A Study on Risk & Return Analysis of Selected Industries in India

** B. Vijayalakshmi*

Abstract

Successful investment requires a careful assessment of the investment's potential returns and its risk of loss. A firm's risk and expected returns directly affect its share price. In real-world situations, the risk of any single investment would not be viewed independently of other assets. New investment must be considered in light of their impact on the risk and return of the portfolio of assets. In traditional financial analysis, investment management tools allow investors to evaluate the return and risk of individual investments and portfolios. Usually, higher the risk, higher the returns and lower the risk, lower the returns. However, a general understanding of this phenomenon is not sufficient to make appropriate decisions relating to investments. A more quantifiable analysis is required to understand the investment. This study reported a statistically significant positive relationship between risk and returns, both at the individual security level and at the portfolio level, confirming the theoretical predictions and empirical findings on this issue in developed markets.

Key words : **risk & return, investment, portfolio management, National Stock Exchange (NSE)**

JEL Classification : G1, G2, G10, G11

Paper Submission Date : February 6, 2017 ; Paper sent back for Revision : July 4, 2017 ; Paper Acceptance Date : October 17, 2017

The risk and return analysis linked with any industry reveals the intricacies involved with that particular industry. A close watch on these values throws light on a clear understanding and facilitates in decision making about the investment in securities. While making decisions regarding investment and financing, one seeks to achieve the right balance between risk and returns in order to optimize the value of a firm. It is also expected that high risk should be compensated by high risk premium, that is, high returns. No company can carry a high risk - low return profile in the long run (Ghosh, 1997). Return is the motivating force inspiring the investors in the form of rewards for undertaking investments. One school of thought argues that risk and returns are influenced by various industry conditions and business strategies but not by each other (Oviatt & Bauerschmidt, 1991). Balakrishnan and Maiti (2017) evaluated the cross sectional relationship between firm characteristics: size and value with risks and expected returns in the Indian stock market on different horizons of time from previous studies. The other group of researchers opined that there existed a negative relationship between risk and returns (Bettis & Mahajan, 1985; Sur & Gupta, 2014). Another school of thought suggested a positive association between risk and returns (Cootner & Holland, 1970). Manjunatha (2009) attempted to understand the relationship between risk and returns and the way securities are priced in the market. These researchers assumed rational investors and constructed the general equilibrium models of security prices and returns.

Gowri and Deo (2016) attempted to evaluate the performance of fund of funds, which were compared with risk free returns as well as the benchmark index (BSE 100), which was taken as the proxy for market returns. Fama

**Professor & Chairperson - BOS,* Department of Business Management, Sri Padmavati Mahila Visvavidyalayam (Women's University), Tirupati – 517 502, Andhra Pradesh. E mail:vijayamba65@yahoo.com

(1991) concluded that measuring the total return variation explained by stocks to expected cash flows, time-varying expected returns, and to expected returns is one way to judge the rationality of stock prices. The results of the study of Manrai (2016) revealed that with an increase in corporate risk, there is an increase in profitability. Similarly, a positive relationship was observed between systematic risk and growth of a corporate, that is, with an increase in systematic risk, the growth opportunities of a firm increase. Guptha and Joshi (2014) described how the securities market function and explained the techniques used by professionals for analyzing and valuing investment alternatives and provided a framework for portfolio management.

In this backdrop, this study deals with the risk and returns involved in the investments of Indian IT, telecommunication, and automobile industries and the expected returns from these industries. Therefore, the present study attempts to empirically gauge the relation between risk and average rate of return. In this perspective, this study has been conducted to analyze the risk - return relationship of selected companies in the Indian stock market and also, an attempt has been made to provide recommendations for the investors to overcome the challenges.

Review of Literature

Risk and returns are the most important variables that investors encounter. Therefore, different studies have been conducted in this field and some of their results are as follows. Ghosh (1997) carried out a study to explain the various risk factors that usually affect a company and attempted to show the relative industry risk and profitability profile of 20 major industries in India during the period from 1991-92 to 1996-97. The study revealed that a major portion of the selected Indian industries were placed in the low risk-low return category. High volatility in profitability of aluminium industry was well compensated by average high returns ; whereas, low volatility in profitability of tea industry and highly volatile profitability of chemical industry got medium returns only. Sharma and Bodla (2012) examined the risk return behaviour of the stocks listed in the stock exchanges of South Asia. The study was aimed at finding out whether the returns and risks were associated over time using descriptive statistics. They found that there were high returns and reasonable risks were involved in those Asian countries. Sinha (2013) conducted a study to compare the performance of IT stocks with banking stocks and the statistical tools which were used for analyzing the hypothesis were descriptive analysis and t-test, and the study suggested to hold stocks to achieve positive results.

Setiawan and Hesty (2013) empirically examined the performance of Syariah stocks with conventional stocks listed on the Indonesia Stock Exchange using risk - adjusted return measurements. They found that there was no significant difference in risk and returns measured by weekly return, standard deviation, and beta between both Syariah and conventional stocks. Furthermore, they also evaluated the performance of both Syariah and conventional stocks portfolio by employing risk-adjusted return measurement consisting of Sharpe ratio, Treynor ratio, and Jensen's alpha. They tried to compare the stock returns with financial results and found that return on equity was the most influential variable in the research. Bhunia (2012) considered the capital asset pricing model as a measurement tool and found that there was no strong efficiency evidenced in the Indian market.

Research Gap

Recently, many studies have been conducted to study risk and return relationship by means of cross sectional studies. Furthermore, many authors have already researched about the concept of risk- return on different financial markets, and results differ from one to the other. Most of the studies have been reported on developed markets, and a few have been conducted in the Indian market. However, no significant study has been made on the risk and return analysis in the combination of different industrial sectors. The present study, in this context, is

relevant in explaining the parity between risk and returns in the Indian stock market. Finally, in contrast to several pre-existing studies that rely on a small number of conditioning variables, we find a positive conditional correlation between risk and return that is strongly statistically significant ; whereas, the unconditional correlation is weakly negative and statistically insignificant. The current study addresses this gap by examining the risk-return for selected companies operating in different industrial sectors.

Objectives of the Study

The present study aims to identify the risk and returns involved in the investment of securities in the market, specifically with respect to selected companies. The purpose of this study is to ascertain from empirical data the risk-return relationship that exists in the information technology, telecommunications, and automobile companies of the Indian stock market. The primary objectives are :

(1) To study and analyze the risk and returns of the selected companies' stocks.

(2) To analyze the market risk of selected companies in terms of Beta.

(3) To compare and calculate portfolio risk and returns by Sharpe's, Treynor's, and Jenson's index models.

(4) To discover the best portfolio for investments chosen from the selected companies.

Database and Research Methodology

The data for the present study is purely secondary data. The data were collected from secondary sources such as National Stock Exchange, Capitaline, fact sheet, reports and websites of the selected companies. Furthermore, magazines, books, and journals, and other publications were also considered for the study. The present research is exploratory and empirical in nature. The data were drawn from the National Stock Exchange (NSE) for nine individual companies, and their market prices were taken for 12 months of different dates from April 2015 to March 2016. In order to establish the possible relationship between risk and returns, the present study has been carried out to analyze the influence of risk variable on security returns in the Indian stock market.

↳ **Tools for Analysis :** The data collected have been analyzed by using the following tools : Standard deviation, Beta, Sharpe ratio, Treynor ratio, alpha, correlation coefficient.

The risk of an asset is measured quantitatively using statistics- the standard deviation and also the beta is analyzed to measure the variability of returns. The most common indicator of risk is standard deviation, σ, which measures the dispersion around the expected value of returns.

Beta is a measure of a fund's sensitivity to market movements. A fund with a beta greater than 1 is more volatile than the market, and a fund with a beta less than 1 is less volatile than the market. A negative beta value indicates that the stock return moves in the opposite direction to the market return.

One way of ranking investments taking into account both risk and return is by using the Sharpe ratio. This ratio essentially divides the return by the risk, after first subtracting the risk-free rate of return from the return, since any asset with a lower return should never be chosen.

The Sharpe ratio is computed as :

$$S_i = \frac{\overline{R}_i - R_f}{\sigma_i}$$

where, $\overline{R}$ is the mean rate of return of the asset and R-f is the risk-free rate of return. This measure can be taken to

show return obtained per unit of risk. The Sharpe ratio is calculated using standard deviation and excess return to determine reward per unit of risk. The higher the Sharpe ratio, the better the portfolio's historical risk - adjusted performance.

Treynor ratio is the performance measure developed by Jack Treynor and is referred to as Treynor ratio or reward to volatility ratio. It is the ratio of the reward or risk premium to the volatility of return as measured by the portfolio beta.

Alpha measures the difference between a fund's actual returns and its expected performance. This ratio attempts to measure the differential between the actual return earned on a portfolio, and the return expected from the portfolio given its level of risk.

Analysis and Results

(1) Risk and Return Analysis of Selected Companies : The Table 1 depicts that the returns of the selected companies in the information technology sector script are recorded to be negative in nature. The returns are positive for the months of August and September 2015 and March 2016. The total stock return of TCS is recorded as -1.81 and the average return is -0.15. The stock return of Infosys is -38.21 and the average return is -3.18 ; the total stock return of Wipro is recorded as -9.84 and the average return is -0.82, respectively.

The Table 2 reveals that the total returns and average returns of the sample telecommunications companies are negative in nature. The total returns of Bharti Airtel are -3.94, the returns of Idea Cellular are -46.18, and Reliance shows returns of -6.61, respectively. The average returns of Bharti Airtel, Idea Cellular, and Reliance are also negative, that is, as -0.33, -3.85, and -0.55, respectively.

The Table 3 depicts the total returns and average returns of selected automobile companies. The total stock return of Tata Motors is recorded as negative returns (-26.68) and the average return also shows a figure of -2.22 ; the stock returns of Mahindra & Mahindra and Maruti Suzuki show positive returns. The figure for total return of

Table 1. Returns of Sample Information Technology Companies

Months	Tata Consultancy (TCS)	Infosys	Wipro
April-15	-3.69	-11.67	-13.60
May-15	4.79	3.25	4.19
June-15	-2.24	-51.58	-2.37
July-15	-2.07	8.90	4.74
August-15	2.42	1.52	0.14
September-15	1.25	6.60	4.65
October-15	-3.99	-2.94	-4.21
November-15	-5.41	-3.73	-0.03
December-15	3.13	1.60	-3.33
January-16	-1.96	5.90	0.54
February-16	-8.96	-7.35	-8.02
March-16	14.92	11.28	7.48
Total	**-1.81**	**-38.21**	**-9.84**
Avg Total	**-0.15**	**-3.18**	**-0.82**

Table 2. Returns of Sample Telecommunication Companies

Months	Bharti Airtel	Idea Cellular	Reliance
April-15	-3.10	-3.93	2.11
May-15	13.92	-2.64	12.02
June-15	0.99	1.47	- 9.67
July-15	-1.16	-1.78	13.34
August-15	-15.64	-10.94	-14.27
September-15	-3.75	-2.73	14.23
October-15	2.84	-6.07	9.53
November-15	-3.78	0.28	0.00
December-15	1.32	1.81	16.12
January-16	-14.72	-27.84	-29.69
February-16	7.97	0.24	-16.93
March-16	11.17	5.96	-3.38
Total	**-3.94**	**-46.18**	**-6.61**
Avg Total	**-0.33**	**-3.85**	**-0.55**

Table 3. Returns of Sample Automobile Companies

Months	Tata Motors	Mahindra & Mahindra	Maruti Suzuki
April-15	-7.44	-3.62	0.70
May-15	-5.88	9.30	-0.30
June-15	-7.44	1.93	6.27
July-15	-5.88	6.53	7.35
August-15	-11.96	-9.83	-4.86
September-15	-10.85	4.66	12.36
October-15	27.70	-7.31	-5.74
November-15	9.62	13.79	3.06
December-15	-8.36	-7.13	0.28
January-16	-14.17	-3.04	-11.36
February-16	-11.53	0.17	-21.08
March-16	28.40	-0.54	16.10
Total	**-26.68**	**4.91**	**2.79**
Avg Total	**-2.22**	**0.41**	**0.23**

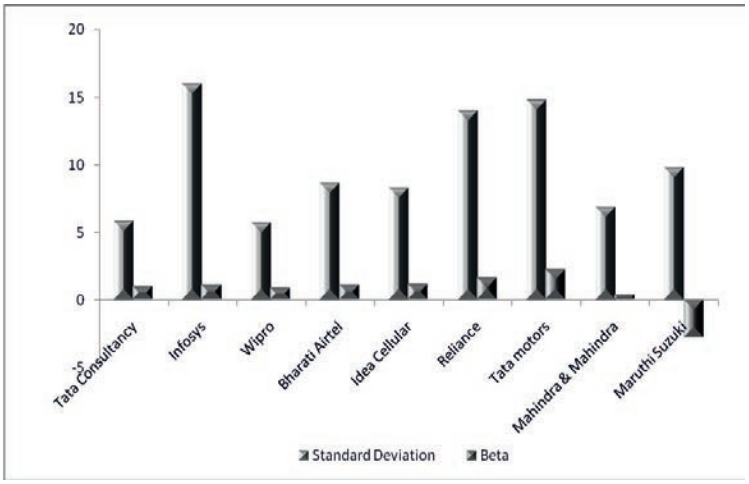
Mahindra & Mahindra is 4.91, and the average return is recorded as 0.41. In case of Maruti Suzuki, the total return is recorded as 2.79 and the average return is 0.23.

The Table 4 and Figure 1 present the standard deviation and Beta for all the selected companies such as Wipro, TCS, Mahindra & Mahindra, Idea Cellular, Bharti Airtel, and Maruti Suzuki. The SD of each selected company is recorded as 5.73, 5.88, 6.87, 8.31, 8.62, and 9.77, respectively. Hence, a script having low standard deviation contains less risk. On the other hand, the highest SD is observed in case of Infosys, Tata Motors, and Reliance, that is, 15.95, 14.75, and 14.00, respectively. The higher risk of these companies is clearly reflected in their higher

Table 4. Risk Analysis of Selected Companies

Name of the Company	Standard Deviation	Beta
Tata Consultancy	5.88	0.99
Infosys	15.95	1.08
Wipro	5.73	0.86
Bharti Airtel	8.62	1.10
Idea Cellular	8.31	1.18
Reliance	14.00	1.65
Tata Motors	14.75	2.21
Mahindra & Mahindra	6.87	0.37
Maruti Suzuki	9.77	-2.75

Figure 1. Risk Analysis of Selected Companies



standard deviation values. A close relationship can be seen between investment and standard deviation: Investments with higher returns have higher standard deviation because higher standard deviation is associated with greater risk, and the historical data confirms the existence of a positive relationship between risk and returns.

Beta (systematic risk) in the selected companies namely, Mahindra & Mahindra, Wipro, and TCS is recorded as 0.37, 0.86, and 0.99, respectively. Hence, it indicates that the beta <1 consists of low risk and also low volatility as compared to other selected companies and the companies for which the beta >1 indicates more risk and high volatility.

(2) Portfolio Returns and Risk of Selected Industries :

Portfolio Return 1 : Information Technology = (R_A+R_B+R_C) considering :

Company A = Tata Consultancy Services (TCS),
Company B = Infosys,
Company C = Wipro.
Weightage Company A = 0.33, Weightage Company B = 0.33, and Weightage Company C = 0.33.

$P_r = W_A * R_A + W_B * R_B + W_C * R_C$
$= 0.33*(-0.15) + 0.33*(-3.018) + 0.33*(-0.82)$
$= -1.32$

Portfolio Standard Deviation (σ)

$\sigma = \sqrt{(W_A^2 * \sigma_A^2 + W_B^2 * \sigma_B^2 + W_C^2 * R_C^2 + 2W_A W_B COV_{AB} + 2W_B W_C COV_{BC} + 2 W_C W_A COV_{CA})}$

$=\sqrt{0.33^2*5.88^2+0.33^2*15.95^2+0.33^2*5.73^2+2*0.33*0.33*35.13+0.33*0.33*40.85+0.33*0.33*21.62)}$

$= 7.04$

Portfolio Return 2: Telecommunications = $(R_A + R_B + R_C)$ considering :

Company *A* = Bharti Airtel,
Company *B* = Idea Cellular,
Company *C* = Reliance.
Weightage Company *A* = 0.33, Weightage Company *B* = 0.33, and Weightage Company *C*= 0.33

$P_r = W_A * R_A + W_B * R_B + W_C * R_C$

$= 0.33*(-0.33) + 0.33*(-3.85) + 0.33*(-0.55)$

$= -1.5609$

Portfolio Standard Deviation (σ)

$\sigma = \sqrt{(W_A^2 * \sigma_A^2 + W_B^2 * \sigma_B^2 + W_C^2 * R_C^2 + 2W_A W_B COV_{AB} + 2W_B W_C COV_{BC} + 2 W_C W_A COV_{CA})}$
$=\sqrt{0.33^2*8.62^2+0.33^2*8.31^2+0.33^2*14^2+2*0.33*0.33*50.64+2*0.33*0.33*65.63+2*0.33*0.33*51.35}$

$= 8.57$

Portfolio Return 3: Automobile = $(R_A+R_B+R_C)$ considering :

Company *A* = Tata Motors,
Company *B* = Mahindra & Mahindra,
Company *C* = Maruti Suzuki.
Weightage Company *A* = 0.33, Weightage Company *B* = 0.33, and Weightage Company *C* = 0.33

$P_r = W_A * R_A + W_B * R_B + W_C * R_C$

$= 0.33*(-2.22) + 0.33*(0.41) + 0.33* 0.23$

$= - 0.5214$

Portfolio Standard Deviation (σ)

$\sigma = \sqrt{(W_A^2 * \sigma_A^2 + W_B^2 * \sigma_B^2 + W_C^2 * R_C^2 + 2W_A W_B COV_{AB} + 2W_B W_C COV_{BC} + 2 W_C W_A COV_{CA})}$

$=\sqrt{(0.33^2*14.75^2+0.33^2*6.87^2 + 0.33^2*9.77^2 + 2*0.33*0.33*(2.75)+2*0.33*0.33*21.96+2*0.33*0.33*41.97)}$

$= 7.249$

Table 5. Portfolio Returns and Risk of Selected Industries

Name of the Industry	Portfolio Returns	Standard Deviation	Sharpe Ratio	Treynor Ratio	Alpha (Jenson's index)
Information Technology	-1.32	7.04	-1.19	-8.72	-7.18
Telecommunications	-1.56	8.57	-1.012	-6.76	12.06
Automobile	-0.52	7.25	-1.054	1.417	-50.069

The Table 5 presents the analysis of portfolio returns and risk through standard deviation, Sharpe ratio, Treynor's ratio, and alpha. The Sharpe ratio is calculated using SD and excess returns to determine reward per unit of risk. The higher the Sharpe ratio, the better the portfolio's historical risk – adjusted performance. The Sharpe ratio characterizes how well the return of an asset compensates the investor for the risk taken. In a set of risky assets, we can find the optimal portfolio asset allocations. It is observed that the sample information technology, telecommunications, and automobile companies show negative portfolio returns as -1.19, -1.012, and -1.054, respectively. It indicates greater risk results in a higher Sharpe ratio.

The Treynor ratio is a risk adjusted measure of return based on systematic risk. It is the annualized monthly excess return of the strategy divided by the beta of the strategy's excess return relative to the strategy's benchmark. According to the Treynor ratio, the information technology and telecommunications companies record returns as -8.72 and -6.76, which indicates that the fund hasn't adequately compensated its investors for the risk, implying that the fund outperformed the risk-free rate by betting against the market.

Alpha is used to measure the performance on a risk adjusted basis. The goal is to know if an investor is being compensated for the volatility risk taken. An alpha over zero means the investment has earned a return that has more than compensated for the volatility risk taken. An alpha of less than zero means the investment has earned a return that has not compensated for the volatility risk assumed. The information technology and automobile companies record negative portfolio returns as -7.18 and -50.069, respectively. Hence, as the alpha is negative, then the portfolio is underperforming the market ; thus, higher alphas are more desirable.

The correlation coefficient is a measure that determines the degree to which two variables' movements are associated. Originally developed by the statistician Karl Pearson, the correlation coefficient is meant to identify the degree of linear dependence between two variables. In securities analysis, it can be utilized to measure the similarity between two stocks' price movements over time. The correlation coefficient has a range between -1.0 and 1.0, where a result of 1 exhibits perfect correlation between two variables, a result of -1 exhibits perfect negative correlation, and 0 reveals no correlation. Two similar stocks in the same industry experiencing similar growth will have a higher correlation than stocks in variant industries with different levels of growth. In order to be able to compare degrees of association between two variables, a standardized measure called the correlation coefficient or simply correlation is used.

The intra-correlation matrices (see Tables 6 and Table 7) indicate that there is a significant correlation among majority of the portfolios. The correlation value of 0.71 (Table 7) between Bharti Airtel and Idea Cellular shows highest correlation, and hence it is considered as the riskiest portfolio. Similarly, the stock returns of Tata Consultancy Services and Wipro show a very high correlation (0.64) and it also considered as one of the most risky portfolios. The next place is occupied by TCS and Maruti Suzuki (0.62) followed by Wipro and Maruti Suzuki (0.59), Idea Cellular and Reliance (0.56), and Reliance and Maruti Suzuki (0.53). These are the top six company pairs which record the most positive correlation portfolios as evidenced from the correlation matrix presented in the Table 7. Even if it has high returns, its high correlation increases the probability of losses in difficult markets due to lack of diversification in the portfolio. Hence, these assets are adding moderate diversification to the portfolio.

Table 6. Returns Analysis of All Selected Companies

TCS	Infosys	Wipro	Bharti Airtel	Idea Cellular	Reliance	Tata Motors	Mahindra & Mahindra	Maruti Suzuki
-3.69	-11.67	-13.60	-3.10	-3.93	2.11	-7.44	-3.62	0.70
4.79	3.25	4.19	13.92	-2.64	12.02	-5.88	9.30	-0.30
-2.24	-51.58	-2.37	0.99	1.47	-9.67	-7.44	1.93	6.27
-2.07	8.90	4.74	-1.16	-1.78	13.34	-5.88	6.53	7.35
2.42	1.52	0.14	-15.64	-10.94	-14.27	-11.96	-9.83	-4.86
1.25	6.60	4.65	-3.75	-2.73	14.23	-10.85	4.66	12.36
-3.99	-2.94	-4.21	2.84	-6.07	9.53	27.70	-7.31	-5.74
-5.41	-3.73	-0.03	-3.78	0.28	0.00	9.62	13.79	3.06
3.13	1.60	-3.33	1.32	1.81	16.12	-8.36	-7.13	0.28
-1.96	5.90	0.54	-14.72	-27.84	-29.69	-14.17	-3.04	-11.36
-8.96	-7.35	-8.02	7.97	0.24	-16.93	-11.53	0.17	-21.08
14.92	11.28	7.48	11.17	5.96	-3.38	28.40	-0.54	16.10

Table 7. Correlation Matrix (Correlation Coefficients of the Portfolios)

	TCS	Infosys	Wipro	Bharti Airtel	Idea Cellular	Reliance	Tata Motors	Mahindra & Mahindra	Maruti Suzuki
TCS	1	0.37	0.64	0.28	0.23	0.20	0.35	-0.10	0.62
Infosys		1	0.48	-0.03	-0.20	0.22	0.18	-0.00	0.05
Wipro			1	0.11	0.45	0.17	0.17	-0.39	0.59
Bharti Airtel				1	0.71	0.43	0.41	0.32	0.17
Idea Cellular					1	0.56	0.33	0.30	0.48
Reliance						1	0.20	0.25	0.53
Tata Motors							1	-0.03	0.29
Mahindra & Mahindra								1	0.33
Maruti Suzuki									1

The Table 7 also reveals negative correlation between the portfolios of Tata Consultancy Services and Mahindra and Mahindra (-0.10), Infosys with Bharti Airtel (-0.03), Infosys with Idea Cellular (-0.20), Wipro and Mahindra and Mahindra (-0.39), and finally Tata Motors and Mahindra and Mahindra (-0.03), which indicates that these sectors have a weak correlation. Hence, it is inferred that the low or negative correlation must be associated with a decent return to provide a well-diversified portfolio and the degree of risk reduction increases as the correlation coefficient between the returns on the two securities decreases.

Therefore, the concept of correlation is essential in developing an efficient portfolio. To reduce the overall risk, it is best to combine or add to the portfolio, assets that have a negative correlation. Combining negatively correlated assets can reduce the overall variability of returns.

Suggestions

The objective of any investor is to maximize expected returns from his/her investments, subject to various constraints and primary risk. It provides investors to compare and contrast different alternative investment opportunities and helps in measuring of historical returns which, in turn, enables the investors to assess how well they have done. Further, it facilitates in measuring the historical returns and helps in estimation of future returns. It is suggested that the investors can use the security-market return correlation coefficient while considering the investment options and evaluating the parity between security returns and market returns. It is suggested that a proper estimation and analysis of beta can be reliably taken recourse to in understanding the risk involved and the returns generated from equity shares. The risk-return analysis can be used as a stable platform by the investors in establishing the trade-off between portfolio risk and returns.

Investors relying exclusively on correlation coefficients to build a diversified portfolio might ,therefore, see all their underlying assets sharing the same trend, despite low or even negative correlations. My opinion is ,therefore, that additional indicators such as trend gaps or the difference between the returns of different assets or between two portfolios should also be taken into consideration when assessing diversification.

Research Implications

The study of risk - return analysis helps the investor to pick up the securities based on his/her choice. A study of this kind provides information about the performance of various stocks in the market in terms of risk and return. The objective of maximizing returns can be pursued only at the cost of incurring risk. While selecting the firms for investment, the investor has to consider both the return potential and the risk involved. The empirical evidence shows that generally there is a high correlation between risk and return over longer periods of time. This relationship is known as the risk - return trade-off. This study will definitely help the stakeholders to take appropriate decisions regarding the time of investment, horizon of investment, quantum of investment, and even portfolio selection. Using the expected return values, the possible outcome could be predicted. The chance of the actual outcome from an investment will vary. The width of a probability distribution of rates of return is a measure of risk. A thorough study of the firms in terms of their capital structure, shareholding pattern, knowledge of the financial market, its intricacies involved in it is needed by investors to make the right decision about their investments. Beta is the measure of relative sensitivity, volatility, and risk of a security vis-à-vis the market risk.

Conclusion

The risk-return relationship is fundamental to finance. Investment analysis is an ongoing process of evaluating current and potential allocations of financial assets and choosing those allocations that best fit the investor's needs and goals. The two opposing considerations in investment analysis are return and risk, which are usually directly proportionate in any given investment vehicle. Almost all investments carry risk and yield return.

From the analysis done so far, one can infer that the higher the risk, the higher the expected return and the larger the value of coefficient of variation, the riskier it is. Using such relations between sectors, we can predict how the stock market would change. In conclusion, minimizing the correlations among assets in the portfolio is the foundation of risk reduction through effective diversification. The ability to glance through a correlation table and identify counter-productive assets will enable one to effectively supervise an advisor's risk management and ability to properly diversify a portfolio.

Limitations of the Study and Scope for Further Research

This study has been conducted purely to understand the risk and return analysis for investors. The construction of a portfolio is restricted to selected companies. This study is limited to some selected industries (information technology, telecommunications, and automobile) for the period from April 2015 to March 2016 from NSE listings. Dividend is not considered in the calculation of returns. Price change is only taken into consideration.

This study covers the Markowitz model. Herein, the study covers the calculation of correlations between the different securities in order to find out at what percentage of funds should an investor invest among the companies in the portfolio. It will definitely help the stakeholders to take appropriate decisions regarding the time of investment, horizon of investment, quantum of investment, and even portfolio selection by monitoring the performance of a portfolio by incorporating the latest market conditions.

References

Balakrishnan, A., & Maiti, M. (2017). Dynamics of size and value factors in stock returns: Evidence from India. *Indian Journal of Finance, 11* (6), 21-35. DOI: 10.17010/ijf/2017/v11i6/115593

Bettis, R. A., & Mahajan, V. (1985). Risk return performance of diversified firms. *Management Science, 31* (7), 785 - 799.

Bhunia, A. (2012). A causal relationship between stock indices and exchange rates empirical evidence from India. *Research Journal of Finance and Accounting, 3*(1), 47 - 54.

Cootner, P. H., & Holland, D. M. (1970). Rate of return and business risk. *The Bell Journal of Economics and Management Science, 1* (2), 211-226.

Fama, E. F. (1991). Efficient capital markets : II. *The Journal of Finance, 46* (5), 1575 - 1617. DOI: 10.1111/j.1540-6261.1991.tb04636.x

Ghosh, T.P. (1997). Managing corporate risk: An accounting approach. *Research Bulletin, 14,* 9 - 14.

Gowri, M., & Deo, M. (2016). Performance evaluation of equity oriented growth and dividend funds of mutual funds in India: An application of risk- adjusted theoretical parameters. *Indian Journal of Finance, 10* (8), 43-54. DOI: 10. 17010 /ijf/2016/ v 10i8/ 99319

Guptha, S.K., & Joshi, R. (2014). *Security analysis and portfolio management*. New Delhi : Kalyani Publishers.

Manjunatha, T. (2009). Risk-return analysis of BSE Sensex companies. *Indian Journal of Finance, 3* (12), 21- 27.

Manrai, R. (2016). Risk-return performance of diversified firms in India. *Indian Journal of Finance, 10* (7), 34 - 47. DOI: 10.17010/ijf/2016/v10i7/97252.

Oviatt, B.M., & Bauerschmidt, A.D. (1991). Business risk and return: A test of simultaneous relationships. *Management Science, 37*(11), 1405 - 1423.

Setiawan, C., & Hesty, O. (2013). Syariah and conventional stocks performance of public companies listed on Indonesia Stock Exchange. *Journal of Accounting, Finance and Economics, 3* (1), 51- 64.

Sharma, G.D., & Bodla, B.S. (2012). Rewards and risks in stock markets: A case of South Asia. *The International Journal of Applied Economics and Finance, 6* (2), 37 - 52.

Sinha, R. (2013). An analysis of risk and return in equity investment in banking sector. *International Journal of Current Research, 5* (08), 2336 - 2338.

Sur, D., & Gupta, A. (2014). Business risk in Indian FMCG industry: A study. *Banijya, 7*(1), 15-25.

About the Author

Dr. B. Vijayalakshmi is currently working as a Professor, Department of Business Management, Sri Padmavati Mahila Visvavidyalayam (Women's University), Tirupati. Her major Research Specialization is "Financial Management and Small Scale Industries" and other disciplines also. She has successfully supervised 10 students for PhD and three for M.Phil, and currently under her, eight students are working for Ph. D. She has taken up many coveted positions like UGC-Nodal Officer, Deputy Warden, NSS Programme Officer, Executive Member and Joint Secretary of SPMVV Teacher's Association, IQAC & NAAC Member, and ICET Member. She has also served as a Member, Board of Studies for many universities and institutes. She has published 51 papers in reputed national and international journals. She has attended many national and international conferences and has presented 48 papers and has participated in national workshops and has also acted as a resource person. Having recognized her valuable services as an academician, researcher, and administrator, she was conferred with "Best NSS Programme Officer" by the University. She was also conferred with Andhra Pradesh State Best Teacher Award for the year 2017.