A Model for Stock Return Predictability in Indonesia

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This study aims to develop a stock return model in Indonesia. Variables consist of stock return as the dependent variable, profitability, earnings management, and liquidity as the independent variable, leverage as the moderating variable and company size as the control variable. Researchers selected 20 of the most active shares in the volume of trading transactions between 2015-2018 and obtained 60 observations. The selection of this nonlinear regression model is based on the justification for the large coefficient of determination. The results of the data analysis show that liquidity has a significant effect on stock returns. Other independent variables, earnings management profitability, and leverage do not significantly affect stock returns. This finding shows that changes in critical variables have not been responded to by investors or supported by relatively small numbers of determining coefficients. This research makes a contribution to incorporating decision-makers to improve their performance creatively to increase stock returns.

Key words: *Stock return, profitability, liquidity, earnings management, leverage.*

Introduction

The capital market is one of the significant financial markets in Indonesia. Investors who invest their capital in stocks hope to obtain stock returns. Therefore, investors need information about return movements. The phenomenon in Indonesia shows that the change of stock returns on the Indonesia Stock Exchange is fluctuating. During 2018, the Composite Stock Price Index (CSPI) weakened by 3.19%, while the top 10 LQ45 shares had the highest increase since the beginning of the year with a wide range of 4.11% - 113.43% (https: //invest.kontan.co.id, 2018). The results of Aprika and Olii's research (2019) in the Pharmaceutical sub-sector showed that some stocks were overvalued and others undervalued. In the consumer sector, the price of sharia shares listed on the Indonesian Sharia Stock Index between 2013 and2018 fluctuated during period (Insyafiati, 2018).

Several researchers have reviewed a range of factors that influence firm value or stock returns. Lee-Soon & You (2019) studied the effect of capital structure on enterprise value and have shown a positive influence. Nurdin, et. al. (2019) examined the effect of corporate social responsibility disclosure on investor reaction. Arista and Astohar (2012) found that Debt to equity ratio (DER) and Price to book value has a significant effect on stock returns in a manufacturing company. This result varies from the findings of Suharli (2018), according to which debt ratio does not affect stock returns. Several other factors that affect stock returns have been investigated. The effect of profitability, liquidity and leverage on stock returns has been investigated by Sutriani (2014) with the results showing that profitability and leverage significantly influence stock returns. Sunardi (2010) examined company performance factors as measured by ROA and EVA. Neither results affect stock returns and they are consistent with the findings of Andini and Oemar (2016).

Other researchers, including Antara et. al. (2014), have shown a return on equity as a proxy for profitability ratios that have a positive and significant effect on stock returns, while current ratios as proxies for liquidity ratios and assets turnover as proxies for activity ratios have a negative impact. Widyastuti (2007) examined the factors of leverage, profitability, earnings management, and company size with the results of leverage and firm size having a negative effect, while profitability and company size have a positive impact on stock returns. Adhariani (2017) maintains that earnings management has a negative influence on stock returns, while according to Surya and Januarti (2012), earning management patterns before and after an IPO affect stock returns. Muid (2007) found no difference in stock returns in companies that undertook earnings management and those that did not.

Haryanto (2012) has used leverage as a moderating variable for the influence between accounting earnings and stock returns. The result is leverage, not as a moderating variable. Octaviani and Astika (2016) find profitability and leverage as moderating variables to strengthen the effect of dividend policy on firm value. Some of the studies have not included real earnings management as an independent variable and leverage as a moderating variable on the impact between profitability and liquidity on stock returns. In contrast to previous studies, we use variable profitability, liquidity, accrual-based and real-based earnings management as factors influencing stock returns. The originality of this research consists of the use of leverage as a moderating variable. Leverage will strengthen or weaken the effect of profitability and liquidity on stock returns.

This paper is expected to make a contribution to corporate decision-makers to improve their performance creatively in order to increase stock returns. Companies with high stock returns will quickly obtain high sales results if they issue new shares. Also, potential investors and capital market practitioners can get information about factors that affect fluctuations in stock returns which they can use as a reference for choosing stocks that have good future prospects.

The development of Science provides evidence about factors that influence fluctuations in stock returns.

This paper is divided into five parts. The first part explains the background for the justification of the research. The second part reviews previous studies as a basis for developing the hypotheses. The third section contains research samples, definition, and measurement of variables and data analysis techniques. The fourth part consists of data analysis and discussion. Finally, the fifth part includes the conclusions and suggestions.

Literature Review and Hypothesis

Signalling Theory

Researchers use signal theory as a basis for discussing the results of data analysis. According to Melewar and Tucker (2005), signalling theory shows that companies will provide signals through actions and communication (Assagaf, et. al., 2019). The company adopted this signal in revealing hidden attributes to stakeholders. It seeks to provide information through financial statements, provide signals regarding various factors that affect the company's financial status, and communicate strategic and policy steps to improve business performance. This study uses signalling theory as the basis for analysing company stock returns.

Stock Returns and Profitability

Stock return is one tool to measure stock performance. Individual and composite stock returns consist of historical and expected future stock returns. Investors calculate expected stock returns based on past returns (K. Reilly & C. Brown, 2012). Wang & Chin (2004) have examined the interaction between historical returns and historical trading volumes in predicting returns. Realised company stock returns correlate with the overall stock returns of companies listed on the stock exchange (Elton, et. al. 2014).

Research on the stock return and several factors which influence it has been examined extensively. Some researchers have examined the effect of company performance on stock returns including Amel-zadeh (2011), Hao, Jin, & Zhang (2011), (Jia & Yan, 2017), (Oemar, 2018), Arista (2012), Suharli (2005), Kristiana and Sriwidodo (2012). Hao et. al., 2011; Jia & Yan, (2017) use profitability proxies for company performance and find that profitability affects stock returns. Companies that produce greater profits have higher average return (Ball, et. al. 2016). Return on assets (Anwaar, 2016), net profit margin, and return on equity ((Martani & Khairurizka, 2009) have a positive effect on stock returns. Kristiana and Sriwidodo (2012) found that only value-added economic variables had a significant effect on stock returns on the Indonesian stock exchange. Previous research by Carlo (2014) found that return on equity had

a significant impact on stock returns. Profitability with earnings per share proxy significantly affects stock returns (Nuryana, 2013; Emamgholipour, et. al. 2013). Based on the above description, the research hypothesis maintains that:

H1: Profitability has a positive effect on company stock returns.

Liquidity

Liquidity shows a company's ability to pay short-term obligations. High liquidity signals to investors that the company has sufficient sources of funds to settle its short-term debts. Previous research conducted by Sutriani (2014) found that liquidity has a significant effect on stock returns. Similarly, this study maintains the following hypothesis:

H2: Liquidity level has a positive and significant impact on company stock returns.

Earnings management

Earnings management is the manager's behaviour to adjust earnings accordingly without violating accounting principles. There are two types of earnings management, accruals and real. Research by Ambarwati (2017) and Muid (2007) shows that earnings management has a significant effect on stock returns. Similarly, this research proposes the following hypotheses:

H3: Accrual-based earnings management has a positive and significant impact on company stock returns.

H4: Real activities-based earnings management has a positive and significant effect on company stock returns.

Leverage

Several studies have examined the effect of capital structure on firm value with various proxies. Some researchers have used leverage with a debt to equity ratio proxy as an independent variable in stock return research. Arista (2012) found that debt to equity ratio and price to book value variables had a significant effect on stock returns, Suharli (2005) has maintained that stock returns were influenced by two variables, including debt to equity ratio and stock beta. Other studies show that debt-equity ratio positively influences stock returns (Nuryana, 2013). Haryanto (2012) found leverage as a moderating variable that strengthens the relationship between independent variables and stock returns. Based on this study's research results:

H5: Leverage moderates the effect of profitability on company stock returns.

H6: Leverage moderates the effect of the level of liquidity on company stock returns.

Research Methods

This study uses a quantitative approach. Secondary data collection is undertaken by documentation. The research sample was selected using the purposive sampling method which is consistent with studies by Assagaf and Yunus, (2016); Assagaf, (2017); Assagaf, et. al., (2017); Assagaf, et. al., (2017b); Sayidah, et. al., (2019); Sayidah and Assagaf, (2019); Sayidah, et. al., (2019) and Sayidah, et. al., (2020). The criteria consist of the most active shares traded on the Indonesian stock exchange over the past three years and listed in the LQ 45 group. Researchers selected 20 of the most dynamic companies in their stock transactions between 2015 and2018. The result consists of 60 observations.

Variables and Measurements

Dependent variable: Stock Return (Ret)

Stock returns result from the difference in price between the current (t) and previous period (t-1). Stock return is measured using the following formula Suharli (2005):

$$\text{Ret} = \frac{P(t) - P(t-1)}{P(t-1)}$$

Ret= stock return, P(t)= share price of current period, P(t-1) = share price of previous period.

Independent Variable

a. Profitability Growth (X1)
Profitability growth is defined as the percentage rate of change between the return on equity (ROE) of the current period and the return on equity (ROE) of the previous period. The formula has been used by Carlo (2014).

$$P = \frac{ROE(t) - ROE(t-1)}{ROE(t-1)}$$

b. Liquidity (X2)
Corporate liquidity is defined as a company's ability to pay short-term debt. Current assets divided by current liabilities measure liquidity. The formula has been used by Lestari, et. al. (2016).

$$\text{Liq} = \frac{Current\ asset}{Current\ liabilities}$$

c. Accruals-based Earnings Management (X3)

Earnings management based on accruals is a management practice carried out to improve a company's financial statements using accrual transactions. This earnings management variable is taken using the total accrual measurement formula requested by Habib (2004), Baharuddin and Setyanugraha (2008) in Assagaf, et. al. (2019):

$$X3 = ACEM = (\Delta CA - \Delta Cash) - (\Delta CL - \Delta STD) - Depreciation$$

X3 or ACEM equals total accruals; ΔCA is a change in current assets; ΔCL is a change in current liabilities; $\Delta Cash$ is a change in cash and cash equivalents. ΔSTD is debt included in current liabilities.

d. Real activities produce management (X4)

Earning management based on actual activities is a management practice to influence a company's financial statements. Management uses credit sales transactions by offering excessive discounts, increasing production to reduce cost, and reducing discretionary expenditures that are not directly related to the company's revenue or profits. Measurement of real activity variables used in this study which are included in Roychowdhury (2006) in Assagaf, et. al. (2019), follows the below diagram:

Equation (1): Cash flow operations (CFO),
$$CFO_t/A_{t-1} = \alpha_0 + \alpha_1 (1/A_{t-1}) + \beta_1 (S_t/A_{t-1}) + \beta_2 (\Delta S_t/A_{t-1}) + e_t$$
Equation (2): *Cost of goods sold (COGS),*
$$COGS_t/A_{t-1} = \alpha_0 + \alpha_1 (1/A_{t-1}) + \beta (S_t/A_{t-1}) + e_t$$
Equation (3): Changes in inventory (ΔINV),
$$\Delta INV_t/A_{t-1} = \alpha_0 + \alpha_1 (1/A_{t-1}) + \beta_1 (\Delta S_t/A_{t-1}) + \beta_2 (\Delta S_{t-1}/A_{t-1}) + e_t$$
Equation (4): *Production (PROD),*
$$PROD_t/A_{t-1} = \alpha_0 + \alpha_1 (1/A_{t-1}) + \beta_1 (S_t/A_{t-1}) + \beta_2 (\Delta S_t/A_{t-1}) + B_3 (\Delta S_{t-1}/A_{t-1}) + e_t$$
Equation (5): *Discretionary expense (DISEXP),*
$$DEXP_t/A_{t-1} = \alpha_0 + \alpha_1 (1/A_{t-1}) + \beta (S_{t-1}/A_{t-1}) + e_t$$

The measurement procedure of this variable is started by using equation (1) to equation (5), then the residual or abnormal is calculated from five equations:

$$X4 = AREAL_t = ACFO_t + ACOGS_t + A\Delta INV_t + APROD_t + ADEXP_t$$

X4 or AREAL = abnormal or residual of real activities; ACFO = abnormal or residual cash flow operating; ACOGS = abnormal or residual cost of goods sold; AΔINV = abnormal or residual changes in inventory value; APROD = abnormal or residual production costs; ADEXP = abnormal or residual discretionary expense; At = end of year total assets t; St: sales period t.

e. Moderating Variable: Leverage (X5)
Leverage shows the level of debt used to meet the funding needs of operations and investment programs of that company. The leverage variable is measured using Haryanto's (2012) formula:

$X5$ = Total Debt/Total Assets

f. Control Variables: Capital Expenditures (X6) and Firm Size (X7)
Capital expenditure (X6)
Capital expenditure shows the amount of investment made by a company in a certain period. Measurement of capital expenditure variables use Rakhimsyah (2011)'s formula below:

$X6 = (\text{Fixed assets (t)} - \text{Fixed assets (t-1)}) / (\text{Fixed assets (t-1)})$

Company size shows the value of assets used by a company, as recorded in financial statements. Measurement of company size variables use formulas, such as Sudarsono et. al. (2014). Amel-zadeh (2011) found past company performance to be a conditional factor in explaining the effect of company size on stock returns.

$X7$ = Total assets

The variables used are described in the following conceptual framework:

Figure 1. Conceptual Framework
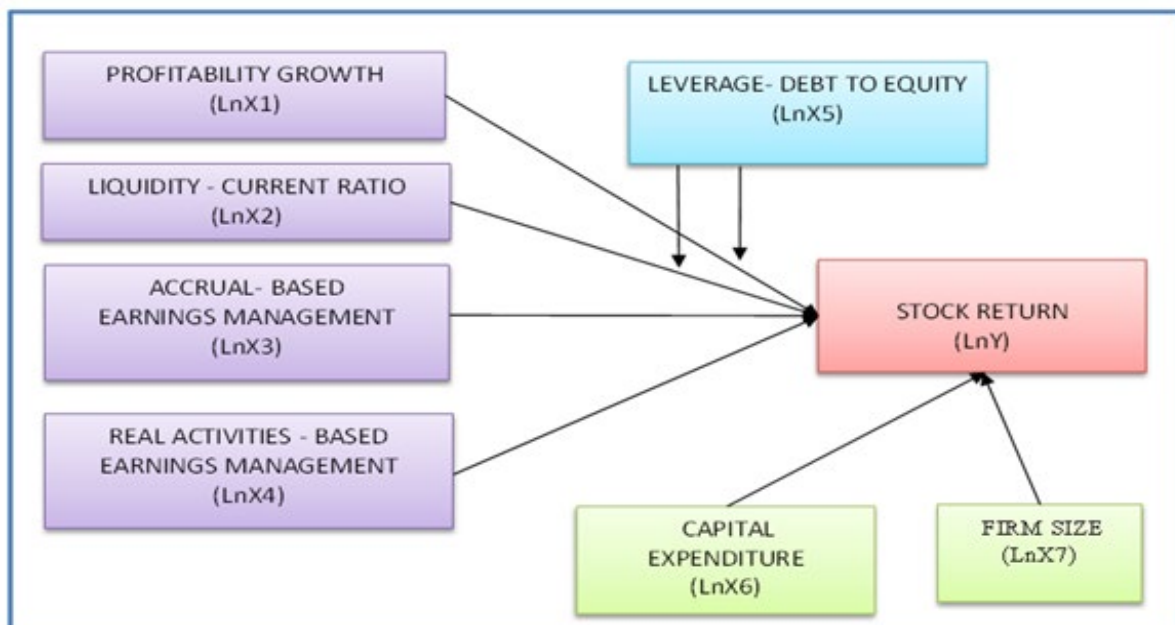
Technique of Analysis

Researchers used nonlinear regression analysis techniques as they have an adjusted R2 (0.162) compared to the linear model (0.102). The nonlinear equation model used is based on Ln. The equation formula is as follows:

$LnY = \beta0 + \beta1\ LnX1 + \beta2\ LnX2 + \beta3\ LnX3 + \beta4\ LnX4 + \beta5\ LnX5 + \beta6\ LnX6 + \beta7\ LnX7 + \beta8\ LnX1X5 + \beta9\ LnX2X5 + e.$

LnY = return
LnX1 = profitability
LnX2 = liquidity
LnX3 = accruals-based earnings management
LnX4 = real activities earnings management
LnX5 = debt to equity
LnX6 = capital expenditure
LnX7 = company size
LnX1X5 = interaction of X1 and X5
LnX2X5 = X2 and X5 interactions
$\beta0$ = constant
$\beta1\ ...\ ...\ \beta9$ = coefficient
e = error

Results and Discussion

Descriptive Statistics

As shown below, descriptive statistics indicate the structure of each variable used in this study. Stock returns are a dependent variable Y with an average value of -3,289 spread between the minimum value of -6 ,601 to a maximum of -0,928, and the magnitude of deviation or standard deviation of 1,144.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
LnY	60	(6.601)	(928)	(3.289)	1.144
LnX1	60	(5.044)	40	(1.505)	1.164
LnX2	60	(798)	1.944	724	681
LnX3	60	(2.011)	4.220	1.019	1.034
LnX4	60	(6.370)	(322)	(2.459)	1.277
LnX5	60	(1.873)	2.825	(53)	1.023
LnX6	60	(6.822)	917	(2.188)	1.167
LnX7	60	1.880	2.431	2.301	86
LnX1X5	60	(5.218)	2.251	(1.558)	1.647
LnX2X5	60	(1.358)	4.254	740	1.197
Valid N (listwise)	60				

Data structures of the independent variable, are (a) structured profitability, or X1 with an average value of -1.505, spread between a minimum value of -5.044 to a maximum of 40 respectively.   The magnitude of deviation or standard deviation of 1.164; (b) liquidity or X2, structured with an average value of 724 spread between the minimum values of -798 to a maximum of 1944, and the magnitude of deviation or standard deviation of 681; (c) accrual-based earning management or X3, structured with an average value of 1,019 spread between a minimum value of -2,011 to a maximum of 4,220, and the magnitude of deviation or standard deviation of 1,034; and (d) real activities based management or X4, structured with an average value of -2.459 which is spread between a minimum value of -6,370 to a maximum of -322, and the magnitude of deviation or standard deviation value of 1,777.

Data variable moderating atau leverage atau X5 sebagaimana tabel 1, yaitu terstruktur dengan nilai rata-rata –53 tersebar antara nilai minimum -1.837 sampai maximum 2.825, dan standard deviation 1.023.

Data variable control sebagaimana tabel 1, terdiri dari (a) expenditure atau X6, yaitu terstruktur dengan nilai rata-rata –2.188 tersebar antara nilai minimum -6.822 sampai maximum 917, dan standard deviation 1.167; (b) variable ukuran perusahaanatau X7, yaitu terstruktur dengan nilai rata-rata 2.301 tersebar antara nilai minimum 1.880 sampai maximum 2.431, dan standard deviation 86.

Data on moderating variables, X5 (leverage) is structured with an average value of -53. The minimum value of this variable is -1,837 while the maximum is2,825, and the magnitude of deviation or standard deviation of 1,023.   Control variable, X6 (capital expenditure) is structured with an average value of -2.188,which is spread between a minimum value of -6,822 to a maximum of 917, and the magnitude of deviation or standard deviation of 1.167; (c) firm

size variable or X7, structured with an average value of 2,301 which is spread between a minimum value of 1,880 to a maximum of 2,431, and the magnitude of deviation or standard deviation 86.

Correlation

Correlation analysis illustrated in table 2 below shows the linear relationship between each variable used in this study. The relationship between stock return and independent variables shows that only the liquidity variable has a significant effect on stock returns. In contrast, other independent variables have no significant impact on stock returns.

Table 2: Correlations

	Y	X1	X2	X3	X4	X5	X6	X7	X1X5	X2X5
LnY	1									
LnX1	0,215	1								
LnX2	.366**	0,0767	1							
LnX3	0,187	0,025	0,212	1						
LnX4	-0,195	-0,126	-.468**	-0,208	1					
LnX5	-0,149	0,131	-.261*	-0,071	-0,002	1				
LnX6	0,027	0,017	-.297*	-0,039	0,098	0,172	1			
LnX7	-0,241	-0,178	-0,032	-0,029	0,134	-0,074	.276*	1		
LnX1X5	0,059	.788**	-0,108	-0,026	-0,091	.714**	0,119	-0,172	1	
LnX2X5	0,017	-.254*	.312*	-0,232	0,086	-0,153	-0,227	0,114	-.275*	1

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Hypothesis Testing

As in table 3, the results of simulations with SPSS 25 show that only the H2 hypothesis or the X2 (Liquidity) variable is proven to have a positive and significant effect on stock returns, while other variables do not support the hypothesis. The control variable is not proposed as a hypothesis. Nevertheless, it has a significant effect on stock returns, including capital expenditure or X6 which has a significant positive impact on the level of 5%, and company size or X7 has a significant negative effect on the level of 1%.

Regression Coefficient

In table 3 the calculation results show that some variables have a significant effect while others do not or do not support the hypothesis. Variable liquidity or X2 has a positive influence of 0.068 and it's significant at the 5% level, which means that each increase of liquidity is one

unit, will increase stock returns by 0.068 units. The relationship that shows the magnitude of the effect of each of these variables on stock returns is expressed through the following regression equation.

$$LnY = 5543.6 + 0.157\,LnX_1 + 0.608\,\,LnX_2 + 0.125\,LnX_3 + 0.026\,LnX_4 - 0.139\,LnX_5 + 0.235\,LnX_6 - 3.746\,LnX_7 - 354.3\,LnX_1X_5 + 0.035\,LnX_2X_5$$

Control variable has a significant effect on stock returns: capital expenditure or X6 has a positive influence of 0.235, therefore each increase in capital expenditure by one unit, will increase stock returns by 0.235, while the size of the company or X7 has a negative effect of -3.764, therefore each company size increase of one unit will cause a decrease in stock returns of 3,764 units.

Table 3: Coefficient of Regression

Variables	Predict.	Coefficient	Significant
(Constant)		5543,651	0,177
LnX1	+	0,157	0,218
LnX2	+	0,608	0,030 **
LnX3	+	0,125	0,386
LnX4	+	0,026	0,840
LnX5	+	-0,139	0,334
LnX6	+	0,235	0,078 *
LnX7	+	-3,746	0,034 **
LnX1X5	+	-354.319	0,369
LnX2X5	+	0,035	0,805
Adjusted R^2	0,162		
F-Statistics	2,421		
Sig.	0.000		
Obs	60		

Classical Assumption Testing

Classical assumptions are required when using a linear regression model. Testing includes the normality, multicollinearity, autocorrelation, and heteroscedasticity tests, while the nonlinear regression model, as used in this study, does not require a classic assumption test.

The choice of a linear or non-linear regression model is dependent on the distribution of research data, which can be tested through scatter plots and the coefficient of the determination test. The results show more appropriate model choices between linear or nonlinear models. We examine the coefficient of determination to ensure the accuracy of this research model. The

results showed that the nonlinear regression model was more appropriate than the linear model. This research does not require a classical assumption test.

Coefficient of Determination (R2)

The results of the coefficient determination (adjusted R2) shows a value of 0.162, which means that this study can explain the phenomenon of 16.2%. This coefficient indicates that the independent variable can clarify 16,2% of the change in the variable dependent return of shares. Other variables outside this study describe the remaining 83.8%.

F Test and T-Test

The significant analysis of the effect of independent variables on stock returns simultaneously shows that the value of F-statistics = 2,421 or significant 0,000, which means that the independent variable has a significant impact on stock returns. Following the F statistical test, the next test partially tested the effect of each independent variable on stock returns. Table 3 shows that the variables which have a significant impact on stock returns, including: (a) independent variable liquidity or X2 significance level of 0.030 or 3%, (b) variable control of capital expenditure or X6 significant level of 0.078 or 7.8%, and (c) firm size control variable or X7 significant level of 0.034 or 3.4%. Whereas other variables, such as X1, X3, X4, and X5, have no significant effect on the dependent variable return of shares on the Indonesian stock exchange.

Discussion

Based on table 3, which shows the regression coefficient, statistics t-test, statistics-F test, and the coefficient determination or adjusted R2, the only independent variable that has a significant effect is the liquidity variable or X2. In contrast, other independent variables have no significant impact. This impact is mainly due to liquidity's role in the company's smooth operation and supporting the acquisition of a sufficient level of profitability. The increase in the value of variable X2 will provide an incentive for investors to choose company shares in their investment decisions.

Other independent variables such as profitability (X1), accruals-based earnings management (X3), real activities earnings management (X4), and debt to equity (X5) have no significant effect on stock returns. These findings indicate that investors tend to make transactions oriented towards short-term margins. Investor decisions only follow supply and demand trends on the Stock Exchange. They only pay attention to key variables that are considered strategic in determining the company's smooth operation, such as liquidity (X2) described above.

The significance level of the influence of liquidity (X2) and investor decisions that tend to undertake short-term speculation is evidenced at the relatively small coefficient determination of 0.162. This coefficient also means that investment decisions are influenced by various factors besides the critical factors used in this study. Investors tend only to pay attention to short-term fluctuations in the issuer's stock prices so that the frequency of transactions for investors is very smooth to conduct buying and selling transactions in a relatively short period, for example weekly or monthly.

Control variable Capital expenditure or X6 and company size or X7 have a significant effect on stock returns, which means that both these variables have functioned well as control variables. If not used as a control variable, this variable has the potential to cause bias or affect the results of this study. Amel-zadeh (2011) found past company performance to be a conditional factor in explaining the effect of company size on stock returns. While the leverage variable or X5 has no significant effect on stock returns, its function as a moderating variable shows that it does not moderate the impact of profitability and liquidity variables on stock returns.

Conclusions and Suggestion

Based on the results of the above research analysis, it can be concluded that: (a) the independent variable liquidity or X2 has a significant effect on stock returns, especially since investors respond to it as a variable that affects the smooth running of operations and company performance. (b) Other independent variables such as X1 (profitability), X3 (accrual-based earnings management), and X4 (real activities earnings management), have no significant effect on stock returns because investors tend to speculate on short-term margin trends and only pay attention to vital strategic variables such as X2 referred to above. (c) The current research only explains the phenomenon of about 16.2% as the coefficient determination or adjusted $R^2 = 0.162$, and other variables explain the remaining 83.8% outside of this research variable.

The managerial implications of this research consist of management needs to prepare innovative strategies and creative policies for key variables that have a significant effect on company stock returns. Managerial decisions related to investment, the composition of the use of debt or leverage, cash flow from operating and company size are determining factors for changes in stock returns. In subsequent studies it is recommended to develop the research results by using a broader and more specific sample of companies according to the company sector on the Indonesian Stock Exchange.

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