RANDOM EFFECT VS FIXED EFFECT STOCK PRICE OF BANKING SECTOR

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Abstract

This study aims to examine the influence of Ownership, EPS, BV and ROA on Stock Price banking sector. The method used is multiple linear regression with the model of Fixed Effect and Random Effect on 12 banks during 4 period 2012 - 2015 (Pooled Data). The results obtained from both models show the variables significantly affect the Stock Price is EPS and ROA. EPS has positive effect and ROA has negative effect. The Hausman test shows the best model is the Fixed Effect model, with the ability to explain 95.6%. One rupiah increase in EPS with the assumption of other independent variables is constant, positively affecting stock price of Rp 22.639. One percent ROA increase with the assumption that other variables are constant, negatively impacting down the stock price by Rp 1408.566. The results of further investigation of both variables, EPS and ROA, EPS variables are stronger and more dominant in explaining the effect on stock prices.

Keywords: Stock Price, Ownership, EPS, BV and ROA

Introduction

The capital market becomes something important and decisive in the current economic era. The capital market is an activity related to the supply and demand of securities such as bonds, sukuk, stocks and others. The capital market can also be interpreted as a market for various long-term financial instruments that can be traded, whether bonds, equities (stocks), mutual funds, derivative instruments or other instruments.

Capital markets also become one of the important indicators in the economy of a country, because this will spur the economic growth of a country. Due to the existence of this capital market will make the sectors of the economy become more developed that will increase the income of a country. Companies can issue their shares for additional capital.

Shares are a sign of capital participation in a company or limited liability company. Many analytical approaches are offered by analysts in analyzing stock price movements. Basically, the analysis of stock movements is divided into two major groups, fundamental and technical analysis. Technical analysis is a frequently used analysis. The reason why technical analysis is often used is the value of return on investment can be easily and quickly seen. In contrast to fundamental analysis that takes some time in the process of analyzing stocks. Technical analysis is an analysis that sees stock movement through graphs (Stevens, 2002). The main indicator in technical analysis is the graph. Graph is used as an indicator to monitor stock movement. Technical analysis more see the movement of stock prices from time to time through the graph.
Fundamental analysis tries to estimate stock prices in the future by estimating the value of fundamental variables that influence stock prices in the future and apply the relationship of these variables to obtain stock price estimation. Fundamental analysis is a method of conducting information analysis, projection of the information in order to produce an appropriate assessment for the company (Penman, 2004). The value of a company is influenced by its ability to generate cash flow over a period of time, which is influenced by growth Business (growth) and investment returns made by the company (Copeland, 2000). Analyzing a company means having to do an analysis of financial variables to estimate the intrinsic value of a company's stock, including estimating the discount rate, making a financial projection and presenting the value of the projection.

Bank is a dynamic company that encourages the growth of the national economy. The bank's business is not only a depositor and a lender, but also the creator of the means of payment, monetary stability, and the dynamics of a country's economic growth. Banks are one of the economic veins of a country, without a community bank can not save and send money, obtain additional capital or conduct international trade transactions effectively and aman, Di countries like Indonesia, the bank plays an important role in development because not only as Source of financing for small, medium and large investment credit, but also able to influence business cycle in economy as a whole.

In the stock market, banks have an important role because there are 53 banks that release their shares from 537 issuers or about 10 percent. While the banking sector has the uniqueness of individuals namely state-owned banks and private property. There are 6 banks listed on LQ45 shares, which are the most actively traded stocks with high frequency, is estimated to be the stock with the highest level of liquidity.

The effect of ownership on stock prices depends on empirical studies of factors of ownership on company performance, ROA (Return On Asset), ROE (Return On Equity) and various other financial ratios. In developing research found that factors that affect the performance of a company not only management But also the role of the company owner. Different types of ownership will provide different capabilities and incentives to control managers (Boubakri et al, 2005). Someone’s research (2008), Henhouse et el. (2007), Ngoc and Ramstetter (2004) revealed that the company's performance will be influenced by who is the owner behind the company. This means that the owner is very relevant in determining the company's performance or stock price.

Pamungkas, (2013), obtaining the result of government ownership variable has a significant negative influence on TOBINSQ (stock market value). From these results can be interpreted that the smaller share of state-owned shares ownership by the government, the better the market performance of the BUMN shares. This is in accordance with previous studies that examined and gained similar results (Wei and Varela, 2003, Wei, et al, 2005, Ng, et al, 2008). In contrast to Sari (2012) research, the Tobin'sQ dependent variable shows the coefficient of government ownership as independent variable is not significant, although the coefficient value is positive.
Several previous studies examined the effect of fundamental factors on stock prices gave contradictory results. As the research conducted by Sari (2013), Chile (2010), Alfiriaidy (2010), and Seetharaman (2013) states that the variable Earning Per Share or EPS (one of the company's performance) has a significant effect on stock prices. This research is very different from Guarantor (2012), Ramadhini (2012) and Dania to (2013) which stated that EPS (Earning Per Share) variable has no significant effect on stock price.

There are 2 questions presented to guide the discussion in this paper:

1. How big is the influence of Variable Fundamental to Stock Price of Banking Sector using Model of Fixed Effect and Random Effect?
2. Which of the two models is best?

Fundamental Analysis Overview

As is known fundamental analysis is the study of economics, industry, and company conditions to estimate the stock price of a company. Fundamental analysis focuses on the main data in the company's financial statements to calculate whether the stock price has been appreciated accurately. Fundamental analysis is a method of stock analysis by analyzing data or information related to company performance. The financial statements are the main sources in this analysis including the use of stock ratios such as liquidity ratios, solvency, Return On Assets (ROA), Return On Equity (ROE), Book Value (BV), earnings per share or Earning Per Share (EPS ), Price Earning Ratio (PER) and others.

In this study the author will only focus on 4 fundamental variables, namely Ownership, Book Value (BV), Earning Per Share (EPS) and Return On Assets (ROA).

Ownership

The Agency Cost Theory (Jensen and Heckling, 1976) states that a company's performance depends on the distribution and sharing of ownership between managers and other parties outside the owner. This theory supports the privatization process because it explains that private owners are more motivated than governmental authorities, which in this case are bureaucrats in monitoring, disciplining and rewarding agents-managers to improve the performance of the company.

Different views for the role of ownership structures in companies other than agency costs raised by Barclay and Holderness (1989) and Bebchuk (1999), suggest that owners with high shareholdings may use their position to gain personal benefits, which are not enjoyed by other shareholders. Such benefits may include, for example, the consumption of goods produced by the company, asset extraction or asset acquisitions for insiders. If these benefits have a detrimental effect on the company's performance, a higher concentration of ownership, whether by outsiders or insiders, may actually degrade performance.
Financial studies show that there is a relationship between firm performance (stock prices) and ownership structure. Scholars argue that the relationship between two variables is not only important, but also determines the impact of the company's efforts. There are other academic groups who disagree with this view and state that only day-to-day business manager work can affect its performance.

Seaton and Tina (2007) argue that private shareholders have no motivation and means to control and influence corporate management behaviour. Therefore, both authors believe that some concentration of ownership is necessary to improve organizational performance. Zeitun and Tian (2007) also add that government ownership affects the probability of a negative failure, that a decrease in government contribution in organizational ownership would preclude some companies failing in a few years.

The opinions of Seaton and Tina were opposed by Mullah, Al Baroque, and Kari (2007). Their study found that most concentration groups of ownership (sponsors, agencies, governments, and foreigners) had a negative impact on the company's financial performance, except minority shareholdings (public).

**Book Value (BV)**

Trying (2009) says that Book Value (BV) is the value / price of a book per sheet of issued shares. Book Value per share issued basically represents the amount of assets / equity owned by the company. Knowing the book value of a stock is not only important to know the capacity of the price per share of a share. It is also important to use as a benchmark in determining the fair value of the stock market (market value).

According to Syamsudin (2009) ordinary shareholders will receive a sum of book value of each share, if the assets of the company are sold and after first pay off all debts. BV is the ratio between the book value of capital itself and the number of shares outstanding. The higher the value then the demand for the stock market price is also higher. High BV values will ensure the security of investment in the company, if the stock market price is higher than the BV value, then this indicates that the market believes that the company will generate added value for both investors and companies. The greater the value of the BV ratio, the share will be more attractive to investors so that stock prices will increase. Mathematically BV can be calculated with the Syamsudin formula (2009):

**Total Equity of a Company**

\[
BV = \frac{\text{Total Equity of a Company}}{\text{Number of Shares Circulating} \times \text{Earning per Share (EPS)}}
\]

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Earning per Share (EPS) is an important measure used to measure company performance. EPS is a corporate profit that can be distributed to shareholders. But in practice, not all of these profits can be shared, some are retained as retained earnings.

According to Nag, (1997) Earning per Share (EPS) is the ratio between net profit after tax on one book year with the number of shares issued. Whereas according to Gilman (2009) Earning per Share is the amount that income earned during the accounting period on each stock Commonly circulated, is calculated by dividing the total income available for this period by the share of the number of common shares.

Based on the above description can be concluded that EPS is the ability of the company to set aside part of its earnings to be distributed as earnings per share bias a. Secure logic if the EPS increases, will attract investors to buy the stock, the stock price will increase.

Systematically Earning per Share (EPS) can be formulated as follows, Gitman (2009):

\[
\text{Earning available for common stockholders} = \frac{\text{Return On Assets (ROA)}}{\text{Number of shares of common stockholders}}
\]

\[
\text{Return On Assets (ROA)} = \frac{\text{Earning After Tax}}{\text{Total Assets}} \times 100\%
\]

This ratio thus attributes the net income derived from the company's operations by the amount of assets owned. As ROA improves, the company has the opportunity to provide greater revenue for shareholders. The impact will increase the demand and stock price of the company.
As long as the company is able to increase its profit then any debt will result in an increase in ROA and profitable for the common shareholder. ROA numbers are said to be good if the value is greater 2%, Febriyanto and Nurwiyanta (2014).

**Previous Research**

The study of Raithatha and Banat (2013) shows that volatility (represented by Beta), earnings (represented by earnings per share (EPS), and size represented by market capitalization (MCAP) significantly influence stock prices. Panel data analysis using Housman Fixed effect model.

The Sharif, Profit & Pilli (2015) study analyzed panel panel data from 41 companies listed on the Bahrain Stock Exchange for 2006-2010 period. The results showed that return on equity, book value per share, dividend per share, dividend yield, price Earnings, and firm size are significant determinants of stock prices.

The Naves Study (2013) uses the Fixed Effect Regression Model with dependent SP (stock price) and independent variables, DY (dividend yield), ROA (return on asset), and AG (asset growth). The results show that "size" has a significant positive relationship with stock prices while the other variables (dividend yield, Asset growth, Return on asset) have an insignificant relationship.

Suharto Study (2013) Using Pooled Least Square method for 29 Companies over 6 years (2005 - 2010). The result shows that Good Corporate Government (GCG) and ROA variable have positive and significant influence to Stock Price. Government ownership variables do not significantly affect stock prices.

Study Hade and Yuliandari (2013) using Common Effects, Fixed Effects & Random Effect Model. With panel data of 24 companies in LQ45, with a period of 3 years (2010 - 2012). The result, Book Value per Share (BVS), ROA has a significant positive effect on stock price. While Debt to Equity Ratio (DER) is not significant. Better Housman Test is a Random Effect model.

The Tablemate and Pangemanan (2015) study used multiple regression analysis of data panels from 5 banks over 5 years (2010 - 2014). The result shows EPS variable has positive and significant effect to stock price, while ROE variable is not significant.

Amyulianti and Rating studies (2016) examined the effect of Economic Value Added (EVA) and Earning Per Share (EPS) on stock returns. There are 21 companies in LQ45 being analyzed, using Multiple Regress with panel data. The results showed that Economic Value Added (EVA) had a significant positive effect on Stock Return, while Earning Per Share (EPS) also had a positive effect on Stock Return.

Muriatic (2015) analyzed the effects of factors such as capital structure, firm size and profitability on stock prices on food and beverage companies listed on the Indonesia Stock Exchange. The results of this study indicate that: 1) Debt to equity ratio shows the direction of negative influence is not significant. 2) Debt to asset ratio (DAR) shows the direction of negative
influence is not significant. 3) The size of the company shows the direction of positive influence is not significant. 4) Return on asset shows the direction of negative influence is not significant, this means that the asset Owned by the company can not affect the stock price change, 5) Return on equity shows the direction of positive influence significantly, this means if there is an increase in ROE it will be followed by an increase in stock prices and 6) Net profit margin (NPM) indicates the direction of positive influence not significant.

Tamuntuan (2015) identifies the effects of several financial ratios, namely Return on Equity (ROE), Return on Assets (ROA) and Earnings per Share (EPS), to stock prices of food and beverage companies listed on the Indonesia Stock Exchange. The financial statements of twelve companies in 2010-2014 were collected through purposive sampling method. The results showed that ROE, ROA and EPS simultaneously have a significant effect on stock prices. On the other hand, partially only EPS has a significant effect on stock prices; ROE and ROA both have no significant effect. For those interested to invest in food and beverage companies listed on the Indonesia Stock Exchange should make earnings per share as the main indicator in the process Infestation decision.

Research of Samba, Murrin and Tamika (2016) aims to see the influence of 10 banks with the largest assets of CAR, NPL, LDR and ROA on Stock Price (in Indonesia Stock Exchange / IDX). The data used in this research is financial report published during 2012-2014. This study used 10 samples. The analysis method uses multiple linear analysis model. The results of the first hypothesis testing obtained CAR value of 0.81. Results of testing the second hypothesis obtained NPL value of 0.833. Results of testing the third hypothesis obtained LDR value of 0.22. The fourth hypothesis obtained ROA value of 0.11. Each variable states that CAR and NPL have no significant effect on stock price. LDR is significant and ROA has a significant positive effect on stock prices.

Methods and Research Design


The samples studied were 12 banks, 6 state banks and 6 private banks with the closing stock price of each bank at the end of 2012 - 2015 period. Dummy variables are used to represent ownership variables, D = 1 Government Ownership and D = 0 Private Ownership. Variable BV, EPS and ROA on each bank.

There are 3 testing methods used in this paper:

1. Fixed Effect(FE) Model

This approach takes into account the possibility that researchers face omitted-variable problems, which may lead to changes in intercept time series or cross-section. The FE model adds a
dummy variable to allow for differences in individual characteristics to be accommodated on these intercept differences.

\[ SP_{it} = \alpha + \beta_1 D_{it} + \beta_2 BV_{it} + \beta_3 EPS_{it} + \beta_4 ROA_{it} + \mu_{it} \]

Where, \( SP \) is Stock Price;

\( i \) is the bank code and \( t \) is time;

\( D \) is Dummy variable, if government bank = 1, and 0 for private bank

\(BV\) is book value;

\( EPS \) is earnings per share;

\( ROA \) is Acceptance per asset (Return On Asset)

\( \mu_{it} \) is the disturbance variable;

\( \alpha \) is the intercept parameter; and

\( \beta_1, \beta_2, \beta_3, \beta_4 \) are slope parameters of each independent variable.

2. Random Effect (RE) Model

This RE approach improves the efficiency of least square processes by taking into account errors from time series and cross-section. The RE model is a variation of the generalized least square (GLS) estimation. Differences in individual characteristics and time are accommodated on the error of the model. So in this model there are two residual components, the residual as a whole, which is a combination of time series and cross section, and individual residuals that are random characteristics of the \( i \)-unit observations and are fixed all the time.

\[ SP_{it} = \alpha + \beta_1 BV_{it} + \beta_2 EPS_{it} + \beta_3 ROA_{it} + \epsilon_i + \mu_{it} \]

Where, \( SP \) is Stock Price;

\( i \) is the bank code and \( t \) is time;

\( BV \) is book value;

\( EPS \) is earnings per share;

\( ROA \) is Acceptance per asset (Return On Asset)

\( \epsilon_i \) is individual residual

\( \mu_{it} \) is the disturbance variable;
α is the intercept parameter; and

β1, β2, β3, β4 are slope parameters of each independent variable.

3. Housman Test

The Housman test can be defined as a statistical test to select whether the most appropriate Fixed Effect or Random Effect model is used. The test of Housman test is performed with the following hypothesis:

Ho: Random Effect Model

H1: Fixed Effect Model

Findings and Discussion

Findings

Fixed Effect and Random Effect Model Testing

Table 4.1. Shows the ability to explain the largest model is the Fixed Effect model, R2 Adjusted of 0.956. This means that 95.6% of Dummy (D1), EPS, BV and ROA variables vary along with Stock Price (SP). The remaining 4.4% is explained by other variables. As for the 4 explanatory variables, only 2 significant variables, namely EPS and ROA, while the variable D1 and BV is not significant. One rupiah increase in EPS assuming other independent variables is constant, positively affecting stock price of Rp 22,639. One percent ROA increase with the assumption that other variables are constant, negatively impacting down the stock price by Rp 1408,566.

Table 4.1 Fixed Effect dan Random Effect Model Testing

<table>
<thead>
<tr>
<th>Koefisien</th>
<th>Fixed Effect</th>
<th>Random Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>838.783</td>
<td>595.679</td>
</tr>
<tr>
<td>Prob.</td>
<td>(0.6298)</td>
<td>(0.5340)</td>
</tr>
<tr>
<td>D1</td>
<td>-737.707</td>
<td>-</td>
</tr>
<tr>
<td>Prob.</td>
<td>(0.5803)</td>
<td></td>
</tr>
<tr>
<td>EPS</td>
<td>22.639</td>
<td>18.502</td>
</tr>
<tr>
<td>Prob.</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>BV</td>
<td>-0.763</td>
<td>-0.477</td>
</tr>
<tr>
<td>Prob.</td>
<td>(0.1776)</td>
<td>(0.2549)</td>
</tr>
</tbody>
</table>
Similarly, the Random Effect, the two significant variables are EPS and ROA. A one-rupiah EPS increase will raise the stock price by Rp 18.502. On the contrary, a 1 percent increase in ROA will lower the stock price by Rp 1026.416.

**Housman Test**

Table 4. 2. Demonstrate Housman’s Test, known Prob. Value = 0.0014, significant at $\alpha \leq 0.05$ or 5%. This means, we accept H1 or use the Fixed Effect Model.

**Table 4.2 Housman Test**

<table>
<thead>
<tr>
<th>Correlated Random Effects - Housman Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pool: Untitled</td>
</tr>
<tr>
<td>Test cross-section random effects</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Summary</th>
<th>Chi-Sq. Statistic</th>
<th>Chi-Sq. d.f.</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section random</td>
<td>15.583501</td>
<td>3</td>
<td>0.0014</td>
</tr>
</tbody>
</table>

**Discussion**

Based on Fixed Effect model test, 2 variables that significantly influence stock price movement for 12 banks, Earning Per Share (EPS) and Return On Asset (ROA). Discussion will be conducted around EPS and ROA effects on Stock Price.

**EPS Effect on Stock Price**
The model test shows one rupiah increase in EPS with the assumption that other variables are constant, positively affecting stock price of Rp 22,639. Similar results were also found in Aletheari & Jami (2016) study, that if earnings per share (X1) increased by Rp1, then Share Price will increase by Rp1,747 with other free variable assumption constant.

Research conducted by Ideate & Wahid (2015) on coal mining company listed on BEI found the best model is Fixed Effect with EPS variable affecting Stock Price equal to 5,907 and significant at probability 0.0000.

The results of testing the effect of EPS individually on Stock Price obtained estimation results in Table 4.4.1. Seen the results of estimates in the form of Tables and Figures. The right model shows the relationship is Power Function. With the determination coefficient of 0.935, this means ESP varies with Stock Price (SP) of 93.5%. The remaining 6.5% is influenced by other variables. An increase of 1 (one) percent EPS with the assumption that other variables will constantly impact SP increase of 1.076 percent.

Table 4.4.1 Estimated EPS Effect on Stock Price (SP)

<table>
<thead>
<tr>
<th>Equation</th>
<th>Model Summary</th>
<th>Parameter Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R Square</td>
<td>F</td>
</tr>
<tr>
<td>Power</td>
<td>.935</td>
<td>592.652</td>
</tr>
</tbody>
</table>

The independent variable is EPS.
The positive effect of EPS on SP implicates investor behavior is very consider the amount of revenue to issued shares. The larger the share of the revenue given per share, the greater the demand for the stock, so that the stock price rises.

The effect of EPS brings long-term effects on the SP, as noted by Islam, Khan, Choudhury and Adnan (2014), firms with strong earnings per share (EPS) may experience an increase in share price. This higher stock price can create a positive impression on the company's products in the minds of customers, so that Greater demand, increased sales and ultimately higher revenues. Higher earnings will raise the company's EPS, then the Share Price of the firm.

**Effect ROA Against Stock Price**

ROA, this ratio shows how profitable a company is measured from the total investment (therefore this ratio is often called ROI). ROA provides an overview of how well the management of all assets by management to convert into the company's earnings. The higher this ratio means the better the company's efficiency in utilizing all of its assets.

Not so with Fixed Effect model test results, one percent ROA increase with other constant variable assumptions, negatively impacting lower stock prices by Rp 1408,566. Similar results were also found by Murniati (2015) in his research, concluding that the variable return on asset (ROA) has a negative and insignificant effect on stock prices in food and beverage companies listed on the Indonesia Stock Exchange. This means that the assets owned by the company can not affect the stock price changes. In addition, the high amount of assets will lead to a lot of less productive funds so that the need for allocation of funds that can generate profits, such as expanding business or adding equipment factory.

Based on research Satria (2013), from the data collected, the movement of ROA since 2005 has not shown significant improvement. ROA as a representation of the efficiency of bank performance shows that the ability of banks in processing the source of funds is still very limited. Of course the question is whether this inefficiency is due to internal banking factors or external factors that are generally caused by the high competition in the banking market structure that is urging the bank's business activities, thus causing lower bank profit opportunities.

If we observe the development of ROA against the 12 Bank samples shown in Figure 4.4.2, the average ROA is 1.91 percent and tends to decrease. The average ROA is 1.89% below the good figure, which is greater than 2%, as stated by Febriyanto and Nurwiyanta (2014).

BMRI decreased from 2.52 percent in 2012 to 2.32 percent in 2015. BBNI, from 2.11 percent to 1.8 percent in 2015. BBRI from 3.39 percent in 2012 to 2.89 percent in 2015. Only BBCA Which showed a significant increase, from 2.65 percent in 2012 to 3.03 percent in 2015.
From the two studies above, it can be concluded that the variable that is very influential on stock price is dominated by EPS variable and not caused by variable ROA.

Conclusions and Recommendations

Conclusion

1. Result of testing of both model (Fixed Effect and Random Effect), only significant EPS and ROA variable. The effect of EPS on stock price is positive, whereas the influence of ROA is negative.

2. Housman test results show the best model is Fixed Effect. With the ability to explain 0.956. This means that 95.6% of Dummy (D1), EPS, BV and ROA variables vary along with Stock Price (SP). The remaining 4.4% is explained by other variables. Only 2 significant variables, ie EPS and ROA. One rupiah increase in EPS assuming other independent variables is constant, positively impacting stock price of \( \text{Rp} \) 22,639. One percent ROA increase with the assumption that other variables are constant, negatively impacting down the stock price by \( \text{Rp} \) 1408.566.

3. Further investigation results on both variables, EPS and ROA, EPS variables are stronger and dominant in explaining the effect on stock prices.

Recommendation

1. The weakness of this research is the inability to recognize the influence of both variables, EPS and ROA on stock prices. This is because it is only based on 12 bank samples from 43 banks listed on BEI. The next research is suggested by using Pooled Least Square, Fixed Effect and Random Effect model on 3 groups of banks from 43 banks grouping them based on their asset criteria.

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