A study of Systematic Risk with reference of Selected Companies

* Neeraj Gupta	* Anurag Singh Gurjar
Lecturer, Amity Business School, Amity University, Airport Road, Gwalior- M.P. 474002. * Corresponding Author	Student (MBA II Sem), Amity Business School, Amity University, Airport Road, Gwalior- M.P.-474002 * Corresponding Author

ABSTRACT The objective of the study is to find out the systematic risk involved in the stock of the selected companies listed in the National Stock Exchange and to study the average return of the selected stocks. The systematic risk affects the entire market, often we read in the newspaper that the stock market is caught in a bear hug and is in bull grip. This indicates that the entire market is moving in a direction either downward or upward economic conditions. The political situation or sociological changes affect the securities market. A recession can affect the stock market all over the world. The economic crisis in the US affected the stock market worldwide. These factors are beyond the control of the corporations or the investors. They cannot be entirely avoided by the investors. This means systematic risk is unavoidable. The equity investment is the most risky investment in all the financial markets. Any investor, before investing his or her investible wealth in a stock, analyses the risk associated with it. Investors analyze the risk factor because a thorough knowledge of the risk helps them plan objectives their portfolio to minimize risk. The present study is to know about the risk of the selected stocks. Finding will definitely be fruitful for investors in making investment decisions.

Introduction

Risk
Risk is the chance that an investment's actual return will be less than its expected return. This risk of loss is linked to the expected variability in the investment's return. The more volatile an investment's return is, the greater the chance investors' will experience a loss.

Type of Risk
1. Systematic risk.
2. Unsystematic risk.

A. Systematic Risk
The systematic risk, also known as "un-diversifiable risk" is due to the influence of external factors on an organization. Such factors are normally uncontrollable from an organization's point of view. The systematic risk is the relevant portion of an asset's risk, attributable to market factors that affect all firms such as interest rates, inflation, recession, war, international incidents, and political events. It cannot be avoided through diversification. Some of the examples of Systematic Risk are Interest rate risk, purchasing power or inflationary risk.

B. Unsystematic Risk
Unsystematic risk is due to the influence of internal factors prevailing within an organization. Such factors are normally controllable from an organization's point of view. It is micro in nature as it affects only a particular organization. It can be planned, so that necessary actions can be taken by the organization to mitigate the unsystematic risk. Some of the examples of unsystematic risk are Business or liquidity risk, Financial or credit risk and Operational risk.

What Is Beta (β)?
Beta is a measure of a stock's volatility in relation to the market. The market has a beta of 1.0, and individual stocks are ranked according to how much they deviate from the market. A stock that swings more than the market over time has a beta above 1.0. If a stock moves less than the market, the stock's beta is less than 1.0. High-beta stocks are supposed to be riskier but provide a potential for higher returns; low-beta stocks pose less risk but also lower returns. Beta is a key component for the capital asset pricing model (CAPM), which is used to calculate cost of equity. The cost of capital represents the discount rate used to arrive at the present value of a company's future cash flows. All things being equal, the higher a company's beta is, the higher its cost of capital discount rate. The higher the discount rate, the lower the present value placed on the company's future cash flows. In short beta can impact a company's share valuation.

Why You Should Know What Beta Is?
Many people opt for investments with low volatility. Other people are willing to take on additional risk because with it they receive the possibility of increased reward. It is very important that investors not only have a good understanding of their risk tolerance, but also know which investments match their risk preferences. By using beta to measure volatility, one can better choose those securities that meet ones criteria for risk. Investors who are very risk averse should put their money into investments with low betas such as utility stocks and Treasury bills. Those investors who are willing to take on more risk may invest in stocks with higher betas.

Here is a basic guide to various betas:
· Negative beta - A beta less than 0, which would indicate an inverse relation to the market (-) is possible but highly unlikely. However, some investors believe that gold and gold stocks should have negative betas because they tended to do better when the stock market declines.
· Beta of 0 - Basically, cash has a beta of 0. In other words, regardless of which way the market moves, the value of cash remains unchanged.
· Beta between 0 and 1 - Companies with volatilities lower than the market have a beta of less than 1 but more than 0.
· Beta of 1 - A beta of 1 represents the volatility of the given index used to represent the overall market, against which other stocks and their betas are measured. The S&P 500 is such an index. If a stock has a beta of one, it will move the same amount and direction as the index. So, an index fund that mirrors the S&P 500 will have a beta close to 1.
· Beta greater than 1 - This denotes a volatility that is greater than the broad-based index.

Warnings about Beta

The most important caveat for using beta to make investment decisions is that beta is a historical measure of a stock's volatility. Past beta figures or historical volatility does not necessarily predict future beta or future volatility. An interesting finding in this study is that betas seem to revert back to the mean. This means that higher betas tend to fall back towards one and lower betas tend to rise towards one.

The second caveat for using beta is that it is a measure of systematic risk, which is the risk that the market as a whole faces. The market index to which a stock is being compared is affected by market-wide risks. So, as beta is found by comparing the volatility of a stock to the index, beta only takes into account the effects of market-wide risks on the stock. The other risks the company faces are firm-specific risks, which are not grasped fully in the beta measure. So, while beta will give investors a good idea about how changes in the market affect the stock, it does not look at all the risks the company alone faces.

Literature Review

To identify the determinants of systematic risk, previous studies have focused on the relationship between beta and liquidity, debt leverage, operating efficiency, profitability, dividend payout, firm size, and growth. The first significant attempt to link market risk and financial variables was made by Beaver, Ketter and Scholes (1970).

According to Capital Asset Pricing Model (CAPM), a company's total risk consists of two types of risk: unsystematic and systematic risk (Sharpe, 1964; Lintner, 1965). The total risk is measured by variance or standard deviation of stock return. The more individual returns deviate from the expected return, the greater the risk greater the potential reward. The degree to which all returns for a particular investment or asset deviate from the expected return of the investment is a measure of its risk.

Amongst many others, some studies of beta estimations concentrated on the stability of beta over time (Harvey 1989), an asset. The studies on the impact of return interval on beta estimates point out the importance of the timescale issue. An early study by Levhari and Levy (1977) shows that if the analyst uses a time horizon shorter than the true one, the beta estimates are biased. Handa (1989) report that different beta estimates are possible for the same stock if different return intervals are considered. Similarly, Handa et al (1993) reject the CAPM when monthly returns are used but fail to reject the CAPM if the yearly return interval is employed. Cohen et al (1986) and references therein provide ample evidence that the beta estimates are sensitive to return intervals.

According to Shrivastava A (2012), "Risk measurements and analysis has been a critical issue for any investment decision because risk can be transferred but cannot be eliminated from the system. The nature and degree of risk varies from industry to industry."

1. Systematic risk is related with market while unsystematic risk is related with the individual firm (Rowe and Kim, 2010)
2. Systematic risk is denoted as Beta (β), it means that change in stock due to change in market, it is covariance of stock return of capital market (Gu and Kim, 2002)
3. Lee and Jaug (2006) incorporated US airline industries and concluded significant result with systematic risk.
4. Gu and Kim (2002) worked on determination of beta by using the data of restaurant industries.
5. Systematic risk(Beta) is refereeing the market's evaluation of any firm's financial production and marketing policies (Logue and Merville 1972)\
6. Logue and Marville (1972) argued that predicted beta is similar to the true beta, which cannot be observed.
7. A very important question was raised by Lee and Jaug(2006) that the predicted beta which is derived from historical schemes, whether it is comparable with the true beta or not.
8. Beta obtained from time series data that presents unbiased consequence only, if produced Beta is stationary (Breen and Lerner, 1973)
9. It was concluded by Logue and Merville (1972) that predicted beta is suitable extent of systematic risk because it depends on all matters by which companies may be associated.
10. Beta is a diminishing function of growth (Hong and Sarkar, 2007)
11. Rapid growth in companies increases systematic risk (Gu and Kim, 2002)
12. Negative and positive relationship has been found among growth and systematic risk
13. According to Roh (2002), growth is positively related with systematic risk
14. Gu and Kim (2002) has declared inverse relationship between systematic risk and high dividend payout
15. Former studies Beaver et al (1970), Breen and Lerven (1973) Bord (1998) and Gu and Kim (2002) has concluded negative impact of dividend payout on systematic risk

Objective of the Study

· To understand concept of risk
· To know how to measure systematic risk
· To distinguish between Systematic Risk and Unsystematic Risk
· To evaluate the Beta of the selected stocks
· To compare the Beta of the selected stocks
· To find the average return of the selected stocks
· To find the average return of the market

Research Methodology

Beta has been calculated using regression analysis.

$$\beta = \{n \sum XY – (\sum X \times \sum Y)\}/ \{n\sum(X2) – (\sum X)\,2\}$$
Return = (P1 – P0)/P0

Where: *** P1 = Closing price of the share,

*** P0 = Opening price of the share

Data Collection
Period of Study

This study is conducted for entire one month, i.e., from Feb 3 to Feb 28, 2014.

The stock price where taken from the NSE. Stock price has been used for calculating Average return and Beta.

The objectives for calculating average return and Beta is to help the investors to arrive at a decision to invest in the shares on the basis of the risk involved in it and also to gain knowledge of the stock market .The findings and suggestion certainly would be of help to the investors.

Tools for evaluation: Statistical tools for evaluations:

▪ Beta
▪ Average Return

Sample selection: Samples selected are listed in Nifty Index.

Randomly two companies are selected for this study each from three selected industries.

Type of company	Selected
IT	2
FMCG	2
AUTOMOBILE.	2

The source of data for the Research Project is mainly secondary data which was collected from the websites, documents, which were in printed forms like annual reports, pamphlets, etc.

Data analysis

Company	Average Return	Beta
IT Sector		
Wipro	-0.216	0.831
HCL Ltd	0.463	0.992

Company	Average Return	Beta
FMCG		
Britannia	0.016	0.446
Dabur	0.011	1.213

Company	Average Return	Beta
Automobile Sector		
Bajaj Ltd	0.271	-0.027
Tata Motors	1.207	0.634

Findings

Company	Beta value	Inference
Wipro	0.831	Less risky than the market
HCL	0.992	Less risky than the market
Britannia	0.446	Less risky than the market
Dabur	1.213	More risky than the market

Bajaj	-0.027	Less risky than the market and indicates an inverse relationship with the market
Tata Motors	0.634	Less risky than the market

Inference

The beta value of most of the company is less than one. Only the beta value of dabur is more than one .The stock of dabur is more volatile as compared to the market. The one percent change in the price of the index will cause a change of 1.213 percent change in the price of the stock of dabur. Similarly the change of one percent in the index will cause a price change of less than one percent in the stock of other companies under study.

Conclusion

The total risk of the investment is measured by the variance or, more commonly the Standard deviation of the return, the total return on the investment has two components, the expected return and the unexpected return. The unexpected return comes above because of the unanticipated event. The risk from investing stems from the possibility of an unanticipated event. The unsystematic risk can be freely eliminated by diversification. The systematic risk principle states that the reward for bearing risk depends only on the level of systematic risk depends only on the level of systematic risk. The level of systematic risk in a particular asset, relative to the average is given by the beta of the asset.

The beta coefficient measures the relative systematic risk of an asset. Beta greater than one indicates more systematic risk than average, asset with greater betas implies greater systematic risk as well as greater expected return.

Limitations

1. The study is limited to some selected sectors (IT, FMCG and Automobile)
2. In calculating the return dividend has not been considered only the price change in the stock has been considered.
3. Stock market conditions are dynamic and subject to change
4. The time frame taken for the study is very short

Appendix

Date	CNX Nifty	Automobile		FMCG		IT	
		Tata motors	Bajaj	Britannia Industries Limited	Dabur India Limited	Wipro Limited	HCL Technologies Limited
03-Feb-2014	6001.8	336.40	1,830.80	886.10	168.40	565.95	1,452.90
04-Feb-2014	6000.9	345.85	1,868.25	874.70	170.05	555.65	1,401.90
05-Feb-2014	6022.4	355.10	1,894.70	870.20	173.10	560.40	1,393.65
06-Feb-2014	6036.3	357.65	1,896.95	887.20	173.25	568.55	1,408.70
07-Feb-2014	6063.2	360.20	1,935.35	900.80	174.80	561.65	1,400.05
10-Feb-2014	6053.45	364.05	1,935.35	910.20	174.65	563.20	1,416.15
11-Feb-2014	6062.7	374.50	1,936.50	901.30	176.30	563.15	1,473.10
12-Feb-2014	6084	376.65	1,927.50	905.75	177.75	562.45	1,490.80
13-Feb-2014	6001.1	375.95	1,902.85	899.40	172.00	555.20	1,489.20
14-Feb-2014	6048.35	388.80	1,839.60	902.60	173.65	563.80	1,497.35
17-Feb-2014	6073.3	386.60	1,845.35	900.55	172.65	561.00	1,502.40
18-Feb-2014	6127.1	391.40	1,844.65	913.05	170.80	557.05	1,486.65
19-Feb-2014	6152.75	391.50	1,820.90	915.35	170.55	565.55	1,494.35
20-Feb-2014	6091.45	391.85	1,842.40	904.95	170.15	565.20	1,472.90
21-Feb-2014	6155.45	396.20	1,862.70	895.60	173.20	571.55	1,538.20
24-Feb-2014	6186.1	396.55	1,861.80	890.75	172.65	577.65	1,530.20
25-Feb-2014	6200.05	398.50	1,902.25	895.15	172.05	596.25	1,548.95
26-Feb-2014	6238.8	401.20	1,920.90	886.60	172.10	603.05	1,572.65
28-Feb-2014	6276.95	416.95	1,946.35	888.40	173.45	597.25	1,575.55

Tata Motors (Automobile Industry)

Date	X	Y	X*Y	X2
03-Feb-2014	------	------	------	-------
04-Feb-2014	-0.150	2.809	-0.421	0.022
05-Feb-2014	0.358	2.674	0.957	0.128
06-Feb-2014	0.230	0.718	0.165	0.052
07-Feb-2014	0.445	0.712	0.323	0.198
10-Feb-2014	-0.160	1.068	-0.170	0.025
11-Feb-2014	0.152	2.870	0.436	0.023
12-Feb-2014	0.351	0.574	0.201	0.123
13-Feb-2014	-1.362	-0.185	0.250	1.855
14-Feb-2014	0.787	3.418	2.689	0.619
17-Feb-2014	0.412	-0.565	-0.232	0.169
18-Feb-2014	0.885	1.241	1.098	0.783
19-Feb-2014	0.418	0.025	0.010	0.174
20-Feb-2014	-0.996	0.089	-0.088	0.992
21-Feb-2014	1.050	1.110	1.165	1.102
24-Feb-2014	0.497	0.088	0.043	0.247
25-Feb-2014	0.225	0.491	0.110	0.050
26-Feb-2014	0.625	0.677	0.423	0.390
28-Feb-2014	0.611	3.925	2.298	0.373
Total	4.378	21.74	9.257	7.325
Average Return	0.243	1.207		

β = {n ∑ X Y – (∑ X   × ∑ Y)}/ {n∑(X2) – (∑X) 2}

= {(18×9.257) – (4.378×21.74)}/ {(18×7.325) – 19.166}

β= 0.634

Bajaj Auto (Automobile Industry)

Date	X	Y	X*Y	X2
03-Feb-2014	------	------	------	-------
04-Feb-2014	-0.150	2.045	-0.306	0.022
05-Feb-2014	0.358	0.001	0.001	0.128
06-Feb-2014	0.230	0.118	0.027	0.052
07-Feb-2014	0.445	2.024	0.900	0.198
10-Feb-2014	-0.160	00	00	0.025
11-Feb-2014	0.152	0.059	0.008	0.023
12-Feb-2014	0.351	-0.464	-0.162	0.123
13-Feb-2014	-1.362	-1.278	1.740	1.855
14-Feb-2014	0.787	-3.323	-2.615	0.619
17-Feb-2014	0.412	0.312	0.128	0.169
18-Feb-2014	0.885	-0.037	-0.032	0.783
19-Feb-2014	0.418	-1.287	-0.538	0.174
20-Feb-2014	-0.996	1.180	-1.175	0.992
21-Feb-2014	1.050	1.101	1.156	1.102
24-Feb-2014	0.497	- 0.048	-0.023	0.247
25-Feb-2014	0.225	2.172	0.488	0.050
26-Feb-2014	0.625	0.980	0.612	0.390
28-Feb-2014	0.611	1.324	0.808	0.373
Total	4.378.	4.878	1.017	7.325
Average Return	0.243	0.271		

β = {n ∑ X Y – (∑ X   × ∑ Y)}/ {n∑(X2) – (∑X) 2}

= {(18×1.017) – (4.378×4.878)}/ {(18×7.325) – 19.166}

Beta = -0.027

Britannia Industries Limited (FMCG Industry)

Date	X	Y	X*Y	X2
03-Feb-2014	------	------	------	-------
04-Feb-2014	-0.150	-1.285	0.192	0.022
05-Feb-2014	0.358	- 0.514	-0.184	0.128
06-Feb-2014	0.230	1.953	0.449	0.052
07-Feb-2014	0.445	1.532	0.681	0.198
10-Feb-2014	-0.160	1.043	-0.166	0.025
11-Feb-2014	0.152	-0.977	-0.148	0.023
12-Feb-2014	0.351	0.493	0.173	0.123
13-Feb-2014	-1.362	-0.701	0.954	1.855
14-Feb-2014	0.787	0.355	0.279	0.619
17-Feb-2014	0.412	-0.277	-0.114	0.169
18-Feb-2014	0.885	1.388	1.228	0.783
19-Feb-2014	0.418	0.251	0.105	0.174
20-Feb-2014	-0.996	-1.136	1.131	0.992
21-Feb-2014	1.050	-1.030	-1.081	1.102
24-Feb-2014	0.497	-0.541	-0.268	0.247
25-Feb-2014	0.225	0.493	0.110	0.050
26-Feb-2014	0.625	-0.955	-0.596	0.390
28-Feb-2014	0.611	0.203	0.124	0.373
Total	4.378.	0.295	2.869	7.325
Average Return	0.243	0.016		

β = {n ∑ X Y – (∑ X   × ∑ Y)}/ {n∑(X2) – (∑X) 2}

= {(18×2.869) – (4.378×0.295)}/ {(18×7.325) – 19.166}

= 0.446

Dabur India Ltd (FMCG Industry)

Date	X	Y	X*Y	X2
03-Feb-2014	------	------	--------	-------
04-Feb-2014	-0.150	0.979	-0.146	0.022
05-Feb-2014	0.358	1.793	0.641	0.128
06-Feb-2014	0.230	0.086	0.019	0.052
07-Feb-2014	0.445	0.894	0.397	0.198
10-Feb-2014	-0.160	-0.085	0.013	0.025
11-Feb-2014	0.152	0.944	0.143	0.023
12-Feb-2014	0.351	0.822	0.288	0.123
13-Feb-2014	-1.362	-3.234	4.404	1.855
14-Feb-2014	0.787	0.959	0.754	0.619
17-Feb-2014	0.412	-0.575	-0.236	0.169
18-Feb-2014	0.885	-1.071	-0.947	0.783
19-Feb-2014	0.418	-0.146	-0.061	0.174
20-Feb-2014	-0.996	-0.234	0.233	0.992
21-Feb-2014	1.050	1.792	1.881	1.102
24-Feb-2014	0.497	-0.317	-0.157	0.247
25-Feb-2014	0.225	-0.347	-0.078	0.050
26-Feb-2014	0.625	0.029	0.018	0.390
28-Feb-2014	0.611	0.784	0.479	0.373
total	4.378	0.210	7.645	7.325
Average Return	0.243	0.011		

β = {n ∑ X Y – (∑ X   × ∑ Y)}/{ n∑(X2) – (∑X) 2}

= {(18×7.645) – (4.378×0.210)}/ {(18×7.325) – 19.166}

= 1.213

Wipro (IT Industry)

Date	X	Y	X*Y	X2
03-Feb-2014	------	-------	--------	-------
04-Feb-2014	-0.150	-1.820	0.273	0.022
05-Feb-2014	0.358	0.854	0.305	0.128
06-Feb-2014	0.230	1.454	0.334	0.052
07-Feb-2014	0.445	-1.213	-0.539	0.198
10-Feb-2014	-0.160	0.275	-0.044	0.025
11-Feb-2014	0.152	-8.877	-1.349	0.023
12-Feb-2014	0.351	-0.124	-0.043	0.123
13-Feb-2014	-1.362	-1.289	1.755	1.855
14-Feb-2014	0.787	1.549	1.219	0.619
17-Feb-2014	0.412	-0.496	-0.204	0.169
18-Feb-2014	0.885	-0.704	-0.623	0.783
19-Feb-2014	0.418	1.525	0.637	0.174

Date	X	Y	X*Y	X2
20-Feb-2014	-0.996	-0.061	0.015	0.992
21-Feb-2014	1.050	1.123	1.179	1.102
24-Feb-2014	0.497	1.067	0.530	0.247
25-Feb-2014	0.225	3.219	0.724	0.050
26-Feb-2014	0.625	1.140	0.712	0.390
28-Feb-2014	0.611	-0.961	-0.587	0.373
total	4.378.	-3.889	4.261	7.325
Average Return	0.243	-0.216		

$β = \{n \sum X Y – (\sum X \times \sum Y)\}/ \{n\sum(X2) – (\sum X)\,2\}$

= {(18×4.261) – (4.378× (-3.889))}/ {(18×6.486) – 19.713}

= 0.831

HCL (IT Industry)

Date	X	Y	X*Y	X2
03-Feb-2014	------	-------	------	-------
04-Feb-2014	-0.150	-3.510	0.526	0.022
05-Feb-2014	0.358	-0.588	-0.210	0.128
06-Feb-2014	0.230	1.079	0.248	0.052
07-Feb-2014	0.445	-0.614	-0.273	0.198
10-Feb-2014	-0.160	1.150	-0.184	0.025
11-Feb-2014	0.152	4.021	0.611	0.023
12-Feb-2014	0.351	1.201	0.421	0.123
13-Feb-2014	-1.362	-0.107	0.145	1.855
14-Feb-2014	0.787	0.547	0.430	0.619
17-Feb-2014	0.412	0.337	0.138	0.169
18-Feb-2014	0.885	-1.048	-0.927	0.783
19-Feb-2014	0.418	0.517	0.216	0.174
20-Feb-2014	-0.996	-1.435	1.429	0.992
21-Feb-2014	1.050	4.369	4.587	1.102
24-Feb-2014	0.497	-0.520	-0.258	0.247
25-Feb-2014	0.225	1.225	0.275	0.050
26-Feb-2014	0.625	1.530	0.956	0.390
28-Feb-2014	0.611	0.184	0.112	0.373
Total	4.378.	8.333	8.24	7.325
Average Return	0.243	0.463		

$β = \{n \sum X Y – (\sum X \times \sum Y)\}/ \{n\sum(X2) – (\sum X)\,2\}$

= {(18×8.24) – (4.378×8.333)}/ {(18×7.325) – 19.166}

= 0.992

REFERENCE   1. Muhammad Junaid Iqbal, Dr. Syed Zulfiqar Ali Shah. Determinants Of Systematic Risk Journal of Economics Volume-4, No.1, ISSN- 2218-8118-2220-6043 | 2. Punithavathy Pandian "Security Analysis and Portfolio Management" VPH Pvt Ltd. ISBN 9789325963085 | 3. Pop R zvan-Gabriel. Analysis of the systematic-risk determinants for Companies listed on Bucharest Stock Exchange | 4. Ramazan Gen¸cay, Faruk Sel¸cuk and Brandon Whitcher. Systematic risk and timescales. QUANTITATIVE FINANCE VOLUME 3 (2003) 108–116 | 5. Toni Rowe, Jungsun (Sunny) Kim. Analyzing the Relationship Between Systematic Risk and Financial Variables in the Casino Industry, UNLV Gaming Research & Review Journal+ Volume 14Issue 2 | 6. Chapter 8 Risk and Return Capital Market Theory Mark E Moore | 7. Return, Risk, and the Security Market Line. McGraw-Hill/Irwin | 8. http://www.investopedia.com | 9. http://ideas.repec.org | 10. www.jsu.edu | 11. http://kalyan-city.blogspot.com |