A Study on Security Analysis of Selected 15 Stocks of National Stock Exchange

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Abstract:
Investing in various types of assets is an interesting activity that attracts people from all walks of life, irrespective of their occupation, economic status, education, & family background. Investment has many alternatives to offer investors. In the present market wide variety of investment avenues are open to all type of investors to suit their needs. Knowledge regarding the different investment avenues is helpful to investors to choose right kind of investment.
Investors can invest money in stock market. He can buy shares of different company from Indian stock market. It includes return and risk. Before invest the money in particular companies share, evaluation is necessary in order to get proper return. This paper aims at to guide the investors to selection of stocks by using different methods of evaluation and analysis.

Keywords: Stock market, Investment, Efficient frontier, Sharpe's optimal portfolio, CAPM.

1. Introduction

Investment is the employment of funds on asset with the aim of earning income or capital appreciation. Investment has two attributes, namely, time and risk. Investor always expects maximum return from their investment with less amount of risk.

As the investors are investing huge amount of money in stock market, the analysis must be done because it involves risk. However, making money from stock market is not an easy task. It requires time and patience. He should do research and put efforts to understand the market.

Here a practical analysis has been done by considering 15 companies' securities from Indian Stock Market with the help of their present performance for last 5 years on quarterly basis.

1.1. Objective of the Study

The risk taker nature of the investors makes him to think twice before investing in any of the securities in the stock market. Considering this, present paper highlights the following objectives.

- To provide knowledge about basic financial concepts
- Understand the nature of change in the stock market
- Guide the investor to determine the risk and return expected from an investment
- Selection criteria of the securities
- Find out the attractive combination of securities for investment.

2. Methodology

2.1. Sources of Data

2.1.1. Primary Data

This study is based on primary data. Data collected from the share price of 15 randomly selected companies and their capital market performance for last 5 years is recorded on the basis of each quarter end market price.

2.1.2. Secondary Data
Secondary data utilized for conceptual frame work. Information is collected from various sources like published books, research works, articles and websites.

2.2. Tools for Analysis
Basically this paper guides the investors to frame the proper and attractive investment plan. Different financial tools have been highlighted to guide the investor in selection of securities. This paper involves several concepts for the evaluation of securities. They are

- Expected return
- Standard deviation
- Beta
- Efficient frontier
- Optimal portfolio
- Capital asset pricing model
- Sharpe's model
- Treynor's model
- Jenson's model

All the calculation required for the study is done with the help of MS-Excel. Final conclusion and interpretation has been drawn from the results of the study.

3. Finding of the Study
This paper helps to an investor to analyze the securities by applying various tools & also select right kind of investment in order to get proper return for his investment in share market. Paper includes various kind tools to analyze the securities.

For the purpose of study following market information is used and Treasury bill rate of return is taken 2%, Beta of the market is considered as 1.

Particular	Market
Average Return	2.63
Standard Deviation	6.77
Variance of Market	45.83

Table 1: Market Information.

The above information about the market is taken from the BSE Sensex on the basis Five-year quarter end prices. With the help of market information these study is made.

SL.NO	Company Name	Mean	S.D	Beta
1	Axis bank	5.89	19.33	2.26
2	Karnataka bank	5.10	27.65	2.33
3	Canara bank	3.52	25.99	2.70
4	TCS	6.95	11.86	0.38
5	Wipro	2.32	13.77	0.55
6	Infosys	2.84	11.62	0.32
7	Maruthi Suzuki	5.92	17.10	1.88
8	Hero motors	3.12	11.05	0.24
9	TVS motors	14.22	31.92	2.13
10	Cipla	4.09	13.20	0.45
11	Glenmark	6.53	12.61	0.65
12	ITC	5.82	7.12	0.10
13	ACC	2.69	11.37	0.49
14	DLF	-2.48	18.29	1.44
15	Force motors	13.19	45.51	3.32

Table 2: Evaluation criteria for selection of securities.
Source: Author's primary data

3.1. Interpretation

3.1.1. Evaluation on the Basis of Average Return (Ri)
Return is the actual income received plus plus any change in market price of an investment. Investor always wants to good rate of return from his investment. The average rate of return can be calculated as follows.

Return= (((closing price – opening price)/opening price)*100)
Average Return = ($\sum$ Return / N)
Where N = number of observations.
In the above table 2 given average expected return (mean) of selected companies. From the above observation, on the basis of average rate of return investor can choose TVS motors (14.22%) & Force motors (13.19%) as its return is more.

3.1.2. Evaluation on the Basis of Standard Deviation (S D)
Investment decision will be more accurate if an investor consider along risk along with return. Risk means any deviation from expected returns. Proper measurement of risk helps to an investor to minimize the risk and increase the return from the investment. Standard deviation represents variation in the expected return. Higher standard deviation represents more variation in the expected return and vice-versa. The security having less standard deviation will be suggestible for the investment. The standard deviation will be calculated as follows.
Standard Deviation (S D) = $\sqrt{} \sum$ (Return – Average Return) ^{2}/
In the above table 2, Standard deviation represents variation in the expected return. From the above observation, securities which are having less variation i.e. ITC (7.12%) & Hero motors (11.05%) companies' securities are suggestible for an investment.

3.1.3. Evaluation on the Basis of Beta
Beta describes the relationship between the stock's return and the market returns. It indicates that one percentage changes in the market index return would cause to some percent of change in stock return. Beta 1 indicates that security price will move with market. A beta of less than one means that the security will be less volatile than the market and vice-versa. The beta of securities can be calculated as follows.
Beta (β) = {$\sum(R_m$ – Mean return of Market) (R_i – Mean return of Security)}/ {$\sum(R_m$– Mean return of the Market)^2 }
The investor who is interested to avoid risk to maximum extent, security with less beta (ITC, β= 0.10) is suggestible for investment.

3.2. Efficient Frontier
Efficient frontier is the technical aspect of optimal portfolio selection to determine the risk-return opportunities available to an investor. This is also referred to as the determination of feasible set of portfolios or the portfolio opportunity set or the minimum variance portfolio opportunity set. Graphically these are summarized by the minimum variance frontier of risky assets. The point on the minimum variance frontier represents the global minimum variance portfolio. The highest point represents the global maximum return portfolio. The line segment between the global minimum variance portfolio and global maximum return portfolio constitutes the efficient frontier. It is shown in the graph.
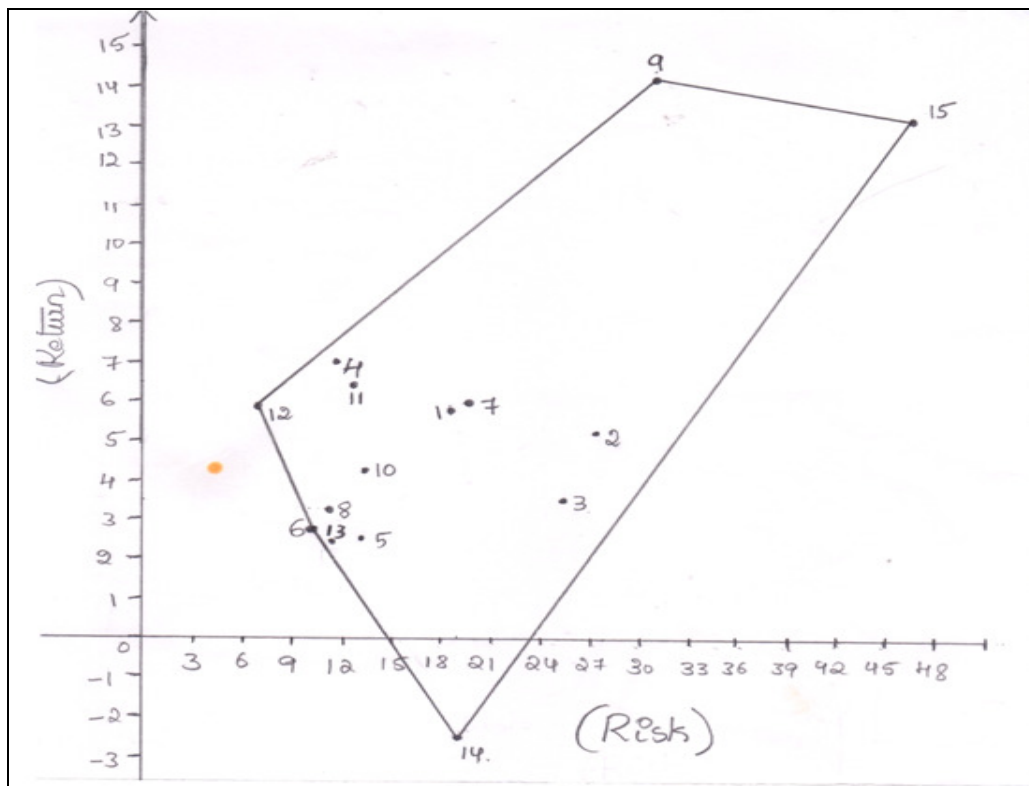

Figure 1: Efficient Frontier Graph
Source: Author's primary source

In the above graphical representation OX axis denotes Standard deviation and OY axis denotes Percentage of return. Risk and returns space formed in the graph shows possible selection of stocks with their relative risk and return. Point 1 to 15 indicates name of the different companies which is shown in table No. 2.

There are three type of investors are available namely risk taker, risk neutral and risk avoider. Risk takers always expect that high rate of return with higher amount of risk since above space which created by risk-return factor, point 15 i.e. Force motors to be selected to reach expectation.

Risk neutral investors are not more conscious about risk and return. They look medium coverage securities on both sides. To achieve the expectation point 9 i.e. TVS motors is selected for investment which gives medium coverage.

Finally, risk avoiders always try to avoid the risk to make minimum return. Point 12 i.e. ITC has less risk and minimum return is suggestible for an investment. By these ways efficient frontier gives clear picture about the selection of security on the basis of their dominance over others.

3.3. Performance Evaluation of Securities

Portfolios are evaluated by portfolio managers, who can help identify a portfolio's strength and weakness and based on its performance, develop a better management strategy. For the purpose of evaluation different models are available. They are as follows.

SL.NO	Company	Sharpe's	Rank	Treynor's	Rank	Jenson's	Rank
1	Axis bank	0.20	7	1.72	10	2.47	7
2	Karnataka bank	0.11	9	1.33	12	1.63	9
3	Canara bank	0.06	12.5	0.56	14	-0.18	0
4	TCS	0.42	2	13.03	2	4.71	3
5	Wipro	0.02	14	0.58	13	-0.03	0
6	Infosys	0.07	11	2.63	8	0.64	11
7	Maruthi Suzuki	0.23	6	2.09	9	2.74	6
8	Hero motors	0.10	10	4.67	5	0.97	10
9	TVS motors	0.38	3	5.74	4	10.88	1
10	Cipla	0.16	8	4.64	6	1.81	8
11	Glenmark	0.36	4	6.97	3	4.12	4
12	ITC	0.54	1	38.20	1	3.76	5
13	ACC	0.06	12.5	1.41	11	0.38	12
14	DLF	-0.24	0	-3.11	0	-5.39	0
15	Force motors	0.25	5	3.37	7	9.10	2

Table 3: Performance evaluation model
Source: Author's primary data

3.3.1. Sharpe's Performance Index
Sharpe's performance index offers a single value to be used for the performance ranking of different funds or portfolios. Under this performance is measured as follows
Sharpe performance index = $[(R_p - R_f)/\sigma]$

3.3.2. Treynor's Performance Index
An investor should know the concept of characteristic line to understand treynor's index model. The fund's performance is measured in relation to the market performance. Following formula is used under this index to evaluate the portfolios.
Treynor's performance index = $[(R_i - R_f)/\beta]$

3.3.3. Jensen's Performance Index
According to this model performance of portfolio is to be compared with the CAPM return. It's because any professional fund manager would be expected to earn at least average portfolio return of CAPM. Following formula is used for the calculation.
Jensen's performance index = $[R_f - \beta (R_m - R_f)]$
In the table.3 performances of all the securities are evaluated and ranked on the basis of their performance.

3.4. Capital Asset Pricing Model

It is the model of linear general equilibrium return in CAPM model. The required rate of an asset is having linear application with assets beta value. With the help of this model investor can take decision of either to sell or purchase security by comparing with equilibrium return. For the purpose of calculation following formula is used.
CAPM return = $[R_f + \beta (R_m - R_f)]$

SL.NO	Company Name	% of return	Beta	CAPM expected return	Excess% of variation	Ranking
1	Axis Bank	5.89	2.26	3.42	72.03	8
2	Karnataka bank	5.10	2.33	3.47	47.06	9
3	Canara bank	3.52	2.70	3.70	-4.89	0
4	TCS	6.95	0.38	2.24	210.35	3
5	Wipro	2.32	0.55	2.35	-1.13	0
6	Infosys	2.84	0.32	2.20	29.00	11
7	Maruthi Suzuki	5.92	1.88	3.18	85.91	6
8	Hero motors	3.12	0.24	2.15	45.04	10
9	TVS motors	14.22	2.13	3.34	325.51	1
10	Cipla	4.09	0.45	2.28	79.11	7
11	Glenmark	6.53	0.65	2.41	171.01	5
12	ITC	5.82	0.10	2.06	182.11	4
13	ACC	2.69	0.49	2.31	16.52	12
14	DLF	-2.48	1.44	2.91	-185.31	0
15	Force motors	13.19	3.32	4.09	222.35	2

Table 4: Capital Asset Pricing Model
Source: Author's primary data

In the above table No.4 the portfolios are evaluated on the basis of CAPM model and ranked based on their performance.

3.5. Optimal Portfolio Construction
Sharpe provided model for the selection of appropriate securities in a portfolio. The selection of any stock is directly related to its excess return-beta ratio. The excess return is the difference between the expected return on the stock and the risk free rate of interest such as the rate offered on a government security or treasury bill. The ratio provides relationship between potential risk and reward.
The ranking of stocks is done on the basis of their excess return to beta. Portfolio manager would like to include stocks with higher ratios. The selection of stocks depends on a unique cut off rate such as all stocks with higher ratio are included, and stocks with lower ratios are left out.
The excess return-beta ratio is calculated as follows.
Excess return-beta = $[(R_i - R_f)/\beta]$

NO.SL	Company	Average Return	Ri-Rf	Beta	Unsystematic Risk	Excess Return to Beta	Ranking
1	Axis Bank	5.89	3.82	2.26	139.57	1.72	10
2	Karnataka bank	5.10	4.95	2.33	515.72	1.33	12
3	Canara bank	3.52	4.53	2.70	341.38	0.56	14
4	TCS	6.95	12.22	0.38	134.04	13.03	2
5	Wipro	2.32	1.12	0.55	174.75	0.58	13
6	Infosys	2.84	2.09	0.32	130.33	2.63	8
7	Maruthi Suzuki	5.92	11.09	1.88	130.43	2.09	9
8	Hero motors	3.12	0.84	0.24	119.46	4.67	5
9	TVS motors	14.22	3.92	2.13	810.96	5.74	4
10	Cipla	4.09	3.89	0.45	164.96	4.64	6
11	Glenmark	6.53	0.69	0.65	139.65	6.97	3
12	ITC	5.82	3.1	0.10	50.04	38.20	1
13	ACC	2.69	0.32	0.49	118.27	1.41	11
14	DLF	-2.48	1.52	1.44	239.49	-3.11	15
15	Force motors	13.19	11.19	3.32	1566.00	3.37	7

Table 5: Ranking the securities on the basis of "excess return to beta"
Source: Author's primary data

In the above table all the securities are ranked on the basis of their excess return-beta ratio.
After ranking the securities, the portfolio manager should decide cut of rate. This helps to an investor to decide which the securities are should be involved in the portfolio. The cut off rate is calculated as follows.

$$C = \frac{\{\sigma m^2 \ [\sum (Ri - Rf)\beta/ \ unsystematic \ Risk)]\}}{\{1 + \sigma m^2 \ [\sum \beta i^2 / \ unsystematic \ Risk]\}}$$

Portion of the investment is calculated as follows.

$X_i = \{z_i / \sum_{i=1}^{N} z_i\}$

Where $Z_i = (\beta_i / \text{unsystematic risk}) \{ (R_i - R_f / \beta_i) - C^* \}$

SL. No	Company	RI	Beta	USR	(Ri-Rf)	(Ri-Rf)*β	(Ri-Rf)*β/USR	C total	(Beta2/USR)	C total	Cut of point*
12	ITC	5.82	0.1	50.04	3.82	0.38	0.008	0.008	0.0002	0.0002	0.36
4	TCS	6.95	0.38	134.04	4.95	1.88	0.014	0.022	0.0011	0.0013	0.95
11	Glenmark	6.93	0.65	139.65	4.53	2.94	0.021	0.043	0.0030	0.0043	1.65
9	TVS motors	14.22	2.13	810.96	12.22	26.03	0.032	0.075	0.0056	0.0099	2.36
8	Hero motors	3.12	0.24	119.46	1.12	0.27	0.002	0.077	0.0005	0.0104	2.39
10	Cipla	4.09	0.45	164.96	2.09	0.94	0.006	0.083	0.0012	0.0116	2.48
15	Force motors	13.19	3.32	1566.0	11.19	37.15	0.024	0.107	0.0070	0.0186	2.65*(C)
6	Infosys	2.84	0.32	130.33	0.84	0.27	0.002	0.109	0.0008	0.0194	2.64
7	Maruthi Suzuki	5.92	1.88	130.43	3.92	7.37	0.057	0.166	0.0271	0.0465	2.43
1	Axis bank	5.89	2.26	139.57	3.89	8.79	0.063	0.229	0.0366	0.0831	2.18
13	ACC	2.69	0.49	118.27	0.69	0.34	0.003	0.232	0.0020	0.0851	2.17
2	Karnataka bank	5.1	2.33	515.72	3.1	7.22	0.014	0.246	0.0105	0.0956	2.10
5	Wipro	2.32	0.55	175.75	0.32	0.18	0.001	0.247	0.0017	0.0973	2.07
3	Canara bank	3.52	2.7	341.38	1.52	4.10	0.012	0.259	0.0214	0.1187	1.84
14	DLF	13.19	3.32	239.49	11.19	37.15	0.155	0.414	0.0460	0.1647	2.22

Table 6: Deciding about securities which to be involved in portfolio by using Sharpe's optimal portfolio
Source: Author's primary data

From the above calculation portfolio manager can decide to have investment in 7 different companies. The portion of investment in the portfolio is shown in following table.

Company	Portion of investment. (%)
ITC	51
TCS	21
Glenmark	14
TVS	6
Hero motors	3
Cipla	4
Force motors	1

Table 7: Portion of the investment in selected securities.
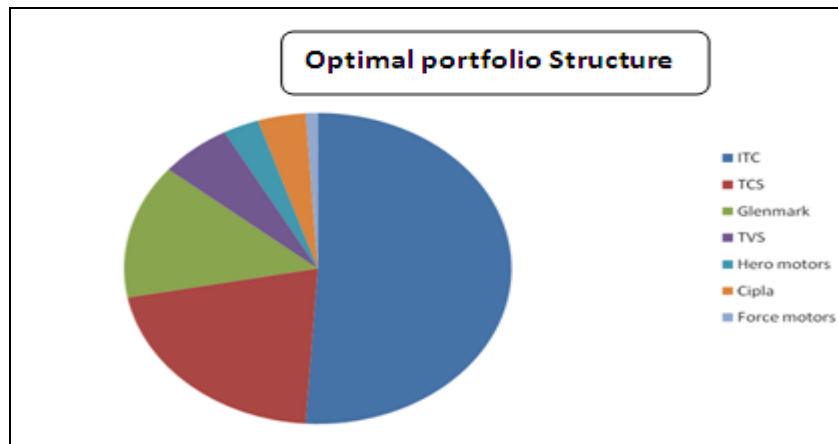*Source: Author's primary data*

Figure 2
Source: Author's primary data

The allocation of investible fund between the securities is shown in pie diagram.

3.6. Portfolio Risk and Return

Company	Proportion of Investment	Return	Risk
ITC	51	5.82	7.12
TCS	21	6.95	11.86
Glenmark	14	6.53	12.61
TVS	6	14.22	31.92
Hero motors	3	3.12	11.05
Cipla	4	4.09	13.20
Force motors	1	13.19	45.51

Table 8

Portfolio Return	6.58%
Portfolio Risk	10.92%

After making an optimal portfolio, the portfolio risk and return is shown above. Here these seven companies are suggested for the investment among the fifteen selected companies.

3.7. Limitation of the Study
- Study conducted on the basis of last five years' quarter end market price.
- Study is based only on past performance of shares.
- It limits only randomly selected fifteen companies.

3.8. Conclusion
Some investors are funded their money in the stock market without having proper knowledge. And making money in the stock market is not an easy task. It requires immense knowledge, patience, and research to increase his understanding ability of the markets. This study is helps for investor make a study about the securities in the stock market and select the right kind of investment in order to get optimum return.

4. References
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