To Study the Relationship between Return on Equity and the Intrinsic Value of the Stock in Basic Metals Industry Companies Listed in Tehran Stock Exchange (TSE)

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Abstract

This is a continuous operation in the capital market using tools such as financial ratios and charts to measure the value of a stock and select the appropriate stock between stakeholders and financial decision makers. More common is the use of charts in the technical analysts and common between fundamental analysts using ratios and predictions. Financial decision makers and investors are seeking to find the best performance metrics, this issue has led the financial researchers’ part of Research and Development Programs spend for choice Best performance metrics. This paper examines the relationship between DuPont ratio that calculates the return on equity by the financial statements information and it is an accounting ratio with the expected value of the stock that calculate the intrinsic value of stocks by using economic data. For above studies selected companies active in Basic metals industries Tehran Stock Exchange during the five year period from 1386 to the end of 1390. The article used the Pearson correlation coefficient, to test the hypothesis and significant relationship between the variables. The result of this study suggests that, there is a significant relationship between the intrinsic value of stock and equity returns.

Keywords: DuPont analysis, Expected value, Return on equity, intrinsic value, Economic data.
1- Introduction

Performance assessment is one of the main issues in investment and financial decision making in decision making process based on development and importance of the role of the capital bazaar. Therefore, it’s one of the useful tools in the field of the financial ratio. Moreover, management performance of economic firms in obtaining profits and returns could be studied using the financial ratios.

Stock price fluctuation is a common issue in stock. These fluctuations are affected by international and national orders which have impact on the stock price. Following prediction of the stock price, decision makers follow finding a pattern in order to forecast the changes of the stock price. If these attitudes are predictable, the investors will make the best choice over the stock. The analysts study the quality of profitability and the financial status in this regard. Additionally, the unique feature of DuPont’s analysis is to put the indexes related to the profitability together as well as making possible the study of them in a formula. The investors and financial decision-makers also intend to know the intrinsic value of stock. Since the intrinsic value of stock includes returns and risk, the economic and financial experts believe the intrinsic value of stock is the best estimation of a stock value based on taking advantages of the available data.

The article studies the relationship between analysis of DuPont and the expected price share in the investment literature, in study of the relationship between these components are based on view and attention of the investors to two return of the present and future. The analysis of DuPont studies present and future data. The analysis of DuPont shows investors which impact the accounting data have on increasing and decreasing the return on equity. In the expected price, the analysts and investors should find the shares value through the predicted data and review of the previous data regarding future profitability.

2- Assumptions and Research Objectives

This study includes a question, therefore, so that the question and the research hypothesis can be stated as follows.

Question: Is there a significant relationship between the DuPont ratio and expected stock price in the basic metals industry companies listed in Tehran Stock Exchange?

Hypothesis: There is a significant relationship between the DuPont ratio and expected stock price in the basic metals industry companies listed in Tehran Stock Exchange.

Objective: This research studies the relationship between the financial ratio of DuPont and expected stock price in basic metals industry companies listed in Tehran Stock Exchange is studied.
3- Research Background

Some relevant researches have been studied in both parts.

3-1- International Research

Saloman (2008) studied the application of DuPont Analysis by the market practitioners and argued due to the fact the only changes in operational turnovers are significant in predicting the future changes of net return of the operational assets, therefore the market reacts to the changes of the operational assets [6].

Penman and Zeng (2002) have used DuPont analysis in evaluation of profitability [7].

Saloman (1996) believes any individual should be aware of specific conditions affecting the market value of an asset which are shown by the price. Some of these conditions include geographical conditions, country economic status, tax and inflation rate. Based on the above mentioned issues, the market value couldn’t always show the real value of the assets because the markets are fundamentally incomplete [8].

3-2- National Researches

In the researches which have studied the components of the Dupont ratio, Alavi Tabari and Alizadeh Eghdam (2006) showed the level of DuPont component in Chemical Industry has no role in predicting stock returns [1].

In order to evaluate usefulness of the used ratios in DuPont system in predicting profitability based on the results of testing the research hypotheses and results of other findings, researches of Ohadi (2008) conclude and judge there is a relationship between DuPont ratio and their adjusted ratio with future profitability of the companies. Moreover, they could help predicting the future earnings. Such prediction could be a major help for them in determining the prediction of national and international growth as well as in management decisions [2].

4- Research Methodology

The present research is applied in terms of objectives and descriptive correlational in terms of data and information collecting. The study period of time in this research includes 5 years from 2007 to the end of 2011. In order to calculate the growth rate, one period before 2007 is used; therefore data of three years earlier are required to calculate the growth rate.

All companies which were listed in Tehran stock Exchange in 2007 and were of the basin metals companies are placed in this sample. Additionally, the below features have been used in selecting the research sample:

A) In order to select active companies, their transactions haven’t been interrupted within 2007-2011. On the other hand, these companies’ shares must be active through the said years in Stock Market and the interruption period mustn’t be longer than three months.
c) to compare in order to prevent their heteronym, the fiscal year should end to March 20th and no changes in the fiscal year must occur within 2007-2011.

c) the financial statements and the explanatory notes which accompany them are available.

In order to collect the required data and information, the library method was used, the research the theoretical bases were collected in this way. Therefore, the research data were collected by referring to the financial statements and the explanatory notes taken from website of the Stock Exchange Organization. Moreover, the data were organized and calculated by the use of Excel and were analyzed by E-views.

5- Research Variables and Method of Calculating them

5-1- DuPont Ratio: one of the other dependent variables of this study is a method which considers the relationship between the assets turnover of the commercial units and its return on sale as a criterion of efficiency and management of the unit. Ratio of the assets turnover is determined respectively that we divide the sale by total assets in order to find out which turnover the assets of the commercial unit had.

The DuPont Formula used in this study is as below (Equation 1):

\[
(1)
\]

\[
\text{ROE} = \frac{(\text{ROI}) \text{ Return on assets}}{1 - \text{Debt ratio}}
\]

The below formula could be used to calculated the debt ratio (equation 2).

\[
(2)
\]

\[
\text{Debt ratio} = \frac{\text{Debt}}{\text{Assets}}
\]

Considering the equation2, the return on equity is calculated as below (equation 3):

\[
(3)
\]

Return on equity = \frac{\text{Earnings}}{\text{Equity}} = \frac{\text{Earnings}}{\text{Assets}} \times \frac{\text{Equity}}{\text{Assets}} = \frac{\text{Return on assets}}{\text{Assets}} \times \frac{\text{Debt}}{\text{Assets}}
\]

Considering the above equations, the return on equity could be increased:

1- Increasing Return on Assets

2- Increase in the debt ratio (in case the rate of return on assets is more than the rate of interest debt).

In order to increase the return on assets, it is possible to increase the earnings margin or to calculate the assets turnover based on the above formula (return on assets) in the said formula as below (equation 4):

\[
(4)
\]

\[
\text{Return on equity} = \frac{\text{Turnover} \times \text{Ratio of earnings to sales}}{1 - \text{Debt ratio}}
\]

Considering the used equations in the study, if the debt ratio is zero, the return on assets is equal with the return on equity and if the debt ratio is (a≠ 0), the return on equity is more than the return on assets [3].
5-2- The Intrinsic Value of Stock (Expected Stock Price):

Considering the fact that the shares value in this research is calculated based on the basic method, intrinsic value of the share is calculated based on reduction method of future cash flows. The method used in this research is Gordon. The model assumes a long-term maintenance of the stock and the cash flows obtained from the share is its cash earnings. Thus, the share value includes the current value of dividends which is calculated as below (equation 5).

\[ V = \frac{D_0 (1+g)}{k_t - g} \]

Where \( D_0 \) is the cash earnings of the under study year, \( g \) is the growth rate and \( k_t \) is the expected rate of return. Method of \( g \) calculation: we assume \( V_0 \) is equal with the value of one variable in year 0 (base year) and \( V_t \) is equal with value of its variable in next year \( t \) and \( g \) is equal with average of the annual growth rate, so that the below equation is introduced to determine \( V_t \) parameter (equation 6).

\[ V_0 (1+g)^t = V_t \]

Now, it’s easily possible to calculate the compound annual growth rate as below (equation 7):

\[ (1 + g)^t = \frac{V_t}{V_0} \]

\[ g = \left( \frac{V_t}{V_0} \right)^\frac{1}{t} - 1 \]

In the equations that are used to calculate the growth rate, only \( V_t \) and \( V_0 \) variables are considered.

Considering the stock market changes in 2009-2011 in comparison with 2006-2008, calculation of the growth rate will be done by the use of the below equation (equation 8):

\[ g = (\frac{EPS_{88}+EPS_{89}+EPS_{90}}{EPS_{85}+EPS_{86}+EPS_{87}})^\frac{1}{5} - 1 \]

so that the growth rate of EPS is introduced as an estimation of the cash dividend growth rate of the under study companies [4].

Method of \( K_i \) calculation (equation 9)

\[ k_i = K_{RF} + (K_m - K_{RF})B_i \]

\( K_m \): the expected market rate which includes all the stock market of the market portfolio and it’s obtained from division of the whole incomes by the total sum. The income includes addition of all invested sum multiplies by the percentage of contribution of each industry of the whole industry.

\( K_{RF} \): i risk-free rate of return which is often considered as the rate of return on bonds.

\( (K_m - K_{RF}) \): the market risk premium and extra return which should be given to the investors to compensate for the market risk in addition to the risk-free return.

\( B_i \): the systematic risk coefficient is the \( i \)th share (equation 10).

\[ r_i \]: historical share return

\[ r_m \]: the market return
(10)

\[ B_i = \frac{\text{COV}_{im}}{\delta_m} \]

\[ B_i = \frac{\sum (r_i - \bar{r}_i)(r_m - \bar{r}_m)}{\sum (r_m - \bar{r}_m)^2} \]

\( (K_m - K_{RF}) B_i \) is premium of the \( i^{th} \) share. The risk premium of each share depending the fact that beta of the share is less, more or equal with 1 may be less, more or equal with the risk premium of average share or the market risk premium [5].

6- Descriptive Statistics

Firstly, data descriptive statistics of the basic Metals industry companies listed in Tehran Stock Exchange which are studied are calculated. Table 1 indicates the descriptive statistics of the model variables including data related to Mean, Median, Maximum and Minimum, Skewness, strain and… the main central index is Mean indicating Equilibrium point and the center of distribution and it’s a good index to show the center of the data. The Median is another central index which demonstrates the society status that a half of the data is less and a half is more than this value.

<table>
<thead>
<tr>
<th>V</th>
<th>ROE</th>
<th>VARIABLE PARAMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1507.0</td>
<td>0.3</td>
<td>Mean</td>
</tr>
<tr>
<td>739.0</td>
<td>0.2</td>
<td>Median</td>
</tr>
<tr>
<td>10430.0</td>
<td>0.7</td>
<td>Maximum</td>
</tr>
<tr>
<td>0.0</td>
<td>0.0</td>
<td>Minimum</td>
</tr>
<tr>
<td>2321.2</td>
<td>0.2</td>
<td>SD</td>
</tr>
<tr>
<td>2.5</td>
<td>0.5</td>
<td>Skewness</td>
</tr>
<tr>
<td>8.8</td>
<td>3.0</td>
<td>Strain</td>
</tr>
</tbody>
</table>

In general, dispersion parameters are a criterion for determining their dispersion rates to their mean. The most important parameter of dispersion is standard deviation.

7- Hypothesis Testing

The research hypothesis is tested by the use of the Peterson correlation coefficient. The correlation coefficient is one of the criteria used to determine the correlation between two
variables and it also shows the relationship intensity as well as the type of the relationship (direct or inverse). This coefficient is between 1 and -1 and in case there is no relationship between two variables, it’s zero. The Peterson correlation coefficient is a parameter method to be used for data with normal distribution or a large number of data. Such coefficient is calculated as below (equation 11).

\[
r = \frac{\sum xy - \bar{x} \bar{y}}{\sqrt{\sum x^2 - n \bar{x}^2} \sqrt{\sum y^2 - n \bar{y}^2}}
\]

Hypothesis: there is a significant relationship between the DuPont ratio and expected stock price in the basic metals industry companies listed in Tehran Stock Exchange.

Table 2: Result of hypothesis test

<table>
<thead>
<tr>
<th>DuPont ratio</th>
<th>Statistics</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.28</td>
<td>Correlation coefficient</td>
<td></td>
</tr>
<tr>
<td>2.15</td>
<td>t-Statistics</td>
<td>Expected value</td>
</tr>
<tr>
<td>0.04</td>
<td>t-Statistics probability</td>
<td></td>
</tr>
</tbody>
</table>

As table 2 shows p-value of t statistics for correlation coefficient between DuPont ratio and the expected value is equal with 0.04 (p-value ≤0.05) which concludes the correlation between DuPont ratio and the expected value is significant and the hypothesis is verified.

8- Conclusion

Considering the theoretical basis, the hypothesis states that there is a significant relationship between DuPont ratio and the expected value of the basic Metals industry companies listed in Tehran Stock Exchange. The hypothesis is tested by the use of the Peterson correlation coefficient. Based on the table 2 showing the hypothesis result, p-value ≤0.05 and equal with 0.04. As a result, the correlation between DuPont ratio as a return on equity and the expected value as an intrinsic value of share is significant and the hypothesis is verified.

9- Proposals

It’s recommended to the investors of Tehran Stock Exchange not only to consider the stock price, but also to consider other criteria of measurement.
References


