero Motors	automobiles - 2 and 3 wheelers	1505.8	2013.66	55.4	76.157333	912.754
Mahindra & Mahindra	automobiles - 4 wheelers	506.05	2895.42	23.79	70.013333	873.818
BPCL	refineries	197.72	2863.84	9.92	93.315333	791.199
Grasim Industries	cement and cement products	1628.42	1384.98	15.46	80.922	777.446
Maruti Suzuki India	automobiles - 4 wheelers	763.88	2242.55	14.14	87.997333	777.142
Jindal Steel & Power	steel and steel products	676.55	2274.53	23.19	92.056667	766.582
Tata Motors	automobiles - 4 wheelers	376.02	2489.19	6.61	51.906	730.932
HUL	diversified	295.34	2403.54	90.32	54.686667	710.972
UltraTech Cement	cement and cement products	776.16	1758.52	20.7	89.313333	661.173
Jaiprakash Associates.	construction	60.49	2493.43	13.31	74.036	660.317
DLF	construction	155.44	2333.21	6.52	48.573333	635.936
Hindalco Ind.	aluminium	-27.33	2466.46	6.56	0.223333	611.478
Sesa Goa	mining	99.76	2233.03	16.48	76.536667	606.452
Dr. Reddy's Lab.	pharmaceuticals	1192.81	1065.2	14.62	73.936	586.642
Sun Pharma.	pharmaceuticals	751.31	1428.72	31.8	41.44	563.318
Reliance Infra.	power	-110.41	2164.11	9.24	83.174667	536.529
Cairn India .	oil exploration/production	131.99	1920.9	4.34	53.536667	527.692
ACC	cement and cement products	781.65	1195.12	18.36	51.498667	511.657
Tata Power	power	350.69	1568.49	9.03	18.688667	486.725
HCL Technologies	computers - software	311.58	1452.69	25.01	60.520667	462.450
Lupin	pharmaceuticals	575.13	958.06	24.99	79.282667	409.366
Kotak Mahindra Bank	banks	458.77	1009.26	12.93	94.890667	393.963
Cipla	pharmaceuticals	240.21	1215.29	16.18	82.365333	388.511
Ambuja Cements	cement and cement products	104.91	1288.99	16.59	69.064	369.889
IndusInd Bank	banks	197.79	739.66	15.26	81.584	258.574
Ranbaxy Lab.	pharmaceuticals	411.32	-503.33	-40.67	30.661333	-25.505

APPENDIX 6: RETURN, RISK AND COEFFICIENT OF VARIATION OF NIFTY COMPANIES

Companies Name	Return	Risk	Coefficient of Variation
ONGC	-0.07	0.44	-6.35
Reliance Ind.	-0.17	0.17	-0.99
HDFC	0.01	0.64	80.88
SBI	0.16	0.52	3.34
NTPC	-0.03	0.12	-3.5
TCS	0.22	0.36	1.68
Coal India	-0.18	0.44	-2.37
Infosys	0.23	0.44	1.91
BhartiAirtel	-0.16	0.24	-1.53
Tata Steel	0.2	1.11	5.68
ICICI Bank	0.31	0.94	3.05
L & T	0.11	0.82	7.38
BHEL	-0.15	0.52	-3.55
I T C	0.15	0.33	2.16
HDFC Bank	0.08	0.66	8.31
NMDC	0.75	2.08	2.79
IDFC	0.26	1.01	3.85
Axis Bank	0.31	0.9	2.85
PNB	0.23	0.74	3.17
PGCI	0.03	0.07	2.24
Bank of Baroda	0.38	0.84	2.21
Bajaj Auto	0.6	1.02	1.7
Asian Paints	0.48	0.72	1.51
GAIL (India)	0.18	0.49	2.66
Hero Motors	0.34	0.42	1.22
Mahindra & Mahindra	0.12	0.35	2.96
Grasim Ind.	0.09	0.44	4.72
BPCL	0.22	0.18	0.83
Maruti Suzuki	0.14	0.39	2.78
Jindal Steel & Power	0.76	2.05	2.69
Tata Motors	0.49	1.67	3.38
HUL	0.19	0.17	0.88
UltraTech Cement	0.23	0.54	2.34
Jaiprakash Ass.	-0.18	0.58	-3.22
DLF	-0.01	0.59	-41.02
Hindalco Ind.	0.27	1.29	4.81
Sesa Goa	0.38	1.91	5.04
Dr. Reddy's Lab.	0.37	0.72	1.94
Sun Pharma.	0.05	0.52	9.93
Reliance Infra.	-0.1	0.61	-6.04
Cairn India	0.09	0.35	4
ACC	0.2	0.49	2.49
Tata Power	-0.1	0.62	-6.16
HCL	0.45	1.22	2.68
Lupin	0.31	0.76	2.49
Kotak Mahindra Bank	0.22	0.87	3.91
Cipla	0.14	0.26	1.77
Ambuja Cements	0.17	0.41	2.43
IndusInd Bank	0.97	1.94	2.01
Ranbaxy Lab.	0.14	0.58	4.02

APPENDIX 7: CO-VARIANCE MATRIX OF SELECTED COMPANIES

Companies	Asian Paints	Bajaj Auto	BPCL	Dr Reddy's Lab.	TCS	HUL
Asian Paints	0.412	0.438	-0.094	0.384	0.143	-0.014
Bajaj Auto	0.438	0.825	-0.116	0.501	0.037	-0.045
BPCL	-0.094	-0.116	0.027	-0.08	-0.019	-0.004
Dr Reddy's	0.384	0.501	-0.08	0.414	0.121	-0.045
TCS	0.143	0.037	-0.019	0.121	0.105	-0.006
HUL	-0.014	-0.045	-0.004	-0.045	-0.006	0.022

APPENDIX 8: SCENARIO WEIGHTS WITH ASCENDING ORDER OF PORTFOLIO RISK

Asian Paints	Bajaj Auto	BPCL	Dr Reddy's Lab.	TCS	HUL	Portfolio Risk	Portfolio Return	C.V
0.05	0.05	0.05	0.05	0.05	0.75	0.144153	0.235873	0.61114
0.1	0.05	0.05	0.05	0.05	0.7	0.150347	0.250235	0.60082
0.05	0.05	0.75	0.05	0.05	0.05	0.154313	0.258443	0.59708
0.1	0.05	0.7	0.05	0.05	0.05	0.157025	0.271194	0.57901
0.1	0.1	0.1	0.1	0.05	0.55	0.162207	0.273542	0.59298
0.1	0.1	0.1	0.05	0.05	0.6	0.163983	0.272216	0.60239
0.1	0.1	0.05	0.05	0.05	0.65	0.168299	0.270604	0.62194
0.1	0.1	0.6	0.1	0.05	0.05	0.169263	0.289664	0.58434
0.1	0.1	0.1	0.1	0.1	0.5	0.169879	0.28261	0.60110
0.1	0.1	0.5	0.1	0.1	0.1	0.171828	0.295508	0.58146
0.1	0.1	0.65	0.05	0.05	0.05	0.172165	0.28995	0.59377
0.1	0.1	0.55	0.1	0.1	0.05	0.175601	0.29712	0.59100
0.15	0.1	0.1	0.1	0.1	0.45	0.184889	0.296972	0.62258
0.15	0.1	0.45	0.1	0.1	0.1	0.185287	0.308258	0.60107
0.15	0.15	0.15	0.1	0.1	0.35	0.213331	0.318953	0.66884
0.15	0.15	0.4	0.1	0.1	0.1	0.214431	0.327014	0.65572
0.15	0.15	0.1	0.1	0.1	0.4	0.21479	0.317341	0.67684
0.15	0.15	0.15	0.15	0.1	0.3	0.215855	0.32028	0.67395
0.15	0.15	0.35	0.15	0.1	0.1	0.216647	0.326728	0.66308
0.15	0.15	0.25	0.15	0.15	0.15	0.22909	0.332572	0.68884
0.15	0.15	0.15	0.15	0.15	0.25	0.229232	0.329348	0.69602

APPENDIX 9: SCENARIO WEIGHTS WITH DESCENDING ORDER OF CO-EFFICIENT OF VARIATION

Asian Paints	Bajaj Auto	BPCL	Dr Reddy's	TCS	HUL	C.V
0.1	0.05	0.7	0.05	0.05	0.05	0.579013
0.1	0.1	0.5	0.1	0.1	0.1	0.581467
0.1	0.1	0.6	0.1	0.05	0.05	0.584344
0.1	0.1	0.55	0.1	0.1	0.05	0.591009
0.1	0.1	0.1	0.1	0.05	0.55	0.592987
0.1	0.1	0.65	0.05	0.05	0.05	0.593775
0.05	0.05	0.75	0.05	0.05	0.05	0.597088
0.1	0.05	0.05	0.05	0.05	0.7	0.600825
0.15	0.1	0.45	0.1	0.1	0.1	0.601079
0.1	0.1	0.1	0.1	0.1	0.5	0.601109
0.1	0.1	0.1	0.05	0.05	0.6	0.602399
0.05	0.05	0.05	0.05	0.05	0.75	0.611147
0.1	0.1	0.05	0.05	0.05	0.65	0.621941
0.15	0.1	0.1	0.1	0.1	0.45	0.62258
0.15	0.15	0.4	0.1	0.1	0.1	0.655723
0.15	0.15	0.35	0.15	0.1	0.1	0.66308
0.15	0.15	0.15	0.1	0.1	0.35	0.668846
0.15	0.15	0.15	0.15	0.1	0.3	0.673958
0.15	0.15	0.1	0.1	0.1	0.4	0.676844
0.15	0.15	0.3	0.15	0.15	0.1	0.687524
0.15	0.15	0.25	0.15	0.15	0.15	0.688844
0.15	0.15	0.15	0.15	0.15	0.25	0.69602
0.2	0.15	0.2	0.15	0.15	0.15	0.718096
0.2	0.15	0.15	0.15	0.15	0.2	0.72192
0.15	0.15	0.15	0.25	0.15	0.15	0.724314

APPENDIX-10: OPTIMUM PORTFOLIO

Companies	Weights	Risk	Return	Portfolio Return	Portfolio Risk	Coefficient Variation
Asian Paints	0.10	0.72	0.48	0.2711	0.1570	0.5790
Bajaj Auto	0.05	1.02	0.6			
BPCL	0.70	0.18	0.22			
Dr Reddy's Lab.	0.05	0.72	0.37			
TCS.	0.05	0.36	0.22			
HU L	0.05	0.17	0.19			
Total	1.00					

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