A STUDY OF TOP FOUR PETROCHEMICAL COMPANIES (RELIANCE, NOCIL, GAIL, PETRONET LNG) ON THE BASIS OF RETURN ON INVESTMENT

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Abstract

Till the early nineties, the petrochemical industry was state-controlled and dominated by the state-owned IPCL. The only other integrated player, that too in the private sector, was NOCIL with a very small capacity. Most other players had small, uneconomic size plants, which were operated on molasses and alcohol. With the liberalisation process in the nineties, the gates of the petrochemical sector were opened out to private enterprises for building up new capacities. In the private sector, Reliance Industries was quick enough to take advantage. It started expanding and building up existing and new capacities in a mega way.

In the post-liberalisation era, Reliance Industries and IPCL have started building up world-size, fully-integrated plants. The Indian petrochemical industry, at present, is highly concentrated. There are only few players: Reliance Industries, Nocil and Petronet LNG and Gail are few of them. All the companies have fully-integrated plants. The present paper aims to analyse the return on investment of these four petrochemical Companies

Key Words: Return, Risk, Book Building

Introduction

India historically been an agricultural country focused on feeding its masses simultaneously fighting wars with the unfriendly neighbors. A major portion of India’s chemical industry was oriented towards fertilizers and dyes stuffs. With no abundant sources of naphtha and natural gas the industry was always planned and controlled by the government to assure equal distribution to benefits to everyone alike (like any democratic government should). Nationalized Indian petrochemicals were operated to provide low cost kerosene to general people, taxing gasoline and other plastics as a luxury items. Most of the petrochemicals were under heavy tariffs to encourage domestic developments
With the 1990s economic reforms India could freely enter most of the petrochemicals with gradual reductions in the tariffs. Petrochemicals were removed from the list of industries reserved for the public sector. Several 100% Foreign Direct Investment is currently permitted with profits and dividends that can be repatriated.

Special economic zones are set up for export oriented units and industrial parks. All these issues are India’s way of spreading a red carpet for foreign direct investment into Indian petrochemicals and plastics. Most of the cracker capacity in India is equally distributed between ethane and naphtha. India is currently a net exporter of naphtha after naphtha was deregulated in 1998. Even today, nearly 31% of the naphtha is used for producing fertilizers to support the agricultural needs. The states of Maharashtra (Bombay) and Gujarat (home of Reliance) have always been in the forefront of chemical industry in India and remain so.

Is India’s Petrochemicals Industry Poised For A Boom?

During the early years of this decade, the chemical industry in India was in a state of near stagnation. Capacity additions had virtually stopped (Fig 1). Tariff protection which had been to the tune of 35-50% till 2000 was being planned to be scaled down to 7.5%- 10% by 2007-08. New global scale capacities were being proposed close to cheap raw material sources (e.g. Middle East) or close to big demand centers (e.g. China). Indian capacities designed to cater to the protected domestic market were sub-scale by new global standards of economic sized capacities, and were based on technology licensing from existing global chemical majors. Doubts were being raised whether India’s chemical industry would be able to withstand the onslaught of global competition.

However, in contrast, as per the petroleum ministry, India’s refining capacity is expected to increase from 135 MMTPA in 2006-07 to 210-225 MMTPA by 2011-12, translating into an exportable surplus of refined products of 78-93 MMTPA by 2011-12 (Fig 2).
What Has Brought About This Transformation?

This growth in refining capacity is led by Reliance, which on the completion of its second refinery in 2008-09 would have added 62 MMTPA of capacity in a decade, comparable to the entire capacity of the regional refining hub, Singapore (Refining Capacity: 67 MMTPA). Further, since its inception, Reliance’s first refinery has consistently had a $2- $3 / barrel better refining margin than the Singapore complex, proving its global competitiveness. In addition to Reliance’s second refinery (29 MMTPA), Essar is also commissioning a new refinery, (10.5 MMTPA), apart from capacity additions and greenfield projects by the PSU’s (35-50 MMTPA). This 60% increase in refining capacity would lead to availability of additional 8-10 MMTPA of naphtha by 2011-12. (Fig 3) Reduction in usage of naphtha in power and fertilizers by 2.5 MMTPA by 2011-12 is expected to increase availability of naphtha in India by 10.5-12.5 MMTPA.

Objectives of The Study

Investors while analyzing securities are concerned with the return expected from holding a security and the corresponding risk associated with it. Risk may be defined as the standard deviations of the returns. Risk is associated with the chance that the actual return from an investment will be lower than the expected return. Investors will select the securities that maximize the expected return within the constraint of their risk tolerance. The selection process will, thus, result in finding out that investment alternative which minimizes the risk for a given level of return or maximizes the return for a given level of risk. Risk is the outcome of the uncertainty in predicting the future events that are affected by external and internal factors which are termed as systematic and unsystematic risks which are defined below:

**Systematic risk:** Variability in a securities total return that is directly associated with overall moment in the general market or economy is called as systematic risk. This risk cannot be avoided or eliminated by diversifying the investment. Normally diversification eliminates a part of the total risk the left over after diversification is the non-diversifiable portion of the total risk or market risk. Virtually all securities have some systematic risk because systematic risk directly encompasses the interest rate, market and inflation risk. The investor cannot escape this part of the risk, because no matter how well he or she diversifies, the risk of the overall market cannot be avoided. If the stock market declines sharply, most stock will be adversely affected, if it rises strongly, most stocks will appreciate in value. Clearly mark risk is critical to all investors.

**Un-systematic risk:** Variability in a security total return not related to overall market variability is called un systematic (non market) risk. This risk is unique to a particular security and is associated with such factors as business, and financial risk, as well as liquidity risk. Although all securities tend to have some nonsystematic risk, it is generally connected with common stocks
Specifically the objectives of the present paper are:
1. To analyse the performance of four petrochemical companies for the period of eight quarters.
2. To compare the returns on equity of present companies.
3. To identify the risk involved in investing in equities of these companies.
4. To identify the top performing stock among the companies chosen.

Methodology

In this study, an attempt is made to examine four petrochemical companies namely, (RELIANCE, NOCIL, GAIL, PETRONET LNG) on the basis of return on investment, price earning Ratio, Systematic & Unsystematic risk with respect to movement of Oil & Gas indices, BSE SENSEX & NSE NIFTY for last eight quarters ending December 2008. The study used following tools for analysis:

a) The Sharpe's index,
b) Jack Treynor measure for portfolios
c) Jensen measure
d) Standard Deviation
e) Beta
f) Alpha

1) Measure For Sharpe's Portfolios Performance

The Sharpe's index measures the risk premium of the portfolio relative to the total amount of risk in portfolio. The Sharpe's index is measured as:

\[ S = \frac{r_p - r_f}{\sigma_p} \]

where,

- \( S \) = Sharpe's Index
- \( r_p \) = average monthly return of fund
- \( r_f \) = risk free return

risk free return \( (r_f) \) is taken as 7.73% per annum

2) Treynor's Performance Measures For Portfolios

Jack Treynor, as measures by portfolio beta coefficients, put an index of portfolio performance that is based on systematic risk, forward. It is used to rank the interest performance of different assets. It is a risk-adjusted rate of return measure than is calculated by dividing the assets risk premium by their beta coefficient.

\[ Tn = \frac{r_p - r_f}{\beta_p} \]

where

- \( Tn \) = Treynor's index
- \( r_p \) = average return on portfolio
- \( r_f \) = risk free return
\( \beta_p = \) beta coefficient of portfolio.

3) Jensen Measure

The Sharpe and Treynor index models provide measures for ranking the relative performance of various portfolios on a risk-adjusted basis according to Jensen equilibrium average return on a portfolio would be a benchmark. Equilibrium average return of the portfolio by the market with respect to systematic risk to portfolio should earn with the systematic return.

\[
Rp = \alpha + (r_m - r_f) \beta_p
\]

Where,

- \( Rp \) = average return of the portfolio.
- \( r_f \) = risk free return
- \( r_m \) = average market return
- \( \beta \) = A measure of systematic risk

\( \alpha = \bar{Y} - \beta \bar{X} \)

if the alpha is positive, the portfolio has performed better and if alpha is negative it has not shown performance upto the benchmark, i.e. the market index.

4) Standard Deviation

It is used to measure the variation in the individual return from the average expected return over a certain period. Standard deviation is used in the concept of risk of a portfolio of investment. Higher the Standard Deviation means a greater fluctuation in expected return.

\[
\sigma = \sqrt{\frac{(Y - \bar{Y})^2}{N}}
\]

Where, \( Y = \) fund return

5) Beta

Beta measures the systematic risk and show how price of security respond to the market foresees. It is calculated by relating the return on security with return for market.

\[
\beta = n \sum X Y - (\sum X)(\sum Y) / n \sum X^2 - (\sum X)^2
\]

Where,

- \( X = \) index return
- \( Y = \) fund return

6) Alpha

It measures the stock unsystematic return and it is average return independent of market return. It is calculated by comparing the funds actual performance with the risk adjusted expected return.

\( \alpha = Y - \beta X \)
X = index return
Y = fund return

RESULTS

This study was carried out to analyse four Petrochemical companies namely RELIANCE, NOCIL, GAIL, PETRONET LNG on the basis of Return on Investment, systematic & unsystematic risk with respect to movement of NIFTY, Oil & Gas Index for the last eight quarters ending Dec. 2008. The summary results of the study are as follows:

1. The results of Beta value, Alpha & Standard deviations are as follows

Table 1: Beta, Alpha And Standard Deviation

<table>
<thead>
<tr>
<th>Company</th>
<th>Beta</th>
<th>Alpha</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>RELIANCE</td>
<td>0.88</td>
<td>1.21</td>
<td>12.81</td>
</tr>
<tr>
<td>PETRONET LNG</td>
<td>1.29</td>
<td>0.83</td>
<td>16.4</td>
</tr>
<tr>
<td>GAIL</td>
<td>1.03</td>
<td>2.68</td>
<td>13.47</td>
</tr>
<tr>
<td>NOCIL</td>
<td>1.50</td>
<td>0.80</td>
<td>21.96</td>
</tr>
</tbody>
</table>

- The beta coefficient, in terms of finance and investing, describes how the expected return of a stock or portfolio is correlated to the return of the financial market as a whole. An asset with a beta of 0 means that its price is not at all correlated with the market; that asset is independent. A positive beta means that the asset generally follows the market. A negative beta shows that the asset inversely follows the market; the asset generally decreases in value if the market goes up and vice versa. The table shows that stock of RELIANCE & GAIL with beta values of 0.88 & 1.03 move more or less with the movement in the market. The stock of NOCIL with beta of 1.50 means that movement in NOCIL is more volatile than the market. This also proves that the risk for investor is least in Relaince and Highest in the case of NOCIL.

- Alpha is a risk-adjusted measure of the so-called active return on an investment. It is the return in excess of the compensation for the risk borne, and thus commonly used to assess active managers' performances. The table reveals that RELIANCE with Alpha value of 1.21 is the most productive stock while NOCIL is the least productive stock.

- In statistics, standard deviation is a simple measure of the variability or dispersion of a population, a data set, or a probability distribution. A low standard deviation indicates that the data points tend to be very close to the same value (the mean), while high standard deviation indicates that the data are “spread out” over a large range of values. The Table reveals that NOCIL with S.D of 21.96 show maximum variability while reliance with S.D of 12.81 show least variability.
2. The Sharpe ratio is used to characterize how well the return of an asset compensates the investor for the risk taken. When comparing two assets each with the expected return $E[R]$ against the same benchmark with return $R_f$, the asset with the higher Sharpe ratio gives more return for the same risk. Investors are often advised to pick investments with high Sharpe ratios. Thus of the four companies GAIL is the most productive and NOCIL the least productive.

### Table 2: Comparison On The Basis Of Sharpe Index

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>SHARPE INDEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>PETRONET LNG</td>
<td>-0.038</td>
</tr>
<tr>
<td>NOCIL</td>
<td>-0.044</td>
</tr>
<tr>
<td>GAIL</td>
<td>0.108</td>
</tr>
<tr>
<td>RELIANCE</td>
<td>0.0121</td>
</tr>
</tbody>
</table>

3. In finance, Jensen's alpha (or Jensen's Performance Index, ex-post alpha) is used to determine the excess return of a security or portfolio of securities over the security's theoretical expected return. Investors are constantly seeking investments that have higher alpha. In our analysis the highest value is for GAIL followed by Reliance, Petronet LNG and NOCIL. The investors will as such prefer investment in GAIL, Followed by Reliance and Petronet LNG. Least preffered will be NOCIL since it has lowest value for Jenson alpha.
Table 3: Comparison On The Basis Of Jensen Ratio

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>Jensen Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>PETRONET LNG</td>
<td>0.91</td>
</tr>
<tr>
<td>NOCIL</td>
<td>0.8275</td>
</tr>
<tr>
<td>GAIL</td>
<td>2.69</td>
</tr>
<tr>
<td>RELIANCE</td>
<td>1.187</td>
</tr>
</tbody>
</table>

4. The **Treynor ratio** is a measurement of the returns earned in excess of that which could have been earned on a riskless investment (i.e. Treasury Bill) (per each unit of market risk assumed). The Treynor ratio (sometimes called reward-to-volatility ratio) relates excess return over the risk-free rate to the additional risk taken; however systematic risk instead of total risk is used. The higher the Treynor ratio, the better the performance under analysis as such the highest value is for GAIL followed by Reliance while NOCIL has lowest value. Thus GAIL is most productive investment while NOCIL is least productive investment according to TREYNOR Ratio.

Table 4: Comparison On The Basis Of Treynor Ratio

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>Treynor Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>PETRONET LNG</td>
<td>-0.488</td>
</tr>
<tr>
<td>NOCIL</td>
<td>-0.64</td>
</tr>
<tr>
<td>GAIL</td>
<td>1.41</td>
</tr>
<tr>
<td>RELIANCE</td>
<td>0.153</td>
</tr>
</tbody>
</table>
Conclusion

This paper analyses the performance of four petrochemical companies. Analysis was based on the risk and returns of these companies. Analysis revealed that there is considerable amount of risk involved, while investing in equities of the companies under study, as beta values falls in the range of 0.88 to 1.50. The study reveals that Reliance is the most fundamentally strong, followed by GAIL, Petronet LNG and NOCIL was the weakest stock of the lot.

References

8. Tathan Black ,Multivariate data analysis(pp326-338)