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ANALYSIS OF SECTORAL EFFICIENCY-
A STUDY OF OIL & POWER SECTORS IN BSE

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Introduction

The sectoral analysis is typically employed by investors who plan to select better stocks to invest in. The investors normally identify most promising sectors and review the performance of companies within the sector to determine which individual stock would provide better returns and ultimately they purchase such stocks. There are three aspects that would generally affect the performance of a company's stock in the stock market. The first aspect is the performance of the individual company. The second is the performance of the market as a whole. The third is the performance of the sector to which the company belongs. It is a known fact that sectors are groups of companies which perform similar functions in the economy. The sector analysis involves the process of dividing the total market into sectors and then studying the market performance of each sector individually, so that each sector can be compared to other sectors or to the market as a whole. The sectoral analysis of this study identifies the market efficiency of different sectors of the economy. The Oil and Power Industry is one of the core sectors of the economy. Therefore, this paper proposes to test the market efficiency across the Oil and Power Sector Companies listed at the BSE by using daily closing share prices during the study period.

Statement of the Problem

The Capital Market is a vital institution because it facilitates economic development. It is true that so many parties are interested in knowing the efficiency of the Capital Market. The retail investors can be motivated to save and invest their savings in the Capital Market only if their securities in the market are appropriately priced. Many studies tested the efficiency in the global stock market and also tested the random walk hypotheses for various popular indices. But in India, few studies examined the returns of the stock market with reference to stock indices like S&P CNX Nifty, BSE 100 Index, Nifty Junior etc. it is important to note that there were no comprehensive studies carried out to test the sectoral efficiency in the Indian context. The individual investors are not fully informed of the sectoral efficiency in the Indian stock market. Therefore, the present study aims to investigate the efficiency of Indian Stock Market for different sectors which were actively traded in the Bombay Stock Exchange (BSE). This study analyses the market efficiency of the sample companies from Oil and Power Sectors listed in the BSE.

Objectives of the Study

The present study was carried out to examine the market efficiency of the Oil and Power Companies' stocks listed in BSE- OIL Index and BSE-POWER Index.

Hypotheses of the Study

The present study tested the following null hypotheses.

NH1: There is no normal distribution in the returns of the shares of sample companies.

NH2: There is no significant difference in the share price behavior of sample stocks.

Methodology of the Study

Sample Selection

For the purpose of this study, the companies listed in BSE- OIL Index and BSE-POWER Index were considered. There are 11 and 15 companies respectively under Oil and Power Sectors, listed on 02.01.2010. The sample companies were identified (Purposive Sampling Method) by ranking the companies based on traded price and continuous trading. From the total population, top five high traded companies from Oil and Power Sector were taken as sample size (i.e. 5 companies out of 11 in Oil Sector and 5 out of 15 in Power Sector).

Period of the Study

The present study was mainly intended to examine the sectoral efficiency (market) of Oil and Power Sector Companies listed in BSE Oil and Power Index from 1st January 2005 to 31st December 2009.

Tools Used for Analysis

In order to evaluate the sectoral efficiency, tools like Runs Test and Autocorrelation were used.

(a) Runs Test

It is a non-parametric test used for measuring market performance. It does not require specification of the probability distribution. It depends only on the price. They are essentially concerned with direction of changes in price.

$$M = \frac{N(N+1) - \sum_{i=1}^{3} n_i^2}{N}$$

Where,

M = Expected number of runs

n_i = Number of price changes of each sign (i=1,2,3)

N = Total number of price changes.

(b) Autocorrelation

It is the statistical tool used for measuring the company's successive terms in a given time series and dependence of the successive share price changes.

$$p_k = \frac{\sum_{t=1}^{n-k} (R_t - \overline{R})(R_{t+k} - \overline{R})}{\sum_{t=1}^{n} (R_t - \overline{R})^2}$$

Where,

K = Number of lags

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R_t = Real rate of returns

n = Total number of observations

P_k = Sample autocorrelation function for the lag K

$\overline{R}$ = Mean returns

Limitations of the Study

The study suffers from the following limitations.

1. The study was based on secondary data, and hence it is riddled with certain limitations which are bound to be connected with the secondary data.
2. This study focused on only two sectors (Oil and Power).
3. All the limitations associated with Runs Test and Autocorrelation Tests are applicable to this study also.

Analysis of Market Efficiency of Oil and Power Sectors' Stocks

The analysis of market efficiency of Oil and Power Stocks is arranged as follows:

Market Efficiency - Runs Test

Market Efficiency- Autocorrelation

Market Efficiency- Runs Test

Out of 5 sample stocks, only one company in the Oil Sector, namely, Aban Off Shore followed the normal distribution. The Z values of this company were significant under normal distribution at 5% level. Therefore, the Null Hypothesis (NH1), namely, "There is no normal distribution in the returns of the shares of sample companies", is not fully accepted. The remaining sample stocks (the stocks of Reliance, Bharat Petroleum, Indian Oil, ONGC) did not follow normal distribution as its mean and median values were not significant.

3 stocks out of 5 stocks in the Power Sector followed the normal distribution. They are TATA power, ABB and Siemens. Besides, the Z values for these 3 companies were significant under normal distribution at 5% level. The remaining two companies, namely, BHEL and Reliance Infrastructure did not follow the normal distribution. According to the analysis, it is to be noted that majority of sample companies followed the normal distribution. Hence the Null Hypothesis (NH1), namely, "There is no normal distribution in the returns of the shares of sample companies" is rejected for the Power Sector.

Market Efficiency – Autocorrelation

Out of 5 sample companies taken for this study, only one company, namely, Indian Oil Corporation earned significant value in all the 10 lags, with the significance level at 5%. The analysis of autocorrelation reveals the fact that there are 4 companies, namely, Reliance, Aban Off shore, Bharat Petroleum and ONGC did not earn significant value at 5% level in all the 10 lags. Hence, the Null Hypothesis (NH2). - There is no significant difference in the share price behavior of sample stocks is accepted

Out of 5 companies taken for this study, only two companies earned significant value at all the 10 lags and those companies are TATA Power and Siemen. Further, it is

to be noted that the value of these two companies are significant at 5% level. The analysis of autocorrelation reveals the fact that three companies, namely, BHEL, Reliance Infrastructure and ABB, did not earn significant value at 5% level in all the 10 lags. Hence the Null Hypothesis (NH2)-"There is no significant difference in the share price behavior of sample stocks" is partially accepted.

Findings of the Study

The following are the important findings of the study.

a) The market efficiency of Oil Sector under Runs Test shows that there, is no randomness in the stock price because the returns for all sample stocks were not normally distributed.

b) It is found that only one company, namely, Aban Off Shore in Oil Sector followed normal distribution based on mean and median values under the Runs Test.

c) The analysis of the share price of Power Sector reveals that share price followed the normal distribution for Tata power, ABB, and Siemens.

d) The results of Autocorrelation shows that out of 5 sample companies, price of Sample Company in Oil Sector recorded significant returns at 5% level.

e) The returns of two sample companies in Power Sector recorded significant returns under the Autocorrelation Test during the study period.

Conclusion

The study examined the returns of five sample companies in Oil Sector and five sample companies in Power Sector to study the market efficiency using Runs Test and Autocorrelation Function (ACF). The study reveals that the results of both tests (Runs and Autocorrelation) for Power Sector companies mostly followed normal distribution and earned significant returns, especially TATA Power and Siemens. This shows that the above two companies were in good position during the study period and the investors in these power companies earned maximum returns in the stock market operations. This depicts the growth of Power Sector and efficiency in the Indian Capital Market.