

Stability of Beta: An Empirical Examination

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Abstract:

The importance of beta is raised in the way back in 1964 by William Sharpe in Capital Asset Pricing Model (CAPM). Although many previous studies upheld that beta alone cannot predict the stock return more accurately and encourages factors such as market capitalization and book to market ratio cause to vary in stock returns Fama French three-factor model (1992). This present study examines the risk-return relationship and betas performance in the Indian BSE market. The study used BSE 200 index stocks. Because of the availability of complete information study used only 198 stocks. By applying methods like Regression analysis, Correlation coefficient, T-statistics samples have been tested. The study evidenced a positive relationship for 67 stocks. The correlation coefficient is strong only for 10 companies.

Key Words: Market risk, Risk-return, diversification, Investments

1. Introduction

In the Indian stock market, BSE and NSE stock exchanges have a high transaction in dealing with the securities market. These exchanges are digitalized, more liquid, and user-friendly. These exchanges encourage the investors to deal with all types of securities. In Investment, all kinds of assets will indeed have definite risks. This is because uncertainty prevailed in the economy due to natural and macro-micro factors. The risk is taken by investors in expectation of return on investment. The risk in investment implies the high volatility in returns. The risk is mainly categorized as systematic and unsystematic risks. The market risks are uncontrollable, undiversifiable and company risks are controllable, diversifiable, and brought to zero. Beta stability helps the investor to gain definite returns. Investor often tries to build a balance between two important variables such as risk and return. The theory put forward by William Sharpe 1964 has given importance to Capital Asset Pricing Model and evidenced a positive relationship between risk and return in securities. Many researchers have empirically analyzed the risk and return relationship in Indian and foreign markets. Studies have shown that investing in some stocks with longer investment horizons yields much higher returns than any other investment. However, this does not mean that all equity investments guarantee a high return.

2. Literature Review

The relevant literatures are reported in this section.

(Perikala & Reddy, 2019) examined the risk-return relationship of Equity stocks of the Indian stock market. The study served the purpose of understanding the annual returns, and risks are measured with the help of standard deviation, variance, and coefficient of variation. The sample size is 100 sample indices of the BSE Sensex and NSE Nifty. The study period consists from 2008-2009 to 2017-18. The study found a similar performance in both markets.

There were only 4 companies that showed a direct relationship between risk and return in sample indices. The study found stability in the returns after 2009. (Bala Kalyan & Salman, 2019) examined portfolio evaluation analysis on NSE stocks. The purpose of the study was to find the risk and return of different sets of securities mix for an investment decision. The study period ranges from July 2016 to June 2017. In the results of the study, only a few companies' stocks move with the linear trend and some are not. The study evidenced that investment in equity for a longer duration gives good returns. (Soni, 2017) analyzed the risk-return relationship to design portfolio among different asset classes. The study period includes from 2012 to 2015. The study shows the strong positive relation between risk and return of individual asset classes and also encourages having a strong portfolio mix to avoid the risks of losing the returns. (Jagannathan & Suresh, 2014) analyzed the risk/return of major Indian stock indices. The study period includes from July 1997 to January 2006. The study reveals that BSE Sensex is the best choice to maximize the return in consideration of risk than other selected samples. The study also revealed that selected indices are positively correlated when using returns from the same period and proved that diversification does not lead to any benefit from indices. (Gong et al., 2017) examined risk-return trade-off in the crude oil future market. The study period includes from March 2006 to April 2014. These high-frequency data show the statistically significant negative risk and return of crude oil future market. Among the volatility risk, down side risk and jump risk, downside risk has the stronger negative relationship. The study shows that there is no risk-return trade off in future market. (Aliu et al., 2017) examined portfolio risk-return analysis in the case of the automotive industry in the Czech Republic. The study aims at appraising the risk level of the companies operating in the automotive industry. The period of the study is from 2005 to 2014. The results evidenced that diversification strategy leads to a greater amount of risk-return tradeoff. (Dash, 2016) studied beta stationarity of the banking sector in the Indian Market. The study used 11 sectors of the 50 Nifty index. The period was between 2005 to 2011. Beta stability is learned in three different phases. Such as boom, recession and recovery. By using the panel regression method study found unstable betas during the study period and there was a significant difference in beta values. (Singh & Tripathi, 2016) emphasized understanding the volatility pattern of the Indian stock market. The study period consists from 1st April 2001 to 3^{1st} March 2016. The study used both symmetric and asymmetric models for analysis. The study found that negative stocks have a significant effect on conditional variance and insignificant risk premium as per the GHARCH model. (Guha et al., 2016) studied the risk-return relationship of sectorial indices and nifty index. The study used 11 sectors and with the help of factor analysis relationship been found. The study found a linear relationship between selected variables. (Bora & Adhikary, 2015) empirically analyzed the risk-return relationship on BSE stocks. The study includes 30 BSE stocks and with the help of multiple regressions, the model study found a direct relationship between two variables and also found unstable beta for the study period. (Harish & Mallikarjunappa, 2015) examined beta stability and structural breaks in the Indian BSE market. The study uses BSE 30 stocks. This 14 years study applied tests like unit root tests, CUSUM tests, Chow tests taking the event of pre and post-financial crisis period. The study revealed that individual stocks are more stable than portfolio betas. (Mahajan & Singh, 2013) examined the relationship between return, volume, and volatility about pre and post-rolling settlement. The study found a more efficient market after the implementation of the rolling settlement. The correlation between Nifty and Sensex shows a positive relationship for post-rolling settlement. (Dharani, 2011) investigated the seasonal anomalies in the returns of the Nifty Shariah index and Nifty index. The study period includes from 2nd January 2007 to 31st December 2010. The study intervals are in terms of days, months, and quarter returns. The study found significant differences in monthly returns of the Shariah index in July and September due to the seasonal effect. (Jeyachitra et al., 2010) empirically analyzed the portfolio risk and return relationship. This is possible by using the sample of nifty-listed stocks. The study period ranges from 1/4/2004 to 31/3/2019. The study strongly evidenced a direct relationship between portfolio risk and returns and justified diversification reduces the unsystematic risks. (Das, 2007) analyzed beta stability over different market phases. The sample of the study consists of 39 Nifty stocks. The samples have been tested in 3 three sub-periods such as two bullish and 1 bearish. By considering two variables such as time and dummy variables, the study found 85% and 65% stable beta. (Mahmudul Alam et al., 2007) investigated market efficiency of Dhaka stock exchange (DSE). The study found a weak form of efficiency since the market is not liquid. The study does not support the risk-return relationship in DSE. (Dhankar & Saini, 2006) analyzed relationship between risk-return and effect of diversification on non-market risk in India stock market. The study period is from June 1996 to May 2005. The study used the market index model. The study sample includes the opening and closing prices of a composite portfolio of 100 BSE companies. The study found a high positive correlation between portfolio return and risk. (Assaf, 2005) analyzed pre and post automation effect on stock volatility and risk-return relationship in Toronto stock exchange. The study employed GARCH (p,q) and GARCH(p,q)-M models to tests the samples. The study found significant changes in volatility and risk-return relationship. (Theriou et al., 2004) investigated the relation between beta and returns in up and down markets in the Athens stock exchange. The period of the study is from 1991 to 2002. The study used the conditional CAPM method and cross-sectional regression method. The results of the study show a

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positive relationship in the up-market and an inverse relationship in the down markets. (Campbell & Vuolteenaho, 2004) analyzed beta as good and bad beta. They grouped high price risks as bad beta and low price risks as bad beta. This study also found two beta models by grouping beta as cash flow beta and discount rate beta. By using the intertemporal asset pricing model study found that value stocks and small stocks have a higher cash flow beta than growth stocks and large stocks as well as high stock returns. (Girard et al., 2003) examined the contemporaneous relationship between market risk premium, conditional variance, and covariance in 9 Asian markets of the US. The study period includes from January 1, 1990, to June 1, 2001. The study used univariate and multivariate GHARCH procedures to model the one-factor CAPM. The study found no relationship to market risk premium and low R values. Subsequently, up stating and down stating the variance and covariance resulted in significant differences in the market risk premium and R values. (Ismail & Shakrani, 2003) analyzed relationship return and beta using cross-sectional regression analysis. The study used the cross-section regression method. The period of the study is from 1st May 1999 to 31st December 2001. They found that using the conditional CAPM significant differences in the up market and negative relationship in the down market. The study evidenced that beta is the right estimator for return estimation and R values, standard errors are appropriate measurements of conditional relationship. (Harrison & Zhang, 1999) investigated risk return relationship in the long horizons. This study been applies to different states in different time intervals. The study used semi-non-parametric density estimation and Monte Carlo integration tests to check the relationship between returns and conditional volatility. The study supported that long period of investment results for the positive return and risks not the shorter period investments. (Isakov, 1999) analyzed testing beta aliveness in Swiss stock markets. The sample study period was between 1973-1991. The sample consists of 358 Swiss stocks. This study lacks survivorship bias. The Fama Macbeth traditional approach of cross-sectional analysis is applied. The Swiss Bank Corporation General Index is used as a market index for the study. The residual risk shows the negative results on average returns of the stocks. The study concluded that beta maintained its power on return on portfolios. (Pettengill et al., 1995) emphasized the conditional relation between beta and returns. The study period includes from January 1926 to December 1990. The study used Sharpe Lintner Black model for analysis. The study shows significantly positive relationship between risk and return. (Fama & French, 1992) analyzed the cross section of expected returns. In this study used variables like beta, market capitalization and book to market ratio. The study found flat relationship with beta factor, but size and book to market ratio shows the differences in returns. (Ritter & Chopra, 1989) investigated the portfolio rebalancing and the turn of the year effect. This study supports the fact that there is a linear relation exists between risk and return in small firms specially in the month of January. The sample period consists of 1935-1986. The ordinary least square method and the CRSP value weighted portfolio index is used. The study found that there is positive relationship between return and risk of small firm in the month of January irrespective of market return direction. (Harrington, 1983) investigated whose beta best? The study used mean square error test to predict accurate beta and returns. The study found that value line forecasts and naive model forecasted best beta for utility samples but not for industrial samples. (Banz, 1981) examined the risk-return relationship between the total market value of the common stock and its return. The sample includes all common stock of NYSE. The study period was between 1936-1975. This 40 years study used the cross-sectional regression method to test the data. The study evidenced that there is an indirect relationship between the size of the firm and stock returns i.e.; small capitalized firms earned more returns and vice-versa. (Sharpe, 1964) examined CAPM under condition of risk. The study used two variables such as standard deviation and expected returns. The study shows the positive relationship between these two variables.

3. Significance of the Study

Beta plays an important role in deciding stock returns. The significant relationship between the risk-return relationships is evidenced in Capital Asset Pricing Model (CAPM). This model is also referred to as Sharpe, Lintner, Black model. This study aims to understand the significance of beta on the Indian BSE market. This study also finds the relationship between risk and return of BSE 200 index stocks. For the study, the purpose study uses 198 stocks of the BSE 200 Index. This is so because of the availability of data. The positive, negative movement between stock return and index returns is found with the help of the Correlation coefficient.

4. Hypotheses of the study

The following is the null hypothesis of the study

H₀: there is no relationship between risk and return of BSE 200 index stocks

5. Data and Methodology

The framework of this study is to compute the risk and return of BSE 200 index stocks. The data for the study has been obtained from BSE websites. With the help of regression analysis beta has been calculated. For the qualitative analysis, the empirical evidence has been done by applying suitable formulas. The return of each stock was calculated as follows:

$$\left(\frac{P_1 - P_0}{P_0}\right) \times 100$$

P₁-Price of today

P₀-Price of yesterday

Beta for the various company is calculated as follows:

$$R_i = \alpha + \beta_i R_m + e_i$$

$$\beta = \frac{cov(R_i, R_m)}{\sigma^2 m}$$

R_m- returns of the market (BSE 200 index)

R_i-expected return of each stock

α is the intercept of the linear regression relationship between R_i and R_m

β_i is the slope of the linear regression relationship between R_i and R_m

6. Analysis and Interpretation

Sl No	Company	Min i	Max	Mean	Stdev	Skewness	Kurtosis
1	3M India	-1.0	0.3	0.0	0.0	-9.8	143.5
2	Abbott India	-1.0	0.2	0.0	0.0	-5.9	69.4
3	ACC	0.0	0.2	0.0	0.0	3.5	20.5
4	Adani Enterp.	-0.6	1.4	0.1	0.0	1.6	2.9
5	Adani Gas	0.0	0.3	0.0	0.0	3.1	10.1
6	Adani Ports	0.0	0.2	0.0	0.0	2.3	9.1
7	Adani Power	-0.4	0.8	0.1	0.0	0.6	0.0
8	Adani Transmissi	0.0	0.5	0.1	0.0	3.9	19.3
9	Aditya Bir. Fas.	-0.4	0.2	0.0	0.0	-4.3	35.7
10	Aditya Birla Cap	0.0	0.2	0.0	0.0	1.0	2.4
11	AIA Engg.	0.0	0.3	0.0	0.0	4.0	21.7
12	Ajanta Pharma	-1.0	0.5	0.0	0.0	-4.6	69.2
13	Alkem Lab	0.0	0.1	0.0	0.0	2.7	7.7
14	Amara Raja Batt.	-0.1	0.2	0.0	0.0	1.0	3.0
15	Ambuja Cem.	-0.2	0.3	0.0	0.0	0.6	6.8
16	Apollo Hospitals	-0.6	1.6	0.0	0.0	4.0	23.9
17	Apollo Tyres	-0.3	0.6	0.0	0.0	1.1	8.0
18	Ashok Leyland	-0.1	0.3	0.0	0.0	1.1	6.0
19	Asian Paints	-1.0	0.2	0.0	0.0	-11.6	6.0
20	Astral Poly	-0.5	1.1	0.1	0.0	1.5	2.9
21	AU Small Finance	0.0	0.1	0.0	0.0	1.6	5.2
22	Aurobindo Pharma	-1.0	0.4	0.0	0.0	-3.9	46.6
23	Avenue Super.	0.0	0.1	0.0	0.0	1.6	1.5
24	Axis Bank	-0.3	0.4	0.0	0.0	0.9	4.5
25	B H E L	-0.1	0.2	0.0	0.0	2.7	11.8

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26	B P C L	-1.0	0.2	0.0	0.1	-4.4	37.7
27	Bajaj Auto	-0.4	0.6	0.0	0.1	1.7	46.2
28	Bajaj Fin.	-1.0	1.4	0.0	0.2	2.0	16.8
29	Bajaj Finserv	-0.6	0.3	0.0	0.1	-4.4	45.7
30	Bajaj Holdings	-0.4	0.2	0.0	0.1	-0.2	2.9
31	Balkrishna Inds	-1.0	0.9	0.0	0.1	-0.8	68.2
32	Bandhan Bank	-0.2	0.4	0.0	0.1	1.5	6.2
33	Bank of Baroda	-1.0	0.9	0.0	0.2	0.6	8.7
34	Bank of India	-0.9	5.3	0.2	1.0	3.5	14.2
35	Bata India	-1.0	0.2	0.0	0.1	-7.6	98.3
36	Bayer Crop Sci.	-1.0	0.3	0.0	0.1	-5.7	57.1
37	Berger Paints	-1.0	0.3	0.0	0.1	-9.6	134.2
38	Bharat Electron	-1.0	0.5	0.0	0.1	-6.4	96.6
39	Bharat Forge	-1.0	0.2	0.0	0.1	-6.9	85.0
40	Bharti Airtel	-1.0	0.4	0.0	0.1	-4.4	50.8
41	Bharti Infra.	-0.6	0.1	0.0	0.1	-7.8	67.4
42	Biocon	-1.0	0.2	0.0	0.1	-10.0	128.9
43	Bosch	-1.0	29.5	0.1	1.9	15.8	249.0
44	Britannia Inds.	-0.9	0.2	0.0	0.1	-5.5	62.8
45	Cadila Health.	-1.0	0.3	0.0	0.1	-9.7	134.8
46	Canara Bank	-0.9	1.3	0.0	0.3	1.0	4.0
47	Castrol India	-0.9	0.1	0.0	0.1	-14.4	221.84
48	Cholaman.Inv.&Fn	-1.0	1.5	0.0	0.2	1.9	12.8
49	Cipla	-0.9	0.3	0.0	0.1	-12.1	186.15
50	City Union Bank	-1.0	0.4	0.0	0.1	-4.9	62.6
51	Coal India	0.0	0.1	0.0	0.0	1.0	3.2
52	Colgate-Palm.	-1.0	0.3	0.0	0.1	-12.6	191.87
53	Container Corpn.	0.0	0.2	0.0	0.0	3.9	20.0
54	Coromandel Inter	-0.2	0.3	0.0	0.1	0.9	7.8
55	Crompton Gr. Con	0.0	0.1	0.0	0.0	3.1	10.6
56	Cummins India	0.0	0.1	0.0	0.0	1.7	2.4
57	Dabur India	-0.1	0.2	0.0	0.0	3.4	18.1
58	Dalmia Bhara.	-0.1	0.1	0.0	0.0	-1.4	3.5
59	Divi's Lab.	0.0	0.5	0.0	0.1	5.1	34.5
60	DLF	-0.3	0.5	0.0	0.1	1.3	6.4
61	Dr Reddy's Labs	-0.3	0.4	0.0	0.1	0.7	9.6
62	Edelweiss.Fin.	-0.2	0.3	0.0	0.1	1.2	4.4
63	Eicher Motors	-0.2	0.3	0.0	0.1	2.1	11.5
64	Emami	-1.0	0.3	0.0	0.1	-8.6	111.68
65	Endurance Tech.	0.0	0.1	0.0	0.0	2.0	4.7
66	Exide Inds.	-0.1	0.3	0.0	0.0	3.0	16.4
67	Federal Bank	-0.3	0.6	0.0	0.1	2.3	14.4
68	Future Retail	-0.4	0.5	0.0	0.1	-0.7	13.1
69	GAIL (India)	0.0	0.3	0.0	0.0	7.3	74.6
70	General Insuranc	0.0	0.1	0.0	0.0	1.3	1.0
71	Gillette India	-0.6	1.7	0.1	0.4	2.8	8.8
72	Glaxosmi. Pharma	-0.9	0.3	0.0	0.1	-3.3	40.4
73	GlaxoSmith C H L	-0.1	0.2	0.0	0.0	1.8	9.4

74	Glenmark Pharma.	-1.0	0.7	0.0	0.1	-2.4	54.0
75	GMR Infra.	-0.4	0.8	0.1	0.3	0.5	-0.2
76	Godrej Consumer	-1.0	0.2	0.0	0.0	-7.0	82.0
77	Godrej Ind.	-0.5	1.4	0.1	0.0	2.5	8.7
78	Godrej Properties.	-0.8	0.4	0.0	0.0	-1.9	16.3
79	Grasim Inds	-1.0	0.4	0.0	0.0	-3.1	40.2
80	Guj.St.Petronet	0.0	0.1	0.0	0.0	1.9	8.6
81	Gujarat Gas	0.0	0.1	0.0	0.0	2.6	6.7
82	H D F C	-0.1	0.2	0.0	0.0	1.6	6.5
83	H P C L	-1.0	0.2	0.0	0.0	-12.5	186.62
84	Havells India	-0.8	4.9	0.1	0.0	6.3	41.7
85	HCL Technologies	-0.2	0.3	0.0	0.0	0.5	2.9
86	HDFC AMC	0.0	0.2	0.1	0.0	0.8	0.5
87	HDFC Life Insur.	0.0	0.1	0.0	0.0	1.0	0.0
88	HDFC Bank	-0.2	0.4	0.0	0.0	1.0	7.0
89	Hero Motocorp	0.0	0.2	0.0	0.0	4.0	20.1
90	Hind. Unilever	-0.1	0.1	0.0	0.0	2.2	12.1
91	Hind.Zinc	0.0	0.3	0.0	0.0	4.1	21.0
92	Hindalco Inds.	-0.9	0.7	0.0	0.0	0.5	3.7
93	Honeywell Auto	-1.0	0.4	0.0	0.0	-9.0	129.67
94	I O C L	0.0	0.2	0.0	0.0	2.6	13.1
95	ICICI Bank	-0.5	0.9	0.0	0.0	1.7	13.0
96	ICICI Lombard	0.0	0.1	0.0	0.0	1.5	2.6
97	ICICI Pru Life	0.0	0.1	0.0	0.0	2.2	7.2
98	IDBI Bank	-0.7	1.6	0.0	0.0	1.5	6.2
99	IDFC First Bank	-0.3	0.5	0.0	0.0	0.7	1.4
100	Indiabulls Hous.	-0.2	0.4	0.0	0.0	1.8	7.4
101	Indian Bank	-0.2	0.4	0.0	0.0	1.0	4.7
102	Indian Hotels	-0.3	0.5	0.0	0.0	0.7	2.9
103	Indraprastha Gas	0.0	0.2	0.0	0.0	3.2	14.1
104	IndusInd Bank	-0.4	0.6	0.0	0.0	1.0	5.2
105	Info Edg.(India)	-0.9	0.2	0.0	0.0	-8.5	97.8
106	Infosys	-1.0	0.3	0.0	0.0	-10.5	151.41
107	Interglobe Aviat	-0.1	0.1	0.0	0.0	0.1	0.6
108	Ipca Labs.	0.0	0.3	0.0	0.0	4.6	27.7
109	ITC	0.0	0.1	0.0	0.0	2.7	10.3
110	Jindal Steel	-0.1	0.5	0.0	0.0	3.3	24.0
111	JSW Energy	-0.5	0.1	0.0	0.0	-9.1	94.0
112	JSW Steel	-0.3	10.6	0.1	0.0	14.9	231.32
113	Jubilant Food.	0.0	0.4	0.0	0.0	4.9	29.7
114	Jubilant Life	-0.3	0.5	0.0	0.0	1.1	4.1
115	Kansai Nerolac	-0.1	0.3	0.0	0.0	2.1	8.1
116	Kotak Mah. Bank	-1.0	0.7	0.0	0.0	-1.2	28.1
117	L & T Infotech	0.0	0.2	0.0	0.0	3.0	10.3
118	L&T Fin.Holdings	-0.1	0.2	0.0	0.0	0.6	2.6
119	L&T Technology	0.0	0.2	0.0	0.0	3.3	10.9
120	Larsen & Toubro	-0.7	1.2	0.0	0.0	3.4	23.6
121	LIC Housing Fin.	-0.1	0.4	0.0	0.0	2.8	16.7

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122	Lupin	-1.0	0.5	0.0	0.0	-4.1	70.0
123	M & M	-0.2	0.3	0.0	0.0	1.5	7.6
124	M & M Fin. Serv.	-0.1	0.3	0.0	0.0	0.6	2.4
125	M R P L	-0.5	1.4	0.0	0.0	7.3	80.4
126	Marico	-1.0	0.3	0.0	0.0	-11.0	161.1
127	Maruti Suzuki	0.0	0.4	0.0	0.0	5.9	54.4
128	Max Financial	-0.2	0.3	0.0	0.0	0.7	3.5
129	Mindtree	-0.1	0.2	0.0	0.0	1.4	5.1
130	Motherson Sumi	-0.1	0.6	0.0	0.0	4.3	29.3
131	Motil.Oswal.Fin.	0.0	0.3	0.0	0.0	3.0	19.2
132	Mphasis	-0.5	1.4	0.0	0.0	2.1	8.3
133	MRF	0.0	0.3	0.0	0.0	5.0	36.1
134	Muthoot Finance	-0.1	0.2	0.0	0.0	1.3	5.1
135	Natco Pharma	-0.4	0.7	0.0	0.0	1.1	4.4
136	Natl. Aluminium	-0.5	1.5	0.0	0.0	2.2	13.4
137	NBCC	0.0	0.4	0.0	0.0	4.3	22.8
138	Nestle India	0.0	0.1	0.0	0.0	2.9	9.5
139	NHPC Ltd	-0.2	0.2	0.0	0.0	0.1	-0.4
140	NMDC	-0.2	0.8	0.0	0.0	1.8	8.7
141	NTPC	0.0	0.1	0.0	0.0	4.4	23.9
142	O N G C	0.0	0.2	0.0	0.0	4.5	25.3
143	Oberoi Realty	-0.1	0.1	0.0	0.0	0.4	2.0
144	Oil India	-0.1	0.1	0.0	0.0	0.4	1.5
145	Oracle Fin.Serv.	-0.1	0.2	0.0	0.0	1.2	4.1
146	P & G Hygiene	0.0	0.3	0.0	0.0	5.9	50.8
147	P I Inds.	0.0	1.1	0.0	0.0	7.6	77.4
148	Page Industries	0.0	0.2	0.0	0.0	2.2	5.1
149	Petronet LNG	0.0	0.3	0.0	0.0	5.5	40.6
150	Pfizer	-0.2	0.3	0.0	0.0	0.7	5.4
151	Pidilite Inds.	-1.0	0.3	0.0	0.1	-10.9	158.33
152	Piramal Enterp.	-0.3	0.4	0.0	0.1	0.6	1.5
153	PNB Housing	0.0	0.2	0.0	0.0	1.6	2.6
154	Power Fin.Corp.	-0.7	0.2	0.0	0.1	-1.9	13.8
155	Power Grid Corp	-0.2	0.2	0.0	0.1	0.4	4.5
156	Punjab Natl.Bank	-0.7	1.9	0.1	0.4	2.4	8.6
157	Quess Corp	-0.1	0.3	0.0	0.1	0.5	0.0
158	Rajesh Exports	-0.2	0.4	0.0	0.1	1.2	5.0
159	RBL Bank	-0.1	0.2	0.0	0.1	0.5	0.1
160	REC Ltd	-0.1	0.2	0.0	0.1	0.5	4.2
161	Reliance Inds.	-1.0	0.4	0.0	0.1	-3.5	39.6
162	Reliance Nip.Lif	0.0	0.2	0.0	0.0	2.7	9.6
163	S A I L	0.0	0.4	0.0	0.0	6.9	58.6
164	Sanofi India	0.0	0.1	0.0	0.0	2.7	10.9
165	Shree Cement	-1.0	0.3	0.0	0.1	-9.2	130.06
166	Shriram Trans.	-0.3	0.5	0.0	0.1	1.8	10.7
167	Siemens	-0.2	0.3	0.0	0.1	1.2	6.1
168	SRF	-0.2	0.3	0.0	0.1	0.5	3.1
169	St Bk of India	-0.2	0.3	0.0	0.1	0.4	1.6

170	Sun Pharma.Ind.	-0.1	0.5	0.0	0.1	2.2	12.7
171	Sun TV Network	-0.3	0.5	0.0	0.1	2.2	15.4
172	Supreme Inds.	-0.3	0.5	0.0	0.1	1.3	10.9
173	Syngene Intl.	0.0	0.1	0.0	0.0	2.1	4.5
174	Tata Chemicals	-1.0	0.2	0.0	0.1	-8.9	119.7
175	Tata Global	-0.1	0.4	0.0	0.0	1.2	6.8
176	Tata Motors	-0.5	0.8	0.0	0.0	1.4	7.3
177	Tata Motors-DVR	-0.7	0.5	0.0	0.0	-2.4	27.6
178	Tata Power Co.	-0.9	0.3	0.0	0.0	-4.0	41.1
179	Tata Steel	-0.9	0.6	0.0	0.0	0.1	3.6
180	TCS	0.0	0.2	0.0	0.0	2.3	8.1
181	Tech Mahindra	-0.3	0.4	0.0	0.0	2.3	25.4
182	The Ramco Cement	-1.0	0.3	0.0	0.0	-11.2	166.42
183	Thermax	-1.0	0.2	0.0	0.0	-11.3	165.27
184	Titan Company	0.0	0.3	0.0	0.0	3.6	15.3
185	Torrent Pharma.	0.0	0.2	0.0	0.0	3.2	11.5
186	Torrent Power	0.0	0.1	0.0	0.0	1.9	7.9
187	Trent	-0.3	0.5	0.0	0.0	0.9	6.1
188	TVS Motor Co.	-0.8	0.4	0.0	0.0	-5.9	83.1
189	UltraTech Cem.	-0.2	0.2	0.0	0.0	-1.5	23.2
190	Union Bank (I)	-0.9	5.9	0.1	0.0	4.7	35.0
191	United Breweries	-0.5	1.4	0.0	0.0	7.8	97.5
192	UPL	-0.2	10.4	0.1	0.0	15.5	242.4
193	Varun Beverages	0.0	0.2	0.0	0.0	1.7	3.3
194	Vedanta	-0.7	2.7	0.1	0.0	4.5	23.6
195	Vodafone Idea	-0.8	5.7	0.2	0.1	3.4	12.2
196	Voltas	0.0	0.5	0.0	0.0	6.9	69.7
197	Whirlpool India	-1.0	1.1	0.0	0.0	2.0	32.3
198	Wipro	-0.3	0.2	0.0	0.0	-1.0	12.0

Table 1 Present the descriptive statistics of 198 companies' stocks. The table shows the positive average return for all the stocks. The highest return is found for Vodafone idea and the lowest return is seen in NPTC. Standard deviation is high for BOSCH, this denotes the high rate of variation in its returns, and low variation in return is found in ACC. The positively skewed implies that the return distribution of the companies traded in the market has a higher probability of earning positive return than negatively skewed. The kurtosis of the daily mean return for all companies is excessive, thus suggesting the presence of leptokurtosis.

Stability of Beta: An Empirical Examination

Table 2 Shows the Results of Beta Values						
Name of the Company	R Square	<i>alpha</i>	<i>Beta</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
3M India	0.09	0.02	0.10	0.02	4.87	0.00
Abbott India	0.25	0.01	0.07	0.01	9.11	0.00
ACC	0.00	0.01	-0.01	0.01	-0.87	0.39
Adani Enterp.	0.20	<i>0.13</i>	<i>-0.31</i>	<i>0.04</i>	<i>-7.86</i>	<i>0.00</i>
Adani Gas	0.21	0.05	0.61	0.38	1.61	0.14
Adani Ports	0.00	0.02	0.02	0.06	0.33	0.75
Adani Power	0.72	0.12	-0.55	0.03	-17.66	0.00
Adani Transmissi	0.01	0.05	-0.19	0.24	-0.79	0.44
Aditya Bir. Fas.	0.01	0.02	0.03	0.04	0.81	0.42
Aditya Birla Cap	0.08	0.04	-0.18	0.13	-1.42	0.17
AIA Engg.	0.10	0.02	0.10	0.02	4.32	0.00
Ajanta Pharma	0.02	0.03	0.03	0.02	2.22	0.03
Alkem Lab	0.01	0.01	0.01	0.02	0.61	0.55
Amara Raja Batt.	0.08	0.03	-0.03	0.01	-4.78	0.00
Ambuja Cem.	0.18	0.02	-0.13	0.02	-7.26	0.00
Apollo Hospitals	0.09	0.03	0.28	0.06	4.81	0.00
Apollo Tyres	0.08	0.03	-0.13	0.03	-4.63	0.00
Ashok Leyland	0.29	0.02	-0.08	0.01	-10.16	0.00
Asian Paints	0.14	0.02	0.16	0.03	6.37	0.00
Astral Poly	0.05	0.08	0.76	0.26	2.93	0.00
AU Small Finance	0.09	0.02	-0.23	0.14	-1.64	0.11
Aurobindo Pharma	0.07	0.03	-0.06	0.01	-4.27	0.00
Avenue Super.	0.05	0.03	0.19	0.15	1.28	0.21
Axis Bank	0.15	0.02	0.19	0.03	6.52	0.00
B H E L	0.08	0.02	0.01	0.00	4.76	0.00
B P C L	0.07	0.02	-0.07	0.02	-4.18	0.00
Bajaj Auto	0.00	0.02	0.02	0.03	0.59	0.56
Bajaj Fin.	0.09	0.05	-0.35	0.07	-4.80	0.00
Bajaj Finserv	0.01	0.03	0.08	0.06	1.30	0.20
Bajaj Holdings	0.00	0.01	0.00	0.00	-0.98	0.33
Balkrishna Inds	0.01	0.03	-0.03	0.02	-1.40	0.16
Bandhan Bank	0.06	0.03	-0.67	0.64	-1.05	0.31
Bank of Baroda	0.28	0.04	-0.31	0.03	-9.93	0.00

Bank of India	0.25	0.32	-0.86	0.09	-9.18	0.00
Bata India	0.13	0.02	-0.04	0.01	-6.05	0.00
Bayer Crop Sci.	0.01	0.02	0.03	0.02	1.40	0.16
Berger Paints	0.00	0.02	0.01	0.03	0.29	0.77
Bharat Electron	0.03	0.02	0.05	0.02	2.51	0.01
Bharat Forge	0.16	0.02	-0.08	0.01	-6.85	0.00
Bharti Airtel	0.11	0.02	-0.07	0.01	-5.03	0.00
Bharti Infra.	0.03	0.01	0.05	0.03	1.61	0.11
Biocon	0.00	0.01	0.00	0.01	0.00	1.00
Bosch	0.00	0.13	0.43	0.64	0.67	0.50
Britannia Inds.	0.25	0.01	0.08	0.01	9.14	0.00
Cadila Health.	0.00	0.02	0.01	0.02	0.26	0.79
Canara Bank	0.46	0.07	-0.35	0.03	-13.08	0.00
Castrol India	0.00	0.01	0.00	0.00	-0.04	0.97
Cholaman.Inv.&Fn	0.12	0.05	-0.33	0.06	-5.84	0.00
Cipla	0.00	0.01	0.00	0.01	0.30	0.77
City Union Bank	0.12	0.02	0.18	0.03	5.69	0.00
Coal India	0.20	0.01	0.02	0.00	5.11	0.00
Colgate-Palm.	0.05	0.01	0.05	0.01	3.71	0.00
Container Corpn.	0.01	0.02	0.01	0.01	1.43	0.15
Coromandel Inter	0.00	0.02	0.00	0.02	0.29	0.78
Crompton Gr. Con	0.02	0.02	0.05	0.06	0.90	0.37
Cummins India	0.01	0.01	0.01	0.01	1.27	0.21
Dabur India	0.00	0.02	0.00	0.01	0.04	0.97
Dalmia Bhara.	0.15	0.03	0.26	0.21	1.26	0.24
Divi's Lab.	0.01	0.03	0.02	0.01	1.65	0.10
DLF	0.18	0.04	-0.09	0.02	-5.70	0.00
Dr Reddy's Labs	0.01	0.02	-0.01	0.01	-1.85	0.07
Edelweiss.Fin.	0.29	0.03	-0.12	0.02	-7.53	0.00
Eicher Motors	0.00	0.03	-0.01	0.01	-0.36	0.72
Emami	0.09	0.02	0.11	0.02	4.59	0.00
Endurance Tech.	0.03	0.03	0.13	0.12	1.04	0.31
Exide Inds.	0.01	0.02	0.02	0.01	1.47	0.14
Federal Bank	0.21	0.02	0.29	0.04	8.07	0.00
Future Retail	0.00	0.04	-0.02	0.36	-0.05	0.96
GAIL (India)	0.00	0.01	0.00	0.01	-0.73	0.47
General Insuranc	0.03	0.04	-0.12	0.18	-0.64	0.54

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Gillette India	0.04	0.08	-0.28	0.09	-3.23	0.00
Glaxosmi. Pharma	0.03	0.01	0.04	0.02	2.61	0.01
GlaxoSmith C H L	0.06	0.01	-0.01	0.01	-1.39	0.18
Glenmark Pharma.	0.58	0.02	-0.04	0.01	-6.38	0.00
GMR Infra.	0.60	0.08	-0.50	0.07	-6.68	0.00
Godrej Consumer	0.02	0.04	0.07	0.10	0.70	0.49
Godrej Ind.	0.84	0.05	1.73	0.14	12.44	0.00
Godrej Properties.	0.01	0.02	0.02	0.06	0.41	0.69
Grasim Inds	0.12	0.01	0.05	0.03	1.98	0.06
Guj.St.Petronet	0.05	0.02	0.04	0.03	1.27	0.21
Gujarat Gas	0.00	0.01	0.00	0.03	-0.14	0.89
H D F C	0.01	0.04	-0.02	0.04	-0.59	0.56
H P C L	0.04	0.02	-0.01	0.01	-1.15	0.26
Havells India	0.08	0.24	1.76	1.12	1.57	0.13
HCL Technologies	0.65	0.04	-0.09	0.01	-7.54	0.00
HDFC AMC	0.00	0.07	-0.08	0.47	-0.18	0.86
HDFC Life Insur.	0.11	0.02	-0.14	0.09	-1.68	0.11
HDFC Bank	0.40	0.04	0.43	0.10	4.49	0.00
Hero Motocorp	0.01	0.02	0.01	0.01	0.50	0.62
Hind. Unilever	0.29	0.02	-0.02	0.01	-3.51	0.00
Hind.Zinc	0.01	0.03	-0.02	0.02	-0.66	0.52
Hindalco Inds.	0.69	0.10	-0.43	0.05	-8.16	0.00
Honeywell Auto	0.04	0.03	0.06	0.06	1.09	0.29
I O C L	0.01	0.02	-0.01	0.01	-0.47	0.64
ICICI Bank	0.49	0.06	0.49	0.09	5.42	0.00
ICICI Lombard	0.10	0.03	0.15	0.10	1.53	0.14
ICICI Pru Life	0.00	0.01	-0.01	0.01	-0.34	0.73
IDBI Bank	0.56	0.06	-0.70	0.11	-6.19	0.00
IDFC First Bank	0.06	0.03	-0.13	0.10	-1.36	0.19
Indiabulls Hous.	0.58	0.07	-0.31	0.05	-6.39	0.00
Indian Bank	0.31	0.04	-0.08	0.02	-3.64	0.00
Indian Hotels	0.00	0.02	0.00	0.03	-0.09	0.93
Indraprastha Gas	0.00	0.02	0.00	0.01	-0.15	0.88
IndusInd Bank	0.16	0.02	0.53	0.23	2.35	0.03
Info Edg.(India)	0.12	0.03	0.12	0.06	2.03	0.05
Infosys	0.01	0.02	0.01	0.02	0.54	0.60

Interglobe Aviat	0.42	0.02	-0.13	0.03	-4.64	0.00
Ipca Labs.	0.01	0.02	0.01	0.03	0.47	0.64
ITC	0.07	0.01	0.01	0.01	1.45	0.16
Jindal Steel	0.18	0.02	0.08	0.03	2.55	0.02
JSW Energy	0.01	0.02	-0.01	0.03	-0.49	0.63
JSW Steel	0.34	0.02	0.22	0.06	3.90	0.00
Jubilant Food.	0.00	0.04	-0.02	0.05	-0.33	0.75
Jubilant Life	0.03	0.02	0.03	0.03	1.04	0.31
Kansai Nerolac	0.01	0.02	-0.01	0.02	-0.40	0.69
Kotak Mah. Bank	0.02	0.02	0.06	0.07	0.79	0.44
L & T Infotech	0.01	0.03	0.11	0.18	0.63	0.54
L&T Fin.Holdings	0.00	0.02	-0.01	0.02	-0.36	0.72
L&T Technology	0.26	0.03	0.24	0.07	3.25	0.00
Larsen & Toubro	0.16	-0.01	0.29	0.12	2.43	0.02
LIC Housing Fin.	0.00	0.02	0.00	0.01	0.07	0.95
Lupin	0.00	0.08	0.02	0.09	0.23	0.82
M & M	0.00	0.03	0.00	0.07	-0.03	0.98
M & M Fin. Serv.	0.21	0.01	0.15	0.05	2.82	0.01
M R P L	0.01	0.02	0.01	0.02	0.60	0.55
Marico	0.57	-0.01	0.61	0.10	6.33	0.00
Maruti Suzuki	0.00	0.03	0.01	0.06	0.18	0.86
Max Financial	0.00	0.02	0.00	0.01	0.06	0.95
Mindtree	0.01	0.03	-0.03	0.05	-0.57	0.57
Motherson Sumi	0.14	0.04	0.18	0.08	2.18	0.04
Motil.Oswal.Fin.	0.15	0.02	0.04	0.02	2.25	0.03
Mphasis	0.09	0.10	0.67	0.40	1.68	0.10
MRF	0.01	0.03	0.04	0.06	0.62	0.54
Muthoot Finance	0.33	0.03	-0.14	0.04	-3.81	0.00
Natco Pharma	0.49	0.03	0.60	0.11	5.32	0.00
Natl. Aluminium	0.07	0.05	0.30	0.21	1.46	0.15
NBCC	0.11	0.05	0.25	0.13	1.93	0.06
Nestle India	0.05	0.01	-0.02	0.01	-1.28	0.21
NHPC Ltd	0.76	0.00	0.20	0.02	9.79	0.00
NMDC	0.00	0.10	-0.04	0.27	-0.15	0.88
NTPC	0.00	0.02	0.00	0.01	-0.17	0.87
O N G C	0.06	0.02	0.02	0.02	1.34	0.19
Oberoi Realty	0.02	0.01	-0.01	0.02	-0.71	0.48
Oil India	0.86	0.01	0.18	0.01	13.54	0.00
Oracle Fin.Serv.	0.20	0.04	-0.08	0.03	-2.70	0.01

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P & G Hygiene	0.08	0.02	-0.02	0.01	-1.58	0.13
P I Inds.	0.00	0.03	0.00	0.02	-0.14	0.89
Page Industries	0.00	0.03	0.00	0.02	-0.11	0.92
Petronet LNG	0.07	0.03	0.05	0.03	1.54	0.14
Pfizer	0.02	0.02	-0.06	0.08	-0.73	0.47
Pidilite Inds.	0.00	0.04	0.00	0.07	-0.02	0.98
Piramal Enterp.	0.03	0.03	-0.34	0.35	-0.98	0.34
PNB Housing	0.10	0.03	-0.10	0.05	-1.79	0.08
Power Fin.Corp.	0.16	0.03	-0.07	0.03	-2.39	0.02
Power Grid Corp	0.00	0.01	-0.01	0.04	-0.28	0.78
Punjab Natl.Bank	0.01	0.08	-0.05	0.10	-0.51	0.62
Quess Corp	0.79	0.04	-0.57	0.05	-10.73	0.00
Rajesh Exports	0.01	0.02	0.01	0.01	0.64	0.53
RBL Bank	0.58	0.03	-0.43	0.07	-6.49	0.00
REC Ltd	0.15	0.04	-0.08	0.04	-2.27	0.03
Reliance Inds.	0.01	0.03	0.03	0.07	0.41	0.69
Reliance Nip.Lif	0.13	0.03	0.27	0.15	1.84	0.08
S A I L	0.01	0.02	0.01	0.02	0.37	0.71
Sanofi India	0.01	0.02	-0.01	0.01	-0.48	0.64
Shree Cement	0.30	0.00	0.35	0.10	3.59	0.00
Shriram Trans.	0.00	0.05	0.02	0.14	0.16	0.87
Siemens	0.01	0.02	0.04	0.07	0.51	0.62
SRF	0.03	0.03	0.05	0.05	1.00	0.32
St Bk of India	0.17	0.01	0.02	0.01	2.44	0.02
Sun Pharma.Ind.	0.01	0.06	0.07	0.11	0.59	0.56
Sun TV Network	0.08	0.05	-0.24	0.15	-1.58	0.13
Supreme Inds.	0.03	0.03	0.09	0.10	0.90	0.38
Syngene Intl.	0.02	0.02	0.02	0.03	0.75	0.46
Tata Chemicals	0.00	0.01	0.00	0.01	-0.16	0.87
Tata Global	0.00	0.02	0.00	0.02	-0.02	0.98
Tata Motors	0.07	0.03	0.07	0.05	1.53	0.14
Tata Motors-DVR	0.05	0.04	0.20	0.15	1.30	0.21
Tata Power Co.	0.02	-0.01	0.07	0.10	0.72	0.48
Tata Steel	0.50	0.06	-0.24	0.04	-5.44	0.00
TCS	0.09	0.02	-0.02	0.01	-1.71	0.10
Tech Mahindra	0.00	0.04	0.01	0.09	0.07	0.95
The Ramco Cement	0.06	0.02	0.07	0.05	1.36	0.18

Thermax	0.01	0.01	-0.01	0.01	-0.61	0.55
Titan Company	0.00	0.02	0.01	0.03	0.28	0.78
Torrent Pharma.	0.01	0.03	-0.02	0.03	-0.56	0.58
Torrent Power	0.04	0.02	0.01	0.01	1.04	0.31
Trent	0.04	0.02	0.02	0.02	1.14	0.27
TVS Motor Co.	0.04	0.05	-0.01	0.01	-1.12	0.27
UltraTech Cem.	0.00	0.03	0.00	0.02	0.10	0.92
Union Bank (I)	0.42	0.09	-0.26	0.06	-4.70	0.00
United Breweries	0.00	0.07	0.03	0.12	0.29	0.78
UPL	0.01	0.04	-0.01	0.03	-0.40	0.69
Varun Beverages	0.04	0.03	0.11	0.11	1.08	0.29
Vedanta	0.01	0.02	-0.01	0.01	-0.60	0.55
Vodafone Idea	0.26	0.54	-1.00	0.31	-3.27	0.00
Voltas	0.00	0.02	0.00	0.01	0.08	0.94
Whirlpool India	0.01	0.03	0.08	0.13	0.59	0.56
Wipro	0.13	0.02	-0.02	0.01	-2.14	0.04
Yes Bank	0.00	0.04	-0.01	0.15	-0.05	0.96

From table 2 it is clear that about 67 companies show statistically significant results. Hence study proves the positive relationship between securities and market returns. At a 5% significance level study rejects the null hypothesis. The correlation value shows the strong relationship only for stated companies such as oil India (86%), Godrej(84%), Qess corp (58%), NHPC(76%), Adani power(72%), Hindalco(69%), HCL Technology(65%), GMR Infra(60%), RBL Bank(58%), India bulls House(58%), Glenmark pharma(58%) and Marico(57%).

Company	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
3M India	0.5	0.6	0.5	0.6	0.8	0.9	0.6	0.4	0.5	0.3
Abbott India	0.5	0.3	0.5	0.6	0.6	0.3	0.1	0.3	0.2	0.4
ACC	1.1	0.9	1.2	0.9	0.8	1.0	1.0	0.7	0.8	0.7
Adani Enterp.	1.6	0.8	0.9	1.0	0.8	0.5	1.1	0.9	0.8	1.0
Adani Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Adani Ports	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.0	0.9	1.2
Adani Power	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8
Adani Transmissi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aditya Bir. Fas.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aditya Birla Cap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AIA Engg.	0.0	0.0	0.0	0.0	0.8	1.1	0.9	0.6	0.7	0.7
Ajanta Pharma	0.5	0.5	1.3	1.2	1.3	0.9	0.4	0.8	0.6	1.1
Alkem Lab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Amara Raja Batt.	1.0	0.9	0.8	1.0	1.0	0.9	0.6	0.9	0.9	0.8
Ambuja Cem.	0.7	0.8	0.8	0.9	1.0	1.0	0.6	0.8	0.7	0.9
Apollo Hospitals	1.3	1.4	0.6	0.8	0.7	0.5	0.3	0.5	0.3	0.8
Apollo Tyres	1.1	0.9	0.9	0.9	0.6	0.7	0.6	0.8	0.7	1.2
Ashok Leyland	1.0	0.8	1.0	0.9	1.2	1.2	1.0	0.9	1.0	1.1
Asian Paints	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4

Stability of Beta: An Empirical Examination

Astral Poly	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7	0.6	1.0
AU Small Finance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aurobindo Pharma	0.9	0.6	1.0	1.0	1.0	0.8	0.5	0.8	0.8	0.8
Avenue Super.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Axis Bank	1.0	1.1	0.9	1.0	0.8	0.9	1.0	1.3	1.4	1.3
B H E L	0.8	1.1	0.9	1.3	1.0	1.1	1.2	1.0	1.0	0.8
B P C L	0.6	1.5	0.9	1.0	0.8	0.6	0.6	0.6	0.4	0.5
Bajaj Auto	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.6	0.7
Bajaj Fin.	0.3	0.8	0.5	0.6	0.9	0.9	0.2	0.7	1.0	0.9
Bajaj Finserv	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.4	0.7
Bajaj Holdings	0.3	0.7	0.4	0.6	0.8	1.0	0.5	0.6	0.7	0.7
Balkrish0.00 Inds	0.2	0.8	0.5	0.5	0.6	0.4	0.4	0.8	0.5	0.7
Bandhan Bank	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bank of Baroda	0.7	1.1	1.3	1.8	1.7	1.0	1.2	0.9	1.0	0.8
Bank of India	1.0	1.1	1.2	1.6	1.9	1.4	1.5	1.0	1.1	1.1
Bata India	1.1	0.7	0.8	1.1	0.9	1.6	1.1	1.1	0.7	0.8
Bayer Crop Sci.	0.4	0.3	0.6	0.8	1.0	1.1	0.9	0.6	0.5	1.0
Berger Paints	0.3	0.3	0.6	0.6	1.3	0.5	0.5	0.5	0.3	0.9
Bharat Electron	1.2	1.9	1.1	0.8	1.0	1.2	0.8	0.6	0.6	0.6
Bharat Forge	1.3	1.2	0.7	0.7	1.1	1.1	0.7	0.8	1.0	1.3
Bharti Airtel	0.0	0.9	0.5	0.9	1.1	0.8	1.1	0.8	0.8	0.7
Bharti Infra.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biocon	0.0	0.0	0.0	0.6	0.6	0.5	0.5	0.7	0.8	0.9
Bosch	0.3	0.3	0.5	0.7	0.4	0.5	0.3	0.4	0.2	0.3
Britannia Inds.	0.2	0.1	0.2	0.2	0.4	0.5	0.2	0.3	0.2	0.3
Cadila Health.	0.7	0.5	0.9	0.8	0.6	0.7	0.4	0.5	0.3	0.2
Ca0.00ra Bank	0.0	2.0	1.3	1.4	1.5	1.3	1.2	0.9	0.9	1.1
Castrol India	0.4	0.3	0.2	0.4	0.6	0.6	0.4	0.4	0.3	0.5
Cholaman.Inv.&Fn	0.2	0.7	0.4	0.7	0.7	0.8	0.6	0.7	0.7	1.4
Cipla	0.6	0.2	0.5	0.7	0.9	0.8	0.6	0.5	0.4	0.6
City Union Bank	0.6	0.4	0.7	1.0	1.1	0.6	0.7	0.8	0.9	0.8
Coal India	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Colgate-Palm.	0.2	0.2	0.3	0.4	0.7	0.8	0.5	0.3	0.3	0.6
Container Corpn.	0.5	1.3	0.6	0.7	0.2	0.7	0.4	0.3	0.2	0.5
Coromandel Inter	0.3	0.7	0.3	0.9	0.6	1.4	0.6	0.9	0.9	0.7
Crompton Gr. Con	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cummins India	0.9	0.6	0.6	0.5	0.8	1.2	0.9	0.6	0.6	0.4
Dabur India	0.5	0.4	0.8	0.8	0.8	1.0	0.5	0.6	0.3	0.5
Dalmia Bhara.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Divi's Lab.	0.0	0.0	1.1	0.5	0.8	1.2	1.2	0.9	0.7	0.7
DLF	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.5	1.7	1.7
Dr Reddy's Labs	0.5	0.7	0.5	0.5	0.8	0.7	0.4	0.4	0.5	0.4
Edelweiss.Fin.	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.3	1.0	1.0
Eicher Motors	0.5	1.5	0.7	0.6	0.6	1.0	0.9	0.8	0.5	0.8
Emami	0.0	-0.2	-0.1	0.3	1.0	0.7	0.6	0.6	0.5	0.8
Endurance Tech.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exide Inds.	0.7	0.3	0.5	0.7	0.9	0.5	0.7	0.6	0.7	0.7
Federal Bank	0.9	1.4	1.2	1.4	1.1	1.1	0.8	0.7	0.8	1.0
Future Retail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

GAIL (India)	0.6	0.9	1.2	1.7	1.2	0.8	0.8	0.9	0.7	0.6
General Insuranc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gillette India	0.9	0.8	0.7	0.6	0.4	0.6	0.2	0.4	0.3	0.4
Glaxosmi. Pharma	0.5	0.4	0.3	0.5	0.6	1.0	0.5	0.3	0.2	0.4
GlaxoSmith C H L	0.2	0.1	0.2	0.5	0.3	0.5	0.2	0.3	0.3	0.2
Glenmark Pharma.	1.0	0.4	0.9	1.0	1.0	0.9	0.9	0.8	0.9	0.8
GMR Infra.	0.0	0.0	0.0	0.0	0.0	1.6	1.2	1.4	1.2	1.3
Godrej Consumer	1.2	0.6	0.2	0.4	0.3	0.5	0.5	0.4	0.2	0.2
Godrej Ind.	0.7	0.3	0.7	0.8	1.0	1.0	0.8	1.1	1.1	1.4
Godrej Properties.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Grasim Inds	0.9	0.6	0.9	0.8	0.8	1.2	0.8	0.8	0.7	0.7
Guj.St.Petronet	0.0	0.0	0.0	0.0	0.0	0.9	0.8	1.0	1.0	1.0
Gujarat Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H D F C	0.3	0.1	0.4	0.6	0.7	0.9	1.0	1.2	1.2	1.0
H P C L	0.6	1.6	0.8	1.0	0.9	0.8	0.7	0.7	0.4	0.5
Havells India	0.2	0.0	0.5	0.9	0.8	0.9	0.9	0.8	0.7	1.0
HCL Technologies	2.4	1.6	1.5	0.7	1.1	0.9	0.7	1.0	1.1	1.0
HDFC AMC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HDFC Bank	0.6	0.3	0.5	0.8	0.9	0.8	1.1	1.0	0.9	0.9
HDFC Life Insur.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hero Motocorp	0.4	1.1	0.8	0.8	0.9	0.7	0.4	0.4	0.5	0.5
Hind. Unilever	0.6	0.7	0.8	0.6	0.9	1.0	0.6	0.5	0.3	0.5
Hind.Zinc	0.8	0.9	1.1	1.4	1.0	1.5	0.9	0.8	0.9	1.3
Hindalco Inds.	0.4	0.4	0.6	0.7	1.1	1.2	1.0	1.2	1.3	1.9
Honeywell Auto	0.6	0.7	0.7	0.7	0.9	1.0	0.6	0.6	0.4	0.7
I O C L	0.5	1.2	1.0	1.4	0.7	0.9	0.7	0.7	0.3	0.1
ICICI Bank	1.1	0.8	0.8	0.8	1.1	0.9	1.2	1.5	1.6	1.5
ICICI Lombard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ICICI Pru Life	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IDBI Bank	0.5	1.0	1.0	1.6	1.4	1.4	1.6	1.2	1.3	1.5
IDFC First Bank	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Indiabulls Hous.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Indian Bank	0.0	0.0	0.0	0.0	0.0	0.0	11.5	0.9	1.2	1.3
Indian Hotels	0.5	0.6	0.6	0.6	0.8	1.4	0.7	0.7	0.9	1.1
Indraprastha Gas	0.0	0.0	6.0	1.2	1.1	0.9	0.6	0.4	0.4	0.5
IndusInd Bank	0.7	1.3	0.9	1.2	1.4	1.6	1.6	1.2	1.2	1.2
Info Edg.(India)	0.0	0.0	0.0	0.0	0.0	0.8	0.6	0.7	0.4	0.6
Infosys	1.8	1.3	1.3	0.7	1.1	0.9	0.6	0.7	0.6	0.7
Interglobe Aviat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ipca Labs.	1.0	1.3	1.2	0.8	0.5	0.6	0.2	0.3	0.5	0.5
ITC	0.5	0.5	0.6	0.6	0.7	1.0	0.6	0.6	0.6	0.6
Jindal Steel	1.4	1.3	1.5	1.1	1.2	1.3	1.3	1.4	1.2	1.1
JSW Energy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
JSW Steel	0.6	1.5	1.5	1.2	- 18.0	1.1	1.3	1.2	1.5	1.9
Jubilant Food.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
Jubilant Life	0.6	0.3	0.4	0.3	0.3	0.8	0.4	0.4	0.8	0.7
Kansai Nerolac	0.4	0.7	0.4	0.5	0.5	0.3	0.2	0.6	0.2	0.4

Stability of Beta: An Empirical Examination

Kotak Mah. Bank	1.2	1.5	1.0	0.7	1.0	1.1	1.3	1.4	1.5	1.3
L & T Infotech	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L&T Fin.Holdings	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L&T Technology	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Larsen & Toubro	1.0	0.7	0.9	0.5	0.9	1.2	1.2	1.1	1.3	1.0
LIC Housing Fin.	0.5	1.3	0.7	0.9	0.8	0.8	1.3	1.3	1.0	1.5
Lupin	-5.2	1.2	1.3	0.8	0.7	0.9	0.7	0.6	0.4	0.5
M & M	1.0	1.3	1.2	0.9	1.0	1.0	1.0	0.9	1.0	1.2
M & M Fin. Serv.	0.0	0.0	0.0	0.0	0.0	0.6	0.4	0.3	0.5	0.8
M R P L	0.7	1.3	1.3	1.6	1.2	1.2	1.1	1.2	0.9	1.2
Marico	0.0	0.3	0.3	0.4	0.7	0.8	0.5	0.5	0.4	0.6
Maruti Suzuki	0.0	0.0	1.2	1.2	1.2	1.1	1.0	0.7	0.7	0.7
Max Fi0.00ncial	1.3	1.4	0.8	1.1	0.6	0.5	0.6	0.6	0.8	0.9
Mindtree	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.4	0.5
Motherson Sumi	0.1	0.5	0.7	1.1	0.7	0.3	0.3	0.4	0.6	0.7
Motil.Oswal.Fin.	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.9	1.1	0.8
Mphasis	1.0	1.2	0.7	0.5	1.0	1.2	0.8	0.8	0.7	0.6
MRF	0.3	0.6	0.7	0.9	0.6	0.7	0.6	0.8	0.6	0.8
Muthoot Finance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natco Pharma	0.3	0.5	1.2	1.2	0.9	0.5	0.4	0.8	0.8	1.1
Natl. Aluminium	0.4	1.8	1.2	1.2	1.2	1.1	0.8	0.9	0.9	0.9
NBCC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nestle India	0.2	0.2	0.0	0.2	0.2	0.5	0.4	0.2	0.1	0.4
NHPC Ltd	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7
NMDC	0.3	1.0	-0.2	0.7	0.6	0.3	0.4	0.8	1.1	1.0
NTPC	0.0	0.0	0.0	1.0	0.9	0.8	0.9	0.9	0.6	0.6
O N G C	0.7	1.5	1.2	1.2	0.9	0.8	1.0	0.9	0.8	0.7
Oberoi Realty	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
Oil India	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4
Oracle Fin.Serv.	0.0	1.1	0.9	1.0	0.9	1.0	0.6	1.0	0.8	0.7
P & G Hygiene	0.3	0.2	0.5	0.4	0.3	0.5	0.0	0.3	0.3	0.4
P I Inds.	0.1	0.4	0.4	-0.4	-0.1	0.1	-0.1	0.0	-0.1	1.0
Page Industries	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.2	0.3
Petronet LNG	0.0	0.0	0.0	0.8	1.1	0.9	0.9	1.1	1.0	1.1
Pfizer	0.3	0.5	0.4	0.7	0.3	0.6	0.4	0.4	0.2	0.4
Pidilite Inds.	0.5	0.5	0.3	0.5	0.5	0.8	0.6	0.6	0.4	0.4
Piramal Enterp.	0.5	0.7	0.8	0.6	1.0	0.9	0.7	0.4	0.4	0.6
PNB Housing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Power Fin.Corp.	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.0	0.7	0.9
Power Grid Corp	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.0	0.8	0.6
Punjab Natl.Bank	0.0	1.1	1.5	1.4	1.3	0.9	1.2	0.9	1.0	0.9
Quess Corp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rajesh Exports	0.1	0.3	-0.1	0.1	1.1	0.9	0.9	1.2	1.0	1.0
RBL Bank	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
REC Ltd	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.8	1.0
Reliance Inds.	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.1
Reliance Nip.Lif	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

S A I L	1.1	1.6	1.9	1.7	1.4	1.5	1.6	1.2	1.4	1.5
Sanofi India	0.2	0.2	0.4	0.6	0.5	0.7	0.3	0.4	0.3	0.2
SBI Life Insuran	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shree Cement	1.9	1.1	0.8	0.9	0.8	0.9	0.8	0.5	0.5	0.6
Shriram Trans.	0.2	0.6	0.7	0.8	1.1	0.7	0.5	0.5	0.2	0.7
Siemens	0.4	0.9	0.6	0.6	0.7	1.3	1.0	1.0	1.2	0.9
SRF	0.5	1.0	0.9	1.4	1.8	1.8	0.9	0.9	0.7	1.4
St Bk of India	0.8	0.9	1.0	1.3	1.3	0.8	1.3	1.0	1.2	1.2
Sun Pharma.Ind.	0.6	0.2	0.7	0.5	0.5	0.7	0.5	0.3	0.3	0.4
Sun TV Network	0.0	0.0	0.0	0.0	0.0	1.1	0.9	0.8	0.8	0.7
Supreme Inds.	1.1	1.1	0.8	1.0	1.0	1.3	0.7	0.6	0.5	0.5
Syngene Intl.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tata Chemicals	1.0	0.9	0.9	1.1	0.8	0.9	0.6	1.1	0.8	1.0
Tata Global	1.1	0.8	0.8	1.0	0.8	0.9	0.7	0.6	0.4	0.8
Tata Motors	1.0	1.1	1.2	1.2	1.2	1.2	1.0	1.0	1.3	1.6
Tata Motors-DVR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.4	1.4
Tata Power Co.	1.1	1.1	1.2	1.4	1.3	0.8	1.1	1.1	0.9	0.7
Tata Steel	1.1	1.1	1.3	1.3	1.2	1.5	1.2	1.3	1.5	1.7
TCS	0.0	0.0	0.0	0.9	1.0	0.9	0.7	0.9	0.8	0.8
Tech Mahindra	0.0	0.0	0.0	0.0	0.0	1.0	0.8	0.9	1.0	1.0
The RamcoCement	0.6	0.2	0.5	0.9	0.8	1.1	0.8	0.7	0.8	0.9
Thermax	1.1	1.0	0.6	0.6	0.5	0.9	0.7	0.6	0.7	0.6
Titan Company	1.1	1.5	1.2	0.9	2.0	1.2	1.0	1.0	0.6	0.9
Torrent Pharma.	0.7	0.9	1.1	0.8	0.6	0.9	0.5	0.7	0.5	0.3
Torrent Power	0.0	0.0	0.0	0.0	0.0	1.3	1.0	1.1	0.9	0.6
Trent	0.8	1.0	0.6	0.8	0.7	0.5	0.5	0.6	0.4	0.5
TVS Motor Co.	1.3	1.0	0.6	1.0	1.0	1.3	1.0	0.9	0.9	1.2
UltraTech Cem.	0.0	0.0	0.0	0.6	0.8	1.0	0.9	0.7	0.6	0.6
Union Bank (I)	0.0	0.4	1.1	1.3	1.4	1.2	1.3	0.9	0.7	1.1
United Breweries	0.0	1.8	0.4	0.6	0.4	1.0	0.6	0.7	0.8	0.6
UPL	0.6	1.3	1.0	22.7	0.6	0.6	0.6	0.8	0.9	1.1
Varun Beverages	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vedanta	1.1	0.8	1.3	1.0	1.3	1.2	0.8	1.0	1.3	1.5
Vodafone Idea	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.0	1.1	0.6
Voltas	0.9	0.6	0.6	1.0	0.9	0.8	1.2	1.1	1.4	1.0
Whirlpool India	0.9	0.8	0.9	0.5	0.9	1.4	0.9	0.7	0.7	1.1
Wipro	2.4	1.3	1.6	1.1	1.3	1.1	0.8	0.9	0.8	0.9
Yes Bank	0.0	0.0	0.0	0.0	0.8	0.7	1.0	1.4	1.3	1.4
Zee Entertainmen	2.1	1.7	1.0	0.7	1.0	0.8	1.1	0.7	0.9	0.9

Table 4 Shows the Systematic Risk of BSE 200 companies (2011-2019)

Company	2011	2012	2013	2014	2015	2016	2017	2018	2019
3M India	0.5	0.2	0.3	0.8	1.1	0.8	0.9	1.0	0.7
Abbott India	0.3	0.4	0.3	0.4	0.2	0.5	0.2	0.6	0.7
ACC	0.7	0.8	0.9	1.2	0.8	1.0	1.1	1.3	1.4
Adani Enterp.	1.2	1.9	1.6	1.8	2.2	1.7	2.1	2.1	2.1
Adani Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	1.1

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Adani Ports	0.8	1.0	0.9	2.0	1.3	1.5	1.6	1.4	1.3
Adani Power	0.9	2.0	1.2	2.2	2.0	1.7	2.5	2.8	1.8
Adani Transmissi	0.0	0.0	0.0	0.0	1.6	1.8	1.7	1.7	0.8
Aditya Bir. Fas.	0.0	0.0	0.5	0.7	1.1	1.1	0.8	0.8	0.8
Aditya Birla Cap	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.3	1.1
AIA Engg.	0.4	0.4	0.5	0.5	0.6	0.3	0.5	0.6	0.4
Ajanta Pharma	0.9	0.6	0.7	0.5	0.8	0.8	0.8	1.4	0.1
Alkem Lab	0.0	0.0	0.0	0.0	-2.6	0.4	0.4	0.3	0.1
Amara Raja Batt.	0.4	0.5	0.6	0.6	0.9	1.0	0.9	1.0	1.0
Ambuja Cem.	0.9	0.9	1.0	1.4	1.1	1.0	1.0	1.4	1.6
Apollo Hospitals	0.3	0.4	0.6	0.7	1.0	0.6	0.6	0.7	0.8
Apollo Tyres	1.3	1.3	0.9	1.4	1.5	1.2	1.5	1.5	1.2
Ashok Leyland	1.0	1.2	0.9	2.0	1.4	1.3	1.5	1.3	2.1
Asian Paints	0.4	0.5	0.9	0.8	1.0	0.8	0.7	0.9	0.9
Astral Poly	0.4	0.4	0.3	0.4	0.7	0.5	0.7	1.0	0.7
AU Small Fi0.00nce	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.9	0.6
Aurobindo Pharma	1.2	1.4	1.1	0.4	1.3	1.4	1.3	1.2	0.9
Avenue Super.	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.3	1.1
Axis Bank	1.4	1.8	1.7	1.4	1.4	1.3	1.1	1.2	1.3
B H E L	1.0	1.7	1.5	1.9	1.1	1.5	1.4	1.4	1.9
B P C L	0.7	0.5	1.3	1.5	1.0	0.8	1.1	1.4	1.4
Bajaj Auto	0.8	0.7	0.8	0.6	0.8	0.9	0.8	1.0	0.8
Bajaj Fin.	0.8	0.7	1.1	0.8	0.8	1.4	1.6	1.5	1.6
Bajaj Finserv	0.8	0.9	0.6	0.7	0.9	1.0	1.4	1.4	1.4
Bajaj Holdings	0.4	0.5	0.3	0.5	0.3	0.8	0.6	0.7	0.7
Balkrish0.00 Inds	0.3	0.5	0.4	0.9	0.5	0.4	0.8	1.3	1.0
Bandhan Bank	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.4
Bank of Baroda	0.9	1.5	1.7	1.8	1.4	1.6	2.0	1.8	1.9
Bank of India	1.0	1.8	2.1	2.3	1.7	1.7	2.2	1.9	2.2
Bata India	0.9	0.9	0.8	1.0	1.0	1.0	1.2	1.2	0.7
Bayer Crop Sci.	0.7	0.2	0.3	0.8	0.4	0.4	0.6	0.4	0.4
Berger Paints	0.6	0.5	0.5	0.5	1.0	0.9	1.0	1.0	1.0
Bharat Electron	0.3	0.6	0.5	1.2	1.2	1.1	1.3	1.2	1.4
Bharat Forge	1.2	1.0	0.9	1.2	1.3	1.1	1.5	1.3	1.5
Bharti Airtel	0.8	0.9	1.2	0.7	0.7	0.7	0.9	1.1	1.0
Bharti Infra.	0.0	0.0	0.5	0.4	0.6	0.6	0.8	0.3	0.6
Biocon	1.0	0.9	0.6	0.8	1.0	0.8	1.0	1.2	0.7
Bosch	0.3	0.4	0.2	0.6	1.2	0.9	0.8	0.6	1.1
Britannia Inds.	0.3	0.3	0.5	0.5	0.7	0.9	0.7	0.9	0.8
Cadila Health.	0.4	0.2	0.2	0.3	0.8	0.9	1.1	1.1	0.9
Ca0.00ra Bank	1.1	1.7	2.0	2.4	1.6	1.7	2.0	2.0	2.0
Castrol India	0.6	0.4	0.3	0.7	0.7	0.8	0.8	0.9	1.0
Cholaman.Inv.&Fn	1.0	0.7	0.6	0.9	0.5	0.5	1.0	1.6	1.6
Cipla	0.5	0.5	0.5	0.5	1.1	0.7	0.8	0.8	0.6
City Union Bank	0.8	0.5	0.6	0.8	0.4	0.6	0.8	0.4	0.6
Coal India	0.6	0.6	0.6	1.4	0.7	0.7	0.7	0.5	0.9
Colgate-Palm.	0.4	0.2	0.5	0.4	0.5	0.5	0.4	0.4	0.7
Container Corpn.	0.5	0.3	0.4	1.1	0.6	0.6	0.9	0.8	0.9
Coromandel Inter	0.6	0.2	0.6	1.1	0.5	1.0	1.3	0.7	0.6

Crompton Gr. Con	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.5	0.9
Cummins India	0.5	0.7	0.5	0.9	0.9	0.8	0.8	1.0	1.0
Dabur India	0.3	0.4	0.5	0.4	0.6	0.7	0.7	1.0	0.5
Dalmia Bhara.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.8
Divi's Lab.	0.6	0.5	0.5	0.5	0.7	0.7	1.3	1.2	0.6
DLF	1.5	1.8	1.9	2.2	1.9	2.4	2.3	2.0	1.8
Dr Reddy's Labs	0.6	0.2	0.5	0.1	0.7	0.6	0.6	0.7	0.4
Edelweiss.Fin.	0.8	0.8	0.7	1.7	1.3	1.8	1.3	2.3	1.9
Eicher Motors	0.6	0.7	0.5	0.7	1.2	1.1	1.1	1.2	1.6
Emami	0.5	0.4	0.7	0.4	0.7	0.5	0.9	0.8	0.7
Endurance Tech.	0.0	0.0	0.0	0.0	0.0	1.0	0.6	1.0	0.8
Exide Inds.	0.6	0.6	0.8	1.2	0.9	1.1	1.3	1.1	1.4
Federal Bank	1.1	1.0	1.4	1.9	1.1	1.4	1.3	1.4	1.6
Future Retail	0.0	0.0	0.0	0.0	0.0	1.6	1.1	0.8	0.3
GAIL (India)	0.6	0.7	0.7	1.2	1.1	0.9	1.0	0.8	1.0
General Insuranc	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.0
Gillette India	0.5	0.4	0.3	0.5	0.7	0.4	0.6	0.2	0.3
Glaxosmi. Pharma	0.2	0.1	0.1	0.2	0.3	0.4	0.3	0.9	0.3
GlaxoSmith C H L	0.4	0.1	0.7	0.5	0.3	0.4	0.3	0.4	0.6
Glenmark Pharma.	0.5	0.2	0.4	0.1	1.0	0.9	0.9	0.9	0.6
GMR Infra.	1.3	2.4	1.5	2.2	1.6	1.8	2.4	2.0	1.3
Godrej Consumer	0.3	0.3	0.5	0.9	0.7	1.1	1.0	0.8	0.6
Godrej Ind.	1.4	1.3	1.0	1.4	1.3	1.1	1.5	1.2	1.0
Godrej Properties.	0.5	0.6	0.5	1.3	1.1	0.9	1.4	1.4	1.0
Grasim Inds	0.7	0.8	0.9	1.0	0.8	1.0	1.2	1.3	1.5
Guj.St.Petronet	0.7	0.7	0.8	1.1	0.4	0.9	0.6	0.6	0.7
Gujarat Gas	0.0	0.0	0.0	0.0	0.3	0.8	0.6	0.6	0.8
H D F C	1.1	0.8	1.3	1.0	1.3	1.0	0.8	1.1	1.1
H P C L	0.6	0.4	1.3	1.6	1.2	1.2	1.5	1.4	1.7
Havells India	1.0	1.0	0.8	1.1	0.8	1.2	1.1	1.3	1.2
HCL Technologies	1.2	0.6	0.4	0.3	0.7	0.6	0.2	0.5	0.3
HDFC AMC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.8
HDFC Bank	1.1	0.9	1.3	0.9	0.9	0.7	0.6	0.6	1.0
HDFC Life Insur.	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.6
Hero Motocorp	0.6	0.8	0.8	0.8	0.7	1.0	0.9	0.9	1.3
Hind. Unilever	0.4	0.3	0.7	0.2	0.5	0.6	0.7	0.7	0.7
Hind.Zinc	1.0	1.1	1.0	1.3	1.0	1.0	1.6	0.8	1.0
Hindalco Inds.	1.5	1.6	1.3	1.9	1.4	1.9	1.9	1.5	1.2
Honeywell Auto	0.6	0.5	0.5	0.8	0.9	0.4	0.7	0.8	0.8
I O C L	0.5	0.4	1.0	1.5	0.8	1.1	1.1	1.2	1.3
ICICI Bank	1.5	1.7	1.6	1.5	1.5	1.6	1.4	1.3	1.4
ICICI Lombard	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.7
ICICI Pru Life	0.0	0.0	0.0	0.0	0.0	0.9	0.8	1.0	0.8
IDBI Bank	1.3	1.7	1.4	2.0	1.8	1.5	1.9	1.0	1.6
IDFC First Bank	0.0	0.0	0.0	0.0	1.0	1.3	1.3	1.6	1.4
India bulls Hous.	0.0	0.0	1.5	1.0	1.2	1.4	1.2	2.2	2.6
Indian Bank	1.1	1.3	1.4	1.6	1.0	1.7	2.3	1.9	1.7
Indian Hotels	0.8	1.2	0.8	0.7	0.5	0.8	0.8	0.7	1.0
Indraprastha Gas	0.4	0.4	0.6	0.9	0.7	0.8	0.8	1.0	0.8

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IndusInd Bank	1.3	1.3	1.8	1.2	1.1	1.0	0.9	0.9	1.9
Info Edg.(India)	0.4	0.3	0.3	0.8	0.7	0.4	0.7	0.6	0.6
Infosys	1.0	0.8	0.4	0.3	0.7	0.7	0.6	0.5	0.2
Interglobe Aviat	0.0	0.0	0.0	0.0	0.7	0.7	0.6	1.0	0.7
Ipcalabs	0.4	0.3	0.3	0.2	0.5	0.7	1.1	0.4	0.5
ITC	0.7	0.3	0.9	0.3	0.7	0.9	1.0	0.8	0.7
Jindal Steel	1.3	1.6	1.2	2.0	1.4	2.2	2.7	2.4	2.3
JSW Energy	1.0	1.9	1.7	2.2	1.8	1.6	1.4	1.4	0.9
JSW Steel	1.7	1.9	1.3	1.7	1.2	0.9	1.8	1.3	1.6
Jubilant Food.	1.1	0.9	0.5	1.1	1.1	1.4	1.1	1.1	1.0
Jubilant Life	0.6	0.4	0.9	0.6	1.2	2.0	1.1	1.0	0.5
Kansai Nerolac	0.1	0.2	0.2	0.5	1.0	0.7	0.7	0.8	0.9
Kotak Mah. Bank	1.2	1.2	1.2	1.0	1.1	0.8	0.7	0.9	0.9
L & T Infotech	0.0	0.0	0.0	0.0	0.0	0.5	0.3	1.0	0.1
L&T Fin.Holdings	0.8	0.7	1.3	1.4	1.0	1.4	1.8	2.0	1.9
L&T Technology	0.0	0.0	0.0	0.0	0.0	0.6	-0.1	1.0	0.4
Larsen & Toubro	1.2	1.7	1.5	1.5	1.2	1.3	1.2	1.1	1.3
LIC Housing Fin.	1.2	1.3	1.8	1.7	1.4	1.6	1.3	1.4	1.6
Lupin	0.6	0.3	0.5	0.4	0.8	0.8	0.8	1.0	0.5
M & M	1.1	0.9	0.9	0.7	1.0	0.9	0.9	1.1	1.5
M & M Fin. Serv.	0.9	0.5	1.2	1.2	0.9	1.4	1.7	2.1	1.7
M R P L	1.2	1.3	0.9	1.4	1.3	1.1	1.6	1.4	0.8
Marico	0.4	0.2	0.3	0.2	0.7	0.8	0.8	0.8	0.4
Maruti Suzuki	0.8	0.8	1.0	1.1	0.8	1.2	1.0	1.1	1.5
Max Fin. Serv.	0.8	0.8	0.6	0.9	0.9	0.8	0.8	1.3	0.7
Mindtree	0.6	0.5	0.3	0.1	0.8	0.7	0.7	0.8	0.5
Motherson Sumi	0.6	0.6	0.5	0.8	1.2	1.8	1.2	1.2	1.8
Motil.Oswal.Fin.	0.8	0.8	0.6	1.1	1.1	1.3	1.3	1.0	1.4
Mphasis	0.9	0.6	0.4	0.7	0.4	0.5	0.3	0.5	0.2
MRF	0.9	1.0	1.0	0.9	1.2	1.0	1.0	1.0	1.0
Muthoot Fin. Serv.	0.9	0.4	1.0	0.8	0.9	0.9	1.9	1.5	1.3
Natco Pharma	0.7	0.5	0.4	0.6	1.3	0.8	1.1	0.9	0.4
Natl. Aluminium	0.7	1.1	0.8	1.6	0.5	1.2	1.9	1.2	1.3
NBCC	0.0	0.8	1.4	1.9	1.4	1.1	1.1	1.6	2.2
Nestle India	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.8	0.7
NHPC Ltd	0.7	0.8	0.6	1.6	0.8	1.0	1.0	0.7	0.4
NMDC	0.9	1.0	1.1	1.1	0.8	1.4	1.5	1.2	1.3
NTPC	0.9	0.7	0.7	1.1	0.9	0.8	0.7	0.6	0.6
O N G C	0.6	0.7	1.3	1.6	1.1	0.9	0.7	1.0	1.1
Oberoi Realty	0.6	0.8	0.9	1.3	1.1	1.1	1.1	1.2	1.0
Oil India	0.4	0.3	0.9	1.2	0.7	0.5	0.7	0.7	1.0
Oracle Fin.Serv.	0.7	0.7	0.3	0.5	0.6	0.6	0.6	0.5	0.6
P & G Hygiene	0.3	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.5
P I Inds.	0.6	0.6	0.5	0.8	0.9	0.7	0.9	0.5	0.5
Page Industries	0.7	0.4	0.1	0.1	0.9	1.0	0.9	1.1	1.3
Petronet LNG	0.7	0.5	0.8	0.9	0.6	1.1	1.1	0.8	0.5
Pfizer	0.2	0.3	0.1	0.4	0.7	0.4	0.3	0.6	0.6
Pidilite Inds.	0.4	0.3	0.6	0.7	0.7	0.8	1.0	1.1	0.9
Piramal Enterp.	0.3	0.5	0.6	0.4	0.6	0.9	1.3	1.8	1.5

PNB Housing	0.0	0.0	0.0	0.0	0.0	1.9	1.5	1.3	1.1
Power Fin.Corp.	1.3	1.8	1.8	2.5	1.4	1.5	1.7	1.7	1.3
Power Grid Corpn	0.6	0.6	0.6	0.9	0.7	0.7	0.6	0.5	0.3
Punjab Natl.Bank	0.9	1.6	1.7	1.8	1.3	1.7	2.5	1.7	1.9
Quess Corp	0.0	0.0	0.0	0.0	0.0	0.9	0.8	1.1	0.8
Rajesh Exports	0.8	0.6	0.5	1.5	1.1	0.7	0.5	0.0	0.0
RBL Bank	0.0	0.0	0.0	0.0	0.0	1.2	1.0	1.3	2.2
REC Ltd	1.4	2.0	1.6	2.3	1.4	1.5	1.5	1.6	1.1
Reliance Inds.	1.2	1.0	1.1	1.2	1.2	0.8	0.9	1.2	0.9
Reliance Nip.Lif	0.0	0.0	0.0	0.0	0.0	0.0	1.9	1.1	0.8
S A I L	1.3	1.5	1.2	1.7	1.3	1.6	2.2	1.8	2.1
Sanofi India	0.1	0.2	0.3	0.3	0.5	0.4	0.5	0.4	0.5
SBI Life Insuran	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.4	0.5
Shree Cement	0.3	0.6	0.6	0.6	0.7	1.1	0.9	1.1	1.1
Shriram Trans.	0.8	0.9	1.0	1.7	0.8	1.5	1.3	1.4	1.7
Siemens	0.7	1.0	1.2	2.0	1.4	1.1	1.5	1.1	1.4
SRF	0.7	0.7	0.6	1.2	1.4	1.3	1.2	1.4	1.1
St Bk of India	1.2	1.6	1.2	1.6	1.4	1.6	1.6	1.4	1.8
Sun Pharma.Ind.	0.7	0.4	0.6	0.2	0.9	0.7	1.1	0.9	0.7
Sun TV Network	0.7	1.0	1.1	0.9	1.1	1.7	1.6	1.4	1.4
Supreme Inds.	0.4	0.3	0.4	0.4	0.5	0.6	0.5	0.7	0.6
Syngene Intl.	0.0	0.0	0.0	0.0	1.0	1.0	0.7	0.5	0.5
Tata Chemicals	0.7	0.7	0.6	1.3	1.2	1.2	1.3	1.0	0.8
Tata Global	1.1	1.2	0.9	1.2	1.2	1.3	1.7	1.2	0.9
Tata Motors	1.7	1.5	1.1	1.4	1.3	1.9	1.6	1.4	2.1
Tata Motors-DVR	1.5	1.7	1.1	1.7	1.5	1.6	1.7	1.3	2.2
Tata Power Co.	0.8	1.2	1.0	1.7	1.1	1.1	1.1	1.5	1.3
Tata Steel	1.3	1.6	1.4	1.6	1.5	1.7	1.6	1.4	1.7
TCS	1.0	0.5	0.4	0.3	0.5	0.6	0.2	0.3	0.3
Tech Mahindra	1.0	0.7	0.3	0.3	0.6	1.0	0.6	0.6	0.3
The Ramco Cement	0.8	0.7	0.7	0.9	1.0	1.0	0.9	1.0	1.2
Thermax	0.7	0.8	0.4	0.7	0.8	0.7	0.9	0.5	0.8
Titan Company	0.9	1.1	1.1	0.9	0.5	1.0	1.4	0.9	0.9
Torrent Pharma.	0.3	0.1	0.3	0.4	0.7	1.0	1.0	0.7	0.3
Torrent Power	0.6	0.7	0.7	1.9	1.0	0.8	1.5	1.7	0.8
Trent	0.6	0.8	0.4	0.8	0.9	0.7	1.1	0.5	0.8
TVS Motor Co.	1.4	1.3	0.9	1.0	1.0	1.1	1.0	1.3	1.7
UltraTech Cem.	0.6	0.6	0.9	1.2	1.1	1.1	1.1	1.1	1.4
Union Bank (I)	1.1	1.6	2.2	2.4	1.8	1.8	2.4	2.0	2.1
United Breweries	1.0	0.4	0.9	0.9	1.1	0.5	0.9	1.2	0.7
UPL	1.0	0.9	1.0	1.2	1.0	1.3	1.1	1.5	0.8
Varun Beverages	0.0	0.0	0.0	0.0	0.0	0.6	0.2	0.4	0.6
Vedanta	1.2	1.8	1.4	1.5	1.7	2.5	1.9	1.4	1.6
Vodafone Idea	0.6	0.7	0.7	1.1	0.7	0.8	1.0	1.3	2.0
Voltas	1.0	2.1	1.1	2.1	1.4	1.5	1.4	1.4	0.9
Whirlpool India	1.0	0.9	0.9	0.9	0.9	0.7	1.0	0.9	0.7
Wipro	0.9	0.6	0.3	0.3	0.6	0.5	0.3	0.4	0.3
Yes Bank	1.5	1.6	2.3	1.9	1.5	1.5	1.2	1.4	2.1
Zee Entertainment	0.6	0.7	0.8	0.6	1.0	1.1	0.9	0.8	0.8

Table 3&4 reveals that the values of betas for different companies from 2001 to 2019. The study shows unstable beta for the study period and in increasing trend. Beta values of ICICI BANK, Punjab National Bank, and SAIL are growing constantly. Bosch Company is having the highest standard deviation among all companies. Around 30 companies show an insignificant beta for the study period. In special situations market reacts with high volatility.

7. Conclusion

Since the importance of beta rose six decades ago, still it has maintained its importance in influencing stock returns. This present study aims to understand the risk-return relationship of BSE 200 index stocks. The study proved 67 stocks are having a direct relationship between risk and return. The strong movement between stock return and the market return is found in only 10 companies, the remaining companies' stocks have a weak relationship. The study found unstable monthly beta for the study period ranging from 2010 to 2019. On the whole, the study concludes that the influence of market risk cannot be rejected. Risk-takers will have a high reward if planned projects move smoothly. Meanwhile, investors need to consider many factors which directly and indirectly matters to the invested assets.

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