

## A Study on Portfolio Management with Reference to Angel Broking Ltd

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### ABSTRACT

Portfolio Management is a very generic term used to refer to the management of different assets. In the financial markets, there are many assets available, such as stocks, bonds, and Treasury bill, commodities, currencies. Etc., The main objective of portfolio is maximize the return and minimize the risk for that one should do the process of selection of portfolio, analysis of portfolio, revision of portfolio and evaluation of portfolio from time-to-time. India is developing country in which stock market is growing day by day. Indian stock markets have attracted huge Foreign Institutional Investors (FII) that is nearly 40% of investment. The study to analysis risk, return of selected to stocks, showing the best combination of portfolio using correlation, sharp index value.

**KEYWORDS:** PORTFOLIO, SECURITIES, RETURN, RISK, INVESTOR

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### INTRODUCTION:

Portfolio management is the key skill that one requires for managing investment effectively. It is a decision- support system that is designed with the view to meet the multi-faced needs of investors.

Different attributes of investment alternatives are analysed and objective of investment guides where and how much money to allocate to each of the alternatives. Investing in more and more assets, with different attributes, diversifies the risk of a portfolio and thereby increases reasonable assurance of the returns.

### NEED FOR THE STUDY:

- The purpose of the study is to analyze the risk and returns of Ultratech, SBI, Dr.Reddy's Lab, Bharati Airtel and Tata Motors.
- It helps investors to choose optimal portfolio.

### OBJECTIVES OF THE STUDY

- To study the investment pattern and its related risk and return of Ultratech, SBI, Dr.Reddy's Lab, Bharati Airtel and Tata Motors
- To analyze and select the best portfolio.

- To know the optimal portfolio of Ultratech, SBI, Dr. Reddy's Lab, Bharati Airtel and Tata Motors

### SCOPE OF THE STUDY

- The study covers the calculation of risk, return of securities in order to find out the best portfolio to investor for a period of 5 years data (2016-2021).

### LIMITATIONS

- Construction of portfolio is restricted to two companies only.
- Very few and randomly selected scripts / companies are analyzed from NSE listings.
- Data collection was strictly confined to secondary source. No primary data is associated with the project.
- The study covers to find out the best portfolio to investor for a period of 5 years data (2016-2021).

### SOURCES OF DATA:

- The study is entirely based on the secondary data analysis.
- Secondary data is collected through the company website of the company.

**Websites:**

- [www.angelbroking.com](http://www.angelbroking.com)
- [www.moneycontrol.com](http://www.moneycontrol.com)

**TOOLS AND TECHNIQUES**

- Standard Deviation.
- Correlation.

**DATA ANALYSIS AND INTERPRETATION****Diagrammatic representation of company and returns****Table 1: Average return of Ultratech**

YEAR	OPENING SHARE PRICE (P0)	CLOSING SHARE PRICE (P1)	(P1-P0)	(P1-P0)/P0*100
2016-17	3249	3984.75	735.75	22.64542936
2017-18	4028.89	3950	-78.89	-1.958107568
2018-19	4123	3998.35	-124.65	-3.023284016
2019-20	4040	3244.85	-795.15	-19.68193069
2020-21	3245	6737.95	3492.95	107.6409861
			TOTAL RETURN	105.6230932
	AVERAGE RETURN = $105.62/5 = 21.12$			

**Table 2: Average return of SBI**

YEAR	OPENING SHARE PRICE (P0)	CLOSING SHARE PRICE (P1)	(P1-P0)	(P1-P0)/P0*100
2016-17	193.69	293.39	99.7	51.47400485
2017-18	294.79	249.89	-44.9	-15.23118152
2018-19	251.8	320.75	68.95	27.38284353
2019-20	321.79	196.85	-124.94	-38.82656391
2020-21	194	364.29	170.29	87.77835052
			TOTAL RETURN	112.5774535
	AVERAGE RETURN = $112.57/5 = 22.51$			

**Table 3: Average return of Dr.Reddy's Lab**

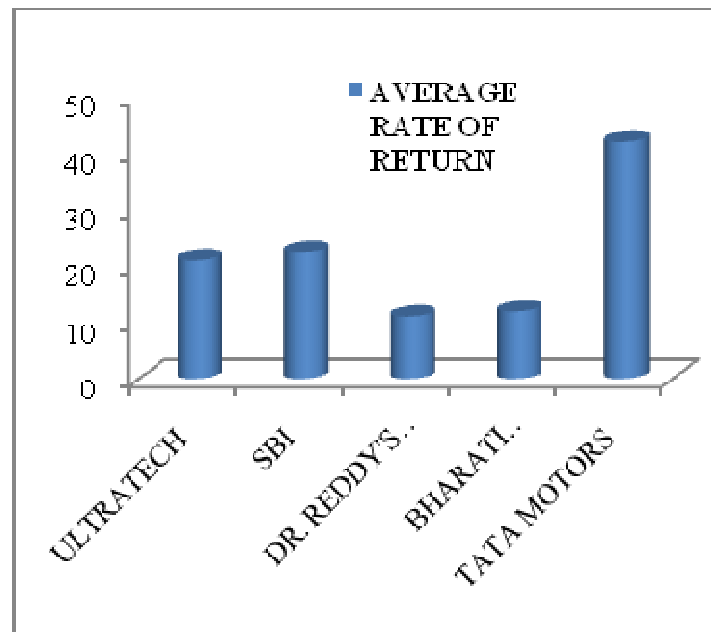
YEAR	OPENING SHARE PRICE (P0)	CLOSING SHARE PRICE (P1)	(P1-P0)	(P1-P0)/P0*100
2016-17	3020.19	2632.35	-387.84	-12.84157619
2017-18	2644.8	2080.55	-564.25	-21.33431639
2018-19	2080	2780.25	700.25	33.66586538
2019-20	2798.94	3120.75	321.81	11.49756694
2020-21	3119.94	4516	1396.06	44.74637333
			TOTAL RETURN	55.73391306
	AVERAGE RETURN = $55.73/5 = 11.14$			

**Table 4: Average return of Bharati Airtel**

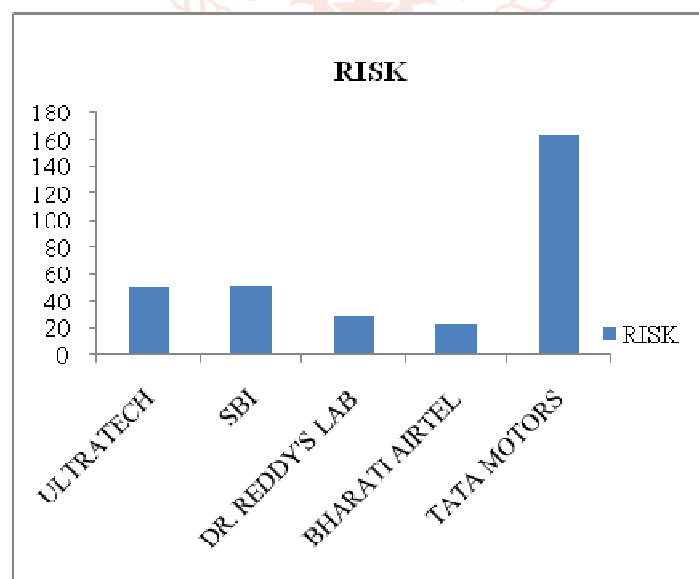
YEAR	OPENING SHARE PRICE (P0)	CLOSING SHARE PRICE (P1)	(P1-P0)	(P1-P0)/P0*100
2016-17	321.54	321.4	-0.14	-0.043540462
2017-18	317.68	366.07	48.39	15.23230924
2018-19	366.81	305.84	-60.97	-16.62168425
2019-20	306.57	440.89	134.32	43.81381088
2020-21	440	517.29	77.29	17.56590909
			TOTAL RETURN	59.9468045
	AVERAGE RETURN = $59.94/5 = 11.98$			

**Table 5: Average return of Tata Motors**

YEAR	OPENING SHARE PRICE (P0)	CLOSING SHARE PRICE (P1)	(P1-P0)	(P1-P0)/P0*100
2016-17	386.39	465.85	79.46	20.56471441
2017-18	468.25	326.85	-141.4	-30.19754405
2018-19	335	174.25	-160.75	-47.98507463
2019-20	176.35	71.05	-105.3	-59.71080238
2020-21	70.5	301.79	231.29	328.070922
			TOTAL RETURN	210.7422153
	AVERAGE RETURN = $210.74/5 = 42.14$			

**Figure 1: Diagrammatic representation of company and returns****INTERPRETATION:**

Based on above average return of securities TATA MOTORS is earning highest return (42.14) and DR.REDDY'S LAB is earning lowest return (11.14). Other securities are earning medium range of returns.

**Figure 2: Diagrammatic representation of company and risk****INTERPRETATION:**

Based on above calculation of standard deviation of the TATA MOTORS is highest risk i.e., 162.74 and BHARATI AIRTEL is lowest risk i.e., 22.45. where other companies are having medium risk (standard deviation).

**Table 6: CALCULATION OF CORRELATION**

COMBINATION	CORRELATION
ULTRATECH - SBI	0.86
ULTRATECH - DR.REDDY'S LAB	0.52
ULTRATECH - BHARATI AIRTEL	-0.04
ULTRATECH - TATA MOTORS	0.99
SBI - DR.REDDY'S LAB	0.7
SBI - BHARATI AIRTEL	-0.48
SBI - TATA MOTORS	0.8
DR.REDDY'S LAB - BHARATI AIRTEL	-0.1
DR.REDDY'S LAB - TATA MOTORS	0.55
BHARATI AIRTEL - TATA MOTORS	0.06

**INTERPRETATION:**

The ULTRATECH & TATA MOTORS has highest positive correlation (0.99). The BHARATI AIRTEL & TATA MOTORS has lowest positive correlation (0.06). The SBI & BHARATI AIRTEL has highest negative correlation (-0.48). The ULTRATECH & BHARATI AIRTEL has lowest negative correlation (-0.04).

**CALCULATION OF PORTFOLIO RISK:**

$$R_p = \sqrt{(\sigma_a \cdot W_a)^2 + (\sigma_b \cdot W_b)^2 + 2 \cdot \sigma_a \cdot \sigma_b \cdot W_a \cdot W_b \cdot \rho_{ab}}$$

**ULTRATECH AND OTHER COMPANIES**

ULTRATECH (a) & SBI (b)

$$\sigma_a = 50.66 \quad \sigma_b = 50.76$$

$$W_a = 0.5 \quad W_b = 0.5 \quad \rho_{ab} = 0.86$$

$$R_p = 48.9$$

ULTRATECH (a) & DR.REDDY'S LAB (b)

$$\sigma_a = 50.66 \quad \sigma_b = 28.57$$

$$W_a = 0.03 \quad W_b = 0.97 \quad \rho_{ab} = 0.52$$

$$R_p = 28.53$$

ULTRATECH (a) & BHARATI AIRTEL (b)

$$\sigma_a = 50.66 \quad \sigma_b = 22.45$$

$$W_a = 0.17 \quad W_b = 0.83 \quad \rho_{ab} = -0.04$$

$$R_p = 22.21$$

ULTRATECH (a) & TATA MOTORS (b)

$$\sigma_a = 50.66 \quad \sigma_b = 162.74$$

$$W_a = 1.44 \quad W_b = -0.44 \quad \rho_{ab} = 0.99$$

$$R_p = 10.3$$

**SBI AND OTHER COMPANIES**

SBI (a) & DR.REDDY'S LAB (b)

$$\sigma_a = 50.76 \quad \sigma_b = 28.57$$

$$W_a = -0.15 \quad W_b = 1.15 \quad \rho_{ab} = 0.7$$

$$R_p = 28.05$$

SBI (a) & BHARATI AIRTEL (b)

$$\sigma_a = 50.76 \quad \sigma_b = 22.45$$

$$W_a = 0.25 \quad W_b = 0.75 \quad \rho_{ab} = -0.48$$

$$R_p = 15.47$$

SBI (a) & TATA MOTORS (b)

$$\sigma_a = 50.76 \quad \sigma_b = 162.74$$

$$W_a = 1.25 \quad W_b = -0.25 \quad \rho_{ab} = 0.8$$

$$R_p = 39.38$$

## DR.REDDY'S LAB AND OTHER COMPANIES

DR.REDDY'S LAB (a) & BHARATI AIRTEL (b)

$$\begin{aligned}\sigma_a &= 28.57 & \sigma_b &= 22.45 \\ W_a &= 0.39 & W_b &= 0.61 & n_{ab} &= -0.1 \\ R_q &= 16.76\end{aligned}$$

DR.REDDY'S LAB (a) & TATA MOTORS (b)

$$\begin{aligned}\sigma_a &= 28.57 & \sigma_b &= 162.74 \\ W_a &= 1.07 & W_b &= -0.07 & n_{ab} &= 0.55 \\ R_q &= 26.1\end{aligned}$$

## BHARATI AIRTEL AND OTHER COMPANIES

BHARATI AIRTEL (a) & TATA MOTORS (b)

$$\begin{aligned}\sigma_a &= 22.45 & \sigma_b &= 162.74 \\ W_a &= 0.98 & W_b &= 0.02 \\ n_{ab} &= 0.06 \\ R_q &= 22.43\end{aligned}$$

## CALCULATION OF PORTFOLIO RETURN:

$$R_P = (R_A * W_A) + (R_B * W_B)$$

## ULTRATECH AND OTHER COMPANIES

ULTRATECH (A) & SBI(B)

$$\begin{aligned}R_A &= 21.12 & R_B &= 22.51 \\ W_A &= 0.5 & W_B &= 0.5 \\ R_P &= (21.12 * 0.5) + (22.51 * 0.5) \\ R_P &= 21.81\end{aligned}$$

ULTRATECH (A) & DR.REDDY'S LAB(B)

$$\begin{aligned}R_A &= 21.12 & R_B &= 11.14 \\ W_A &= 0.03 & W_B &= 0.97 \\ R_P &= (21.12 * 0.03) + (11.14 * 0.97) \\ R_P &= 11.43\end{aligned}$$

ULTRATECH (A) & BHARATI AIRTEL(B)

$$\begin{aligned}R_A &= 21.12 & R_B &= 11.98 \\ W_A &= 0.17 & W_B &= 0.83 \\ R_P &= (21.12 * 0.17) + (11.98 * 0.83) \\ R_P &= 13.53\end{aligned}$$

ULTRATECH (A) & TATA MOTORS(B)

$$\begin{aligned}R_A &= 21.12 & R_B &= 42.14 \\ W_A &= 1.44 & W_B &= -0.44 \\ R_P &= (21.12 * 1.44) + (42.14 * -0.44) \\ R_P &= 11.87\end{aligned}$$

## SBI AND OTHER COMPANIES

SBI (A) & DR.REDDY'S LAB (B)

$$\begin{aligned}R_A &= 22.51 & R_B &= 11.14 \\ W_A &= -0.15 & W_B &= 1.15 \\ R_P &= (22.51 * -0.15) + (11.14 * 1.15) \\ R_P &= 9.43\end{aligned}$$

SBI (A) & BHARATI AIRTEL (B)

$$\begin{aligned}R_A &= 22.51 & R_B &= 11.98 \\ W_A &= 0.25 & W_B &= 0.75 \\ R_P &= (22.51 * 0.25) + (11.98 * 0.75) \\ R_P &= 20.24\end{aligned}$$

SBI (A) & TATA MOTORS (B)

$$R_A = 22.51 \quad R_B = 42.14$$

$$WA=1.25 \quad WB=-0.25$$

$$RP=(22.51*1.25)+(42.14*-0.25)$$

$$RP= 17.6$$

### DR.REDDY'S LAB AND OTHER COMPANIES

DR.REDDY'S LAB (A) & BHARATI AIRTEL (B)

$$RA=11.14 \quad RB=11.98$$

$$WA=0.39 \quad WB=0.61$$

$$RP=(11.14*0.39)+(11.98*0.61)$$

$$RP= 11.65$$

DR.REDDY'S LAB (A) & TATA MOTORS (B)

$$RA=11.14 \quad RB=42.14$$

$$WA=1.07 \quad WB=-0.07$$

$$RP=(11.14*1.07)+(42.14*-0.07)$$

$$RP= 8.97$$

### BHARATI AIRTEL AND OTHER COMPANIES

BHARATI AIRTEL (A) & TATA MOTORS (B)

$$RA=11.98 \quad RB=42.14$$

$$WA=0.98 \quad WB=0.02$$

$$RP=(11.98*0.98)+(42.14*0.02)$$

$$RP= 12.58$$

**Table 7: DISPLAY OF CALCULATED VALUES**

SCRIPT A	SCRIPT B	PORTFOLIO RETURN	PORTFOLIO RISK
ULTRATECH	SBI	48.9	21.81
ULTRATECH	DR.REDDY'S LAB	28.53	11.43
ULTRATECH	BHARATI AIRTEL	22.21	13.53
ULTRATECH	TATA MOTORS	10.3	11.87
SBI	DR.REDDY'S LAB	28.05	9.83
SBI	BHARATI AIRTEL	15.47	20.24
SBI	TATA MOTORS	39.38	17.6
DR.REDDY'S LAB	BHARATI AIRTEL	16.76	11.65
DR.REDDY'S LAB	TATA MOTORS	26.1	8.97
BHARATI AIRTEL	TATA MOTORS	22.43	12.58

### INTERPRETATION:

The ULTRATECH & SBI portfolio has highest returns i.e., 48.9 and highest risk with 21.81. ULTRATECH & TATA MOTORS has lowest return i.e., 10.3 and medium risk with 11.87. DR.REDDY'S LAB & TATA MOTORS has lowest risk i.e., 8.97 and moderate return with 26.1. Remaining portfolios have medium risk and return.

**Table 8: CALCULATION OF SHARPE INDEX**

Sharpe index $S_p = (R_p - T) / SD$					
COMBINATION	RETURN OF PORTFOLIO	T ( risk free rate/n)	S.D (risk)	SHARPE RATIO	RANK
ULTRATECH & SBI	48.9	0.5	21.81	2.21916552	4
ULTRATECH & DR.REDDY'S LAB	28.53	0.5	11.43	2.45231846	3
ULTRATECH & BHARATI AIRTEL	22.21	0.5	13.53	1.60458241	7
ULTRATECH & TATA MOTORS	10.3	0.5	11.87	0.82561078	9
SBI & DR.REDDY'S LAB	28.05	0.5	9.83	2.80264496	2
SBI & BHARATI AIRTEL	15.47	0.5	20.24	0.73962451	10
SBI & TATA MOTORS	39.38	0.5	17.6	2.20909091	5
DR.REDDY'S LAB & BHARATI AIRTEL	16.76	0.5	11.65	1.39570815	8
DR.REDDY'S LAB & TATA MOTORS	26.1	0.5	8.97	2.85395764	1
BHARATI AIRTEL & TATA MOTORS	22.43	0.5	12.58	1.74324324	6



**INTERPRETATION:**

From the sharpe index the DR.REDDY'S LAB & TATA MOTORS have high sharpe ratio when compared with other combination. Then SBI & DR.REDDY'S LAB, ULTRATECH & DR.REDDY'S LAB, ULTRATECH & SBI are followed respectively

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	RISK - RETURNS	4.12580E1	45.04816	20.14615	-14.67668	97.19268	2.048	4	.110

**INTERPRETATION:**

In t-test, if t(cal) value is greater than t(table) value we reject null hypothesis and accept alternative hypothesis and vice versa. Here, T(cal) value is less than T(table) value.

$T(\text{cal}) < T(\text{table})$  i.e.,  $2.048 < 2.776$

Hence we accept null hypothesis ( $H_0$ ). i.e., There is no significant relationship between risk and return

**FINDINGS:**

- Individual returns on the selected stocks including ULTRATECH, SBI, DR.REDDY'S LAB, BHARATI AIRTEL, TATA MOTORS are 21.12%, 22.51%, 11.14%, 11.98% and 42.14% respectively.
- Individual risk on the selected stocks including ULTRATECH, SBI, DR.REDDY'S LAB, BHARATI AIRTEL, TATA MOTORS are 50.66%, 50.76%, 28.57%, 22.45% and 162.74% respectively.
- Portfolio risk of ULTRATECH & SBI (21.81) followed by SBI & BHARATI AIRTEL (20.24) stood on the top while portfolio risk of DR.REDDY'S LAB & TATA MOTORS (8.97) followed by SBI & DR.REDDY'S LAB (9.83) stood at the bottom
- Portfolio returns of ULTRATECH & SBI (48.9) followed by SBI & TATA MOTORS (39.38) and ULTRATECH & DR.REDDY'S LAB (28.53) stood on the top while portfolio returns of ULTRATECH & TATA MOTORS (10.3), SBI & BHARATI AIRTEL (15.47) and DR.REDDY'S LAB & BHARATI AIRTEL (16.76) stood at the bottom.
- On evaluating performance DR.REDDY'S LAB & TATA MOTORS ranks 1<sup>st</sup> in sharpe index performance.
- investors should be careful while investing in TATA MOTORS.
- The investors who require minimum return with low risk can invest in BHARATI AIRTEL.
- Risk takers has good opportunity to invest in TATA MOTORS which has highest risk and return i.e., 162.74 and 42.14 respectively.
- Investors are advised to invest in portfolios of ULTRATECH & SBI (48.9) followed by SBI & TATA MOTORS (39.38) and ULTRATECH & DR.REDDY'S LAB (28.53) which has given the maximum returns.
- Low risk investors are advised to keep away from ULTRATECH & SBI (21.81) which have high risk and prefer the portfolios of DR.REDDY'S LAB & TATA MOTORS (8.97) SBI & DR.REDDY'S LAB (9.83) which have the less risk.

**CONCLUSION:**

- Portfolio management is the process of encompassing many activities of investment assets and securities. It is a dynamic and flexible concept and involves regular and systematic analysis, judgment and action. A combination of securities held together will give a beneficial result if they grouped in a manner to secure higher returns after taking into consideration the risk elements.
- **“Greater portfolio return with less risk is always is an attractive combination”** for the investors.

**SUGGESTIONS:**

- Comparing the individual risks, TATAMOTORS is risky security compared to the other securities like SBI, ULTRATECH, DR.REDDY'S LAB and BHARATI AIRTEL and it suggested that the

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