

INTERPRETATION OF STOCK BETA IN NATIONAL STOCK EXCHANGE

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Abstract

Financial experts have developed many approaches to measure the expected return of stock. The objective of this paper is to estimate the beta value for the securities listed in National Stock Exchange (NSE). Investment made on securities is predominantly increasing with growing interest on Savings and their need for an additional income. Investors are ready to invest on securities to generate high return, but the uncertainty in the stock market is being an obstacle for them to do so. The major problem faced by investor is the lack of knowledge on building a Portfolio for their investment. CAPM explains the stock return is the sum of the risk free rate plus beta times the excess return. However the beta value for the stock measures the volatility of the stock and determines the level of risk involved in the stock. The beta times the excess return in the CAPM formula states the importance of the stock beta in their expected return. Here the beta value is measured to determine the movement of stock in their respective market. The data is collected for the securities listed in nifty 50 for the period of 10 years from 2010 to 2020 to estimate the beta value. The ranking of securities are done based on the beta value for the above specified period. The study further focuses on the determining the coefficient of determination (R^2) to find the variance in proportion of dependent variable to that of independent variable.

Key words: Beta, NSE, R square.

Introduction

Beta is a numeric worth which quantifies the fluctuations and the responsiveness of a stock's cost to changes in the general market. A stock's beta will change after some time since it contrasts the stock's arrival and the profits of the general market. On examination of the benchmark file NSE Nifty to a specific stock returns, builds up that demonstrates the stock's receptiveness to the market chance. The NIFTY 50 Index has a beta of 1.0, and individual stocks are positioned by the amount they digress from the market. This causes the speculator

to choose whether he needs to go for the more risky stock that is profoundly corresponded with the market, beta over 1, or with a less unpredictable one beta underneath 1. That is the stock that swings more than the market after some time has a beta above 1.0. In the event that a stock moves not exactly the market, the stock's beta is under 1.0. High-beta stocks should be less secure yet give better yield potential, low-beta stocks asserts less risk yet in addition lower returns. Beta is a part of the Capital Asset Pricing Model, which computes the expense of value subsidizing and can help decide the pace of come back to anticipate that relative should apparent risk. Beta is likely a superior marker of present moment as opposed to long haul risk. The CAPM equation utilizes the complete normal market return and the beta estimation of the stock to decide the pace of return that investors may sensibly expect dependent on saw venture risks. Right now, can affect a stock's normal pace of return and offer valuation. Also, beta offers an unmistakable, quantifiable measure that is anything but difficult to work with. Without a doubt, there are minor departure from beta relying upon things, for example, the market record utilized and the timespan estimated. In any case, comprehensively, the thought of beta is genuinely direct. It's an advantageous measure that can be utilized to figure the expenses of value utilized in a valuation strategy. Risk is a significant thought in holding any portfolio. The risky in holding protections is for the most part connected with the likelihood that acknowledged returns will be not exactly the profits anticipated. Risks can be delegated Systematic risk and Unsystematic risk. Unsystematic risks are those risks that are special to a firm or industry. Factors, for example, the executive's capacity, customer inclinations, work, and so forth add to unsystematic Risks. Unsystematic risks are controllable commonly and can be impressively diminished by adequately differentiating one's portfolio. Methodical risks are those risks related with the monetary, political, sociological and other full scale level changes. They influence the whole market all in all and can't be controlled or dispensed with simply by differentiating one's portfolio. In what manner should financial specialists evaluate chance in the stocks that they purchase or sell? While the idea of risky is difficult to factor in stock examination and valuation, one of the most mainstream markers is a factual measure called beta. Investigators use it regularly when they need to decide a stock's risky profile. In any case, while beta says something about value chance, it has its cut-off points for financial specialists hoping to decide key risky factors. Beta is determined utilizing relapse investigation. Numerically, it speaks to the inclination for a security's profits to react to swings in the market. The recipe for ascertaining beta is the covariance of the arrival of an advantage with the arrival of the market separated by the change of the arrival of the market over a specific period. Furthermore, the other method to process is utilizing the slant work.

BETA FORMULA

Beta is calculated as:

$$\beta = \frac{\text{Cov}(X, Y)}{\text{Var}(X)}$$

Where,

- Y is the returns on your portfolio or stock - Dependent Variable

- X is the market returns or index - Independent Variable
- Variance is the square of standard deviation.
- Covariance is a statistic that measures how two variables co-vary, and is given by:

$$Cov(x,y) = [1/(N-1)] \sum_{t=1}^N [x_t - \bar{x}][y_t - \bar{y}]$$

Where, N denotes the total number of observations, and \bar{x} and \bar{y} respectively represent the arithmetic averages of x and y.

Review of literature

Chintan A. Shah, June (2015) Construction of Optimal Portfolio Using Sharpe Index Model & CAPM for BSE Top 15 Securities this study was mainly about the Sharpe model gives exact number of securities along with weightage for investment, while this is not possible in CAPM model. They have used the descriptive research design and secondary data is used as a major thing in this paper. CAPM model only suggests that different securities where investor can invest but it does not give a particular portfolio and weightage to investment in different securities. Based on the study of returns of top 15 BSE securities from past years data using Sharpe Model, an investor can invest in following securities. HDFC Bank Ltd, HDFC Ltd., ICICI Bank Ltd., TCS, TATA Motors.

Dr. S Poornima and Swathiga P, June (2017) this study is on relationship between risk and come analysis of elect stocks on NSE victimization capital quality valuation model this study shows the link of risk and return analysis helps the capitalist to select up the securities supported his selection. The study of this sort provides data concerning the performance of assorted stocks within the market in terms of risk and return with the assistance of CAPM. The study measures the link between risk and return analysis of elect firms in 2 sectors listed in NSE. within the case of automobile firms here, investors will choose Maruti Suzuki Ltd (5.31%) and Hieronymus Bosch (3.48%). within the case of IT firms here, he will choose HCL Technologies (1.02%) severally. Since the author has elect solely 2 sectors like automobile and IT Sectors, wherever the automobile firms has performed higher and has accumulated growth within the market when put next to that Sector has negative average returns.

Hui-Shan Lee¹, Fan-Fah Cheng, Shyue-Chuan Chon, 2016 Markowitz Portfolio Theory and Capital Asset Pricing Model for Kuala Lumpur Stock Exchange: A Case Revisited the idea right now speculators could utilize CAPM to gauge the conduct and the precise risk of the stocks in Malaysia before putting resources into financial exchange. This could be an approach to limit their drawback risk as they comprehend the stock pattern of the organization and consequently contribute objectively. Moreover, administrators in the organizations of Malaysia can utilize CAPM as an intermediary to assess their stock return and execute the correct strategy in their administration so as to augment benefit simultaneously increment investor riches expansion. Besides, it is recommended to apply portfolio expansion to lessen the unsystematic risk. Generally, portfolio broadening could develop the speculators' certainty towards the venture choice and to build up a sound

speculation money related market in helping Malaysia to accomplish its strategic be a created nation in 2020.

Dr.Rupinder Katoch, January (2018) The Capital Asset Pricing Model: An Empirical Test on Indian Stock Market and the investigation finishes up blended reactions to the uses of CAPM in Indian Stock Market. The examination began with the point of holding CAPM on Indian Stock Market viz. to test whether higher beta yields higher expected return and the catch rises to zero. The outcomes by and large approve the CAPM's forecasts that higher risky (beta) is related with a more significant level of return. The speculation that the block λ is zero is dismissed at 5% level of essentialness since the t-esteem is more noteworthy than 2.132 which is a logical inconsistency to the hypothesis of CAPM.

Hayat Khan, Itbar Khan, Hassan Ali Raza, Rashid Jan, Amir Sohail, December (2016) Capital asset pricing model (CAPM) versus Fama and French three-factor model: An empirical comparison in Pakistani equity market. The investigation shows that they are taking an example of fifty Pakistani organizations the outcome provided us some insight that models which we are taking, have performed better. Three book keeping factors, size premium, book-to-advertise value premium and market premium, empower us to catch the normal returns over the period. These models can be utilized as benchmark for portfolio execution assessment by support chiefs and speculators. Reserve administrators and speculators can assess their portfolios by contrasting their portfolio returns with the benchmark model with comparative size, book-to-advertise value attributes. In the event that their portfolio returns are higher than the benchmark, they can outflank the market. Fama and French find the situation of exactly un-clarified components of Sharp's CAPM, which have a little experimental proof for suggestion. In any case, our outcome shows that CAPM, Fama and French three on-screen characters model have great spellbinding force. Here we are taking fifty organization's month to month normal returns and three autonomous factors; figure parameters, P-qualities and R-Square through straightforward relapse. The outcome indicated that these models are performing great to ascertain organizations stock's returns recorded on Karachi stock trade, for the whole investigation time frame January 2003 till December 2012. They are here contrasting models based on parameter α (alpha), if α (alpha) is irrelevant the model is said to be right. Tables finally show that six alphas for Fama and French 3 - factor model, five for CAPM model are inconsequential.

Need of the study

- a. To understand the importance for the measure of beta value for the securities.
- b. To understand how beta value influence the individual stock in the corresponding market.
- c. To know the level of deviation in securities to that of the market which they occupied.
- d. To find the variance in proportion of dependent variable to that of independent variable.

Objective of the study

- a. To select securities listed in NIFTY 50.
- b. To estimate the beta value for each securities.
- c. To rank the securities based on the obtained beta value.
- d. To find the coefficient of determination (R^2) for each securities.

Data:

Here, researcher has used Descriptive Research Design because in this research design the researcher has got very specific objectives, clear-cut data requirements. Daily data for 50 securities (NIFTY 50) collected for a time period of 10 years that is from February 1st 2010 to January 31st 2020. Data collected is a secondary data and been collected from the NSE website.

Table 1.1 for securities listed on NIFTY 50

S.NO	SYMBOL	S.NO	SYMBOL	S.NO	SYMBOL
1	ADANIPTS	18	HDFC	35	ONGC
2	ASIANPAINT	19	HEROMOTOCO	36	POWERGRID
3	AXISBANK	20	HINDALCO	37	RELIANCE
4	BAJAJ-AUTO	21	HINDUNILVR	38	SBIN
5	BAJAJFINSV	22	ICICIBANK	39	SUNPHARMA
6	BAJFINANCE	23	INDUSINDBK	40	TATAMOTORS
7	BHARTIARTL	24	INFRATEL	41	TATASTEEL
8	BPCL	25	INFY	42	TCS
9	BRITANNIA	26	IOC	43	TECHM
10	CIPLA	27	ITC	44	TITAN
11	COALINDIA	28	JSWSTEEL	45	ULTRACEMCO
12	DRREDDY	29	KOTAKBANK	46	UPL
13	EICHERMOT	30	LT	47	VEDL
14	GAIL	31	M&M	48	WIPRO
15	GRASIM	32	MARUTI	49	YESBANK
16	HCLTECH	33	NESTLEIND	50	ZEEL
17	HDFC BANK	34	NTPC		

Estimation of Beta

The beta value is obtained for every individual security from the following formula:

$$\beta = \frac{Cov(X, Y)}{Var(X)}$$

Where,

- Y is the returns on securities which is considered as a dependent variable

- X is the market returns or index returns and which is considered as an independent variable
- Variance is the square of standard deviation.
- Covariance is a statistic that measures how two variables co-vary with each other.

Table 1.2 Showing Beta Value For Listed Securities:

S.no	SYMBOL	BETA	S.no	SYMBOL	BETA
1	YESBANK	1.596	26	BHARTIARTL	0.847
2	TATAMOTORS	1.570	27	BAJFINANCE	0.840
3	HINDALCO	1.517	28	EICHERMOT	0.810
4	VEDL	1.516	29	ZEEL	0.803
5	ICICIBANK	1.503	30	BAJAJ-AUTO	0.771
6	TATASTEEL	1.452	31	IOC	0.762
7	AXISBANK	1.438	32	HEROMOTOCO	0.757
8	JSWSTEEL	1.422	33	NTPC	0.741
9	SBIN	1.371	34	ASIANPAINT	0.737
10	INDUSINDBK	1.248	35	ITC	0.727
11	LT	1.240	36	COALINDIA	0.697
12	ADANI PORTS	1.153	37	INFY	0.696
13	RELIANCE	1.102	38	SUNPHARMA	0.689
14	HDFC	1.089	39	HCLTECH	0.687
15	KOTAKBANK	1.075	40	TECHM	0.668
16	M&M	1.023	41	CIPLA	0.610
17	HDFC BANK	0.979	42	TCS	0.597
18	ONGC	0.975	43	POWERGRID	0.592
19	BAJAJFINSV	0.945	44	WIPRO	0.562
20	UPL	0.944	45	HINDUNILVR	0.526
21	MARUTI	0.924	46	INFRA TEL	0.515
22	BPCL	0.901	47	DRREDDY	0.480
23	GRASIM	0.884	48	BRITANNIA	0.474
24	ULTRACEMCO	0.871	49	NESTLEIND	0.373
25	TITAN	0.857	50	GAIL	0.078

Interpretation

A beta of greater than 1.0 indicates that the fund is more volatile than the market, and less than 1.0 is less volatile than the market. A beta of 1.5 means that a stock's excess return is expected to move 1.5 times the market excess returns. From the above table 1.2 we can infer that there are 16 securities (YES BANK, TATA MOTORS, HINDALCO, VEDL, ICICI BANK, TATA STEEL, AXIS BANK, JSW STEEL, SBIN, INDUSINDBK, LT, ADANI PORTS, RELIANCE, HDFC, KOTAK BANK, M&M) have a beta value greater than 1 which indicates that these securities are more volatile than the market as a whole and to be

riskier but provide a potential for higher returns. YES BANK has the highest beta value of 1.596 and GAIL has the lowest beta value of 0.078 in the Nifty 50 market index.

Estimation R-Squared and Adjusted R-Squared

R-squared is a factual proportion of how close the information are to the fitted relapse line. It is otherwise called the coefficient of assurance, or the coefficient of numerous conclusions for different relapses. 100% shows that the model clarifies all the fluctuation of the reaction information around its mean. So also the balanced R-squared is an altered variant of R-squared that has been balanced for the quantity of indicators in the model. The balanced R-squared increments just if the new term improves the model more than would be normal by some coincidence. It diminishes when an indicator improves the model by not exactly expected by some coincidence.

Table 1.3 for R-squared and adjusted R-squared:

S.NO	SYMBOL	R-squared	R-squared %	Adjusted R-squared
1	TATASTEEL	0.393797	39.4%	0.393553
2	HINDALCO	0.360134	36.0%	0.359876
3	LT	0.359662	36.0%	0.359404
4	INDUSINDBK	0.358915	35.9%	0.358657
5	ICICIBANK	0.318463	31.8%	0.318188
6	RELIANCE	0.303891	30.4%	0.30361
7	VEDL	0.296755	29.7%	0.296471
8	AXISBANK	0.284586	28.5%	0.284297
9	MARUTI	0.272642	27.3%	0.272349
10	TATAMOTORS	0.261735	26.2%	0.261437
11	ULTRACEMCO	0.255642	25.6%	0.255342
12	SBIN	0.230701	23.1%	0.230391
13	KOTAKBANK	0.227225	22.7%	0.226913
14	JSWSTEEL	0.215871	21.6%	0.215555
15	HDFC	0.211912	21.2%	0.211594
16	NTPC	0.205403	20.5%	0.205083
17	YESBANK	0.192379	19.2%	0.192053
18	M&M	0.190373	19.0%	0.190046
19	HEROMOTOCO	0.177755	17.8%	0.177423
20	POWERGRID	0.174186	17.4%	0.173853
21	HDFC BANK	0.168099	16.8%	0.167764
22	BHARTIARTL	0.165701	16.6%	0.165364
23	BAJAJ-AUTO	0.161224	16.1%	0.166885
24	UPL	0.156319	15.6%	0.155979
25	ADANI PORTS	0.154341	15.4%	0.154
26	BAJFINANCE	0.150237	15.0%	0.149895
27	ONGC	0.144353	14.4%	0.144007

28	CIPLA	0.143928	14.4%	0.143582
29	COALINDIA	0.141476	14.1%	0.1411
30	EICHERMOT	0.137949	13.8%	0.137602
31	ITC	0.134364	13.4%	0.134015
32	GRASIM	0.131282	13.1%	0.130932
33	HINDUNILVR	0.124163	12.4%	0.12381
34	GAIL	0.117969	11.8%	0.117613
35	BAJAJFINSV	0.107475	10.7%	0.107115
36	BPCL	0.106684	10.7%	0.106323
37	ZEEL	0.099043	9.90%	0.098679
38	TCS	0.095604	9.6%	0.095239
39	IOC	0.090408	9.0%	0.090041
40	ASIANPAINT	0.088974	8.9%	0.088607
41	HCLTECH	0.086194	8.6%	0.085825
42	TITAN	0.084820	8.5%	0.08445
43	DRREDDY	0.081598	8.2%	0.081228
44	INFY	0.077368	7.7%	0.076995
45	TECHM	0.073002	7.3%	0.072628
46	WIPRO	0.069934	7.0%	0.069559
47	SUNPHARMA	0.063687	6.4%	0.06331
48	NESTLEIND	0.060637	6.1%	0.060258
49	INFRATEL	0.041683	4.2%	0.041135
50	BRITANNIA	0.035153	3.5%	0.034763

Interpretation

From the above table 1.3 we can interrupt that only 6 securities have more than 30% of R-squared value. TATA STEEL has a highest proportion of the variance 39.4% that can be predicted from the corresponding market and suggests that the model is good in explaining the size effect among the other listed securities in the market. While BRITANNIA has the lowest proportion of the variance 3.5% that can be predicted from the corresponding market and suggests that the model is not too much good in explaining the size effect among the other listed securities in the market.

Conclusion

The study concludes that from the past data we can infer that YES BANK has the highest beta value among all the securities listed in Nifty 50 and only 16 securities has beta value greater than 1 and indicates the amount of risk and ability to fetch high potential return. And also indicates that banking sector securities has a larger influence in Nifty 50 by means of the beta value. As far as coefficient of determination concern in explaining the size effect. Here the TATA STEEL has a highest proportion of the variance that can be predicted from

the corresponding market and suggests that the model is good in explaining the size effect among the other listed securities in the market.

Table1.4 Showing combined result for beta value and R-square value:

S.no	SYMBOL	BETA	R-squared	R-squared (%)	Adjusted R-squared	Standard error
1	ADANIPOINTS	1.153	0.154341	15.4%	0.154	0.026043
2	ASIANPAINT	0.737	0.088974	8.9%	0.088607	0.022748
3	AXISBANK	1.438	0.284586	28.5%	0.284297	0.021991
4	BAJAJ-AUTO	0.771	0.161224	16.1%	0.166885	0.016953
5	BAJAJFINSV	0.945	0.107475	10.7%	0.107115	0.026276
6	BAJFINANCE	0.840	0.150237	15.0%	0.149895	0.019281
7	BHARTIARTL	0.847	0.165701	16.6%	0.165364	0.018331
8	BPCL	0.901	0.106684	10.7%	0.106323	0.025148
9	BRITANNIA	0.474	0.035153	3.5%	0.034763	0.023978
10	CIPLA	0.610	0.143928	14.4%	0.143582	0.014351
11	COALINDIA	0.697	0.141476	14.1%	0.1411	0.016501
12	DRREDDY	0.480	0.081598	8.2%	0.081228	0.01547
13	EICHERMOT	0.810	0.137949	13.8%	0.137602	0.019524
14	GAIL	0.078	0.117969	11.8%	0.117613	0.020486
15	GRASIM	0.884	0.131282	13.1%	0.130932	0.02194
16	HCLTECH	0.687	0.086194	8.6%	0.085825	0.021565
17	HDFC BANK	0.979	0.168099	16.8%	0.167764	0.020999
18	HDFC	1.089	0.211912	21.2%	0.211594	0.020261
19	HEROMOTOCO	0.757	0.177755	17.8%	0.177423	0.015705
20	HINDALCO	1.517	0.360134	36.0%	0.359876	0.019507
21	HINDUNILVR	0.526	0.124163	12.4%	0.12381	0.01354
22	ICICIBANK	1.503	0.318463	31.8%	0.318188	0.021205
23	INDUSINDBK	1.248	0.358915	35.9%	0.358657	0.016084
24	INFRATEL	0.515	0.041683	4.2%	0.041135	0.022077
25	INFY	0.696	0.077368	7.7%	0.076995	0.023193
26	IOC	0.762	0.090408	9.0%	0.090041	0.02331
27	ITC	0.727	0.134364	13.4%	0.134015	0.017804
28	JSWSTEEL	1.422	0.215871	21.6%	0.215555	0.02615
29	KOTAKBANK	1.075	0.227225	22.7%	0.226913	0.019127
30	LT	1.240	0.359662	36.0%	0.359404	0.015965
31	M&M	1.023	0.190373	19.0%	0.190046	0.020352
32	MARUTI	0.924	0.272642	27.3%	0.272349	0.014557
33	NESTLEIND	0.373	0.060637	6.1%	0.060258	0.014169
34	NTPC	0.741	0.205403	20.5%	0.205083	0.014061
35	ONGC	0.975	0.144353	14.4%	0.144007	0.022887
36	POWERGRID	0.592	0.174186	17.4%	0.173853	0.012437

37	RELIANCE	1.102	0.303891	30.4%	0.30361	0.016088
38	SBIN	1.371	0.230701	23.1%	0.230391	0.024152
39	SUNPHARMA	0.689	0.063687	6.4%	0.06331	0.025469
40	TATAMOTORS	1.570	0.261735	26.2%	0.261437	0.025435
41	TATASTEEL	1.452	0.393797	39.4%	0.393553	0.017375
42	TCS	0.597	0.095604	9.6%	0.095239	0.017703
43	TECHM	0.668	0.073002	7.3%	0.072628	0.022954
44	TITAN	0.857	0.084820	8.5%	0.08445	0.02714
45	ULTRACEMCO	0.871	0.255642	25.6%	0.255342	0.014339
46	UPL	0.944	0.156319	15.6%	0.155979	0.021153
47	VEDL	1.516	0.296755	29.7%	0.296471	0.022513
48	WIPRO	0.562	0.069934	7.0%	0.069559	0.019769
49	YESBANK	1.596	0.192379	19.2%	0.192053	0.031545
50	ZEEL	0.803	0.099043	9.90%	0.098679	0.023362

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