Determinants of P/E Ratio: An Empirical Study on Listed Manufacturing Companies in DSE

Kumar Debasis Dutta*, Mallika Saha**, Dibakar Chandra Das***

*Assistant Professor, Department of Finance & Banking, Patuakhali Science & Technology University, Bangladesh
**Assistant Professor, Department of Accounting & Information Systems, University of Barisal, Bangladesh
***Lecturer, Department of Business Administration, Global University Bangladesh, Bangladesh

Abstract: Price-to-Earnings ratio, one of the most widely used tools for stock selection, a relative valuation technique which always remained as a center concern of investors and market analysts. Variations of P/E ratio have significant impact on investor’s perception and several factors are responsible for the variations of P/E ratio. This paper is an attempt to identify the major determinants for P/E ratio of manufacturing companies listed in Dhaka stock exchange. Descriptive statistics, correlation matrix and regression analysis are used to accomplish the objectives of this paper. Results reveal that dividend yield, leverage, size and net asset value per share are significant determinants of P/E ratio where dividend yield and size have negative influence but leverage and net asset value per share have positive influence on P/E ratio. This paper is an evidence for fundamental analysts or decision makers to evaluate determinants that explain variations in Price-to-Earnings ratio of manufacturing firms of Bangladesh.

Keywords: Bangladesh, DSE, Manufacturing firms, P/E ratio etc.

1. INTRODUCTION:

Organization’s long run survival or potentiality largely depends on its competitive advantages. Possibility of creating these competitive advantages largely depends on its competitiveness in stock market. Publicly listed companies always try to capture relative attractiveness in the stock market and wealth maximization goal always direct the firm to do so. But from the opposite side the investors try to judge the absolute position and the relative attractiveness of the firm. In this context the researchers, market analysts, fund managers and investors rely on various valuation techniques. However most of them rely on Price-to-Earnings ratio for valuing and evaluating individual stocks. (Molodovsky 1953), where P/E ratio is a useful metric for evaluating the relative attractiveness of a company's stock price compared to the current earnings of a firm. P/E ratio, measured as dividing stock price by earnings per share, alternatively known as “Price Earnings Multiples”. Considerable research has focused on Price-to-Earnings (P/E) ratio in analyzing the stock market performance through time series analysis. Sometimes these comparisons of P/E ratio may be misleading due to lack of relevancy of this ratio in firm performance unless changes in the underlying fundamental determinants of P/E are taken into account. Previously researchers tried to identify the determinants of P/E ratio that can influence investor’s confidence towards firms for making investment decisions. Existing literature has studied the determinants of Price-to-Earnings (P/E) ratio by using various proxies of growth, dividend payout, risk and discount rate generally in developed countries (Dudney et el., 2008; Shamsuddin and Hiller, 2004 and White, 2000). However, some studies have analyzed the factors influencing price earnings ratio in developing countries (Kumar and Warne 2009; and Ramcharran 2002). Additionally to firm-specific factors, fewer studies have examined sector, size and year effects (Kumar and Warne, 2009; and Anderson and Brooks, 2006). The result was mixed and not conclusive in nature. Here this paper is also an attempt to identify some conclusive remark about the major determinants of P/E ratio.

2. LITERATURE REVIEW:

Price-to-earnings ratio has gained enormous concern for evaluating individual stocks among the investors and other related parties. Numerous studies have been performed regarding the P/E ratio. Empirical results from these studies are mixed and sometimes controversial. This study is an attempt to reveal the determinants of P/E ratio, which was performed previously by different researcher but quite in different context. Dr. O. B. Emudainohwo (2017) examined that dividend growth rate has negative impacts on P/E ratio but results are not sufficient to explain movements in P/E ratio for non-financial firms listed in the NSE over the period examined. Although, the results are not sufficient to explain movement in P/E ratio, it however tends to suggest that dividend growth rate is inversely related to P/E ratio, but not moving in the same direction as theoretically expressed.
E. Nikbakhi & C. Polat (1998) stated that increase in DPS over time while maintaining a long-term growth rate is expected to relate with higher P/E ratio. Perhaps, due to promising information contents from firms, the relatively more dividend paying firms should be related with relatively higher P/E multiples.

T. Afza and S. Tahir (2012) found that dividend payout ratio is the most important determinants of price earnings ratio. Y. R. Bhattrai (2014) and Dr. M. Azam (2010) found that dividend payout ratio has the significant positive association with P/E ratio but M. Taliento (2013) identify that dividend payout ratio has insignificant relationship with price earnings ratio. In the study of Dr. M. A. Almumani (2014), it is found that dividend payout ratio is negatively correlated with price earnings ratio. In the study of H. Wenjing (2017), it is found that dividend payout ratio does not effect on the price earnings ratio. B. Jitmaneeroj (2017) concludes that the relationship between dividend payout ratio and price earnings ratio is insignificant.

M. Taliento (2013), Y. R. Bhattrai (2014) and B. Jitmaneeroj (2017) considered dividend yield in their study to correlate with price earnings ratio. (Marco Taliento, 2013) found the negative association between dividend yield and P/E ratio. In the study of Y. R. Bhattrai (2014), it was found that dividend yield showed the significant inverse association with share price and also found that dividend yield is the most influencing factors in determining share price in Nepalese commercial banks. B. Jitmaneeroj (2017) considers dividend yield in his study and that is positively correlated with price earnings ratio.

The earnings growth showed insignificant relationship with price earnings ratio (Dr. T. Afza and Ms. S. Tahir, 2012). In the study of Dr. M. Azam (2010), it was found that earnings growth has significant positive effect on price earnings ratio. Richard et al. (2014) examine the earnings growth in their study that is the significantly related to changes in price earnings ratio. K. C. Parker (2005) found there to be a positive relationship between the payout ratio and earnings growth across the United States, Canada and Australia, with the relationship weakest in Australia over the period 1956 to 2005. In this report earnings growth shows insignificant relationship with price earnings ratio at 5% level of significance.

Dr. T. Afza and Ms. S. Tahir (2012) found that leverage is negatively correlated with price earnings ratio. The estimated results a negative effect of leverage on P/E ratio, supporting of H. Ramcharran (2002), C. P. Jones (2000), and W. Beaver and D. Morse (1978). H. Arslan, Y. Iltas and T. kayhan (2017) argued that P/E decreases as the leverage of company increases. The uprend in leverage bodes the bankruptcy risk of the firms. This has a negative effect on market multiples. The increase in the working capital need is also a sign of risk levels of the companies and it decreases PE ratios, all other factors are fixed, in the average. In other words, even if the company has a strong net profit, it may lose its net profit due to investment in working capital and cannot generate cash in the bottom line. Investors seem to take this into account working capital effect in the target PE formation.

M. Taliento (2013) and H. Wenjing (2017) in their study they used return on equity (ROE) to correlate price earnings ratio. H.Wenjing (2017) illustrates that (ROE) is the direct determinant of P/E ratios conclude that ROE is negatively related with P/E ratio. S. H. Penman (1996) gave a detailed discussion about the theoretical essence of P/E ratio and return on equity (ROE). The study concludes that P/E ratio is a united decision of current and future ROE; it has negative relation between current ROE. J. Ohlson and Z. Gao (2006) theoretically predict a U-shaped relation between the forward P/E ratio and return of equity (ROE). They propose that firms with very high or very low ROE have higher forward P/E ratio than other firms.

Dr. Talat Afza and Ms. Samya Tahir(2012), Yuga Raj Bhattrai (2014), Gurdip Baksi and Amy Chan (2000), Keith Anderson and Chris Brooks (2006), Anthony Flint, Andrew Tan and Gary Tian (2010), Dr. Mohammad Abdelkarim Alhumani (2014) used firm’s size as their independent variable to correlate with price earnings ratio. Dr. Talat Afza and Ms. Samya Tahir (2012) found a negative relationship of size with P/E ratio for the first three years of study i.e. 2005, 2006 and 2007, whereas sign turned to positive for the next two years i.e. 2008 and 2009. This implies that during the stock market growth, investors value more the shares of small firms as they have growth opportunities but as the stock market start declining investors pull out their investments from small firms and prefer to invest in the shares of large and stable firms. In Yuga Raj Bhattrai (2014), it was found that size is significantly positively related with price earnings ratio which means that these variable move together with share prices. Anthony Flint, Andrew Tan and Gary Tian (2010) found in his research paper that the size variable indicates that larger firms have slower earnings growth than smaller firms.

Dr. T. Afza and Ms. S. Tahir (2012) found that Tobin’s Q remains the most important determinants of price earnings ratio for pooled as well as time series analysis.

3. RESEARCH PROBLEM AND QUESTIONS:
In capital market P/E ratio is one of the most dominant factors. Furthermore, many studies have conducted to make a concluding remark about the determinants of P/ E ratio. But in real world, this issue is a complex term because the uniqueness of each market and each industry can alter noticeably the ultimate conclusion. Till now, it’s an unresolved issue and this is highly true for the country like Bangladesh where the capital market is not enough matured in terms of quality and time. So this article is an attempt to identify the validity of some most common factors as the determinants of P/E ratio.

In this context, the research question of this article is as follows:
Whether the dividend growth, dividend payout ratio, dividend yield, earnings growth, leverage, net asset value per share, return on asset, return on equity, size, and tobin’ Q have any relationship with P/E ratio?

Whether the relationships of dividend growth, dividend payout ratio, dividend yield, earnings growth, leverage, net asset value per share, return on asset, return on equity, size, and tobin’ Q with P/E ratio are positive or negative and in what extent?

4. RESEARCH METHODOLOGY:

a. Sampling and data collection:
This article is an outcome of all the listed manufacturing firms in Dhaka Stock Exchange (DSE). The sample of the study consists of 45 companies. So at first instance there were 225 samples but unavailability some companies are excluded from the final sample. The period for this study is selected from 2011 to 2015. All the data are secondary in nature and are collected from the financial statement of the selected companies.

b. Variable description:
This article is an attempt to identify the determinant of P/E ratio. So price/earnings ratio is the dependent variable for this study. In this respect, a large number of factors are available as independent variables. We have selected ten factors as dependent variable i.e. dividend growth, dividend payout ratio, dividend yield, earnings growth, leverage, net asset value per share, return on asset, return on equity, size and tobin’ Q.

Dependent Variable:
Price-earnings ratio (P/E ratio): The price-earnings ratio (P/E ratio) measures its current share price relative to its per-share earnings. The price-earnings ratio is also sometimes known as the price multiple or the earnings multiple.

\[
\text{Price-earnings ratio (P/E ratio)} = \frac{\text{Market Value Per Share}}{\text{Earnings Per Share}}
\]

Independent variables:
Dividend growth (DG): Dividend growth rate is the annual percentage rate of growth that a dividend achieves over one year.

\[
\text{Dividend growth} = \frac{D_{t} - D_{0}}{D_{0}}
\]

Dividend payout ratio (DPR): Dividend payout ratio indicates the portion of net income that is distributed to shareholders in the form of dividends during the year. The formula is below:

\[
\text{Dividend payout ratio} = \frac{\text{Dividend}}{\text{Net Income}}
\]

Dividend Yield (DY): Dividend yield indicates how much a company pays out as dividends each year relative to its share price. Dividend yield is calculated as follow:

\[
\text{Dividend Yield} = \frac{\text{Dividend}}{\text{Share Price}}
\]

Earnings Growth (EG): This ratio measures the growth of company's net income over a specific period, often one year. The formula is as follow:

\[
\text{Earnings growth} = \frac{N_{t} - N_{0}}{N_{0}}
\]

Leverage ratio (Lev.): Leverage ratio indicates that how much asset comes in the form of debt (loans) and assesses the ability of a company to meet financial obligations.

\[
\text{Leverage} = \frac{\text{Total Debt}}{\text{Total Assets}}
\]

Net Asset Value per Share (NAVPS): Net asset value per share indicates the value of a share which is calculated by subtracting total liabilities from total assets and dividing the result by the number of shares that exist. The formula is as follow:

\[
\text{Net Asset Value per Share} = \frac{\text{Total Assets} - \text{Total Liabilities}}{\text{Number of Outstanding Share}}
\]

Return on assets (ROA): Return on assets measures the company’s profitability in respect to its total assets. The formula is as follow:

\[
\text{Return on Assets (ROA)} = \frac{\text{Net Income}}{\text{Total assets}}
\]

Return on Equity (ROE): Return on equity is the amount of net income returned as a percentage of shareholders equity. The formula is as follow:

\[
\text{Return on Equity (ROE)} = \frac{\text{Net Income}}{\text{Total shareholder equity}}
\]

Size (SZ): Firm size can be stated in total of assets or total sales. Here size is measured as natural log of sales.

\[
\text{Size} = \log (\text{total sales})
\]

Tobin’s Q (TQ): The Tobin's Q ratio is initiated by James Tobin of Yale University, Nobel laureate in economics, who argued that the combined market value of all the companies on the stock market should be about equal to their replacement costs. This
ratio is calculated as the total market value of a company i.e. market value of all outstanding share divided by the replacement value of the firm’s assets.

\[
\text{Tobin’s } Q = \frac{\text{Total Market Value of Firm}}{\text{Total Asset}}
\]

c. Procedure of data analysis:
In this study, different statistical tools have been applied. A supporting tool named descriptive statistics has been performed to postulate statistical characterization of the variables. Correlation matrix executes the inter relationship among the variables whereas regression analysis is used to evaluate the determinative relationships of independent variables with the dependent variable.

d. Generation of Hypothesis:
According to the objectives, and taking into account the previous research, the research hypotheses that this study investigates are:

\[\text{H}_01: \text{ There is no significant relationship between dividend growth and P/E ratio.} \]
\[\text{H}_02: \text{ There is no significant relationship between dividend payout ratio and P/E ratio.} \]
\[\text{H}_03: \text{ There is no significant relationship between dividend yield and P/E ratio.} \]
\[\text{H}_04: \text{ There is no significant relationship between earnings growth and P/E ratio.} \]
\[\text{H}_05: \text{ There is no significant relationship between leverage and P/E ratio.} \]
\[\text{H}_06: \text{ There is no significant relationship between net asset value per share and P/E ratio.} \]
\[\text{H}_07: \text{ There is no significant relationship between return on asset and P/E ratio.} \]
\[\text{H}_08: \text{ There is no significant relationship between return on equity and P/E ratio.} \]
\[\text{H}_09: \text{ There is no significant relationship between size and P/E ratio.} \]
\[\text{H}_10: \text{ There is no significant relationship between tobin’ Q and P/E ratio.} \]

e. Research Model:
The following equation is developed to answer the research question of this study:

\[
P/E = \beta_0 + \beta_1 \text{(DG)}_{i,t} + \beta_2 \text{(DPR)}_{i,t} + \beta_3 \text{(DY)}_{i,t} + \beta_4 \text{(EG)}_{i,t} + \beta_5 \text{(Lev.)}_{i,t} + \beta_6 \text{(NAVPS)}_{i,t} + \beta_7 \text{(ROA)}_{i,t} + \beta_8 \text{(ROE)}_{i,t} + \beta_9 \text{(SZ)}_{i,t} + \beta_{10} \text{(TQ)}_{i,t} + \varepsilon_{i,t}
\]

Where,

\[
\begin{align*}
\text{DG} & : \text{Dividend growth} \\
\text{DPR} & : \text{Dividend payout ratio} \\
\text{DY} & : \text{Dividend yield} \\
\text{EG} & : \text{Earnings growth} \\
\text{Lev} & : \text{Leverage} \\
\text{NAVPS} & : \text{Net asset value per share} \\
\text{ROA} & : \text{Return on asset} \\
\text{ROE} & : \text{Return on equity} \\
\text{SZ} & : \text{Size} \\
\text{TQ} & : \text{Tobin’ Q} \\
\varepsilon & : \text{Error}
\end{align*}
\]

5. RESULT AND DISCUSSION:
a. Descriptive statistics and Correlation matrix:

<table>
<thead>
<tr>
<th>Table-01: Descriptive Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>P/E</td>
</tr>
<tr>
<td>DG</td>
</tr>
<tr>
<td>DPR</td>
</tr>
<tr>
<td>DY</td>
</tr>
<tr>
<td>EG</td>
</tr>
<tr>
<td>Lev</td>
</tr>
<tr>
<td>NAVPS</td>
</tr>
<tr>
<td>ROA</td>
</tr>
<tr>
<td>ROE</td>
</tr>
<tr>
<td>SZ</td>
</tr>
<tr>
<td>TQ</td>
</tr>
</tbody>
</table>
Table 1 depicts the descriptive statistics of the sample which includes the minimum value, maximum value, mean value and standard deviation. Price earnings ratio shows a mean value of 30.02% and standard deviation of 19.64%. Though the minimum value of P/E ratio is 2.43% but the mean value is satisfactory for the investors. NAPVS has highest standard deviation i.e. 443.49%, which indicates the high volatility. Leverage has the lowest standard deviation among all the variables. This indicates that during the study period, the listed manufacturing firms of DSE have same proportion of debt in respect of the total assets. Average dividend growth i.e. 1.35% indicates that selected companies have a positive dividend growth.

Table 2 is showing correlation coefficients between sets of variables. Net asset value per share (NAPVS) is showing a significant positive relationship with P/E ratio and this relationship is significant at 1% level of significance. If NAPVS of the firms increase, then P/E ratio will increase and vice versa. Size has a significant negative relationship with P/E ratio at 1% level of significance. P/E ratio has insignificant positive relationship with dividend growth and leverage but insignificant negative relationship with dividend payout ratio, dividend yield, earning growth, return on asset, return on equity and tobin’s Q.

b. Regression analysis:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>(Constant)</td>
<td>118.930</td>
<td>17.977</td>
</tr>
<tr>
<td>DG</td>
<td>0.397</td>
<td>0.320</td>
</tr>
<tr>
<td>DPR</td>
<td>0.800</td>
<td>2.899</td>
</tr>
<tr>
<td>DY</td>
<td>-1.802</td>
<td>0.948</td>
</tr>
<tr>
<td>EG</td>
<td>-0.261</td>
<td>0.278</td>
</tr>
</tbody>
</table>

F value is significant at 1% level of significance (i.e. F test: 5.219; Sig: 0.000). This indicate that the overall model is significant, so the independent variables have a relationship with P/E ratio.

Regression coefficient results are shown in the above table. Results show that some variables have insignificant relationship where others have insignificant relationship with P/E ratio. Dividend yield has statistically significant impact on P/E ratio. Coefficient of dividend yield indicates a negative impact and theoretically this relationship is also valid because the denominator of dividend yield is the numerator of P/E ratio. Leverage has significant positive impact on P/E ratio. Theoretically this is correct if the inclusion of debt decrease the earning capacity of the firm. Again if the inclusion debt increases the earning capacity, then P/E will also increase but this would be possible in the long run. Because usually market will take some time to realize the earning potentiality of that respective firm. Net asset value per share has significant positive impact on P/E ratio. This empirical result is also consistent with theory because if the number of outstanding share remains constant then an increase in NAPVS will results an increase in asset directly or indirectly. This will create a positive perception among the investors, though an increase in the earnings may lower the P/E ratio but this will ultimately increase the share price at a large scale resulting higher P/E ratio. Empirical result is showing that size has a significant negative impact on P/E ratio reflecting that investors are more willing to invest in small firms.

CONCLUSION

Share valuation is a prerequisite for the investors in making investment decisions. From investor’s perspective, they try to measure the actual value of stock so that they don’t lose their invested funds. But from company’s perspective, it tries to make positive perception about its stock among the investors. P/E ratio is a medium for both parties to communicate with each other. P/E ratio simply indicates the share price against earning. In normal sense, higher P/E ratio indicates better position of a firm and vice versa. So a firm may increase P/E ratio by reporting less earnings less than actual figure if it wants to make foolish the investors. Determinants of P/E ratio may be irrelevant for technical analysts. But no scope is left for fundamental analysts to overlook the relevancy of determinants in valuing P/E ratio. Valuing the listed manufacturing firms, now investors may consider the dividend yield, leverage, size and net asset value per share as the most significant determinants of P/E ratio. But this article is failed to reveal the significance of other selected variables i.e. dividend growth, dividend payout ratio, earnings growth, return on asset, return on equity, tobin’s Q as the determinants of P/E ratio. Because some selected samples were deducted due to unavailability of data. The selected variables don’t cover all possible factors. In spite of these limitations, still this article is an empirical evidence for the fundamentals analysts.

REFERENCES


http://dx.doi.org/10.29322/IJSRP.8.4.2018.p7624


Muhammad, A. (2010). Factors Influencing the Price-Earnings Multiples and Stock Values. Interdisciplinary Journal of
Contemporary Research in Business, Vol. 2, No. 5, pp. 105-139


Taliento, M. (2013). Determinants of Price to Earnings Multiple around the World Recent Findings. International Review of
Business Research Papers, Vol. 9, No. 4, Pp. 1 – 21

Rothovius.
AUTHORS:
First Author – Kumar Debasis Dutta, MBA, BBA, Assistant Professor, Department of Finance & Banking, Patuakhali Science & Technology University, Bangladesh and debasisdutta@live.com
Second Author – Mallika Saha, MBA, BBA, Assistant Professor, Department of Accounting & Information Systems, University of Barisal, Bangladesh and mallikasaha.bu@gmail.com
Third Author – Dibakar Chandra Das, MBA, BBA, Lecturer, Department of Business Administration, Global University Bangladesh, Bangladesh and dibakar2edu@gmail.com

Correspondence Author – Dibakar Chandra Das, dibakar2edu@gmail.com, dibakar2jobs@gmail.com, +8801719017940.