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SIMULTANEOUS RESPONSE OF DIVIDEND POLICY AND VALUE OF INDONESIA MANUFACTURING COMPANIES: AN APPROACH OF VECTOR AUTOREGRESSION

Rusiadi, Ade Novalina, Muhammad Isa Indrawan, Rahmat Hidayat, Bakhtiar Efendi, Rahmad Sembiring, Irawan, Yossie Rossanty and Muhammad Dharma Tuah Putra Nasution

Faculty of Social Science, Universitas Pembangunan Panca Budi, Indonesia

Andysah Putera Utama Siahaan, Solly Aryza

Faculty of Science and Technology, Universitas Pembangunan Panca Budi, Indonesia

ABSTRACT

This paper examines the long-term simultaneous response between dividend policy and corporate value. The main problem studied is that the dividend policy is responded very slowly to the final goal of corporate value. Analysis of Data was using Vector Auto regression (VAR). The result of the discussion concludes the effect of different simultaneous response every period between dividend policy with corporate value, short-term, medium-term, and long-term. The strongest response to dividend changes comes from free cash flow whereas the highest response to corporate value comes from market book value.

Key words: Dividend, Corporate Value, Free Cash Flow, Return On Asset, Return On Investment.

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1. INTRODUCTION

The main purpose of the company is to increase the value of the company and provide prosperity for the owners or shareholders [1]–[3].The dividend policy has the ultimate goal of corporate value invoked [4]–[8]. Transmission from dividend policy to the ultimate goal is determined by perfect interaction and information [9]–[12]. Information provided at more

dividend announcement means than earnings announcement [13]–[17]. The higher value of the company means the company's performance is becoming better too [18]–[20] . Price to Book Value is a ratio that can be used to measure the value of the company. Many factors influence dividend policy and corporate value [21]–[27]. The size of free cash flow, profitability, and investment opportunity sets can affect dividend policy and firm value generated by the company [28]. The dividend policy is an integral part of the company's funding decisions [29]–[33].

Investment activities aim to maximize expected returns within acceptable risk limits for each investor. Dividends represent company earnings distributed to shareholders. The dividend is the profit sharing given by the issuing company of the share of the profits generated by the company [34]. The dividend policy is a decision whether the profits earned by the company will be given to the shareholders as dividends or will be retained in the form of retained earnings to finance future investments [35]. The dividend policy is something that can not be separated from the company's funding decision.

The empirical problem is identified that the company's value from year to year has decreased. The average value of the company is at the level of 3.9% which decreased from the previous year which is in 2015 which is at the level of 20.2% and decreased again and touched 3.8% level in 2017. This case indicates that some factors affect the value of the company, such as profitability and investment opportunity set. Reinforced by the results of previous studies found that profitability has a significant effect on firm value. Meanwhile, Moniaga research results profitability does not have a significant effect on the value of the company. The investment opportunity sets have a significant influence on firm value. The investment opportunity set has no significant influence on dividend [36]. The decline in corporate value is the result of corporate profits, the slow response of other financial variables [31]. This study is to examine how strong the response of corporate financial variables to dividend policy and the value of manufacturing companies in Indonesia.

2. REVIEW OF LITERATURE

The value of the company reflects the assets owned by the company [37]. The value of the company is the price that the prospective buyer is willing to pay for when the company is sold and for the company issuing the shares on the stock exchange. The stock price traded is an indicator of company value. The stock prices high reflect the company's value is also high. There is positive and significant influence between the dividend policy on corporate value [38]. Investment decisions have a positive effect on the value of the company. However, according to investment decisions negatively affect the value of the company, because at the time of investing to make a retained earnings to be large as investment costs [39]–[42].

The stock price is the price that occurs when the stock is traded in the market. The share price and corporate value summarize the cumulative valuation of investors about how strong a company is, whether the current performance or prospects [43]. The value of the company is the company's value of sale or value added for shareholders, the size of the objective value by the public and the orientation on the company's survival. In the opinion of experts, the value of the company is measured by using Price to Book Value (PBV) which is a ratio that compares the price per share with book value per share. Price to Book Value (PBV) ratio gives an idea of how many times we pay a share with the book value of the company.

Jensen and Meckling argued that agency theory explain that the interests of management and shareholders are often opposite, which can lead to conflict between the two. This case happens to cause the managers to tend to prioritize personal interests. The shareholder does not like the manager's personal interest, because it will increase the cost to the company so that it will lower the profit earned. Conflicts between managers and shareholders can be reduced by a

supervisory mechanism that aligns those related interests. However, with the emergence of such mechanisms will cause a cost called agency cost and can be agency cost of equity.

Dividend payout will be a monitoring and bonding tool for management. This dividend distribution will make shareholders have additional return other than capital gain. This dividend also enables the shareholders to secure income and reduce the agency cost of equity due to the perquisites' actions such as the cost of official travel or class accommodation or the management of the company's cash flow as the monitoring costs are decrease because the shareholders are confident that the management policy will benefit it. Besides, companies that will go public means should reach a rigorous screening process through auditors and the Capital Market Supervisory Agency, and outside publicly traded investors will help oversee managers for the benefit of shareholders outside the management.

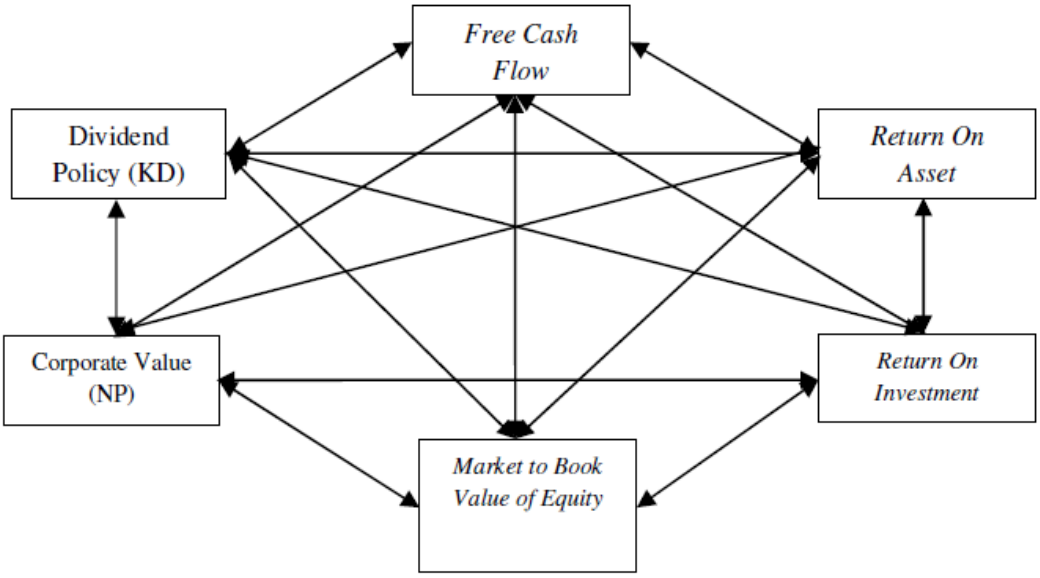

Figure 1 Conceptual Framework VAR

3. RESEARCH METHODS

3.1. Vector Autoregression

This test is performed to determine whether there is a simultaneous relationship or mutual related between Testing VAR with the formula:

$$FCF_t = \beta_{10}TOTO_{t-p} + \beta_{11}INTP_{t-p} + \beta_{12}SMCB_{t-p} + \beta_{13}SMGR_{t-p} + \beta_{14}CPIN_{t-p} + \beta_{15}EKAD_{t-p} + \beta_{16}TKIM_{t-p} + \beta_{17}DPNS_{t-p} + \beta_{18}LION_{t-p} + \beta_{19}LMSH_{t-p} + \beta_{20}SMBR_{t-p} + \beta_{21}AMFG_{t-p} + \beta_{22}ARNA_{t-p} + \beta_{23}ASII_{t-p} + \beta_{24}AUTO_{t-p} + \beta_{25}BRAM_{t-p} + \beta_{26}IMAS_{t-p} + \beta_{27}SMSM_{t-p} + \beta_{28}INKP_{t-p} + \beta_{29}JPFA_{t-p} + \beta_{30}ICBP_{t-p} + \beta_{31}INDF_{t-p} + \beta_{31}FCF_{t-p} + \beta_{32}ROA_{t-p} + \beta_{33}ROI_{t-p} \beta_{34}MBVE_{t-p} + e_{t1} + \beta_{35}DIVIDEN_{t-p} \beta_{36}NP_{t-p} + e_{t1}$$

$$ROA_t = \beta_{10}TOTO_{t-p} + \beta_{11}INTP_{t-p} + \beta_{12}SMCB_{t-p} + \beta_{13}SMGR_{t-p} + \beta_{14}CPIN_{t-p} + \beta_{15}EKAD_{t-p} + \beta_{16}TKIM_{t-p} + \beta_{17}DPNS_{t-p} + \beta_{18}LION_{t-p} + \beta_{19}LMSH_{t-p} + \beta_{20}SMBR_{t-p} + \beta_{21}AMFG_{t-p} + \beta_{22}ARNA_{t-p} + \beta_{23}ASII_{t-p} + \beta_{24}AUTO_{t-p} + \beta_{25}BRAM_{t-p} + \beta_{26}IMAS_{t-p} + \beta_{27}SMSM_{t-p} + \beta_{28}INKP_{t-p} + \beta_{29}JPFA_{t-p} + \beta_{30}ICBP_{t-p} + \beta_{31}INDF_{t-p} + \beta_{31}FCF_{t-p} + \beta_{32}ROA_{t-p} + \beta_{33}ROI_{t-p} \beta_{34}MBVE_{t-p} + e_{t1} + \beta_{35}DIVIDEN_{t-p} \beta_{36}NP_{t-p} + e_{t1}$$

$$ROI_t = \beta_{10}TOTO_{t-p} + \beta_{11}INTP_{t-p} + \beta_{12}SMCB_{t-p} + \beta_{13}SMGR_{t-p} + \beta_{14}CPIN_{t-p} + \beta_{15}EKAD_{t-p} + \beta_{16}TKIM_{t-p} + \beta_{17}DPNS_{t-p} + \beta_{18}LION_{t-p} + \beta_{19}LMSH_{t-p} + \beta_{20}SMBR_{t-p} + \beta_{21}AMFG_{t-p} + \beta_{22}ARNA_{t-p} + \beta_{23}ASII_{t-p} + \beta_{24}AUTO_{t-p} + \beta_{25}BRAM_{t-p} + \beta_{26}IMAS_{t-p} + \beta_{27}SMSM_{t-p} + \beta_{28}INKP_{t-p} + \beta_{29}JPFA_{t-p} + \beta_{30}ICBP_{t-p} + \beta_{31}INDF_{t-p} + \beta_{31}FCF_{t-p} + \beta_{32}ROA_{t-p} + \beta_{33}ROI_{t-p} \beta_{34}MBVE_{t-p} + e_{t1} + \beta_{35}DIVIDEN_{t-p} \beta_{36}NP_{t-p} + e_{t1}$$

$$MBVE_t = \beta_{10}TOTO_{t-p} + \beta_{11}INTP_{t-p} + \beta_{12}SMCB_{t-p} + \beta_{13}SMGR_{t-p} + \beta_{14}CPIN_{t-p} + \beta_{15}EKAD_{t-p} + \beta_{16}TKIM_{t-p} + \beta_{17}DPNS_{t-p} + \beta_{18}LION_{t-p} + \beta_{19}LMSH_{t-p} + \beta_{20}SMBR_{t-p} + \beta_{21}AMFG_{t-p} + \beta_{22}ARNA_{t-p} + \beta_{23}ASII_{t-p} + \beta_{24}AUTO_{t-p} + \beta_{25}BRAM_{t-p} + \beta_{26}IMAS_{t-p} + \beta_{27}SMSM_{t-p} + \beta_{28}INKP_{t-p} + \beta_{29}JPFA_{t-p} + \beta_{30}ICBP_{t-p} + \beta_{31}INDF_{t-p} + \beta_{31}FCF_{t-p} + \beta_{32}ROA_{t-p} + \beta_{33}ROI_{t-p} \beta_{34}MBVE_{t-p} + e_{t1} + \beta_{35}DIVIDEN_{t-p} \beta_{36}NP_{t-p} + e_{t1}$$

$$DIVIDEN_t = \beta_{10}TOTO_{t-p} + \beta_{11}INTP_{t-p} + \beta_{12}SMCB_{t-p} + \beta_{13}SMGR_{t-p} + \beta_{14}CPIN_{t-p} + \beta_{15}EKAD_{t-p} + \beta_{16}TKIM_{t-p} + \beta_{17}DPNS_{t-p} + \beta_{18}LION_{t-p} + \beta_{19}LMSH_{t-p} + \beta_{20}SMBR_{t-p} + \beta_{21}AMFG_{t-p} + \beta_{22}ARNA_{t-p} + \beta_{23}ASII_{t-p} + \beta_{24}AUTO_{t-p} + \beta_{25}BRAM_{t-p} + \beta_{26}IMAS_{t-p} + \beta_{27}SMSM_{t-p} + \beta_{28}INKP_{t-p} + \beta_{29}JPFA_{t-p} + \beta_{30}ICBP_{t-p} + \beta_{31}INDF_{t-p} + \beta_{31}FCF_{t-p} + \beta_{32}ROA_{t-p} + \beta_{33}ROI_{t-p} \beta_{34}MBVE_{t-p} + e_{t1} + \beta_{35}DIVIDEN_{t-p} \beta_{36}NP_{t-p} + e_{t1}$$

$$NP_t = \beta_{10}TOTO_{t-p} + \beta_{11}INTP_{t-p} + \beta_{12}SMCB_{t-p} + \beta_{13}SMGR_{t-p} + \beta_{14}CPIN_{t-p} + \beta_{15}EKAD_{t-p} + \beta_{16}TKIM_{t-p} + \beta_{17}DPNS_{t-p} + \beta_{18}LION_{t-p} + \beta_{19}LMSH_{t-p} + \beta_{20}SMBR_{t-p} + \beta_{21}AMFG_{t-p} + \beta_{22}ARNA_{t-p} + \beta_{23}ASII_{t-p} + \beta_{24}AUTO_{t-p} + \beta_{25}BRAM_{t-p} + \beta_{26}IMAS_{t-p} + \beta_{27}SMSM_{t-p} + \beta_{28}INKP_{t-p} + \beta_{29}JPFA_{t-p} + \beta_{30}ICBP_{t-p} + \beta_{31}INDF_{t-p} + \beta_{31}FCF_{t-p} + \beta_{32}ROA_{t-p} + \beta_{33}ROI_{t-p} \beta_{34}MBVE_{t-p} + e_{t1} + \beta_{35}DIVIDEN_{t-p} \beta_{36}NP_{t-p} + e_{t1}$$

3.2. Impulse Response Funtion (IRF)

According Ghozali (2012) IRF perform a search for the impact of a shock (shock) on a variable to the system (all variables) over a certain time. Impulse Response Function (IRF) is performed to determine the dynamic response of each variable to one standard deviation of innovation. IRF is a measure of the direction of movement of each variable transmitted due to changes in other transmit variables. This model is able to know prediction pattern of shock or effect between variables.

3.3. Forecast Error Variance Desomposition (FEVD)

According to [44] Variance Decomposition composes the change in the value of a variable caused by its own variable shaking and shock from other variables. Forecast Error Variance Desomposition (FEVD) is done to determine the relative importance of various shocks to the variable itself and other variables. Identify FEDV using Cholesky decomposition. FEDV analysis aims to determine the influence or contribution between transmit variables. This analysis is able to form the most effective integration in shaping market integration through GDP and interest rates. By testing the following assumptions:

Unit Root Test

Time series data usually have problems especially on stationary or non stationary. When analyzed on non stationary data will produce spurious regression results and conclusions are taken less meaningful (Ghozali, 2012). The stationarity test is performed to see if the time series data contains the root of the unit (root unit). For that, commonly used methods are Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) test. The data set is said to be stationary if the mean and variance of the time series data is not systematically altered over time or the average variance is constant [44]–[46] In testing whether the data contains the root of the unit or not, Dickey-Fuller suggests regression of the following models:

$$\Delta Y_t = \theta Y_{t-1} + e_t$$

$$\Delta Y_t = \beta_1 + \theta Y_{t-1} + e_t$$

$$\Delta Y_t = \beta_1 + \beta_2 t + \theta Y_{t-1} + e_t$$

4. RESULTS

4.1. Stationary Test Results

Stationary test can be done by unit root test developed by Dickey Fuller. The alternative of the Dickey-Fuller test is Augmented Dickey-Fuller (ADF) which attempts to minimize autocorrelation. This test contains regression of the first difference of time series data against the lag of the variable, lagged difference terms, constants, and trend variable. To view stationarity using DF or ADF test is done by comparing the critical value of Mc Kinnon at a 0.05% significance level with Augmented Dickey Fuller value. Non-stationary data can cause lancid regression, and it is necessary to test the stationarity of the data.

Table 1 Results of Stationary Test With Root Units At Level

Variables	Value Augmented Dickey-Fuller	Mc Kinnon's Critical Value at Level of Significance of 1%	Probability	Information
FREE CASH FLOW	-5.693583	-3.534868	0.0000	Stationer
RETURN ON ASSET	-6.475820	-3.534868	0.0000	Stationer
RETURN ON INVESTMENT	-6.659751	-3.534868	0.0000	Stationer
MARKET TO BOOK VALUE OF EQUITY	-5.279599	-3.536587	0.0000	Stationer
DIVIDEND POLICY	-4.243388	-3.534868	0.0012	Stationer
CORPORATE VALUE	-3.935184	-3.540198	0.0032	Stationer

Augmented Dickey-Fuller test results show that the data of all stationary variables at the level or on the actual data, as indicated by Dickey-Fuller statistic score above the critical value of Mc Kinnon at 1% confidence level. If all variables are stationary then the next step is to analyze the data.

4.2. Stability Test Results Lag Structure VAR

The stability of VAR system will be seen from the inverse roots of its polynomial AR characteristics. It can be seen from the modulus value in the AR-nominal table, and if all AR-roots values are below 1, then VAR system is stable.

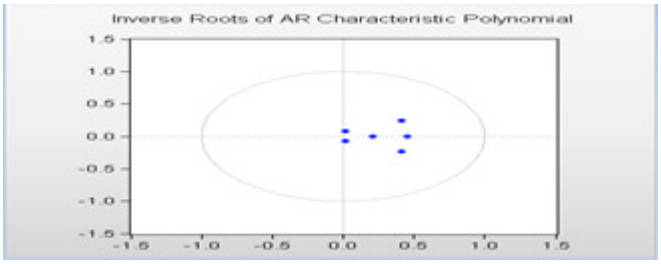

Figure 2 Lag Stability 1 Structure

The model specifications formed by using Roots of Characteristic Polynomial and Inverse Roots of AR Characteristic Polynomial obtained stable results, it can be shown that almost all units of roots are in the circle of Inverse Roots of AR Characteristic Polynomial image. The stability of lag is fulfilled then the VAR analysis can proceed.

4.3. Vector Autoregression Analysis (VAR)

VAR analysis is used in predicting the response strength of each variable. The following table concludes the contribution of VAR analysis:

Table 2 VAR Analysis Results

Variables	The first largest contribution.	The second largest contribution
FCF	FCFt-1 0.352294	DIVIDENt-1 -0.262023
ROA	ROA-1 0.203158	DIVIDENt-1 0.213824
ROI	ROIt-1 0.197723	NPt-1 0.118573
MBVE	MBVEt-1 0.002713	DIVIDEN-1 0.057964
DIVIDEND	FCFt-1 0.065023	ROIt-1 0.504879
NP	ROAt-1 0.076926	ROIt-1 -0.091649

The largest contribution to the dividend is the company's free cash flow and the dividend policy. The largest contribution to ROI is the corporate value and ROI. The largest contribution to MBVE is free cash flow and dividend policy. In MBVE policy seen from the development of free cash flow, because at the time of free cash flow decline can be indicated there is a decreasing profit in the previous period where profit is a variable used to see the economic conditions of a company. The condition of the company also becomes the reference of dividend policy control. The largest contribution to dividend policy is free cash flow and subsequent ROI. Free cash flow will boost ROI growth, increase ROI in the company will increase dividend policy. The largest contribution to company value is ROA and ROI. Profitability of the company greatly affects the dividend policy. Profitability describes the profit earned by a company, as well as describes the condition of a company.

Impulse Response Function Analysis (IRF)

Based on the response of one standard deviation from the dividend, it is concluded that there is a change of influence from each standard deviation of each of the original positive variable becomes negative and vice versa, in the medium term and long-term.

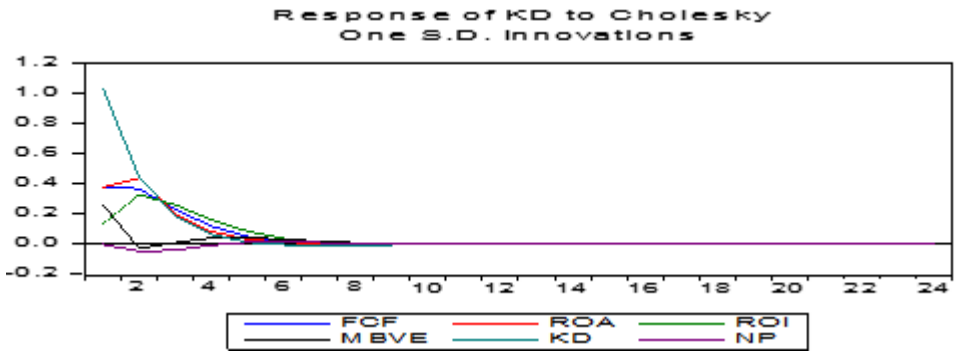

Figure 3 Response Strength of Dividend Variable on the Other Variables.

According to Figure 3 indicate that changes to one dividend standard deviation can be responded to by other variables. Based on the above figure the stability of response of all variables formed at period 10 or medium term and long term. Stable response stability is due to the movement behavior of MBVE which is responded by other variables almost equal to the movement in the short term period.

Table 4 Summary of Impulse Response Function dividend

No	Variables	Short-term	Medium-term	Long-term
1	FCF	+	-	-
2	ROA	+	+	+
3	ROI	+	-	-
4	MBVE	+	+	-
5	DIVIDEND	+	+	+
6	Corporate Value (NP)	+	+	+

Based on table, the results show that dividend policy responded positively in the short term by all variables in the study. Medium negative response by free cash flow and return on investment then positive response by return on asset, market to book value of equity, dividend policy, and firm value. In the long term responded negatively by free cash flow, return on investment and market to book value of equity then responded positively by return on assets, market to book value of equity, dividend policy, and firm value. Based on the response of one standard deviation from the value of the company, it is concluded that there is a change of influence of each standard deviation of each of the original positive variable becomes negative and vice versa, in the medium term and long term.

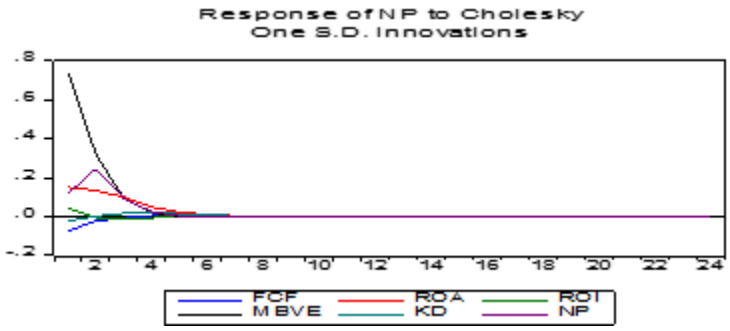

Figure 4 Variable Response of Company Value to Other Variables

Figure 4 describes that the changes to one standard deviation NP can be responded to by other variables. Based on the above figure the stability of response of all variables formed at period 8 or medium term and long term. Stable response stability is due to the movement behavior of MBVE which is responded by other variables almost equal to the movement in the short term period.

Table 4 Summary of Impulse Response Function of NP

. No	Variables	Short-term	Medium-term	Long-term
1	FCF	-	+	+
2	ROA	+	+	+
3	ROI	+	+	+
4	MBVE	+	+	+
5	DIVIDEND	-	-	-
6	NP	+	+	+

Based on table, the result note that the value of the company in the short term responded positively by all variables in the study except free cash flow and dividend policy. In the medium-term is responded positively by all research variables except dividend policy. In the long term, the negative response by dividend policy is responded positively by free cash flow, return on asset, return on investment, market to book value of equity and corporate value.

Analysis of Forecast Error Variance Decomposition (FEVD)

Variance Decomposition aims to determine the percentage contribution of each variable in the short-term, medium-term and long-term. It can be used as a recommendation for policy making for control of these variables. Using the variance decomposition method in Eviews obtained the following results:

Table 5 Variance Decomposition Dividend

Variance Decomposition of Dividend:							
Period	S.E.	FCF	ROA	ROI	MBVE	DIVIDEND	NP
1	1.273554	10.17002	9.820990	1.251629	4.741159	74.01620	0.000000
12	1.625845	15.03471	16.29827	9.789096	3.176525	55.52097	0.180433
24	1.625845	15.03471	16.29827	9.789096	3.176525	55.52097	0.180433

The short-term result (period 1), the estimated variance error of 74.01% is explained by the dividend itself, while other variables that respond are ROA of 9.82%, FCF of 10.17%, ROA of 9.82%, ROI of 0.16%, and MBVE of 4.74%, NP variable does not respond where the response of these variables just appeared in the second period. In the medium term (period 12) an estimated variance error of 55.52% is explained by the dividend. Another variable that most influence dividend as policy variable besides dividend itself is ROA equal to 16,29%, then FCF equal to 15,03%, while the smallest influence dividend is NP equal to 0,18%. In the long run (period 24) an estimated variance error of 55.52% is explained by the dividend itself. Another variable that most influence dividend as policy variable besides dividend itself is ROA equal to 16,29%, then FCF equal to 15,03% while the smallest variable influence dividend is NP equal to 0,18%.

Table 6 Dividend Recommendations

Period	DIVIDEND	The First Largest	The Second Largest
Short-term (Period 1)	74.01%	FCF 10.17%	ROA 9.82%
Medium-term (Period 12)	55.52%	ROA 16.29%	FCF 15.03%
Long-term (Period 24)	83.52%	ROA 16.29%	FCF 15.03%

Based on table 6, it is known that short-term dividend policy control is made by free cash flow and return on asset, then in the medium and long-term besides through dividend policy itself also influenced by return on asset and free cash flow. It means that to increase dividend policy; the company needs to increase return on asset and free cash flow.

Variance Decomposition of NP

Table 7 Variance Decomposition NP

Period	S.E.	FCF	ROA	ROI	MBVE	DIVIDEND	NP
1	0.812842	0.917619	3.856383	0.336024	**92.37391**	0.087448	2.428616
12	0.948514	0.758622	6.689995	0.285488	**81.54630**	0.195555	10.52404
24	0.948514	0.758622	6.689995	0.285488	**81.54630**	0.195556	10.52404

Based on the results of the research as shown in Table 7, the results show that the NP in the short term (period 1), the estimated variance error of 2.42% is explained by the NP itself, while other responding variables are ROA of 3.85%, FCF 0.91%, ROA of 3.85%, ROI of 0.33%, MBVE of 92.37%, and dividend by 0.08%. In the medium term (period 12) the estimated variance error of 10.52% is explained by the NP itself. Other variables that most influence the NP as policy variables other than the NP itself is MBVE of 81.54%, then ROA of 6.68%, while the smallest affect the NP is a dividend of 0.19%. In the long run (period 24) the estimated variance error of 10.52% is explained by corporate value (NP) itself. Other variables that most affect the NP as policy variables other than the NP itself is the MBVE of 81.54%, then ROA of 6.68%, while the smallest variable affect the NP is a dividend of 0.19%.

Table 8 Policy Recommendations to Corporate Value

Period	NP	Largest Number 1	Largest Number 2
Short-term (Period 1)	2.42%	MBVE 92.37%	ROA 3.85%
Medium-term (Period 12)	10.52%	MBVE 81.54%	ROA 6.68%
Long-term (Period 24)	10,52%	MBVE 81.54%	ROA 6.68%

Based on table 8, it is known that for short-term, the company's value control is done by market to book value of equity and return on asset, then in the medium and long-term besides done through the company's value itself also influenced by market to book value of equity and return on asset. It means to increase the corporate value, and the company needs to increase the market to book the value of equity and return on assets.

CONCLUSION

The result of the discussion concludes the effect of different simultaneous response every period between dividend policy with firm value, short-term, medium-term, and long-term. The strongest response to dividend changes comes from free cash flow whereas the highest response to corporate value comes from market book value.

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