Price Earnings Ratio and Stock Return Analysis (Evidence from Liquidity 45 Stocks Listed in Indonesia Stock Exchange)

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ABSTRAK

Price to Earnings Ratio (PE Ratio) telah umum digunakan oleh analis dan investor untuk pemilihan saham. Saham-saham dengan PE Ratio yang rendah dianggap memiliki harga saat ini yang murah sehingga diharapkan dapat memperoleh return yang tinggi pada periode berikutnya. Penelitian ini bertujuan untuk menguji kemampuan memprediksi return saham berdasarkan hubungan antara PE Ratio dan return saham pada periode berikutnya. Secara lebih spesifik, untuk menguji apakah saham-saham dengan PE Ratio yang tinggi akan diikuti dengan return saham yang rendah pada periode berikutnya dan sebaliknya saham-saham dengan PE Ratio yang rendah akan diikuti dengan return saham yang tinggi. Penelitian ini menggunakan saham-saham yang tergabung dalam Likuiditas 45 selama periode observasi tahun 2005-2010 sebagai sampel. Hasil penelitian menunjukkan bahwa terdapat perbedaan yang signifikan antara return portofolio saham dengan PE Ratio yang rendah dan PE Ratio yang tinggi apabila portofolio tersebut ditahan untuk jangka waktu pendek (6 bulan) tetapi tidak ada perbedaan yang signifikan antara return kedua portofolio saham tersebut apabila ditahan untuk satu, dua, tiga, dan empat tahun. Penelitian ini juga menemukan bahwa tidak ada hubungan yang signifikan antara return saham dan trailing PE Ratio.

Kata Kunci: *price to earnings ratio, pemilihan saham, return saham*

ABSTRACT

Price to Earnings Ratio (PE Ratio) has been broadly used by analysts and investors for stock selection. Stocks with low PE ratio are perceived as having cheaper current price hence expected to generate higher return in subsequent period. This paper aims to examine predictability of stock return using PE Ratio based on historical relationship between PE Ratio and subsequent stock return. Particularly, it seeks to find whether stocks with high PE Ratio followed by low stocks return and on the contrary, stocks with low PE Ratio followed by high stocks return. Using stocks which are included as member of Liquidity 45 and observation period 2005-2010 as samples, results show that there is significance difference between low PE and high PE portfolio stock return in short term (holding period of 6 months) but there is no significance difference between both portfolio stock return if they are hold for one, two, three, and four years. This research also finds that there is no significant relationship between stock return and (trailing) PE Ratio which suggests that (trailing) PE Ratio is not useful in estimating both short term and long term stock returns.

Keywords: price to earnings ratio, stock selection, stocks return

INTRODUCTION

Price to Earnings (PE) Ratio has been extensively used by financial (securities) analysts and investors as an investment tool to pick which stocks to be bought. PE Ratio gains popularity among securities analysts and investors since it is easy to calculate and understand. Thus far, many securities analysts, particularly in Indonesia, recommend investors to buy certain stocks if their PE Ratio is low compared to their counterparts. Stock with low PE ratio is perceived as having cheaper current price hence expected to generate higher return in subsequent period.

Some researches support this PE Ratio hypothesis. Using NYSE common stocks as sample of analysis, Basu (1977, 1983) confirmed by Jaffe *et al*. (1989) found that stocks with high (low) P/E ratios generate lower (higher) returns. Tseng (1988) conclude that low PE ratio portfolios are found to have higher risk adjusted return than high PE ratio portfolios. Trevino & Robertson (2002), using US stock market data, found that current PE ratios are

useful in estimating long-term average stock returns but not for short-term average stock returns.

On the contrary, some studies find that there is no significant relationship between PE Ratio and stock return. Ahmed (2003) found that there is no significant relationship between yearly return of S&P 500 Index and PE Ratio. Asri (2002a, 2002b) tested the existence of low PE Ratio effects in Indonesia stock market using 267 stocks listed in Jakarta Stock Exchange and selected the period of 1994-2000 as the focus of analysis. He found that low PE effect does not exist in Indonesian market. However, his finding about the non existence of low PE effect could be caused by illiquid stocks categorized in low PE portfolio. Illiquidity issue is the biggest shortcoming of his research.

Mixed result of the relationship between PE Ratio and stock return and the shortcoming of previous research motivate author to carry out this research in Indonesia stock market using Liquidity 45 stocks listed in Indonesia Stock Exchange (IDX) as sample. Since Liquidity 45 stocks are used instead of all stocks listed in IDX, this research does not suffer from illiquidity stocks concerned in previous research. Results of this study can be used by securities analysts and investors for their investing strategy. If low PE Ratio investing strategy works in Indonesia stock market, investors could earn systematically above average return by investing in liquid stocks with low PE Ratio. Therefore this paper attempts to analyze whether stocks with high PE Ratio followed by low stock return and on the contrary, stocks with low PE Ratio followed by high stock return. This study can indicate the predictability of stock return using PE Ratio by examining historical relationship between PE Ratio and subsequent stock return.

LITERATURE REVIEW

PE Ratio is widely used and recognized by securities analysts and investors for common stocks valuation. Basically, PE Ratio can be calculated by dividing stock price per share with its earnings per share. However there are two main variations of PE Ratio, based on the way it is calculated, which are trailing (current) PE and leading (forward) PE. The usage of most recent four quarter or past 12 months EPS in the denominator resulting in trailing PE while the usage of next year expected EPS in the denominator resulting in leading PE. For the purpose of prediction, the usage of forecasted EPS (usually based on analysts' consensus estimates) is preferable than most recent four quarter or past 12 month EPS. However, unlikely for listed companies in US stock exchange which their analysts' earnings growth rate forecasts can be obtained from I/B/E/S database, there is no database which provide those information in Indonesia. Therefore, this research uses EPS as reported in company audited financial statements. Using Gordon Growth Dividend Discount Model, PE Ratio can be calculated as follows:

$$\frac{P_0}{E_0} = \frac{D_0 \times (1+g)/r - g}{E_0} \tag{1}$$

which can be rearranged to

$$\frac{P_0}{E_0} = \frac{D_0 / E_0 \times (1+g)}{r - g} \tag{2}$$

From the model above, we know that fundamental factors affecting PE Ratio are dividend payout ratio (D_0 / E_0), expected constant dividend growth rate (g), and stock's required rate of return (r) which reflecting its risk. From the equation, it can be seen that dividend payout ratio and expected growth rate have positive relationship with PE Ratio while stock's required rate of return has inverse relationship to PE Ratio. Holding all else constant: 1) the higher the dividend payout ratio (D_0 / E_0), the higher the PE ratio, 2) the higher the expected growth rate (g), the higher the PE Ratio, and 3) the higher the stock's required rate of return (r), the lower the PE Ratio. From this relationship, therefore, stocks with high PE Ratio often called "growth stocks" since the higher the expected growth rate, the higher the PE Ratio while stocks with low PE Ratio often called "value stocks".

Damodaran (2006) states that other things held equal, higher growth firms will have higher PE ratios than lower growth firms. Other things held equal, higher risk firms will have lower PE ratios than lower risk firms and other things held equal, firms with lower reinvestment needs will have higher PE ratios than firms with higher reinvestment rates. However, he also reminds that other things are difficult to hold equal since high growth firms tend to have risk and high reinvestment rates.

PE Ratios is one multiple in relative valuation besides price to book value, price to sales and many others. In relative valuation, value of an asset is compared to the values assessed by the market for similar or comparable assets. In other words, price multiples (one of them is PE Ratios) of a particular stock is compared to a benchmark value of the multiple to evaluate whether it is relatively fairly valued, relatively undervalued, or relatively overvalued (Stowe *et al*., 2007). Many analysts often use

PE Ratio multiples in their valuation to make recommendation to buy, hold, or sell stocks. Particularly, they make recommendation to buy certain stocks with low PE Ratio compared to their counterparts because they are perceived to be undervalued relative to their counterparts.

According to the mispricing view, there is an inverse relation between P/E ratio and portfolio stock returns. Specifically, stocks with low P/E ratios earn significantly higher returns than stocks with high P/E ratios suggesting that an investor could earn higher returns by investing in low P/E ratio portfolios. Basu (1977) introduced this proposition and carried out empirical research to test the hypothesis. Using NYSE industrial firms in the period of September 1956 - August 1971, he found that low PE Ratio portfolios earn superior risk adjusted returns. Basu (1983) enhanced his previous research and found that high Earning Price (low PE) stocks earned significantly greater risk adjusted returns even after controlling for firm size. Tseng (1988) and Jaffe *et al.* (1989) found similar results which show that low PE ratio portfolios have higher risk adjusted return than high PE ratio portfolios. Fama & French (1992) also found positive abnormal returns related with low PE stocks. Trevino and Robertson (2002) examine the relationship between current PE ratios and subsequent stock market average returns using US stock market data. Their findings indicate that PE ratios are not useful in predicting short term returns but useful in estimating long-term average stock returns. In emerging equity markets, Aydogan & Gursoy (2000) conclude that the relationship between Earning Price Ratio (EP), PBV, and future returns has low explanatory power in the models estimated.

On the contrary, some studies find that there is no significant relationship between PE Ratio and stock return. Ahmed (2003) performed regression analyses between PE Ratio and yearly stock returns from S&P 500 index in periods 1992-2001 and 1983-2001 to examine correlation between both variables. He found that PE Ratio does not have significant relationship with yearly return both before and after risk-adjusted scenarios. Asri (2002a, 2002b) scrutinized the existence of low PE Ratio effects in Indonesia stock market using 267 stocks listed in Jakarta Stock Exchange and selected the period of 1994-2000 as the focus of analysis. He found that low PE effect does not exist in Indonesian market. However, his finding about the non existence of low PE effect could be caused by illiquid stocks categorized in low PE portfolio.

RESEARCH METHODOLOGY

This research uses Liquidity 45 stocks listed in Indonesia Stock Exchange (IDX) as sample. PE Ratio is calculated by dividing current stock price with earning per share. This research use Earning Per Share (EPS) as reported in the audited financial statement. The dependent variable in this research is average holding period return while the independent variable is PE Ratio.

Holding Period Return

$$HPR = \frac{P_t - P_{t-1}}{P_{t-1}} \tag{3}$$

P_t = Stock Price at time t

P_{t-1} = Stock Price at time t-1

PE Ratio (PER)

$$PER = \frac{Current\ market\ price\ of\ stock}{EPS\ over\ the\ last\ 4\ quarters} \tag{4}$$

After calculating PE Ratio of individual stocks which are member of Liquidity 45 stocks listed in IDX, stocks are ranked by their PE Ratios from the highest to the lowest. Stocks in one third of top quintile are categorized as stocks with high PE Ratio while stocks in one third of bottom quintile are categorized as stocks with low PE Ratio.

Descriptive statistics and ANOVA are carried out to examine whether subsequent low PE stock portfolio return is significantly different with high PE stock portfolio return. Paired sample t-test is employed to examine mean difference between subsequent low PE stock portfolio return and high PE stock portfolio return for various holding period (6 months, 1, 2, 3, and 4 years). Null hypothesis and alternative hypothesis for tests of mean difference are as follows:

$$H_0 : \mu_x - \mu_y = D_0$$

$$H_1 : \mu_x - \mu_y \neq D_0$$

The decision rule is reject H_0 if

$$\frac{\bar{d} - D_0}{s_d / \sqrt{n}} < -t_{n-1,\alpha/2} \text{ or } \frac{\bar{d} - D_0}{s_d / \sqrt{n}} > t_{n-1,\alpha/2} \tag{5}$$

This research uses $\alpha = 0.05$.

After that, linear regression between PE Ratio and stock return is carried out to examine the relationship between both variables. The linear regression model is:

$$Y_i = b_0 + b_1 X_i + \varepsilon_i \quad (6)$$

Y_i = average portfolio stock return for holding period 6 months, 1, 2, 3, and 4 years

b_0 = intercept of regression line

b_1 = slope (coefficients/parameters) of regression line

X_i = PE Ratios

ε_i = error term

Ordinary Least Squared (OLS) regression is employed to estimate the intercept and slope that minimize sum squared errors. OLS assumes that errors have zero mean, constant variance (homoscedasticity), are uncorrelated with each other and normally distributed. These OLS assumptions are tested before interpreting the results.

RESULTS AND ANALYSIS

Stocks which are included as member of Liquidity (LQ) 45 in the period August 2005-January 2006 are sort based on their calculated PE Ratio. The period of August 2005-January 2006 is deliberately chosen because this paper attempt to examine short term (holding period of 6 months and one year) and long term (holding period for two, three, and four years) subsequent portfolio stock return.

Table 1. Low and High PER Portfolio

Low PER Portofolio	PER	High PER Portfolio	PER
Barito Pacific Timber Tbk	2.10	AdhiKarya (Persero) Tbk	16.64
Internasional Nickel Ind. Tbk	4.94	Indocement Tunggal Prakarsa Tbk	17.67
Gajah Tunggal Tbk.	5.12	Indosat Tbk	18.31
Berlian Laju Tanker Tbk	6.70	Ramayana Lestari Sentosa Tbk	18.84
Astra Internasional Tbk	7.57	Bank Permata	18.90
Aneka Tambang (Persero) Tbk	8.10	Citra Marga Nusaphala Persada	19.01
Panin Life Tbk	8.22	Unilever	22.64
Bakrie Sumatra Plantations Tbk	8.36	Pabrik Kertas Tjiwi Kimia	23.73
Timah Tbk	8.52	GT Petrochem	29.68
Bank Niaga Tbk	8.79	Perusahaan Gas Negara	35.91
Tambang Batubara Bukit Asam Tbk	8.88	Energi Mega Persada	36.35
PP London Sumatera Tbk	9.08	Bank Mandiri	55.03
Kawasan Industri Jababeka Tbk	9.26	Indofood	69.30
		Indah Kiat Pulp	74.74
		Palm Asia Corpora	277.22

Source: IDX Annual Statistics, 2006

After calculating and rank 45 stocks based on their PE Ratio, stocks in one third of top quintile are categorized as stocks with high PE Ratio while stocks in one third of bottom quintile are categorized as stocks with low PE Ratio. In other words, there are 15 stocks in low PE portfolios and 15 stocks in high PE portfolios while 15 stocks with moderate are not used because the focus of this research is for contrasting low PE portfolio and high PE portfolio. However, there are two companies (Semen Cibinong Tbk. and Jakarta International Hotel & Development Tbk.) which are excluded from low PER portfolio because their earnings per share (EPS) and corresponding PER are negative. Negative PER are not really meaningful for the analysis therefore low PER portfolio only consist of 13 stocks. Table 1 shows list of companies included in low PE portfolio and high PE portfolio with their corresponding PE Ratio.

Return of Low and High PER Stocks

Buy and hold approach during observation period is taken to calculate short term returns (holding period of 6 months) and long term returns (holding period of 1, 2, 3, and 4 years). Buy and hold approach means that after buying low PE stocks, investors hold them for certain period of time (6 months, 1, 2, 3, and 4 years), not buying and selling every month. Table 2 shows subsequent holding period 6 months, 1, 2, 3, and 4 years returns for individual stocks classified in low PE portfolio.

Table 3 below shows following holding period 6 months, 1, 2, 3, and 4 years returns for individual stocks categorized in high PE portfolio.

Table 4 below shows average (mean) return of low and high PE stocks portfolio. For calculating portfolio return, it is assumed that investors are investing the same amount of money on each stock inside the portfolio (weighted average). From table 4, it can be seen that average stock return in low PE portfolio is higher than average stock return in high PE portfolio for all holding period (6 months, 1, 2, 3, and 4 years). In a glance, it seems that investing in low PE stocks generate higher subsequent returns than investing in high PE stocks.

However, after tested for mean difference using paired sample t test with $\alpha = 0.05$, it is found that only 6 months holding period return of low PE portfolio which significantly different from high PE portfolio. There are no significance difference between low PE and high PE portfolio stock return in long term (holding period of one, two, three, and four years).

This finding could provide a signal for investors to invest in low PE stocks for short-term time horizon (6 months) in order to realize the benefits (profit taking).

Table 2. Low-PER and Return

Low PER	Rtn6mth	Rtn1yr	Rtn2yr	Rtn3yr	Rtn4yr
Barito Pacific Timber Tbk	-0.42	0.28	2.44	-0.19	0.92
Internasional Nickel Ind. Tbk	0.37	1.27	-0.45	-0.83	-0.75
Gajah Tunggal Tbk.	-0.14	-0.10	-0.33	-0.69	-0.27
Berlian Laju Tanker Tbk	0.56	0.46	0.46	-0.58	-0.39
Astra Internasional Tbk	-0.08	0.43	1.62	0.25	2.46
Aneka Tambang (Persero) Tbk	0.22	0.82	3.18	0.30	1.49
Panin Life Tbk	-0.16	0.14	0.02	-0.52	-0.02
Bakrie Sumatra Plantations Tbk	1.55	1.40	5.01	-0.40	0.38
Timah Tbk	-0.09	3.09	14.00	-0.43	0.16
Bank Niaga Tbk	0.52	1.14	0.69	0.01	0.76
Tambang Batubara Bukit Asam Tbk	0.67	0.59	4.82	2.78	7.78
PP London Sumatera Tbk	0.53	0.81	3.14	0.03	1.91
Kawasan Industri Jababeka Tbk	0.44	0.84	1.01	-0.44	0.32

Table 3. High-PER and Return

High PER	Rtn6mth	Rtn1yr	Rtn2yr	Rtn3yr	Rtn4yr
AdhiKarya (Persero) Tbk	-0.26	0.00	0.38	-0.68	-0.50
Indocement Tunggal Prakarsa Tbk	0.06	0.35	0.96	0.14	2.42
Indosat Tbk	-0.26	0.03	0.22	-0.03	-0.03
Ramayana Lestari Sentosa Tbk	-0.07	0.01	-0.11	-0.46	0.02
Bank Permata	-0.01	0.30	0.21	-0.29	0.14
Citra Marga Nusaphala Persada	-0.22	1.63	1.47	0.17	0.10
Unilever	-0.02	0.36	0.60	0.84	1.63
Pabrik Kertas Tjiwi Kimia	-0.25	-0.44	-0.60	-0.73	-0.38
GT Petrochem	-0.42	-0.38	-0.56	-0.81	-0.55
Perusahaan Gas Negara	0.42	0.13	0.61	0.33	1.27
Energi Mega Persada	-0.20	-0.27	0.65	-0.92	-0.79
Bank Mandiri	-0.01	0.45	0.87	0.02	1.63
Indofood	0.19	0.92	2.21	0.11	3.09
Indah Kiat Pulp	-0.18	-0.19	-0.15	-0.19	1.01
Palm Asia Corpora	0.05	0.01	-0.18	-0.01	-0.90

In the next stage, linear regression between PE Ratio and portfolio stock returns (for holding period of 6 months, 1, 2, 3, and 4 years) are carried out to examine the relationship between both variables. Ordinary Least Squared (OLS) regression is employed to estimate the intercept and slope of PE Ratio for each holding period portfolio return that minimize sum squared errors. This is done to determine whether PE Ratio is a significant factor to predict stock returns in the future, both for short term (6 months) and long term (1, 2, 3, and 4 years) holding period. There are no violations on OLS assumptions that errors have zero mean, constant variance (homoscedastic), are uncorrelated with each other and normally distributed. Therefore, we can continue to the results interpretation. Results from OLS regression are shown in the Table 5.

Results from the regression between portfolio stock return and PE Ratio revealed that both in low PE and high PE portfolios, PE Ratio parameter is not significant at each holding period return. The PE Ratio coefficient is very small, nears zero, and insignificant. It shows that there is no significant relationship between (trailing or current) PE Ratio and stock return. Moreover, R-squared or coefficient of determination from the regression is small which indicate that variation in stock returns cannot be explained well by variation in PE Ratio. Many others factors besides PE that contribute to stock returns.

Table 4. Short-term and Long-term Return of Low & High PER Portfolio

Low PER Portfolio	Mean	High PER Portfolio	Mean	p-value Paired sample t-test
Return 6 month	0.2560	Return 6 month	-0.0787	0.004*
Return 1 year	0.7673	Return 1 year	0.1940	0.052
Return 2 year	2.5100	Return 2 year	0.4387	0.390
Return 3 year	0.0233	Return 3 year	-0.1673	0.507
Return 4 year	0.9833	Return 4 year	0.5440	0.309

Source: SPSS output

Table 5. Linear Regression Coefficient of PER and Short and Long term Return

	Rtn6mth	Rtn1yr	Rtn2yr	Rtn3yr	Rtn4yr
Low-PER					
Constant	0.090	0.504	1.739	0.165	0.494
Low-PER coefficient	0.032	0.051	0.148	-0.027	0.094
p-value	0.145	0.146	0.370	0.551	0.321
R-Square	0.156	0.156	0.062	0.028	0.076
High-PER					
Constant	-0.116	0.226	0.516	-0.208	0.706
High-PER coefficient	0.001	0.000	-0.002	0.001	-0.003
p-value	0.398	0.770	0.662	0.690	0.525
R-Square	0.055	0.007	0.019	0.013	0.032

Source: SPSS output

Even after overcoming illiquidity issue which becomes main concern of previous research done by Asri (2002a, 2002b) and using newer observation period, result of this study find that (trailing or current) PE Ratio is not a significant factor in the prediction of stock returns in the future. This finding suggests that investors cannot systematically achieve superior returns by investing in low PE stocks in Indonesia Stock Market.

Bodie, Kane & Marcus (2008) states that riskier firms will have higher required rate of return hence their PE Ratio will be lower. In other words, stocks with low PE Ratio is not necessary a good bargain since their PE Ratio could be lower simply because they are riskier firm and hence investors demand higher required rate of return. Low PE Ratio stock does not necessarily mean that its current price is cheap or undervalued hence does not necessarily generate higher return in the subsequent period.

Investors need to carefully examine the driver or fundamental factors affecting PE Ratio of particular companies that they want to invest in instead of just following common investing strategy by investing in low PE Ratio stocks. Before deciding whether particular stock is over or undervalued, investors need to examine differences between firms that may affect the PE Ratio. Results of this study also entail investors to consider other fundamental factors of companies instead of just looking at their PE Ratios.

CONCLUSION

In Indonesia, investing in low PE Ratio stocks has been common investment strategy followed by investors. Stock with low PE ratio is perceived as having cheaper current price hence expected to generate higher return in subsequent period. Using stocks which are included as member of Liquidity 45 in Indonesia Stock Exchange with observation period 2005-2010 as samples, findings show that there is significance difference between low PE and high PE portfolio stock return in short term (holding period of 6 months) but there is no significance difference between both portfolio stock return if they are hold for one, two, three, and four years. This finding provides a signal for investors to invest in low PE stocks for short-term time horizon (6 months) in order to realize the benefits (profit taking).

When it is processed further using regression analysis to determine whether PE Ratio is a significant factor to predict stock returns in the future, both for short term (6 months) and long term (1, 2, 3, and 4 years) holding period, results show that there is no significant relationship between stock return and (trailing) PE Ratio. This finding implies that (trailing) PE Ratio is not useful in estimating both short term and long term stock returns which suggests that investors can not earn systematically above average return by investing in liquid stocks with low PE Ratio. This research uses Earnings Per Share (EPS) as reported in the company's audited financial statement. For further research, the usage of normalized EPS (exclude extraordinary items from earnings) or estimate EPS instead of reported EPS could be explored. This research could be extended in term of period of analyses, portfolio rebalancing, and other independent variables or research methodologies. Decomposition of PE Ratio into a fundamental component and a mispriced component can be carried out to gain deeper understanding and more useful investment tools for investment strategy.

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