A Study on the application of Capital Asset Pricing Model on selected NIFTY 50 Stocks

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Abstract: **The Capital Asset Pricing Model (CAPM) is a general equilibrium market model evolved to analyze the relationship between risk and required rates of return on assets when they are held in well-diversified portfolios. As a result, a security's only impact on market risk is through its systemic risk; however, measuring systematic risk does not reveal whether or not stocks are accurately priced. Risk and return are related. The higher the risk the higher the returns and a person is willing to accept risk, the better the returns he/she is able to achieve. CAPM assists in identifying under-priced or overpriced qualitative properties. As a result, picking the right stock to get the desired return has become a problem for investors. With regard to NSE NIFTY stocks, this study is conducted with the aid of CAPM to assist investors in the discovery of right-priced stocks. measure the return on stocks selected Asian paints, PowerGrid, Nestle, Britannia and Hindustan Unilever and to measure the risk of selected securities.**

Key terms: NSE NIFTY, CAPM, Beta, Risk, and Return

I. INTRODUCTION

The risk or variation in the return on a security is caused by two types of factors: The first type of factor affects the performance of almost all securities in the market; Examples of such sources of risk are interest rate changes and market inflation. Economy, movement of the stock index and movement of the exchange rate. The risk caused by such factors is called systematic risk. In addition to the systematic risk, the variation in the performance of a security is also caused by a number of other factors specific to a security, e.g. B. a strike against a company or the caliber of management of a company. The risk caused by such factors is called unsystematic or specific risk. The unsystematic risk of a security can be diversified by combining different securities in a portfolio. Diversification through portfolio construction so that the real risk of a security is a systematic risk, as investors can diversify unsystematic risks through portfolio construction. A security's tic risk is measured using a statistic called beta. The beta of a security measures the sensitivity of a security's return to changes in the performance of the market portfolio or the stock index.

Capital Asset Pricing Model (CAPM):

The Capital Asset Pricing Model (CAPM) is a general equilibrium market model designed to analyze the relationship between risk and required returns on assets in well-diversified portfolios. between the required return (Ri) of a security and its systematic or non-diversifiable risk, measured by the beta of the security. The systematic risk of a security, as measured by the security's beta coefficient, is market risk, which cannot be.

The CAPM requires a number of broad assumptions:

- All investors will have an expected benefit from maximizers of terminal wealth in a single time period.
- Choose between alternative portfolios based on the expected return and the standard deviation of each portfolio.
- Unlimited Amount at a Specific Risk-Free Rate Investors have homogeneous expectations (that is, investors have identical estimates of expected values, changes, and covariances in return for all assets).
- All assets are perfectly divisible at the current price and there are no transaction costs that are perfectly negotiable. There are no taxes.
- All investors are price takers (that is, all investors assume that their own buying and selling activities will not affect share prices). The amounts of all assets are indicated and determined.

According to Capital Asset Pricing Model approach, the required return on a security is given by the equation:

$$R_i = R_f + \beta(R_m - R_f)$$

Where,

R_i = Required rate of return on security i or cost of equity.

R_f = Risk-free rate of return. β = Beta of security i.

R_m = Rate of return on market portfolio

II. METHODOLOGY

Research problem:

Investors always try to maximize the expected returns with respect to their analysis and risk bearing capacity. The peril associated with the holdings is that the return the study of

jeopardy vis-à-vis reruns always holds a greater consequentiality, which immensely favors key decision-making process than the return that was expected. Hence, the study of risk vis-à- vis reruns always holds a great significance which immensely helps in the key decision-making process. Investors thus have to make decisions regarding the type of securities to invest. Estimates need to be prepared of the return and risk associated with the securities for a certain period of time. This is known as security analysis is built around the idea that investors are concerned with expected return and risk, the two principal properties inherent in securities. Thus the return and risk arid their measurement using Capital Asset Pricing Model (CAPM) will be the core of the study undertaken. The affixment of the paramount paramountcy of these two principal properties; return and jeopardy, Intrinsical in securities with the analysis of any investment decision makes the study paramount.

Objectives of the study:

- To measure the return on stocks selected Asian paints, PowerGrid, Nestle, Britannia and Hindustan Unilever.
- To measure the risk of selected securities.
- To measure the rate of return expected by the investors using the CAPM model.
- To find whether the selected securities are undervalued or overvalued.

Need for the study:

The return on securities traded in the stock market is composed of two parts, primarily is the normal or expected return from the stock which the investors in the market predict or expect. It authentically depends on the information investors have that bears on the security or stock, and it is predicated on the markets understanding today of the consequential factors that will influence stock in the coming year. Secondly, a component of the return on the stock is the skeptical or precarious part, the portion that comes from unexpected information that is revealed within the year. The unexpected return is therefore the true risk of any investment. The volatility of a security's return is measured by variance which is the squared deviations of a security's return from its expected returns.

Scope of the study:

The study is confined to the statistics of the five leading companies in the NIFTY 50 which are Asian paints, PowerGrid, Nestle, Britannia and Hindustan Unilever. The data considered for analysis is from 2010 to 2020. The data is collected through secondary sources in order to find the application of CAPM model on the above mentioned stocks.

Profiles of the sample:

- POWERGRID CORPORATION OF INDIA
- ASIAN PAINTS
- BRITANNIA
- HINDUSTAN UNILEVER
- NESTLE INDIA

The study type is analytical, quantitative and historical. Analytical because facts and existing information is used for the analysis, Quantitative as relationship is examined by expressing variables in measurable terms and also Historical as the historical information is used for analysis and interpretation. The gathered data is analyzed by applying Regression analysis , Scatter plot diagrams, arithmetic mean, geometric mean and CAPM

Sampling frame includes the closing value of the NIFTY 50 index. Sample includes historical closing values of NIFTY 50 index value for the period of 10 years from 1st January 2010 to 1st January 2020.

III. REVIEW OF LITERATURE

Asgar and K.N Badhani(2021) The study presents an empirical test of the capital asset pricing model (CAPM) in the Indian equity market to examine the existence of low risk/low beta anomaly. This study covered 650 actively traded stocks for a period of 189 months from July 2002 to March 2018, and the Fama–MacBeth procedure has been applied by the researchers for testing CAPM. The results of the study were found robust after controlling for outliers and correcting the bias in standard errors, as suggested by Petersen (in Rev Financ Stud 22(1):435–480, 2009). A non-linear relationship was observed between CAPM beta and expected returns. *Hou, Mo, Xue, Zhang, 2019, Hou, Mo, Xue, Zhang, 2020* in their paper, have tested the consistency of the q5 model of Hou et al. (2019, 2020) with Merton's (1973) intertemporal capital asset pricing model (ICAPM) framework. It is observed that the expected growth factor that is found to be helpful in describing cross-sectional average returns fails to predict future investment opportunities with the correct sign, which indicates that it is not a valid risk factor under the ICAPM. Overall, the ICAPM cannot be used as a theoretical background for the q5 model. *Antony, Jeena and K. P, Nitha (2020)* the researchers have identified that there exists a linearity in the securities market line for most of the indian companies. According to, Karakoc *2016* conducted a validity test of CAPM in the Istanbul stock exchange using seven years data of 25 large companies from the BIST 100 index and the time period covers from 2007 to 2014. It is analyzed that CAPM is able to explain the changes in the rate of profits statistically but the model couldn't explain the relationship between beta and return of the stocks.

IV. DATA ANALYSIS

A detailed analysis has been made with various sector stocks that the performance of the stock could indicate that the expected return forecasted for a stock is more or less than its fair return given its risk and the CAPM is used widely because of the insight it offers and because of its accuracy

for important application. The data analysis of the study based on monthly return data of the companies and the market are conducted. The validity or applicability of the CAPM model in the Indian equity market are being tested. The analysis has also been conducted for the sample period from 2010 to 2020 for 10 years data has been taken to test the CAPM model on the below mentioned stocks.

METHOD OF CALCULATION OF COMPANIES RETURNS:

STEP 1: Monthly share price of the mentioned stocks is collected from the yahoo finance and NSE only

STEP 2: The monthly index value NIFTY is downloaded from the national stock exchange website, the composition of NIFTY is subjected to scrutiny on a periodic basis. any change in the composition of the NIFTY could impact all the index values.

STEP 3: Monthly return (in percentage terms) of the stock and the index is calculated

STEP 4: These monthly returns are annualized by arithmetic mean(average) and geometric mean, which is always a better option since compounding is taken into account though returns could be annualized using natural logarithm. The geometric method of annualizing the return was preferred for its simplicity. and the data has been analyzed from 1st January 2010 to 1st January 2020 for the period of 10 years.

STEP 5: To find beta value of the stock is calculated using the ms excel spreadsheet software. Beta is the only measure in the CAPM concept.

NIFTY 50

STEP 6: Expected return calculation needs the risk-free rate of return (Rf) is the government of India 10 years bond so we have taken as 5.89% per annum as taken from the yahoo finance.

STEP 7

Expected return by CAPM

$E(R) = Rf + \beta(Rm - Rf)$

Where, Rm = market return of NIFTY

β = Beta value (return of the stocks and return of the index)

STEP 8: Construction of security market line keeping beta is the only measure scrutiny market line was constructed for each firm in order to identify the undervaluation and overvaluation of stock.

CALCULATION OF MONTHLY RETURNS OF NIFTY(MARKET)

To calculate the CAPM we require the market risk called risk premium so that we should find the market risk by taking the NIFTY index as a sample for those stocks mentioned above.

Below table shows the NIFTY index adjusted closing prices from the 1st January 2010 to 1st January 2020 monthly wise and the returns are also calculated using the excel spreadsheet for the entire sample period like current closing price minus opening price divided by opening price of the nifty and the for rest of the stocks too.

Table 4.1 shows the monthly returns of the NIFTY 50

Date	Closing price	Monthly returns	Date	Closing price	Monthly returns
01-01-2010	4882.05		01-03-2015	8491	-0.03998
01-02-2010	4922.3	0.008244	01-04-2015	8181.5	-0.03645
01-03-2010	5249.1	0.066392	01-05-2015	8433.65	0.03082
01-04-2010	5278	0.005506	01-06-2015	8368.5	-0.00773
01-05-2010	5086.3	-0.03632	01-07-2015	8532.85	0.019639
01-06-2010	5312.5	0.044472	01-08-2015	7971.3	-0.06581
01-07-2010	5367.6	0.010372	01-09-2015	7948.9	-0.00281
01-08-2010	5402.4	0.006483	01-10-2015	8065.8	0.014706
01-09-2010	6029.95	0.116161	01-11-2015	7935.25	-0.01619
01-10-2010	6017.7	-0.00203	01-12-2015	7946.35	0.001399
01-11-2010	5862.7	-0.02576	01-01-2016	7563.55	-0.04817
01-12-2010	6134.5	0.046361	01-02-2016	6987.05	-0.07622
01-01-2011	5505.9	-0.10247	01-03-2016	7738.4	0.107535
01-02-2011	5333.25	-0.03136	01-04-2016	7849.8	0.014396
01-03-2011	5833.75	0.093845	01-05-2016	8160.1	0.03953
01-04-2011	5749.5	-0.01444	01-06-2016	8287.75	0.015643
01-05-2011	5473.1	-0.04807	01-07-2016	8638.5	0.042321
01-06-2011	5647.4	0.031847	01-08-2016	8786.2	0.017098

01-07-2011	5482	-0.02929	01-09-2016	8611.15	-0.01992
01-08-2011	5001	-0.08774	01-10-2016	8638	0.003118
01-09-2011	4943.25	-0.01155	01-11-2016	8224.5	-0.04787
01-10-2011	5326.6	0.07755	01-12-2016	8185.8	-0.00471
01-11-2011	4832.05	-0.09285	01-01-2017	8561.3	0.045872
01-12-2011	4624.3	-0.04299	01-02-2017	8879.6	0.037179
01-01-2012	5199.25	0.124332	01-03-2017	9173.75	0.033127
01-02-2012	5385.2	0.035765	01-04-2017	9304.05	0.014204
01-03-2012	5295.55	-0.01665	01-05-2017	9621.25	0.034093
01-04-2012	5248.15	-0.00895	01-06-2017	9520.9	-0.01043
01-05-2012	4924.25	-0.06172	01-07-2017	10077.1	0.058419
01-06-2012	5278.9	0.072021	01-08-2017	9917.9	-0.0158
01-07-2012	5229	-0.00945	01-09-2017	9788.6	-0.01304
01-08-2012	5258.5	0.005642	01-10-2017	10335.3	0.055851
01-09-2012	5703.3	0.084587	01-11-2017	10226.5	-0.01052
01-10-2012	5619.7	-0.01466	01-12-2017	10530.7	0.029741
01-11-2012	5879.85	0.046292	01-01-2018	11027.7	0.047195
01-12-2012	5905.1	0.004294	01-02-2018	10492.8	-0.0485
01-01-2013	6034.75	0.021956	01-03-2018	10113.7	-0.03613
01-02-2013	5693.05	-0.05662	01-04-2018	10739.3	0.061862
01-03-2013	5682.55	-0.00184	01-05-2018	10736.1	-0.0003
01-04-2013	5930.2	0.043581	01-06-2018	10714.3	-0.00204
01-05-2013	5985.95	0.009401	01-07-2018	11356.5	0.059939
01-06-2013	5842.2	-0.02401	01-08-2018	11680.5	0.02853
01-07-2013	5742	-0.01715	01-09-2018	10930.4	-0.06421
01-08-2013	5471.8	-0.04706	01-10-2018	10386.6	-0.04976
01-09-2013	5735.3	0.048156	01-11-2018	10876.7	0.047191
01-10-2013	6299.15	0.098312	01-12-2018	10862.5	-0.00131
01-11-2013	6176.1	-0.01953	01-01-2019	10830.9	-0.00291
01-12-2013	6304	0.020709	01-02-2019	10792.5	-0.00355
01-01-2014	6089.5	-0.03403	01-03-2019	11623.9	0.077035
01-02-2014	6276.95	0.030783	01-04-2019	11748.1	0.010689
01-03-2014	6704.2	0.068066	01-05-2019	11922.8	0.014866
01-04-2014	6696.4	-0.00116	01-06-2019	11788.8	-0.01123
01-05-2014	7229.95	0.079677	01-07-2019	11118	-0.05691
01-06-2014	7611.35	0.052753	01-08-2019	11023.2	-0.00852
01-07-2014	7721.3	0.014445	01-09-2019	11474.4	0.040932
01-08-2014	7954.35	0.030183	01-10-2019	11877.4	0.035122
01-09-2014	7964.8	0.001314	01-11-2019	12056.0	0.015037
01-10-2014	8322.2	0.044872	01-12-2019	12168.4	0.009323
01-11-2014	8588.25	0.031969	01-01-2020	11962.1	-0.01696
01-12-2014	8282.7	-0.03558			
01-01-2015	8808.9	0.06353			
01-02-2015	8844.6	0.004053			

(source: above values are taken from the yahoo finance and NSE website)

Interpretation: From the above table we get the monthly average returns for the entire sample period from 2010 to 2020. After that we need to use the geometric mean instead of average returns as specified earlier because geometric means will give us exact value because it has some weights to the values and the result would be accurate.

Therefore   **$R_m = 0.007496$**

POWERGRID CORPORATION OF INDIA

From the below table also have taken the adjusted closing prices of the power grid company from the period 1st january 2010 to 1st January 2020 and the monthly returns are computed by using the average formula in the excel for the entire period as given below

Average returns of PowerGrid company = 0.007488474

Table 4.2 shows the monthly returns of the PowerGrid corporation of India

POWERGRID						
Date	**Closing prices**	**Monthly returns**		**Date**	**Closing prices**	**Monthly returns**
01-01-2010	81.63039			01-02-2015	125.8381	0.061487
01-02-2010	78.2408	-0.04152		01-03-2015	116.3462	-0.07543
01-03-2010	77.94981	-0.00372		01-04-2015	114.4119	-0.01663
01-04-2010	80.05949	0.027065		01-05-2015	115.6188	0.010549
01-05-2010	75.149	-0.06134		01-06-2015	111.9177	-0.03201
01-06-2010	75.73098	0.007744		01-07-2015	114.251	0.020848
01-07-2010	73.03931	-0.03554		01-08-2015	105.119	-0.07993
01-08-2010	79.15015	0.083665		01-09-2015	106.4868	0.013012
01-09-2010	77.47694	-0.02114		01-10-2015	104.7	-0.01678
01-10-2010	73.72158	-0.04847		01-11-2015	110.7583	0.057864
01-11-2010	69.71976	-0.05428		01-12-2015	114.7837	0.036344
01-12-2010	72.1796	0.035282		01-01-2016	120.2321	0.047467
01-01-2011	70.89463	-0.0178		01-02-2016	105.7571	-0.12039
01-02-2011	72.65687	0.024857		01-03-2016	113.7388	0.075472
01-03-2011	75.21723	0.035239		01-04-2016	117.2548	0.030913
01-04-2011	77.17331	0.026006		01-05-2016	122.6515	0.046025
01-05-2011	74.58981	-0.03348		01-06-2016	133.363	0.087333
01-06-2011	80.82715	0.083622		01-07-2016	143.911	0.079093
01-07-2011	77.5793	-0.04018		01-08-2016	150.2071	0.04375
01-08-2011	73.96237	-0.04662		01-09-2016	144.3608	-0.03892
01-09-2011	72.67061	-0.01747		01-10-2016	145.0145	0.004528
01-10-2011	78.40354	0.078889		01-11-2016	158.2052	0.090961
01-11-2011	74.10387	-0.05484		01-12-2016	151.2801	-0.04377
01-12-2011	74.85165	0.010091		01-01-2017	170.8187	0.129155
01-01-2012	77.84273	0.03996		01-02-2017	158.4113	-0.07264
01-02-2012	84.49786	0.085495		01-03-2017	163.4684	0.031924
01-03-2012	81.47839	-0.03573		01-04-2017	172.3337	0.054232
01-04-2012	83.81387	0.028664		01-05-2017	172.2923	-0.00024
01-05-2012	79.97164	-0.04584		01-06-2017	174.4464	0.012503
01-06-2012	85.54665	0.069712		01-07-2017	185.0101	0.060556
01-07-2012	89.6149	0.047556		01-08-2017	181.6546	-0.01814
01-08-2012	89.99161	0.004204		01-09-2017	174.8193	-0.03763
01-09-2012	90.78265	0.00879		01-10-2017	178.3269	0.020064
01-10-2012	86.80309	-0.04384		01-11-2017	173.4447	-0.02738
01-11-2012	89.77265	0.03421		01-12-2017	168.6466	-0.02766
01-12-2012	87.37417	-0.02672		01-01-2018	163.1331	-0.03269
01-01-2013	83.90965	-0.03965		01-02-2018	166.4159	0.020124
01-02-2013	79.41722	-0.05354		01-03-2018	164.7346	-0.0101
01-03-2013	81.80538	0.030071		01-04-2018	177.1802	0.07555
01-04-2013	86.75391	0.060492		01-05-2018	178.5441	0.007698

01-05-2013	87.60445	0.009804
01-06-2013	86.05804	-0.01765
01-07-2013	78.1713	-0.09164
01-08-2013	75.50375	-0.03412
01-09-2013	75.81303	0.004096
01-10-2013	79.26379	0.045517
01-11-2013	74.41251	-0.0612
01-12-2013	78.16834	0.050473
01-01-2014	74.7255	-0.04404
01-02-2014	73.94303	-0.01047
01-03-2014	82.15892	0.111111
01-04-2014	83.9102	0.021316
01-05-2014	96.75845	0.153119
01-06-2014	110.3998	0.140984
01-07-2014	105.5619	-0.04382
01-08-2014	102.4688	-0.0293
01-09-2014	107.2671	0.046827
01-10-2014	116.7867	0.088748
01-11-2014	114.3036	-0.02126
01-12-2014	110.5389	-0.03294
01-01-2015	118.549	0.072464

01-06-2018	159.279	-0.1079
01-07-2018	155.4003	-0.02435
01-08-2018	171.7672	0.105321
01-09-2018	160.6002	-0.06501
01-10-2018	160.8126	0.001322
01-11-2018	155.7966	-0.03119
01-12-2018	171.7958	0.102692
01-01-2019	163.1044	-0.05059
01-02-2019	158.1317	-0.03049
01-03-2019	171.1471	0.082308
01-04-2019	166.1764	-0.02904
01-05-2019	168.7618	0.015558
01-06-2019	184.4522	0.092974
01-07-2019	187.9291	0.01885
01-08-2019	178.7466	-0.04886
01-09-2019	179.5801	0.004663
01-10-2019	178.9486	-0.00352
01-11-2019	174.3926	-0.02546
01-12-2019	171.6409	-0.01578
01-01-2020	168.5735	-0.01787

(source:above values are taken from the yahoo finance and NSE website)

The next step is to calculate the beta value for the power grid company so that we can calculate the directly by using the manual formula but here a huge number of variables are available so that we can use the excel spreadsheet to compute the beta value for the power grid company. There are 2 methods to find out the beta value first one is by using the slope formula and the another one is regression analysis but with the help of the regression analysis we can also get the R square and the intercept values as below

SUMMARY

Regression Statistics	
Multiple R	0.489297
R Square	0.239412
Adjusted R Square	0.232966
Standard Error	0.047373
Observations	120

ANOVA

	df	SS	MS	F	Significance F
Regression	1	0.083356	0.083356	37.14306	1.42E-08
Residual	118	0.264814	0.002244		
Total	119	0.34817			

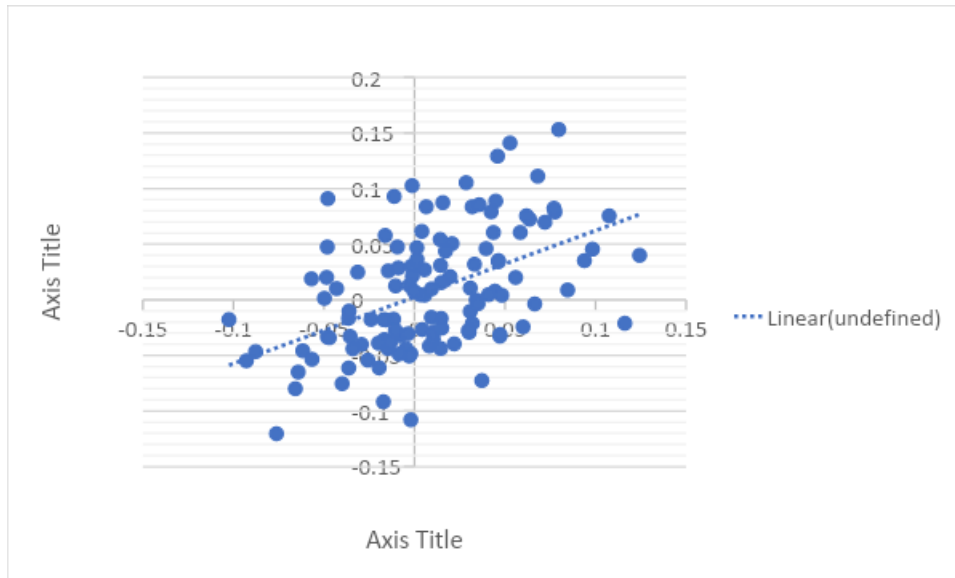|	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.002431	0.004403	0.552007	0.581988	-0.00629	0.011151	-0.00629	0.011151
X Variable 1	0.597909	0.098106	6.094511	1.42E-08	0.403632	0.792185	0.403632	0.792185

Figure 4.1 shows the beta & alpha values of the PowerGrid corporation of India

It is observed that the beta value by using the scatter plot of the returns of the nifty and the power grid corporation of india we can cross check with the help of slope formulas applied.

Beta value for the power grid company is 0.597909

ASIAN PAINTS

From the below table also have taken the adjusted closing prices of the ASAIN paints company from the period 1st january 2010 to 1st January 2020 and the monthly returns are computed by using the average formula in the excel for the entire period as given below

Average monthly returns for the company is 0.02225356

Table 4.3 shows the monthly returns of the ASIAN PAINTS

ASIAN PAINTS			ASIAN PAINTS		
Date	Closing prices	Monthly returns	Date	Closing prices	Monthly returns
01-01-2010	168.7141		01-02-2015	774.7946	-0.05899
01-02-2010	164.8656	-0.02281	01-03-2015	778.7781	0.005141
01-03-2010	185.7157	0.126467	01-04-2015	731.8863	-0.06021
01-04-2010	189.3547	0.019594	01-05-2015	755.5002	0.032265
01-05-2010	190.0196	0.003512	01-06-2015	725.0709	-0.04028
01-06-2010	209.6674	0.103399	01-07-2015	852.2562	0.175411
01-07-2010	239.0083	0.13994	01-08-2015	819.2393	-0.03874
01-08-2010	253.6333	0.06119	01-09-2015	812.4816	-0.00825
01-09-2010	244.503	-0.036	01-10-2015	801.9106	-0.01301
01-10-2010	246.7569	0.009218	01-11-2015	811.6479	0.012143
01-11-2010	243.9732	-0.01128	01-12-2015	855.2552	0.053727
01-12-2010	265.1386	0.086753	01-01-2016	842.0424	-0.01545
01-01-2011	237.397	-0.10463	01-02-2016	819.0045	-0.02736
01-02-2011	221.1131	-0.06859	01-03-2016	840.5903	0.026356
01-03-2011	232.6352	0.05211	01-04-2016	838.5091	-0.00248
01-04-2011	255.5506	0.098503	01-05-2016	953.311	0.136912
01-05-2011	288.5973	0.129316	01-06-2016	971.1702	0.018734
01-06-2011	293.3591	0.0165	01-07-2016	1084.226	0.116412
01-07-2011	290.7851	-0.00877	01-08-2016	1126.801	0.039268
01-08-2011	304.8929	0.048516	01-09-2016	1129.526	0.002418
01-09-2011	292.9703	-0.0391	01-10-2016	1041.165	-0.07823
01-10-2011	293.1558	0.000633	01-11-2016	943.8504	-0.09347

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01-11-2011	267.9923	-0.08584	01-12-2016	869.2711	-0.07902
01-12-2011	241.2802	-0.09968	01-01-2017	946.9743	0.089389
01-01-2012	278.7843	0.155438	01-02-2017	999.1667	0.055115
01-02-2012	295.0956	0.058508	01-03-2017	1047.262	0.048135
01-03-2012	301.7457	0.022535	01-04-2017	1093.064	0.043736
01-04-2012	328.2531	0.087847	01-05-2017	1123.063	0.027444
01-05-2012	374.3015	0.140283	01-06-2017	1075.992	-0.04191
01-06-2012	361.9226	-0.03307	01-07-2017	1135.281	0.055102
01-07-2012	341.7288	-0.0558	01-08-2017	1141.975	0.005897
01-08-2012	341.5786	-0.00044	01-09-2017	1105.963	-0.03154
01-09-2012	369.1718	0.080781	01-10-2017	1153.995	0.04343
01-10-2012	363.2046	-0.01616	01-11-2017	1123.188	-0.0267
01-11-2012	407.2762	0.121341	01-12-2017	1134.696	0.010246
01-12-2012	416.8882	0.023601	01-01-2018	1105.117	-0.02607
01-01-2013	423.3402	0.015476	01-02-2018	1094.784	-0.00935
01-02-2013	401.8071	-0.05086	01-03-2018	1097.379	0.002371
01-03-2013	462.4751	0.150988	01-04-2018	1177.009	0.072563
01-04-2013	440.2789	-0.04799	01-05-2018	1277.844	0.085671
01-05-2013	457.3821	0.038846	01-06-2018	1238.47	-0.03081
01-06-2013	436.07	-0.0466	01-07-2018	1428.296	0.153275
01-07-2013	481.1622	0.103406	01-08-2018	1350.603	-0.0544
01-08-2013	399.0253	-0.17071	01-09-2018	1272.713	-0.05767
01-09-2013	435.3305	0.090985	01-10-2018	1210.814	-0.04864
01-10-2013	511.3536	0.174633	01-11-2018	1327.703	0.096538
01-11-2013	478.4258	-0.06439	01-12-2018	1354.436	0.020135
01-12-2013	465.4594	-0.0271	01-01-2019	1393.45	0.028804
01-01-2014	448.076	-0.03735	01-02-2019	1386.15	-0.00524
01-02-2014	449.3109	0.002756	01-03-2019	1472.464	0.062269
01-03-2014	520.5072	0.158457	01-04-2019	1443.315	-0.0198
01-04-2014	479.8507	-0.07811	01-05-2019	1388.222	-0.03817
01-05-2014	482.178	0.00485	01-06-2019	1339.738	-0.03493
01-06-2014	564.2509	0.170213	01-07-2019	1508.575	0.126022
01-07-2014	601.8275	0.066596	01-08-2019	1602.892	0.062521
01-08-2014	597.5673	-0.00708	01-09-2019	1747.64	0.090304
01-09-2014	602.689	0.008571	01-10-2019	1794.699	0.026927
01-10-2014	630.6633	0.046416	01-11-2019	1695.232	-0.05542
01-11-2014	714.8479	0.133486	01-12-2019	1773.527	0.046186
01-12-2014	722.1432	0.010205	01-01-2020	1784.159	0.005995
01-01-2015	823.3661	0.14017			

(source:above values are taken from the yahoo finance and NSE website)

Interpretation: The next step is to calculate the beta value for the Asian paints company so that we can calculate it directly by using the manual formula but here a huge number of variables are available so that we can use the excel spreadsheet to compute the beta value for the Asian paints. There are 2 methods to find out the beta value first one is by using the slope formula and the another one is regression analysis but with the help of the regression analysis we can also get the R square and the intercept values as below

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.460529
R Square	0.212087

Adjusted R Square	0.20541	
Standard Error	0.062999	
Observations	120	

ANOVA

	df	SS	MS	F	Significance F
Regression	1	0.126061	0.126061	31.76281	1.21E-07
Residual	118	0.468322	0.003969		
Total	119	0.594383			

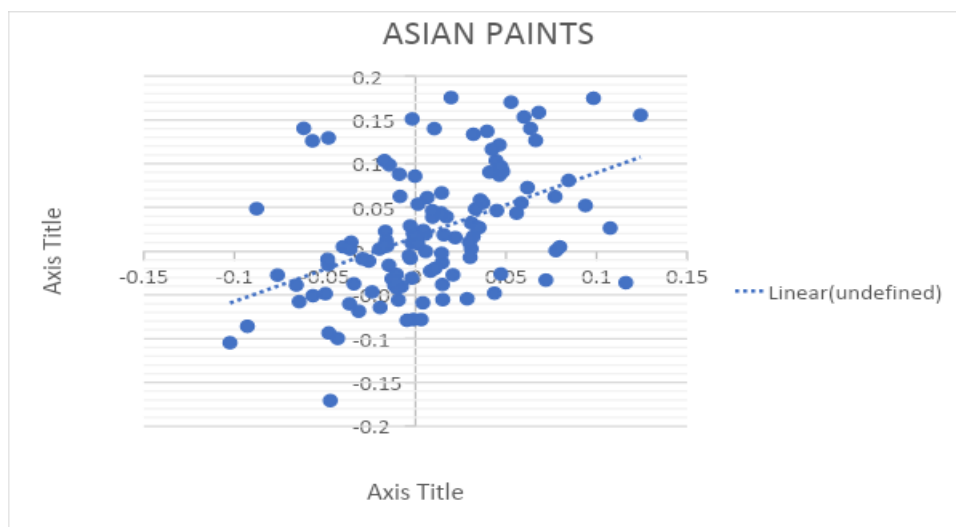|	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.016034	0.005856	2.738046	0.007138	0.004437	0.02763	0.004437	0.02763
X Variable 1	0.735287	0.130466	5.63585	1.21E-07	0.476929	0.993646	0.476929	0.993646

Figure 4.2 shows beta and alpha values of the ASIAN PAINTS

We got the beta value for the Asian paints with the help of the regression analysis and scatter plot chart

beta value of the Asian paints is 0.7353

BRITANNIA

From the below table also have taken the adjusted closing prices of the Britannia company from the period 1st january 2010 to 1st January 2020 and the monthly returns are computed by using the average formula in the excel for the entire period as given below

Average monthly returns for the entire sample period is 0.028827947

Table 4.4 shows the monthly returns of the BRITANNIA company

BRITANNIA				Date	Closing prices	Monthly returns
Date	**Closing prices**	**Monthly returns**		01-02-2015	957.1057	0.102938
01-01-2010	134.6418			01-03-2015	991.6056	0.036046
01-02-2010	143.8342	0.068273		01-04-2015	1009.659	0.018207
01-03-2010	137.4395	-0.04446		01-05-2015	1168.997	0.157813
01-04-2010	142.2355	0.034896		01-06-2015	1269.258	0.085766
01-05-2010	146.8811	0.032662		01-07-2015	1448.739	0.141407
01-06-2010	159.589	0.086518		01-08-2015	1353.455	-0.06577
01-07-2010	169.1811	0.060105		01-09-2015	1423.693	0.051895
01-08-2010	178.4806	0.054968				

Date	Value	Change
01-09-2010	190.671	0.068301
01-10-2010	180.0914	-0.05549
01-11-2010	175.2153	-0.02708
01-12-2010	180.0261	0.027457
01-01-2011	164.7011	-0.08513
01-02-2011	146.4372	-0.11089
01-03-2011	162.1759	0.107477
01-04-2011	160.7827	-0.00859
01-05-2011	183.0737	0.138641
01-06-2011	208.6301	0.139596
01-07-2011	209.8273	0.005739
01-08-2011	215.8272	0.028594
01-09-2011	207.3318	-0.03936
01-10-2011	207.0008	-0.0016
01-11-2011	207.0008	0
01-12-2011	197.9758	-0.0436
01-01-2012	200.1603	0.011034
01-02-2012	229.6625	0.147393
01-03-2012	261.7023	0.139508
01-04-2012	247.9331	-0.05261
01-05-2012	235.9513	-0.04833
01-06-2012	231.847	-0.01739
01-07-2012	205.0589	-0.11554
01-08-2012	224.8118	0.096328
01-09-2012	213.4814	-0.0504
01-10-2012	217.0264	0.016605
01-11-2012	223.5553	0.030084
01-12-2012	223.8022	0.001104
01-01-2013	216.286	-0.03358
01-02-2013	216.0616	-0.00104
01-03-2013	235.5588	0.090239
01-04-2013	260.1938	0.104581
01-05-2013	324.9674	0.248944
01-06-2013	302.5761	-0.0689
01-07-2013	313.7044	0.036779
01-08-2013	318.9509	0.016724
01-09-2013	373.2597	0.170273
01-10-2013	426.6376	0.143005
01-11-2013	398.0075	-0.06711
01-12-2013	418.0327	0.050314
01-01-2014	400.7546	-0.04133
01-02-2014	403.4111	0.006629
01-03-2014	382.9772	-0.05065
01-04-2014	392.354	0.024484
01-05-2014	400.0962	0.019733
01-06-2014	457.9016	0.144479
01-07-2014	521.4738	0.138834
01-08-2014	570.9695	0.094915
01-09-2014	639.4869	0.120002

Date	Value	Change
01-10-2015	1492.937	0.048637
01-11-2015	1350.268	-0.09556
01-12-2015	1370.247	0.014796
01-01-2016	1242.359	-0.09333
01-02-2016	1273.217	0.024838
01-03-2016	1240.996	-0.02531
01-04-2016	1322.344	0.06555
01-05-2016	1250.097	-0.05464
01-06-2016	1274.464	0.019492
01-07-2016	1355.234	0.063376
01-08-2016	1609.796	0.187837
01-09-2016	1564.882	-0.0279
01-10-2016	1540.669	-0.01547
01-11-2016	1410.859	-0.08426
01-12-2016	1342.663	-0.04834
01-01-2017	1456.238	0.084589
01-02-2017	1502.268	0.031609
01-03-2017	1569.534	0.044776
01-04-2017	1686.086	0.074259
01-05-2017	1643.336	-0.02535
01-06-2017	1716.556	0.044556
01-07-2017	1824.27	0.06275
01-08-2017	1979.41	0.085042
01-09-2017	2032.416	0.026779
01-10-2017	2170.546	0.067963
01-11-2017	2252.933	0.037957
01-12-2017	2203.178	-0.02208
01-01-2018	2191.435	-0.00533
01-02-2018	2336.512	0.066202
01-03-2018	2325.448	-0.00474
01-04-2018	2579.298	0.109162
01-05-2018	2771.464	0.074503
01-06-2018	2907.044	0.04892
01-07-2018	3060.706	0.052859
01-08-2018	3188.959	0.041903
01-09-2018	2756.656	-0.13556
01-10-2018	2671.734	-0.03081
01-11-2018	3000.914	0.123208
01-12-2018	2949.458	-0.01715
01-01-2019	3027.375	0.026417
01-02-2019	2894.074	-0.04403
01-03-2019	2921.151	0.009356
01-04-2019	2741.792	-0.0614
01-05-2019	2766.313	0.008943
01-06-2019	2597.557	-0.061
01-07-2019	2466.245	-0.05055
01-08-2019	2557.747	0.037102
01-09-2019	2803.473	0.096072
01-10-2019	3110.516	0.109522

01-10-2014	703.2266	0.099673
01-11-2014	757.0435	0.076528
01-12-2014	845.3143	0.116599
01-01-2015	867.7783	0.026575

01-11-2019	2911.597	-0.06395
01-12-2019	2883.126	-0.00978
01-01-2020	3047.764	0.057104

(source:above values are taken from the yahoo finance and NSE website)

The next step is to calculate the beta value for the Asian paints company so that we can calculate it directly by using the manual formula but here a huge number of variables are available so that we can use the excel spreadsheet to compute the beta value for the Asian paints. There are 2 methods to find out the beta value first one is by using the slope formula and the another one is regression analysis but with the help of the regression analysis we can also get the R square and the intercept values as below

SUMMARY

Regression Statistics	
Multiple R	0.316487
R Square	0.100164
Adjusted R Square	0.092538
Standard Error	0.068631
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.061868	0.061868	13.135	0.000429
Residual	118	0.555803	0.00471		
Total	119	0.617672			

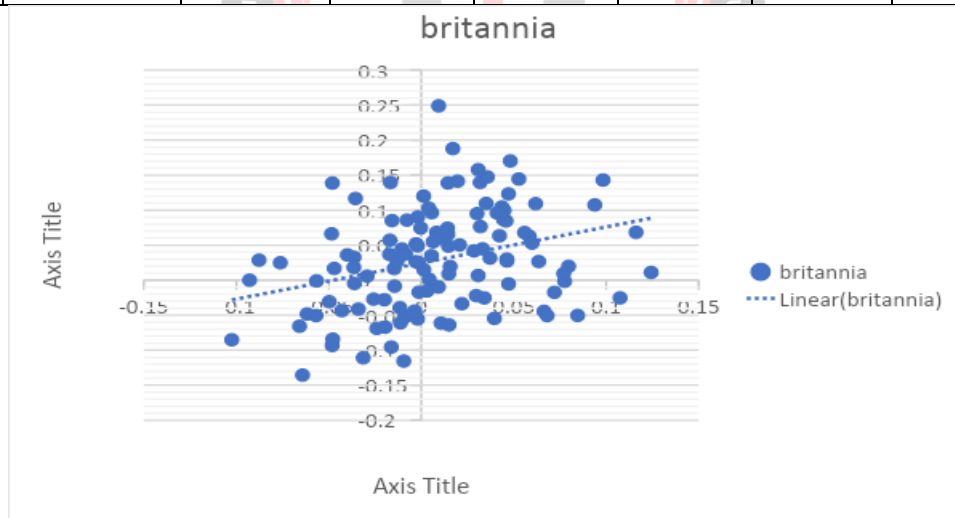|	*Coefficients*	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.024471	0.006379	3.835858	0.000202	0.011838	0.037104	0.011838	0.037104
X Variable 1	0.515111	0.14213	3.624224	0.000429	0.233655	0.796567	0.233655	0.796567

Figure 4.3 shows the beta and alpha values of the Britannia company

Beta value for the Britannia company is 0.515

HINDUSTAN UNILEVER

From the below table also have taken the adjusted closing prices of the HULcompany from the period 1st january 2010 to 1st January 2020 and the monthly returns are computed by using the average formula in the excel for the entire period as given below

Average monthly returns for the entire sample period is 0.0212569

Table 4.5 shows the monthly returns of the HUL

HINDUSTAN UNILEVER

Date	Closing prices	Monthly returns
01-01-2010	197.856	
01-02-2010	192.8749	-0.02518
01-03-2010	195.6104	0.014183
01-04-2010	195.8145	0.001043
01-05-2010	193.6915	-0.01084
01-06-2010	218.4745	0.127951
01-07-2010	205.3277	-0.06018
01-08-2010	218.8463	0.065839
01-09-2010	255.7068	0.168431
01-10-2010	243.8337	-0.04643
01-11-2010	246.771	0.012046
01-12-2010	261.5548	0.059909
01-01-2011	226.6558	-0.13343
01-02-2011	235.7254	0.040015
01-03-2011	239.9885	0.018085
01-04-2011	238.4003	-0.00662
01-05-2011	254.575	0.067847
01-06-2011	287.2589	0.128386
01-07-2011	270.8334	-0.05718
01-08-2011	270.6454	-0.00069
01-09-2011	287.7086	0.063046
01-10-2011	317.4425	0.103347
01-11-2011	335.4771	0.056812
01-12-2011	347.3155	0.035288
01-01-2012	323.0614	-0.06983
01-02-2012	324.1271	0.003299
01-03-2012	349.5747	0.078511
01-04-2012	356.0111	0.018412
01-05-2012	364.8773	0.024904
01-06-2012	387.469	0.061916
01-07-2012	398.4238	0.028273
01-08-2012	443.1478	0.112252
01-09-2012	469.6026	0.059697
01-10-2012	470.2478	0.001374
01-11-2012	462.9351	-0.01555
01-12-2012	458.2427	-0.01014
01-01-2013	413.8023	-0.09698
01-02-2013	386.8238	-0.0652
01-03-2013	407.6907	0.053944
01-04-2013	509.7115	0.250241
01-05-2013	517.3076	0.014903
01-06-2013	510.8902	-0.01241
01-07-2013	534.813	0.046826
01-08-2013	556.8372	0.041181
01-09-2013	553.3101	-0.00633
01-10-2013	537.7896	-0.02805
01-11-2013	529.217	-0.01594

Date	Closing prices	Monthly returns
01-02-2015	805.3604	-0.04868
01-03-2015	793.014	-0.01533
01-04-2015	771.9529	-0.02656
01-05-2015	780.3049	0.010819
01-06-2015	832.186	0.066488
01-07-2015	845.5012	0.016
01-08-2015	789.7705	-0.06591
01-09-2015	747.4336	-0.05361
01-10-2015	734.4985	-0.01731
01-11-2015	751.1303	0.022644
01-12-2015	798.0759	0.0625
01-01-2016	755.663	-0.05314
01-02-2016	768.151	0.016526
01-03-2016	804.3199	0.047086
01-04-2016	802.8398	-0.00184
01-05-2016	784.6167	-0.0227
01-06-2016	831.1923	0.059361
01-07-2016	862.812	0.038041
01-08-2016	857.668	-0.00596
01-09-2016	811.654	-0.05365
01-10-2016	782.334	-0.03612
01-11-2016	789.3484	0.008966
01-12-2016	779.363	-0.01265
01-01-2017	806.7614	0.035155
01-02-2017	816.6642	0.012275
01-03-2017	859.9072	0.052951
01-04-2017	881.788	0.025446
01-05-2017	1006.33	0.141237
01-06-2017	1018.213	0.011809
01-07-2017	1099.823	0.08015
01-08-2017	1160.726	0.055375
01-09-2017	1117.094	-0.03759
01-10-2017	1177.569	0.054136
01-11-2017	1210.876	0.028284
01-12-2017	1310.129	0.081968
01-01-2018	1311.566	0.001096
01-02-2018	1262.143	-0.03768
01-03-2018	1277.085	0.011838
01-04-2018	1445.227	0.131661
01-05-2018	1543.45	0.067963
01-06-2018	1571.896	0.018431
01-07-2018	1671.092	0.063106
01-08-2018	1717.847	0.027979
01-09-2018	1552.152	-0.09646
01-10-2018	1564.987	0.008269
01-11-2018	1702.321	0.087754
01-12-2018	1766.037	0.037429

01-12-2013	507.7724	-0.04052
01-01-2014	507.2831	-0.00096
01-02-2014	488.7304	-0.03657
01-03-2014	538.8269	0.102503
01-04-2014	504.9695	-0.06284
01-05-2014	536.8694	0.063172
01-06-2014	551.9963	0.028176
01-07-2014	618.188	0.119913
01-08-2014	668.4731	0.081343
01-09-2014	671.6694	0.004781
01-10-2014	664.7814	-0.01026
01-11-2014	713.6265	0.073475
01-12-2014	690.0236	-0.03307
01-01-2015	846.5746	0.226878

01-01-2019	1711.298	-0.031
01-02-2019	1681.6	-0.01735
01-03-2019	1656.511	-0.01492
01-04-2019	1705.912	0.029822
01-05-2019	1735.804	0.017523
01-06-2019	1734.931	-0.0005
01-07-2019	1687.888	-0.02711
01-08-2019	1839.653	0.089914
01-09-2019	1937.457	0.053164
01-10-2019	2126.515	0.097581
01-11-2019	1999.95	-0.05952
01-12-2019	1889.601	-0.05518
01-01-2020	1998.919	0.057852

(source:above values are taken from the yahoo finance and NSE website)

The next step is to calculate the beta value for the HUL company so that we can calculate the directly by using the manual formula but here a huge number of variables are available so that we can use the excel spreadsheet to compute the beta value for the HUL. There are 2 methods to find out the beta value first one is by using the slope formula and the another one is regression analysis but with the help of the regression analysis we can also get the R square and the intercept values as below:

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.37795
R Square	0.142846
Adjusted R Square	0.135582
Standard Error	0.057176
Observations	120

ANOVA

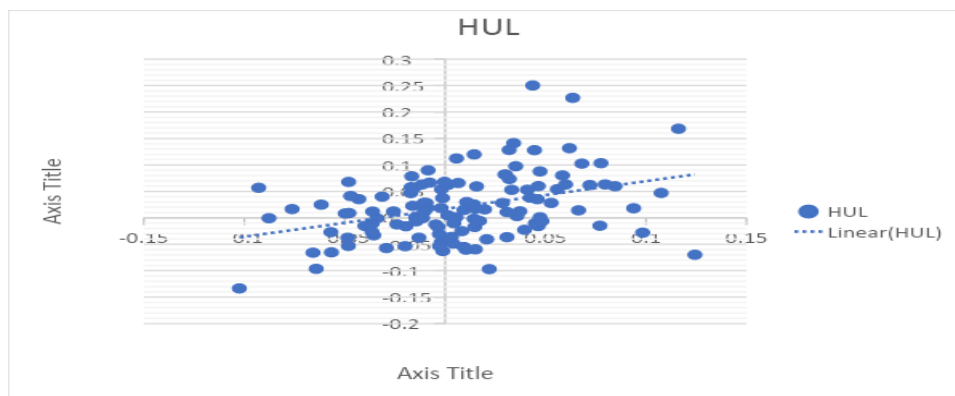|	df	SS	MS	F	Significance F		
Regression	1	0.064285	0.064285	19.66487	2.08E-05		
Residual	118	0.385747	0.003269				
Total	119	0.450032					
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.016815	0.005315	3.163966	0.00198	0.006291	0.02734	0.006291	0.02734
X Variable 1	0.525076	0.118407	4.434509	2.08E-05	0.290598	0.759554	0.290598	0.759554

Figure 4.4 shows the beta and alpha values of the HUL company

Beta value for the HUL company is 0.5251

NESTLE

From the below table also have taken the adjusted closing prices of the Nestle company from the period 1st january 2010 to 1st January 2020 and the monthly returns are computed by using the average formula in the excel for the entire period as given below.

Average monthly returns for the entire sample period is 0.017781267

Table 4.6 shows the monthly returns of the NESTLE India

nestle India						
Date	**Closing prices**	**Monthly returns**		**Date**	**Closing prices**	**Monthly returns**
01-01-2010	2186.178			01-02-2015	6404.4	-0.01295
01-02-2010	2267.221	0.037071		01-03-2015	6337.305	-0.01048
01-03-2010	2304.937	0.016636		01-04-2015	5995.463	-0.05394
01-04-2010	2384.772	0.034636		01-05-2015	6158.7	0.027227
01-05-2010	2503.683	0.049863		01-06-2015	5816.196	-0.05561
01-06-2010	2503.988	0.000122		01-07-2015	5820.957	0.000819
01-07-2010	2626.684	0.049		01-08-2015	5462.032	-0.06166
01-08-2010	2677.251	0.019252		01-09-2015	5830.341	0.067431
01-09-2010	2941.036	0.098528		01-10-2015	5652.939	-0.03043
01-10-2010	3029.994	0.030247		01-11-2015	5365.572	-0.05084
01-11-2010	3152.517	0.040437		01-12-2015	5336.227	-0.00547
01-12-2010	3341.743	0.060024		01-01-2016	5038.888	-0.05572
01-01-2011	2915.717	-0.12749		01-02-2016	4598.169	-0.08746
01-02-2011	3109.496	0.06646		01-03-2016	5286.195	0.14963
01-03-2011	3239.047	0.041663		01-04-2016	5256.906	-0.00554
01-04-2011	3498.72	0.08017		01-05-2016	5598.372	0.064956
01-05-2011	3577.415	0.022492		01-06-2016	5990.423	0.070029
01-06-2011	3620.422	0.012022		01-07-2016	6632.615	0.107203
01-07-2011	3842.508	0.061342		01-08-2016	6021.056	-0.0922
01-08-2011	3868.064	0.006651		01-09-2016	5946.009	-0.01246
01-09-2011	3747.327	-0.03121		01-10-2016	6457.063	0.085949
01-10-2011	3740.057	-0.00194		01-11-2016	5813.691	-0.09964
01-11-2011	3721.286	-0.00502		01-12-2016	5572.12	-0.04155
01-12-2011	3608.745	-0.03024		01-01-2017	5422.684	-0.02682
01-01-2012	3757.347	0.041178		01-02-2017	5795.572	0.068765
01-02-2012	3914.525	0.041832		01-03-2017	6190.7	0.068178
01-03-2012	4107.36	0.049261		01-04-2017	6206.546	0.00256
01-04-2012	4157.72	0.012261		01-05-2017	6157.758	-0.00786
01-05-2012	4007.437	-0.03615		01-06-2017	6279.275	0.019734
01-06-2012	4037.546	0.007513		01-07-2017	6307.564	0.004505
01-07-2012	3983.82	-0.01331		01-08-2017	6637.617	0.052326
01-08-2012	4123.163	0.034977		01-09-2017	6741.484	0.015648
01-09-2012	3931.395	-0.04651		01-10-2017	6762.502	0.003118
01-10-2012	4197.674	0.067731		01-11-2017	7159.062	0.058641
01-11-2012	4257.779	0.014319		01-12-2017	7352.81	0.027063
01-12-2012	4458.638	0.047175		01-01-2018	7006.694	-0.04707
01-01-2013	4254.126	-0.04587		01-02-2018	7281.083	0.039161
01-02-2013	4268.694	0.003425		01-03-2018	7695.624	0.056934
01-03-2013	4124.208	-0.03385		01-04-2018	8814.758	0.145425

01-04-2013	4477.599	0.085687	01-05-2018	9056.269	0.027398
01-05-2013	4766.049	0.064421	01-06-2018	9266.396	0.023202
01-06-2013	4363.129	-0.08454	01-07-2018	9946.777	0.073425
01-07-2013	4758.183	0.090544	01-08-2018	10940.33	0.099887
01-08-2013	4416.5	-0.07181	01-09-2018	9178.938	-0.161
01-09-2013	4707.688	0.065932	01-10-2018	9603.077	0.046208
01-10-2013	5048.078	0.072305	01-11-2018	10186.95	0.060801
01-11-2013	4640.494	-0.08074	01-12-2018	10489.78	0.029726
01-12-2013	4785.944	0.031344	01-01-2019	10932	0.042158
01-01-2014	4566.882	-0.04577	01-02-2019	10116.13	-0.07463
01-02-2014	4401.612	-0.03619	01-03-2019	10421.52	0.030189
01-03-2014	4550.233	0.033765	01-04-2019	10368.61	-0.00508
01-04-2014	4315.019	-0.05169	01-05-2019	10957.21	0.056767
01-05-2014	4488.93	0.040304	01-06-2019	11403.31	0.040713
01-06-2014	4484.13	-0.00107	01-07-2019	11176.73	-0.01987
01-07-2014	4664.776	0.040286	01-08-2019	12324.75	0.102716
01-08-2014	5483.604	0.175534	01-09-2019	13501.08	0.095444
01-09-2014	5429.119	-0.00994	01-10-2019	14528.85	0.076125
01-10-2014	5700.515	0.049989	01-11-2019	14049.6	-0.03299
01-11-2014	5652.093	-0.00849	01-12-2019	14371.72	0.022928
01-12-2014	5816.808	0.029142	01-01-2020	14987.68	0.042859
01-01-2015	6488.457	0.115467			

(source:above values are taken from the yahoo finance and NSE website)

The next step is to calculate the beta value for the Asian paints company so that we can calculate it directly by using the manual formula but here a huge number of variables are available so that we can use the excel spreadsheet to compute the beta value for the Asian paints. There are 2 methods to find out the beta value. The first one is by using the slope formula and the other one is regression analysis but with the help of the regression analysis we can also get the R square and the intercept values as below.

Regression Statistics

Multiple R	0.432661
R Square	0.187196
Adjusted R Square	0.180308
Standard Error	0.051677
Observations	120

ANOVA

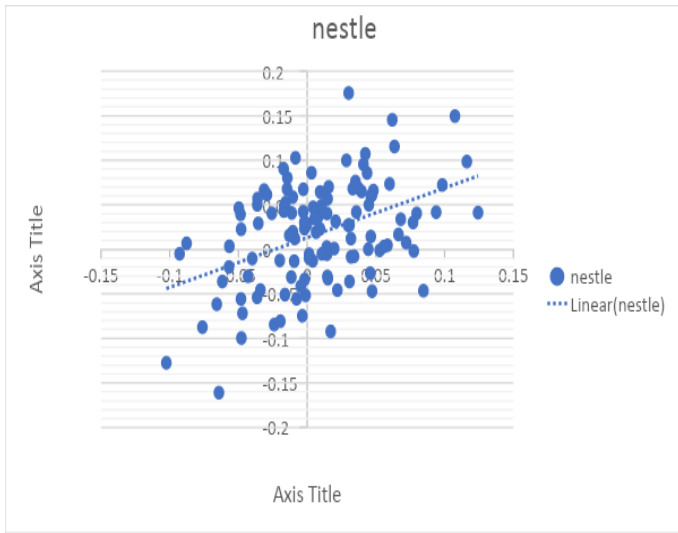|	df	SS	MS	F	Significance F			
Regression	1	0.072576	0.072576	27.17641	8.01E-07			
Residual	118	0.315125	0.002671					
Total	119	0.387701						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.013062	0.004804	2.719211	0.007532	0.00355	0.022574	0.00355	0.022574
X Variable 1	0.557908	0.10702	5.213099	8.01E-07	0.345979	0.769838	0.345979	0.769838

Figure 4.5 shows the beta alpha values for the NESTLE India

Beta value for the nestle company is 0.5579

CALCULATIONS OF EXPECTED RETURNS:

$$Er = Rf + \beta*(Rm - Rf)$$

Risk free return has been taken from the government of india issued 10 year bonds yield is 5.89% but are computing for the whole monthly returns of the mentioned stocks and even for the nifty so we have to divide the bond yield with 12 so that we can get the monthly return of the government of India bonds.

So that

Rf = 0.004908333

Rm = 0.007496

- **POWERGRID CORPORATION OF INDIA:**

Beta value for the power grid company is 0.597909

$Er = Rf + \beta*(Rm - Rf)$

= 0.004908333 + 0.597909(0.007496 - 0.004908333)

= 0.004908333 + 0.597909(0.002587667)

= 0.004908333 + 0.00154719

Therefore, PowerGrid company expected return = 0.006455

- **ASIAN PAINTS:**

Beta value of the Asian paints is 0.7353

$Er = Rf + \beta*(Rm - Rf)$

= 0.004908333 + **0.7353***(0.007496 - 0.004908333)

= 0.004908333 + 0.001903

= 0.006811

Therefore expected return for the Asian paints = 0.006811

- **BRITANNIA:**

Beta value for the Britannia company is 0.5151

$Er = Rf + \beta*(Rm - Rf)$

= 0.004908333 + **0.5151***(0.007496 - 0.004908333)

= 0.004908333 + 0.5151*(0.002587667)

= 0.004908333 + 0.001333473

= 0.0062419

Therefore expected return for the Britannia company = 0.0062419

- **HUL:**

Beta value for the HUL company is 0.5251

$Er = Rf + \beta*(Rm - Rf)$

= 0.004908333 + **0.5251***(0.007496 - 0.004908333)

= 0.004908333 + 0.5251*(0.002587667)

= 0.004908333 + 0.0013588

= 0.00626712

Therefore expected return for the HUL company = 0.00626712

- **NESTLE**

Beta value for the nestle company is 0.5579

$Er = Rf + \beta*(Rm - Rf)$

= 0.004908333 + **0.5579***(0.007496 - 0.004908333)

= 0.004908333 + 0.5579*(0.002587667)

= 0.004908333 + 0.00144366

= 0.006352

Therefore, expected return for the nestle company = 0.006352

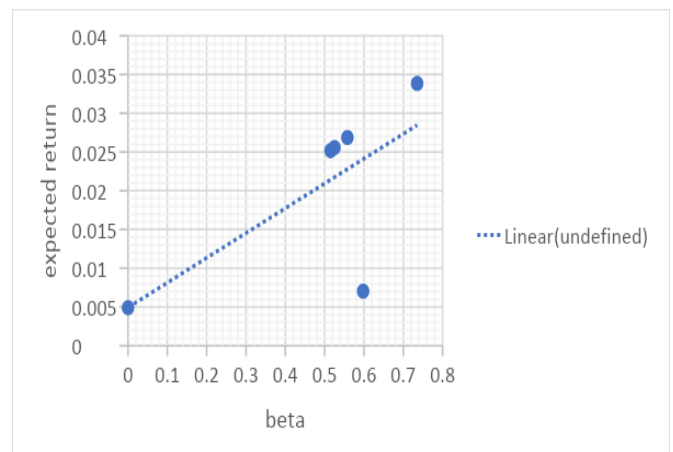**SECURITY MARKET LINE OF VARIOUS FIRMS:**

Figure 4.6 shows the undervalued and overvalued companies

The capital asset pricing model (CAPM) and the security market line (SML) are used to gauge the expected returns of securities given levels of risk.

CAPM, SML, and Valuations Together, the SML and CAPM formulas are useful in determining if a security being considered for investment offers a reasonable expected return for the amount of risk taken on. If a security's expected return versus its beta I is plotted above the security market line, it is considered undervalued, given the risk-return tradeoff. Conversely, if the security's expected return versus its systematic risk is plotted below the SML, it is overvalued because the investor would accept a smaller return for the amount of systematic risk associated.

Beta is an input into the CAPM and measures the volatility of a security relative to the overall market.

SML is a graphical depiction of the CAPM and plots risks relative to expected returns.

A security plotted above the security market line is considered undervalued and one that is below SML is overvalued. The data has been analyzed by using beta, expected return, security market line. The beta and expected return has been calculated on 1st January and by taking 12 months for 10 years. The analysis has been done by taking the exchange rate as a dependent variable and company share for 12 months for a sample period. In the similar way, index is taken as an independent variable and its impact on exchange rate for 12 months for 10 years.

The above graph shows that the BETA values of the above-mentioned stocks are plotted on the x axis and the capm means expected returns are plotted on the y axis. In the above chart the line is called the security market line. Therefore, from the above chart we came to know that Asian paints, Britannia and Hindustan Unilever companies are undervalued and suggested investing in these companies for the long term because these stocks are plotted above the security market line so that they are undervaluation firms. But in the case of power grid corporations of India and Nestle India are overvalued firms because they are plotted under the security market line if we invest in these firms so that we can put them for short term gain and exit the market.

V.   FINDINGS

- It is observed that most of the investors are risk averse and attempt to maximize their wealth at the minimum risk. It is established that risk can be reduced to minimum, but cannot be completely avoided or eliminated.

- For the convenience of the investors, analysts measure risks to be able to combine securities and to reach that portfolio which suit's the individual needs of an investor risk is measured through a beta test.

- The CAPM assumes the investors are single-period planners who agree on a common input list from security analysis and seek mean-variance optimal portfolios.

- The CAPM implies that the risk premium on any individual asset or portfolio is the product of the risk premium on the market portfolio and the beta.

- Based on the analysis, it is found that Asian paints, Britannia, Hindustan Unilever companies and Nestle India companies are undervalued. In the case of power grid corporations of India are overvaluing firms because they are plotted under the security market line. Therefore, asain paints, Britannia are being underpriced. It is perceived as fair to buy and can keep for the long term.

- SML is a graphical depiction of the CAPM and plots risks relative to expected returns security plotted above the security market line is considered undervalued and one that is below SML is overvalued.

- Powergrid corporation of India expected returns are lesser than the actual returns and also same for Britannia. Only Asian paints have the highest beta value with highest expected returns among the others. It can be analyzed if their expected returns are better than the actual or not with the help of the alpha by subtracting the expected returns from the actual returns.

VI.   CONCLUSION

In the area of financial literature asset pricing found a central place. The first asset pricing model was introduced by Sharpe (1964) based on the work of Markowtiz (1952) portfolio management. Since the introduction of the model by Sharpe (1964) other authors introduced so many different types of asset pricing model but still CAPM is a pioneer in this area. According to the model, beta or systematic risk or market risk is the single component for determining the expected return of an asset. The sensitivity of the stock's return is measured through beta according to the changes in the market conditions. The risk of an asset is divided into two parts by the model i.e. systematic risk and unsystematic risk.

The model known as the capital asset pricing model, or CAPM, has come to dominate modern finance. Almost any manager who wants to defend a project be it a brand, a factory or a corporate merger must justify his decision partly based on the CAPM. The reasons are that the model tells a firm how to calculate the return that its investor demands. If shareholders are to benefit, the returns from the project must clear this hurdle rate.

Beta is what makes the CAPM so powerful. Although an investment may face many risks, diversified investors should care only about those that are related to the market basket. Beta not only tells managers how to measure those risks, but it also allows them to translate them directly into a hurdle rate. If the future profits from a project will not exceed that rate it is not worth shareholders money. The rewards on a

specific investment depend only on the extent to which it affects the market basket's risk and suggest investing in these companies for the long term because these stocks are plotted above the security market line so that they are undervaluation firms.

● Conveniently, that contribution to the market basket's risk can be captured by a single measure, - dubbed "beta" - which expresses the relationship between the investment's risk and the markets.

● Thus, the investor should not value any security merely by considering only the Beta factor of the security. He should analyze the overall economic factors, which affect the rate of return and the risk involved

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