Risk and Return Analysis of NSE Small, Medium & Large Capitalization Indices -An Empirical study

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ABSTRACT: *This paper examines the risk and return relationship and performance evaluation of NSE Small, Medium and Large Capitalization indices for the period April 2005 to March 2018 .Simple Linear regression is used to find beta and Karl Pearson'correlation coefficient is used to find relationship between risk and returns. The study reports that there is no positive relationship between risk and returns in Indian Stock market. The result of performance measures suggests that most of indices provide excess risk adjusted returns.*

Key Words: : *Indices, Beta, Risk-Return Relationship.*

Introduction

The famous Capital Asset Pricing Model, CAPM suggests that beta , or the systematic risk is the only pertinent risk determinant for stock pricing and a positive relationship should exist between beta and expected returns . The Linear regression helps to identify the risk involved in individual securities. But the degree of various risk is vital for all securities market participants and other stakeholders for discovering the return to their investments. The capital that is invested through stock is sensitive to price fluctuations and market economic conditions .This implies that firm value is considerably influenced by market price and various risks associated with firm and market. There are numerous ways to measures risk, such as standard deviation and variance, volatility, coefficient of variation, value at risk or beta coefficient. The beta coefficient is one of the most extensively tested financial models in the literature, and it reveals the sensitivity of an asset (an investment in equity) towards the total market movements.

Modern investment theory also suggests that - 'High risk, High returns; Low risk, low returns'. It means that higher returns can earn by investing in risky securities, but not the guarantee of high returns because there are likelihood of high possible losses also. Hence, an investor must assess his risk bearing capacity before investing in various investment options. In this study, an endeavor has been made to empirically investigate the risk and return relationship in Indian stock market using linear regression.

Literature Review:

Madhusoodanan (1997) examined the validity of CAPM in indian Stock Market for the period 1987 to 1995. It is concluded that there were no positive returns in short time period and it is suggested that the investors have to invest their wealth for long time to earn higher returns in the Indian Stock Market. Otherwise they lose their money as higher risk leads to high returns. Sehgal (1997) analyzed that there is negative correlation between beta and returns during the study period of 1984 to 1993. Gurumoorthy and Amilan (2003) studied the relationship between beta and stock returns on a random sample of 30 specified groups of BSC stocks. Beta values were calculated for individual stocks and then three portfolios were made by arranging stocks in ascending order on the basis of beta. It is found that the beta can be used as an important measure of future returns of stocks. Raj S. Dinakar and Rakesh Kumar (2006) investigated the relationship between risk and returns and the effect of diversification on portfolio of BSE 100 companies for the period June 1996 to May 2005.The study concluded that there is a positive and linear relationship between stock's market risk and expected return. Similar result is also exist in portfolio market risk and expected return. Manjunatha and Mallikarjunappa (2006) studied that CAPM establish relationship between the returns and risk. It is found that no other variable can significantly explained the variance of security/portfolio returns except beta and excess market returns.

 Ansari (2000) examined the data during the period January 1990 to December 1996 related to 96 stocks of Bombay stock exchange and concluded that there is a very weak relationship between risk and return in Indian stock market. Manickaraj and Lokanathan (2004) concluded that betas are not constant in Indian stock market. As a result risk cannot assess accurately. Sehgal and Tripathi (2005) and value effects Sehgal

and Tripathi (2007) are also noticeable in Indian stock market. So, there is not much proof available to analyze the risk and return relationships in Indian stock market.

Objective of the study:
- To find out the Beta and Mean return of Large, Medium and Small Capitalization Indices.
- To analyze the risk and returns relationship in Indian Stock Market.
- To evaluate the performance of Indices.

Hypothesis:
- H01: There is no significant positive relationship between beta and mean returns in Indian stock market.
- H02: There in no positive risk adjusted returns in Indian Stock Market.

Data and Methodology:
 The present study depends on the secondary source. The data for eight major indices were taken from the National Stock Exchange (NSE) official website (www.nseindia.com) during the study period from April 2005 to March 2018. The monthly indices prices were taken into account for this study. The monthly closing values of Nifty500 index of National Stock Exchange is used as a proxy. The yield on 91 days treasury bills is taken as proxy for risk free return and had from the official site of the central bank (www.rbi.org). The index returns were calculated with the help of following formula

$R_i = \ln(\frac{P_t}{P_{t-1}})*100$,

Wherein,

R_i = Index returns,

P_t = Closing price of index,

P_{t-1} = Opening price of index.

Beta as a measure the systematic of individual security βs is obtained in the CAPM framework to arrive at risk premium in form of an intercept as given below:

$r_i - r_f = \alpha_j + \beta_{im}(r_m - r_f)$

Wherein,

r_i = realized index return, r_m = the realized return of market index

r_f = risk-free rate of return, β_{im} = beta of index i with respect to market index

To measure the relationship between risk and returns, Karl Pearson' coefficient of correlation has been used.

Empirical Results and Discussion:
The analysis of Table-1 reveals the comparison of risk, return statistics of eight indices .It shows that the return on large cap stocks indices, on an average, varies between 0.73 to 1 percent monthly during the study period and return on small cap stocks indices, on an average, varies between 0.54 to .80 percent monthly during the study period. The risk on large cap stocks indices varies between 0.18 to 1. The risk on small cap stocks indices varies between 1.17 to 1.3.

The beta coefficient is above 1 for all small cap stocks indices. This shows that changes in prices of these Small Cap stocks are more volatile than that of market index (Nifty 500). The beta coefficient is below 1 for all large cap stocks. This shows that change in prices of these large Cap stocks are less volatile than that of market index (Nifty 500). The beta coefficient is above 1 for mid cap stocks index. This shows that change in prices of mid cap stocks index is more volatile than that of market index (Nifty 500).

Nifty Next 50 index perform better than all other indices with high return and low risk. In the same way, Nifty Midcap 100 index perform better than all other indices, but substantially higher risk. Nifty Smallcap 50 index and Nifty Smallcap 100 index experience similar results with expectations of lower return and higher risk than benchmark respectively. Nifty 50 index and Nifty 500 index experience similar results.

Table 1: **Risk and Return Analysis of NSE Small, Medium & Large Capitalization Indices**

Indices	Mean returns	Annualized returns	Variability	Volatility(β)
Large Cap Stocks Indices				
Nifty 50	0.007306	0.087676	0.066283	0.92513
Nifty Next 50	0.01065	0.127799	0.082797	0.182731
Nifty 100	0.007706	0.092468	0.067635	0.952505

Nifty 500	0.007465	0.089577	0.070554	1
Mid Cap Stocks Index Nifty Midcap 100	0.009051	0.108612	0.078692	1.070321
Small Cap Stocks Indices Nifty Smallcap 50	0.005426	0.065111	0.098414	1.303283
Nifty Smallcap 100	0.006921	0.08305	0.092703	1.214556
Nifty Smallcap 250	0.008072	0.096864	0.089153	1.17754

Karl Pearson's correlation coefficient is used to test the hypothesis where r = -0.82 is significant at 5% which shows negative relationship between indices beta and return .Thus the null hypothesis –H01,"There is no significant positive relationship between Risk and returns", is rejected.

Table 2: **Risk Adjusted Performance of NSE Small, Medium & Large Capitalization Indices**

Indices	Sharpe	Treynor	Jenson alpha
Large Cap Stocks Indices Nifty 50	0.0212	0.0015	0.0000
Nifty Next 50	0.0573	0.0260	0.0044
Nifty 100	0.0267	0.0019	0.0003
Nifty 500	0.0221	0.0016	0.0000
Mid Cap Stocks Index Nifty Midcap 100	0.0400	0.0029	0.0015
Small Cap Stocks Indices Nifty Smallcap 50	-0.0048	-0.0004	-0.0025
Nifty Smallcap 100	0.0110	0.0008	-0.0009
Nifty Smallcap 250	0.0243	0.0018	0.0003

Table 2 reveals that the risk adjusted performance of Small, Medium and Large Capitalisation indices. As per sharpe ratio, Treynor and Jensons performance evaluation ratio, Nifty next 50 index outperformed the market followed by Nifty Midcap100 index. However, Nifty Smallcap 50 index is the lowest performer during the study period. Most of indices earn excess risk adjusted returns. So the null hypothesis –H02," There is no positive risk adjusted returns in Indian Stock Market", is rejected.

Conclusion: This paper examines the performance of Large, Medium and Small Capitalization Indices. The analysis is based on data from April 2005 to March 2018. Nifty Next 50 index and Nifty Midcap 100 index outperform the market with high returns at low risk this is due to investment in diversified portfolio. However small cap stocks indices do not outperform the benchmark indices with low returns and high risk except Nifty Small cap 250. These results challenge the prevailing theory that suggests that higher risk results higher returns and vice-versa. So new research could crack the current deadlock in the area of risk and return theory of Indian Stock Market.

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