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OPTIMAL PORTFOLIO CONSTRUCTION OF SELECTED STOCKS FROM NSE USING SHARPE'S SINGLE INDEX MODEL

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ABSTRACT

This research work concentrates on the Optimal Portfolio Construction of selected stocks from NSE (National Stock Exchange) using Sharpe's Single Index model. Constructing a Portfolio is a difficult task for the individual investors and the institutional investor's .Every investors having a target of getting highest investment return at a given level of risk. So by conducting this study the researcher can get a practical knowledge and also can create awareness in the minds of the investors. For this purpose fifty companies listed in the NSE had been selected .Out of the fifty companies only eleven companies were included in the optimal portfolio construction. The results of the present study and such micro level studies enables investors to go for scientific diversification and also have more utility value to the fund managers of emerging economies like India where the capital markets are still in their developing stages and many foreign institutional investors are also interested to invest in the leading stock.

KEY WORDS: Beta, Cut-off rate, Excess return to beta Ratio

JEL CODE: G11

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INTRODUCTION

Investment is the sacrifice of certain value of money for an uncertain future reward. Every investment always follows a risk and return. Risk is like a ginger and return is like a jam. If the investor doesn't have a proper knowledge on investment and portfolio management they can't make wise decisions regarding their investments. So a portfolio is constructed to meets the requirements of the investor. Actually there are two approaches in portfolio management. First one is the traditional approach and second one is the modern approach. In traditional approach investors requirements in terms of income and capital are to be evaluated and suitable securities are to be selected. But in the case of modern approach Markowitz model is used in the construction of portfolios. Markowitz theory is otherwise known as modern portfolio theory. But Markowitz model have some complexities in arriving at an optimal portfolio. So William Sharpe extended the concept introduced by Markowitz by suggesting a Single index model for arriving at an optimal portfolio.

NEED FOR THE STUDY

Whole investors are facing some complexities while securities from a combination of portfolios. They don't know among those securities which are performing well and not performing well in the market .So by undertaking this study the researcher can guide the investors to select a security that satisfies their needs. More over with the help of these study investors can construct a portfolio that gives maximum return at a given level of risk.

OBJECTIVES OF THE STUDY

The following are the objectives of the study:

- To measure the risk and return of the selected sample for the study period.
- To analyze sector wise return and risk.
- To construct an optimal portfolio empirically using the Sharpe's Single Index Model and to calculate the cut-off rate which serves as a bench mark to select stocks to be included in a portfolio.
- To know the proportion of investment of each security included in the optimum portfolio.

RIVIEW OF LITERATURE

Andrade and Pratibha Jenifer (2012) aimed at developing an optimal equity portfolio of IT sector through Sharpe's Single Index Model. In this study, a sample of six top performing IT companies traded in BSE had been chosen .The data related to the daily returns of the securities and the market index had been collected through secondary sources. Data had been collected for a period of three years i.e. 2009 to 2011. It was found that the optimal portfolio had been constructed with five companies.

Desai et al., (2013): Constructed an optimal portfolio by using fifty companies listed in NSE for a period of three years. Among the fifty companies only ten companies were included for the optimum portfolio construction.

R. Nalini (2014): The main purpose of her study is to construct an optimal portfolio by using Sharpe's single index model. For that, fifteen companies from the S&P BSE Sensex index were selected for the study. Only secondary data had been used for conducting the study. The main objective of the study is to calculate the proportion of investment to be made in to each of the stock that is included in the optimal portfolio. Among the fifteen sample companies, only four were selected for optimal portfolio using SIM.

Francis Mary and G. Rathika (2015): Their study focussed on portfolio construction by using the monthly closing prices of ten companies listed in NSE and CNX Pharma. The period of study was from September 2010 to September 2014. Based up on the cut-off value out of the ten companies only one company is selected for the optimal portfolio construction.

RESEARCH METHODOLOGY

This study is fully based on secondary data collected by using Prowess software. The period covered for the study is five financial years from 2010-2015 and 50 companies from Banking sector, Metal Sector, Mining Sector, Pharmaceutical Sector, and Power Sector are taken. Purposive sampling method is used. The research is descriptive in nature. The tools used for analysis are 1) Return 2) Standard Deviation3) Excess return to beta ratio4) cut-off point.

Equations used for calculating the excess return to beta ratio and cut-off point are as follows

1) Excess return to beta ratio= (Ri-Rf)/ βi, Where Ri is the expected return on stock I (Collected by using Prowess).Rf=Risk free rate of return (here 6.5 percent is considered as risk free rate based on the portfolio on 91-day Government of India treasury bills).

2) Cut-off point

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

3) Construction of the optimal portfolio

. The percentage of funds to be invested in each security can be estimated as follows:

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

Where, X_i = proportion of investment in each stock

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

Where, C^* = cut off point

The first expression indicates the weights on each security and the second shows the relative investment in each security.

DATA ANALYSIS AND INTERPRETATION

1) SECTORWISE ANALYSIS OF RISK AND RETURN

Sector	Mean Return (Ri)	Risk (σ)
Banking	3.786	1.735378
Metal	0.592	2.613477
Mining	1.473	2.052078
Pharmaceutical	2.768	1.800246
Power	1.499	1.621772
	2.023	

Source: Calculated by author

The above table shows the sector wise analysis of risk and return. The value 2.023 is considered as a bench mark for finding the top performing sector. Based up on the bench mark it was found that Banking sector and Pharmaceutical sector are top performing and Mining and Power sector are medium performing and Metal sector was the low performing

sector. The risk evaluation shows that, Metal sector having the highest risk and Power sector having the lowest risk.

i) CALCULATED VALUE OF MEAN RETURN AND BETA VALUES OF SAMPLE COMPANIES STOCKS

serial no:	Company Name	Mean Return (Ri in %)	Beta
1	Allahabad	7.292	1.228
2	Andhra	9.386	1.3097
3	Axis	2.204	1.28
4	BOI	12.466	1.425
5	BOB	6.782	1.1033
6	Canara	17.07	1.2467
7	Dena	10.54	1.4267
8	SBI	4.642	1.2417
9	SIB	10.806	1.1478
10	UBI	9.694	1.206
11	Bhushan	4.578	1.155
12	ISMT	-0.722	1.274
13	JSW ISPAT	7.496	1.6433
14	Jai Balaji Industries	-8.098	1.385
15	Jindal steel power limited	-2.488	1.23
16	Kalyani steels	6.904	1.6583
17	Kamadhenu ISPAT limited	-3.948	1.3283
18	MukundLtd	-3.196	1.26
19	National Steel &agro limited	1.472	1.3167
20	Shah alloys limited	12.21	1.0183
21	Ashpura Mine Chem limited	0.57	1.67
22	Cairn India Limited	3.482	0.8733
23	Green Earth Resources &projects limited	11.98	1.16
24	Gujarat Mineral development corporation	-1.398	1.442
25	Hindustan Oil Exploration Company	-3.498	1.8868

	Limited		
26	NMDC	4.084	1.43
27	ONGC	7.366	0.87
28	OilIndia Limited	8.05	0.4825
29	Oriental Trimex limited	5.996	0.97
30	Selan Exploration Technology limited	-1.0535	1.155
31	Paneca Biotech limited	6.498	0.945
32	Pfizer limited	5.102	0.4217
33	Piramel enterprises limited	12.368	0.515
34	Plethico pharmaceuticals limited	-1.694	0.846
35	RPG life sciences limited	7.222	1.015
36	Ranbaxy laboratories	1.828	1.1388
37	Sms pharmaceuticals	9.834	0.68
38	Sanofi India limited	8.202	0.36
39	Shasun Pharmaceuticals limited	11.696	1.425
40	Shilpa medicare limited	5.368	1.05
41	Adnai Power limited	0.974	1.525
42	BF Utilities limited	13.31	1.195
43	CESC Ltd	-0.976	1.6867
44	Gujarat Industries power company limited	1.948	1.048
45	India power corporation limited	1.096	0.79
46	Indo wind energy limited	5.35	1.398
47	JSW energy limited	4.402	1.8525
48	Jai Prakash Power ventures Limited	2.606	1.62
49	NTPC Limited	3.202	0.766
50	NHPC Limited	4.066	0.893

Source: Prowess

The above table shows the calculated value of mean return and beta values of sample companies stocks. This table reveals that Canara bank has the highest return of 17.07% and Jai Balaji Industries having the lowest return of -8.098%. The return on stock investment is positive for forty companies and negative for ten companies. Further, beta is a measure of the systematic risk associated with stock returns and higher beta value signify that the volatility

in stock return is high and thus not always desirable. It can be seen from the table that thirty seven companies have beta values greater than 1, which means they are Volatile. JSW Energy Limited has the highest beta value of 1.853 and Sanofi India Limited has the lowest beta value of 0.36.

ii) RANKING OF STOCKS BASED ON EXCESS RETURN TO BETA RATIO

S. no:	Company name	Ri	Ri-Rf	β_i	Ri-Rf/β_i	Rank
1	Allahabad	7.292	0.792	1.228	0.645	17
2	Andhra	9.386	2.886	1.310	2.204	14
3	Axis	2.204	-4.296	1.280	-3.356	31
4	BOI	12.466	5.966	1.425	4.187	7
5	BOB	6.782	0.282	1.103	0.256	20
6	Canara	17.070	10.570	1.247	8.479	2
7	Dena	10.540	4.040	1.427	2.832	12
8	SBI	4.642	-1.858	1.242	-1.496	26
9	SIB	10.806	4.306	1.148	3.752	9
10	UBI	9.694	3.194	1.206	2.648	13
11	Bhushan	4.578	-1.922	1.155	-1.664	28
12	JSW	7.496	0.996	1.643	0.606	16
13	Kalyani	6.904	0.404	1.658	0.244	19
14	National	1.472	-5.028	1.317	-3.819	35
15	Shah	12.210	5.710	1.018	5.607	4
16	Ashpura	0.570	-5.930	1.670	-3.551	32
17	Cairn	3.482	-3.018	0.873	-3.456	34
18	Green	11.980	5.480	1.160	4.724	5
19	NMDC	4.084	-2.416	1.430	-1.690	27
20	ONGC	7.366	0.866	0.870	0.995	15
21	OilInd	8.050	1.550	0.483	3.212	11
22	Oriental	5.996	-0.504	0.970	-0.520	22
23	Paneca	6.498	-0.002	0.945	-0.002	21
24	Pfizer	5.102	-1.398	0.422	-3.315	36
25	Piramel	12.368	5.868	0.515	11.394	1
26	RPG	7.222	0.722	1.015	0.711	18
27	Ranbaxy	1.828	-4.672	1.139	-4.103	37
28	Sms	9.834	3.334	0.680	4.903	6
29	Sanofi	8.202	1.702	0.360	4.728	8

30	Shasun	11.696	5.196	1.425	3.646	10
31	Shilpa	5.368	-1.132	1.050	-1.078	25
32	Adnai	0.974	-5.526	1.525	-3.624	33
33	BF Utili	13.310	6.810	1.195	5.699	3
34	Gujarat	1.948	-4.552	1.048	-4.344	38
35	India power	1.096	-5.404	0.790	-6.841	40
36	Indo wind	5.350	-1.150	1.398	-0.823	23
37	JSW energy	4.402	-2.098	1.853	-1.133	24
38	Jai Prakash	2.606	-3.894	1.620	-2.404	29
39	NTPC	3.202	-3.298	0.766	-4.306	39
40	NHPC	4.066	-2.434	0.893	-2.727	30

The above table shows the ranking of stocks based on Excess Return to beta ratio. The securities with negative returns are excluded for the analysis and construction of optimal portfolio. For the calculation of this ratio, the risk free rate of return (Rf) is taken as the rate of return on the 91-day Treasury bill which is found to be 6.5% for the period under study. Ranking of the stocks are done on the basis of their excess return to beta. Based on the excess return to beta ratio the stocks are ranked from 1 to 40, with Piramel being in the first rank and India Power being in the last.

iii) SAMPLE COMPANIES BASED ON THEIR RANKS AND UNSYSTEMATIC RISK

Rank	Company Name	Unsystematic risk $(\sigma_{ei}^2)= \sigma_i^2 - \beta^2\sigma_m^2$	$\frac{(R_i - R_f) * \beta_i}{\sigma_{ei}^2}$	$\sum_{i=1}^{N} \frac{(R_i - R_f) * \beta_i}{\sigma_{ei}^2}$
1	Piramel	104.249	0.029	0.029
2	Canara	100.218	0.131	0.160
3	BF Utili	53.743	0.151	0.312
4	Shah	232.805	0.025	0.337
5	Green	274.019	0.023	0.360
6	Sms	166.906	0.014	0.374

7	BOI	173.380	0.049	0.423
8	Sanofi	28.177	0.022	0.444
9	SIB	38.577	0.128	0.573
10	Shasun	124.809	0.059	0.632
11	OilInd	38.029	0.020	0.769
12	Dena	59.223	0.097	0.729
13	UBI	95.732	0.040	0.789
14	Andhra	76.096	0.050	0.839
15	ONGC	42.043	0.018	0.857
16	JSW	75.806	0.022	0.878
17	Allahabad	99.391	0.010	0.888
18	RPG	101.493	0.007	0.895
19	Kalyani	100.044	0.007	0.901
20	BOB	101.917	0.003	0.905
21	Paneca	148.908	0.000	0.905
22	Oriental	147.440	-0.003	0.902
23	Indo wind	131.837	-0.012	0.889
24	JSW energy	44.504	-0.087	0.802
25	Shilpa	76.165	-0.016	0.787
26	SBI	31.121	-0.074	0.712
27	NMDC	26.966	-0.128	0.584
28	Bhushan	19.550	-0.114	0.470
29	Jai Prakash	127.569	-0.049	0.421
30	NHPC	30.088	-0.072	0.349
31	Axis	46.489	-0.118	0.231
32	Ashpura	193.757	-0.051	0.179
33	Adnai	73.969	-0.114	0.066
34	Cairn	25.100	-0.105	-0.039
35	National	145.858	-0.045	-0.085
36	Pfizer	30.348	-0.019	-0.104
37	Ranbaxy	31.051	-0.171	-0.275
38	Gujarat	17.142	-0.278	-0.553
39	NTPC	24.336	-0.104	-0.657
40	India power	89.271	-0.048	-0.705

The above table shows the ranks of the selected stocks and the calculated value s of their unsystematic risk.Unsystematic risk is the unique risk affecting the firm due to certain factors at the time of issuing such security. It is an avoidable or controllable risk. Green Earth Resources and projects Limited having the highest value of unsystematic risk ,

i.e. 274.01 and Gujarat Mineral Development corporation having the lowest value of unsystematic risk, i.e. 17.142.

iv) Ci OF SAMPLE COMPANIES STOCKS

Company Name	$\frac{(R_i - R_f) * \beta_i}{\sigma_{ei}^2}$	$\sum_{i=1}^{N} \frac{(R_i - R_f) * \beta_i}{\sigma_{ei}^2}$	$\sigma_m^2 * \sum_{i=1}^{N} \frac{(R_i - R_f) * \beta_i}{\sigma_{ei}^2}$	$\frac{\beta_i^2}{\sigma_{ei}^2}$	$\sum_{i=1}^{N} \frac{\beta_i^2}{\sigma_{ei}^2}$	$1+\sigma_m^2 * \sum_{i=1}^{N} \frac{\beta_i^2}{\sigma_{ei}^2}$	C_i
Piramel	0.029	0.029	0.391	0.003	0.003	1.034	0.378
Canara	0.131	0.160	2.166	0.016	0.018	1.244	1.742
BF Utili	0.151	0.312	4.210	0.027	0.045	1.602	2.627
Shah	0.025	0.337	4.547	0.004	0.049	1.662	2.735
Green	0.023	0.360	4.860	0.005	0.054	1.729	2.811
Sms	0.014	0.374	5.044	0.003	0.057	1.766	2.856
BOI	0.049	0.423	5.705	0.012	0.068	1.924	2.965
Sanofi	0.022	0.444	5.999	0.005	0.073	1.986	3.020
SIB	0.128	0.573	7.728	0.034	0.107	2.447	3.158
Shasun	0.059	0.632	8.529	0.016	0.123	2.667	**3.198=C***
OilInd	0.020	0.789	10.651	0.006	0.179	3.418	3.116
Dena	0.097	0.729	9.843	0.034	0.158	3.131	3.144
UBI	0.040	0.769	10.386	0.015	0.173	3.336	3.113
Andhra	0.050	0.839	11.322	0.023	0.202	3.723	3.041
ONGC	0.018	0.857	11.564	0.018	0.220	3.966	2.916
JSW	0.022	0.878	11.855	0.036	0.255	4.447	2.666
Allahabad	0.010	0.888	11.987	0.015	0.271	4.651	2.577
RPG	0.007	0.895	12.085	0.010	0.281	4.788	2.524
Kalyani	0.007	0.902	12.175	0.027	0.308	5.159	2.360
BOB	0.003	0.905	12.216	0.012	0.320	5.321	2.296
Paneca	0.000	0.905	12.216	0.006	0.326	5.402	2.262
Oriental	-0.003	0.902	12.171	0.006	0.332	5.488	2.218
Indo wind	-0.012	0.890	12.007	0.015	0.347	5.688	2.111
JSW energy	-0.087	0.802	10.828	0.077	0.424	6.729	1.609
Shilpa	-0.016	0.787	10.617	0.014	0.439	6.924	1.533
SBI	-0.074	0.712	9.617	0.050	0.488	7.593	1.267

NMDC	-0.128	0.584	7.887	0.076	0.564	8.616	0.915
Bhushan	-0.114	0.471	6.355	0.068	0.632	9.537	0.666
Jai Prakash	-0.049	0.421	5.687	0.021	0.653	9.815	0.579
NHPC	-0.072	0.349	4.713	0.026	0.680	10.172	0.463
Axis	-0.118	0.231	3.116	0.035	0.715	10.648	0.293
Ashpura	-0.051	0.180	2.426	0.014	0.729	10.842	0.224
Adnai	-0.114	0.066	0.888	0.031	0.761	11.267	0.079
Cairn	-0.105	-0.039	-0.529	0.030	0.791	11.677	-0.045
National	-0.045	-0.085	-1.142	0.012	0.803	11.837	-0.097
Pfizer	-0.019	-0.104	-1.404	0.006	0.809	11.916	-0.118
Ranbaxy	-0.171	-0.275	-3.717	0.042	0.851	12.480	-0.298
Gujarat	-0.278	-0.554	-7.473	0.064	0.915	13.345	-0.560
NTPC	-0.104	-0.657	-8.874	0.024	0.939	13.670	-0.649
India power	-0.048	-0.705	-9.520	0.007	0.946	13.765	-0.692

The above table represents the cut-off value (Ci) of sample companies. The square value of β divided by the unsystematic risk and its cumulative are necessary for the calculation of Ci. The Ci values goes on increasing from 0 .37829 to 3.19815 and thereafter starts declining. Therefore, the value of 3.19815 is considered as the '*cut-off point'*. The securities which come after the cut-off point will not be considered for the optimal portfolio construction.

V) CONSTRUCTION OF OPTIMAL PORTFOLIO

Rank	Company Name	$\frac{R_i - R_f}{\beta_i}$	C_i
1	Piramel	11.3942	0.37829
2	Canara	8.47861	1.74168
3	BF Utili	5.69874	2.62741
4	Shah	5.6072	2.73517
5	Green	4.72414	2.81144
6	Sms	4.90294	2.85572
7	BOI	4.18667	2.96507
8	Sanofi	4.72778	3.02016
9	SIB	3.7516	3.15793

10	Shasun	3.64632	**3.19815=C***
11	OilInd	3.21244	3.1158
12	Dena	2.83178	3.14386
13	UBI	2.64842	3.1134
14	Andhra	2.20361	3.04125
15	ONGC	0.9954	2.91589
16	JSW	0.60609	2.6661
17	Allahabad	0.64495	2.57711
18	RPG	0.71133	2.52373
19	Kalyani	0.24362	2.35975
20	BOB	0.25559	2.29599
21	Paneca	-0.0021	2.26155
22	Oriental	-0.5196	2.2179
23	Indo wind	-0.8226	2.11093
24	JSW energy	-1.1325	1.60921
25	Shilpa	-1.0781	1.53337
26	SBI	-1.4964	1.26655
27	NMDC	-1.6895	0.91538
28	Bhushan	-1.6641	0.66628
29	Jai Prakash	-2.4037	0.57942
30	NHPC	-2.7272	0.46327
31	Axis	-3.3563	0.29263
32	Ashpura	-3.5509	0.22376
33	Adnai	-3.6236	0.07884
34	Cairn	-3.4557	-0.0453
35	National	-3.8187	-0.0965
36	Pfizer	-3.3154	-0.1178
37	Ranbaxy	-4.1027	-0.2978
38	Gujarat	-4.3435	-0.56
39	NTPc	-4.3055	-0.6492
40	India power	-6.8405	-0.6916

The above table shows the Excess return to beta ratio and the cut-off values of all companies included in the optimal portfolio construction. Only those stocks with Excess return to beta ratio are to be selected in the optimal portfolio. It can be observed that only 11 stocks qualify to be included in the optimal portfolio on this criterion. They are Piramel Enterprises ltd, Canara Bank ,BF Utilities limited, Shah Alloys limited, Green Earth Resources and projects limited, SMS Pharmaceuticals limited, Bank of India, Sanofi India Limited, South Indian Bank, Shasun Pharmaceuticals limited and Oil India limited.

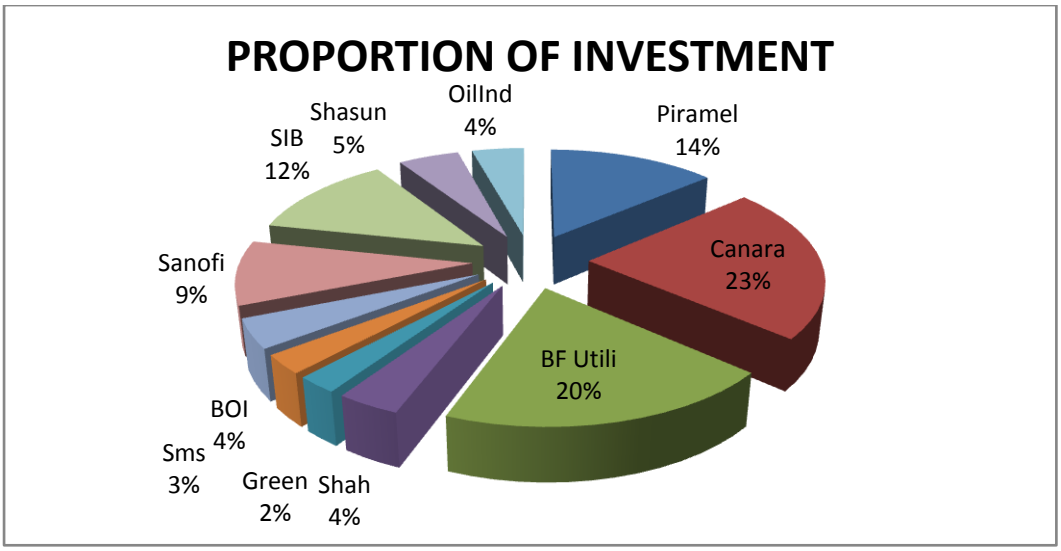
VALUES OF CUT-OFF POINT AND INVESTMENT PROPORTION FOR THE STOCKS INCLUDED IN THE OPTIMAL PORTFOLIO

Company Name	C_i	Zi	Proportion of Investment Xi
Piramel Enterprises Limited	0.378	0.040	13.76%
Canara Bank	1.742	0.066	22.15%
BF Utilities Limited	2.627	0.057	19.53%
Shah Alloys Limited	2.735	0.011	3.70%
Green Earth resources &Projects Limited	2.811	0.007	2.42%
Sms Pharmaceuticals	2.856	0.008	2.75%
BOI	2.965	0.012	4.24%
Sanofi India Ltd	3.020	0.027	9.33%
OilInd Ltd	3.116	0.037	4.28%
SIB	3.158	0.015	12.41%
Shasun pharmaceuticals Limited	3.198	0.013	4.99%
		ɛZi=0.294	ɛXi=100.00

The above table represents the proportion of investment to be made in each security. The securities ranking from 1 to 11 are selected for the optimal portfolio. The percentage of funds to be invested in Piramel Enterprises Limited is 13.76%, in Canara Bank 22.15%,in BF Utilities Limited 19.53%,in Shah Alloys Limited 3.70%,in Green Earth resources &Projects

Limited 2.42% ,in Sms Pharmaceuticals 2.75%,in BOI 4.24%,in Sanofi India Ltd 9.33%,in Oil India Ltd 4.28%.in SIB 12.41% and in Shasun pharmaceuticals Limited 4.99%.

CHART SHOWING THE PROPORTION OF INVESTMENT PROPOSED



The above chart 1.1 represents the percentage of funds to be invested in each security. Majority of the fund is to be invested in Canara Bank (23%) and the least is to be invested in Green earth resources and projects ltd(2%).

FINDINGS OF THE STUDY

The major findings of the study are as follows

- Canara Bank has shown highest return of 17.07% and Jai Balaji Industries has shown the highest negative return of -8.098%.
- The banking sector and metal sector have been identified as high return with high risk portfolio's.
- The banking and power sector have been identified as high return with low risk portfolio's.
- The mining and metal sector have been identified as low return with high risk portfolio's.
- The metal and power sector have been identified as low return with low risk portfolio's.
- The returns on stock investment are positive for forty companies and negative for ten companies.

- It is found thirty seven companies have beta values greater than one, which means they are volatile. JSW Energy limited has the highest beta value of 1.853 and Sanofi India limited has the lowest beta value of 0.36.
- Based on the Ci values only 11 stocks are qualified to be included in the optimal portfolio construction. They are Piramel Enterprises Ltd, Canara Bank, BF Utilities Ltd, Shah Alloys Ltd, Green Earth Resources and Projects Limited, SMS Pharmaceuticals limited ,Bank of India, Sanofi India Limited, South Indian Bank, Shasun Pharmaceuticals Ltd and Oil India Limited.
- The percentage of funds to be invested in Piramel Enterprises Limited is 13.76%,Canara Bank 22.15%,BF Utilities limited 19.53%,Shah Alloys Limited 3.70%,Green Earth Resources and Projects Limited 2.42%,SMS Pharmaceuticals limited 2.75%,Bank of India 4.24%,Sanofi India Limited 9.33%,Oil India Limited 4.28%,South Indian Bank 12.41%,Sha Sun Pharmaceuticals 4.99%.This implies that the majority of funds may be invested on Canara Bank.

SUGGESTIONS

- The investors are recommended to invest in the following companies' share which is having the high cut-off value and excess return to beta ratio. They are Piramel Enterprises Limited, Canara Bank, BF Utilities Limited, Shah Alloys Limited, Green Earth Resources and Projects Limited, SMS Pharmaceuticals Limited, Bank Of India, Sanofi India Limited, Oil India Limited, South Indian Bank, Shasun Pharmaceuticals Limited.
- If the investor wants to invest in individual sectors they can invest in Banking, Pharmaceutical and Power sector which gives high return and low risk.
- Risk taking investors can invest in Metal, Mining, Banking and Pharmaceutical sector which gives high return high risk.
- Investors should not invest in individual sectors like Metal and Mining which gives high risk and low return.

CONCLUSION

Risk and return are the two sides of a coin. Both are important while taking investment decisions .In this research work forty companies had shown positive returns and ten companies had shown negative returns. With regard to beta values, out of 50 companies selected only 37 companies showed beta above 1, indicating that their stocks are outperforming than the stock market. The results of the present study and such micro level

studies enables investors to go for scientific diversification and also have more utility value to the fund managers of emerging economies like India where the capital markets are still in their developing stages and many foreign institutional investors are also interested to invest in the leading stock. This study would serve as a guide to investors. Further this study has enabled the researcher to gain knowledge in optimum portfolio construction.

REFERENCES

J. Francis Mary and G. Rathika (2015).” The single index model and the construction of optimal portfolio with cnxpharma scrip”. *International Journal of Management*, Volume no.6, Issue no: 1, ISSN 0976 – 6502(Print), ISSN 09 76-6510 (Online), pp. 87-96.

R. Nalini(2014).” Optimal portfolio construction using Sharpe’s Single Index model - a study of selected stocks from BSE”. *International Journal of Advanced Research in Management and Social Sciences,* Volume no.3, Issue no: 12, *ISSN: 2278-6236,* pp.62-93.

Dr. G Ramesh Babu,” Portfolio Management Including Security Analysis”, Concept Publishing Company, New Delhi. (2010).

Fischer, Donald E. Ronald J Jordan, ”Security Analysis and Portfolio MAnagemnt”,6 th Edition, Prentice Hall India (P) Limited, New Delhi(1996).

Vikrant Panwar(2014),” Application of Sharpe Single Index model: Portfolio C.onstruction and evaluation”. *Masters International Journal of Management Research and Development.* Volume no.2, Issue no: 3, ISSN 2347-9043,pp.122-13

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