The Influence of Loan to Value Policy and Macroeconomic Factors Against The Stock Return of Real Estate and Property Subsector in The Indonesia Stock Exchange

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Abstract- The global financial crisis in 2008 brought impact to the superpower country, the United States, starting from the fall of property sales; in fact, the decrease in property sales also hit Asian region (business Indonesia, 2010). The granting of mortgage loan plays a role in the declining demand in the property sector due to the crisis, which eventually affected the stock return of property and real estate, in addition to the macroeconomic factors in Indonesia. This study aims to verify the impact of macroeconomic factors that is interest rate, the exchange rate, world oil price, money supply, and loan to value policy on the stock return of real estate and property subsector by using Vector Error Correction Model (VECM) for 2010-2014: 55 period. This study applied historical research and uses periodical data and sample determination considers purposive sampling while research data analysis utilizes. Samples of this research are divided into three groups based on market capitalization that is big cap, med cap and small cap. The result of cointegration test shows that there is a long-term or equilibrium relationship between interest rate, the exchange rate, world oil price, money supply, kurs, loan to value and return of the real estate and property subsector. IRF analysis shows that the shock on macroeconomic factors and loan to value policy gives different response to the return fluctuation. The return model is the most vulnerable when the presence of the shocks in macroeconomic variables are the return property and real estate. The results show several finding, that some variables have significance determinant to return of the property and real estate. The result shows the new loan to value policy does not have a significant impact, so that policy makers need to make some revisions to deal with changes of contents and provisions therein.

Index Terms- Loan to Value, Macroeconomics, Market Capitalization, Stock Return, Vector Error Correction Model (VECM)

I. INTRODUCTION

Indonesia also was exposed to global financial crash in 2008, causing some firms in real estate and property in Indonesia stock exchange to file for bankruptcy. The crisis occurred because of the granting of loan to borrowers who are not credible (subprime mortgage) leading to the bubble in the property sector. The property bubble is the situation where the property price increases unreasonably. Bank Indonesia anticipated the possibility of similar crises to occur by setting the limits of loan by publishing a loan to value policy. Terms of loan to value also aim to provide greater opportunities for the people with lower-middle income to acquire a proper home and to enhance consumer protection in the property sector. Information on the loan to value policy also exerts influence to the decision-makers, that is, investors in the property sector.

The loan to value policy determines the amount of loan that can be granted by the Bank against the value of the collateral at the time of granting, with a maximum of 70%. The establishment of the loan to value policy also affects the property sector especially contractors or developers. The policy influences the company's performance in terms of housing unit sales volume that would affect the profitability of the company (Bei 2015). The performance is affected by a decline in the demand of property that also leads to changes of stock price in the property sector. The rising trend of stock price in property and real estate subsector has emerged even before the stipulation of loan to value policy, and then continues to experience a declining trend from 2012 (Figure 1).
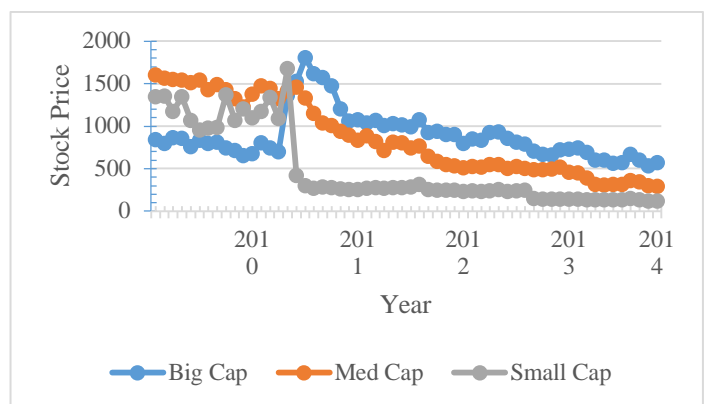

Figure 1: The movement of stock prices in real estate and property subsector in the period of 2010-2014

Gunanta (2013) in his research identified a decrease in the stock price of property and real estate during the loan-to-value restriction than before the restriction effectively applies. Changes in stock prices would affect the stock return value. Stock return is the degree of profits gained on investment taken. To measure the stock return can use market capitalization as the indicator. The market capitalization value is gained by multiplying the stock price with the outstanding shares. Market capitalisation is the value of the company's outstanding shares in the market that shows a good company growth potential with low risk (Thobarry 2009). Investment selection is also based on information, that the stock return is also affected by macroeconomic factors outside the company and causes ups and downs in company performance, either directly or not (Rakasetya et al., 1995).

Housing stock price in Indonesia experiences a decreasing trend. Shares in the property field in majority decline sharply, exchange rate weakens up to Rp12000 per dollar, followed with the increase in the interest rate (BI rate); these eventually outweigh the risk of failure in credit payment. Bank Indonesia raises minimum down payment required for home loan since July 2012 because the institution has noted a slowdown in the rate of property-related credits. The real estate performance declines along with weakening commercial property sales as the impact of the loan to value policy application. The degradation in issuer's performance will affect the total shareholder return in Indonesia stock exchange. This condition raises fears of bubble outbreak in property sector in the United States, besides some fluctuative macroeconomic variables. Macroeconomic variables such as interest rates, inflation, money supply, the exchange rate, and world oil price are some of the variables that are experiencing fluctuations in each period, triggering to the ups and downs in investment activity. The macroeconomic variables change, either decrease or increase, will reflect the condition of stock return to either a positive or negative result. Based on the description, the problem formulated in this study is to what extent the influence of macroeconomic factors and loan to value policy against the stock return of real estate and property subsector in the Indonesia stock exchange. The purpose of this study is to analyze the effect of macroeconomic factors and loan to value policy against the stock return of real estate and property subsector in the Indonesia stock exchange.

II. METHODOLOGY

The type of data is displayed in Table 1 with a research period of 2010-2014. As many as 54 issuers included in the property and real estate subsector and listed on the Indonesia stock exchange were included in this study.

Table 1: Types, sources and data unit

No	Types	Sources	Data Unit
1	*Closing price*	The Indonesia Stock Exchange	Poin
2	Inflation	Central Statictic Institution	Percent (%)
3	Interest Rate	Bank Indonesia	Percent (%)
4	The Exchange Rate	Bank Indonesia	IDR/USD
5	The Money Supply	Central Statictic Institution	Sheet
6	Oil Price	Energy Information Administration	US$/Barrel

The number of issuers who met the requirements in this research is 24 issuers. Issuers were then grouped to: 8 issuers with a large market capitalization value, 8 issuers with a middle market capitalization value, and 8 issuers with a small market capitalization value. The selection of the issuers is based on:
1. Issuers of property and real estate subsector that are listed and still active in Indonesia stock exchange during the year of 2010 to 2014.
2. Issuers have data or a market capitalization value, monthly stock price, and net income (> 50% comes from housing and or apartment) for the year of 2010 to 2014.

Vector Error Correction Models model was selected in this study because there is co-integration between variables. In-level VAR model could not be used for analysis based on testing at pre-estimation. Pre-estimation testing is namely: (1) Stationary test; (2) Stability test of the VECM model; (3) determination of the optimal lag; (4) Cointegration test.

The VECM Research Model.

VECM estimation modeling is aimed to know the influence of loan to value policy and macroeconomic factors, as follows:

$$D(Return) = \alpha_{10} + \alpha_1 LD(Return) + \alpha_2 LD(INF) + \alpha_3 D(SBI) + \alpha_4 LD(KURS) + \alpha_5 LD(M2) + \alpha_6 LD(Oil\ Price) + \alpha_7 LD(Dummy) + \alpha_7 LEC + e_1$$

$$D(INF) = b_{10} + b_1 LD(Return) + b_2 LD(INF) + b_3 D(SBI) + b_4 LD(KURS) + b_5 LD(M2) + b_6 LD(Oil\ Price) + b_7 LD(Dummy) + b_7 LEC + e_2$$

$$D(M2) = c_{10} + c_1 LD(Return) + c_2 LD(INF) + c_3 D(SBI) + c_4 LD(KURS) + c_5 LD(M2) + c_6 LD(Oil\ Price) + c_7 LD(Dummy) + c_7 LEC + e_3$$

$$D(KURS) = d_{10} + d_1 LD(Return) + d_2 LD(INF) + d_3 D(SBI) + d_4 LD(KURS) + d_5 LD(M2) + d_6 LD(Oil\ Price) + d_7 LD(Dummy) + d_7 LEC + e_4$$

$$D(M2) = e_{10} + e_1 LD(Return) + e_2 LD(INE) + e_3 D(SBI) + e_4 LD(KURS) + e_5 LD(M2) + e_6 LD(Oil\ Price) + e_7 LD(Dummy) + e_7 LEC + e_5$$

$$D(Oil\ Price) = f_{10} + f_1 LD(Return) + f_2 LD(INF) + f_3 D(SBI) + f_4 LD(KURS) + f_5 LD(M2) + f_6 LD(Oil\ Price) + f_7 LD(Dummy) + f_7 LEC + e_6$$

$$D(Dummy) = g_{10} + g_1 LD(Return) + g_2 LD(INF) + g_3 D(SBI) + g_4 LD(KURS) + g_5 LD(M2) + g_6 LD(Oil\ Price) + g_7 LD(Dummy) + g_7 LEC + e_7$$

Description:
L = operation of lag (LZ = Zt-1); EC is the error correction term; e is the disturbance term; D is the first difference order which is used to reduce the stationer of variables. INF = inflation; SBI = Indonesian interest rate; KURS = Indonesian rupiah exchange rate to US dollar; M2 = the amount of money supply; Oil Price = world oil price; Dummy = loan to value policy.

Impuls Respone Function (IRF). Impulse response function was performed to test the dynamic structure of the variable system in the model investigated, namely by innovation variable. Moreover, IRF also denoted the response of each endogenous variable all the time against shocks from the variable itself and other endogenous variables.

Forecast Error Decomposition of Variance (FEVD). FEVD could be used to see a change in one macro variable, indicated by changes in variance error. This method can also characterize the dynamic structures of VAR model, as well as see the strengths and weaknesses of each variable in affecting the other variables for quite a long time.

III.   RESULT AND DISCUSSION

The stationary test using the ADF (Augmented Dickey Fuller) was done to find out the model with constant, either with or without including the current trend constant. The result of ADF test shows that the strock return, dummy variable, and macroeconomic variables were not stationary at the level. The six variables used were stationary at first difference with the ADF value smaller than the Mac Kinnon critical value. The rest of the variables used were multiplied by the amount of lag from each VAR. Then, the result of stability test shows that the variables were stable at lag 1. The range of modulus value obtained was between 0.24-0.97. This suggests that the estimation model has been stable (< 1). Determination of the optimal lag was done by considering the optimal VAR lag method of endogenous variables is an independent variable used in the model. The test for optimal lag undertaken in the study was lag 1 based on SC criteria. Gupta et al. (2012) put forward the VAR model, which generally uses the same length of lag for all variables in the model.

The next stage is cointegration test. The result of cointegration test with multi variables using Johansen maximum likelihood with the optimum lag length of 1 shows that the number of long-term relations in the system is mostly one (r = 1) for the 5% significance level. Thus, this study employed the VECM model because all models were cointegrated. The emergence of cointegration in equation system depicts the short-term dynamics, which is consistent with the long-term relation. All models were cointegrated, so that the dummy variable as well as macroeconomic variables in stock return of property and real estate subsector were analyzed using vector error correction model. The result of VECM estimation can be seen in Table 2.

Table 2: The result of estimation of VECM model regarding stock return in real estate and property subsector based on the market capitalisation

Variabel	Short Term		
	Big cap	*Med cap*	*Small cap*
CointEq1	-0.354944*	-0.074886*	-0.178741*
D(*RETURN*(-1))	-0.409588*	-0.675431*	-0.703178*
D(INF(-1))	0.031739	0.057600	0.047175*
D(SBI(-1))	0.083788	0.265290	-0.138492*
D(LN_KURS(-1))	-0.298550	-0.392755	-0.127260
D(LN_M2(-1))	1.074760	-1.173096	-1.355311*
D(LN_OIL PRICE(-1))	0.008945	0.002515	-0.224774
D(DUMMY(-1))	0.111693*	0.091583	-0.067830
Long Term			
RETURN(-1)	1.000000*	1.000000*	1.000000*
INF(-1)	0.030638*	0.048540*	0.021884
SBI(-1)	0.027288	0.094409*	0.044901
LN_KURS(-1)	0.330688	0.330688*	1.244805
LN_M2(-1)	0.795951*	0.795951*	1.778309
LN_ OIL PRICE (-1)	0.577659*	0.640812*	1.102463
DUMMY(-1)	0.213156*	0.301468*	0.482834

Description: an asterisk (*) indicates the variable is significantly influential

A. The influence of loan to value policy against stock return of real estate and property subsector

Allegedly, the application of the loan to value policy will influence the property value and the volume of property sales because of reduced consumer buying power. This condition also gives considerable impact to the performance of companies which lower the stock prices and volume of properties stock sale. For the short term, the loan to value policy positively affects the small cap stock return model (Table 2). As well as in the long term, the loan to value policy has a positive effect on the big cap and med cap return model (Table 2). Investors trust the credibility of the property firms by persistently soaking their capital in the property and real estate stock (Bei 2015). In other words, the market is not reactive to the application of loan to value policy due to the investor's confidence to the business performance in property subsector. In the long term, the application of the policy no longer contains strong information, so it does not have a positive effect on the stock return.
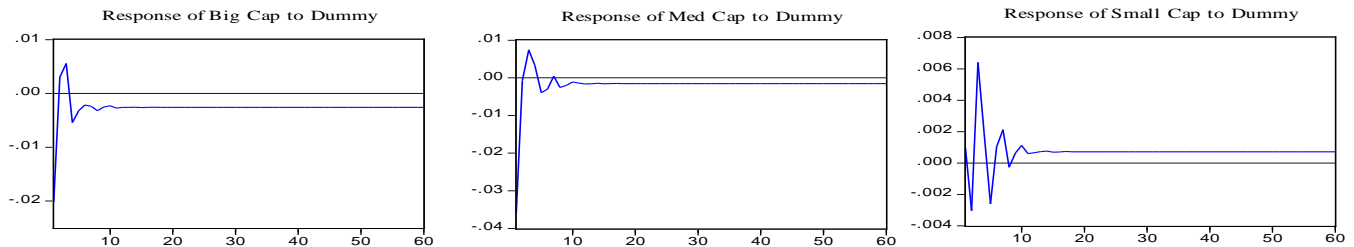

Figure 2: The results of the impulse response test with loan to value policy to stock return real estate and property subsector with big, medium, and small capitalization

B. The influence of inflation against stock return of real estate and property subsector

In the short term, the inflation affects negatively to small capitalization stock return model (Table 2). Inflation can increase revenues, but push up the production costs of the company at the same time. If the increase in the cost of production is higher than the increase in the price as set by the company, the company's profitability will decline. The research of Ito (2013) also found the negative influence of inflation against the stock return. Rising inflation would lead to a decrease in the stock demand. Thobarry (2009) added that inflation indicates a decrease in the purchasing power of individuals or companies. Rising inflation would lead to a decrease in the stock demand and also make the investors expect the highest demand on the risk premium and rate of return that will result in the decline in stock return. Long-term inflation positively influences big capitalization and medium capitalization return model (Table 2). Regarding the long-term effect, this research is in line with a study by Yulianto (2015) that inflation can occur not only because of the rising cost but also the demand-pull. The rising inflation due to the demand-pull will increase revenue for the company that ultimately improves the earning gained by shareholders. Investors treat the rising inflation as a positive signal, and then they will respond it by raising the stock price on the capital market.
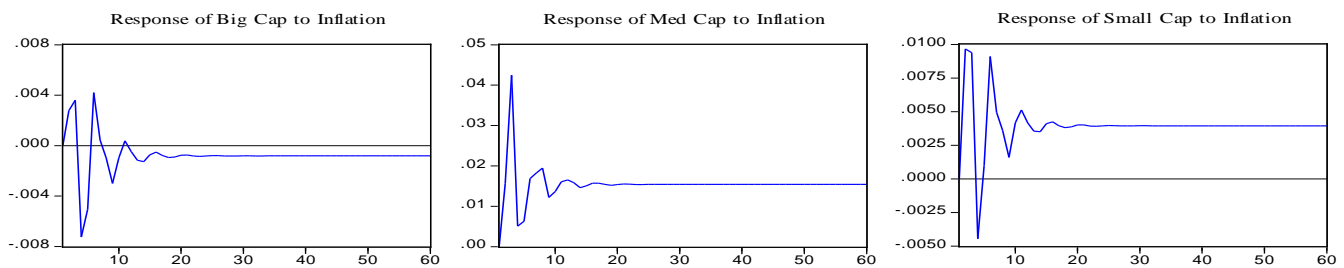

Figure 3: The results of the impulse response test with inflation to stock return real estate and property subsector with big, medium, and small capitalization

C. The influence of the money supply against stock return of real estate and property subsector

In the short run, the money supply has a negative effect on the small cap stock return model (Table 2). This is different from the finding of research done by Octafia (2013) that the increasing money supply in the society will cause the investors to invest in property stock to gain more advantage. In the short term, people prefer to invest in the investment portfolio which is easy to liquidate and has a small risk. They tend to meet their daily needs first, so as not to invest in stock. For the long term, the money supply brings a positive effect on the big cap and med cap return model (Table 2).

The amount of supply money circulating in the community causes the interest rate to fall, so that the property becomes an alternative stock investment compared to banking products. Investors will likely choose to soak their money on stock compared to the savings and deposits in the long term, so that the demand for shares has increased. Meanwhile, in the short term, they will choose to invest with in the investment form with small risks, such as valuables, or prefer to meet their personal needs first, so that investments in stock with a large risk are undesirable.
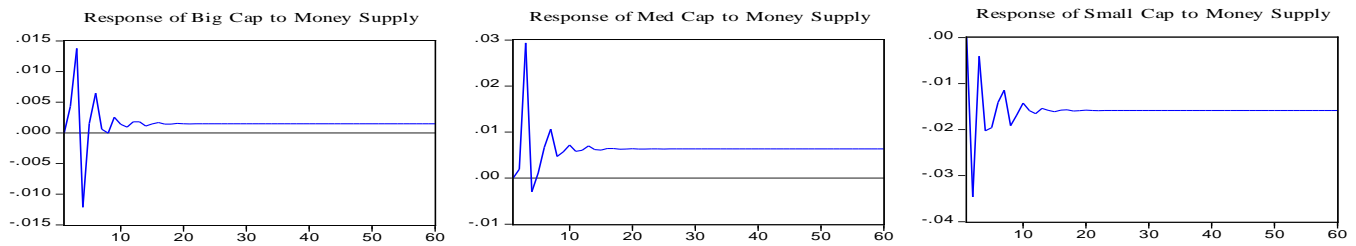
Figure 4: The The results of the impulse response test with the money supply to stock return real estate and property subsector with big, medium, and small capitalization

D.   The influence of the interest rate against stock return of real estate and property subsector

In the short term, the interest rate affects negatively to small cap stock return model (Table 2). The result is similar to the finding of Octafia (2013) that high interest rate causes investors to withdraw their stock investments and move it to savings or deposits. In the long-term, interest rate positively influences the med cap return model (Table 2). In the long run, when interest rate declines, the demand in property and real estate subsector such as apartments and housing will increase. Although in the beginning the profitability acquired by companies initially decrease, soon they will get increasing demand which allows them to make a profit. This will increase the stock price and attract investors to invest. Purnama (2013) suggested there is a positive influence between interest rates and the stock return of the company, because of the different characteristics of companies. In addition, the interest rate affects stock return in the long term through the fundamental condition of the company.
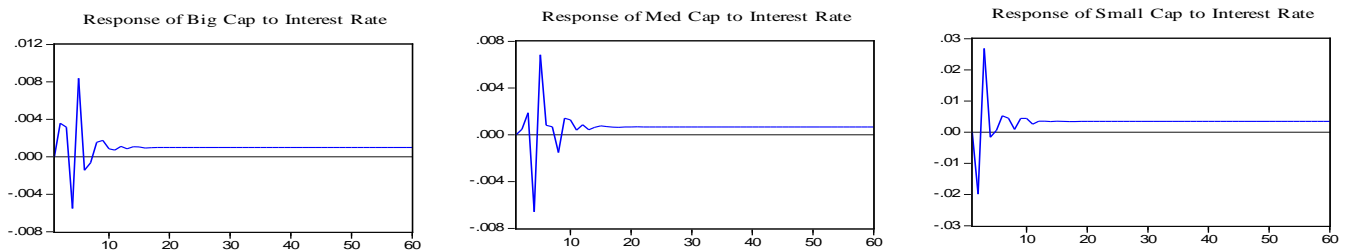

Figure 5: The The results of the impulse response test with the interest rate to stock return real estate and property subsector with big, medium, and small capitalization

E.   The influence of the exchange rate against stock return of real estate and property subsector

In the long term, the exchange rate positively influences the med cap return model (Table 2). The finding is similar to the research result of Pratikno (2009), that when rupiah currency is stronger than other foreign currencies (appreciation), it will lower the cost of imports for production. Lower import costs will lead to lower production costs and improved profitability of the company so that the dividend distribution increases. The research of Suyanto (2007) identified a negative relationship between the exchange rate of dollar/USD and the return of shares. The rise in the exchange rate of USD shows the weakening rupiah, so investors in the stock market will tend to hold or sell the stock. If the exchange rate of rupiah declines, it will eventually lead to a declining profit of the company. Conversely, if the exchange rate of dollar against rupiah declines, the investors will invest in the form of shares due to the fair economic condition.
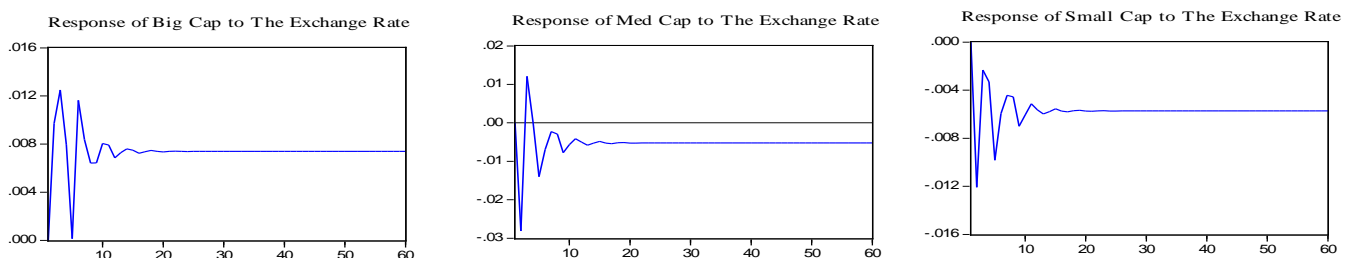

Figure 6: The The results of the impulse response test with the exchange rate to stock return real estate and property subsector with big, medium, and small capitalization

F.   The influence of world oil price against stock return of real estate and property subsector

In the long-term, world oil price would positively affect the big cap and med cap return model (Table 2). This is in accordance with the research by Movahedizadeh et al. (2001)

that suggested the world oil price has a positive influence on stock return. The rising world oil price impacts on the increasing fuel price. Since every economic activity requires transportation in its efforts, the rise in fuel price affects all econominic sectors which depend their business on fuel as an energy source.

Dornbusch (2004) puts forward that world oil price is also affecting state budget, given the change in fuel price will affect the the selling price within the country, and the price of other goods including stock price traded on the Indonesia Stock Exchange.
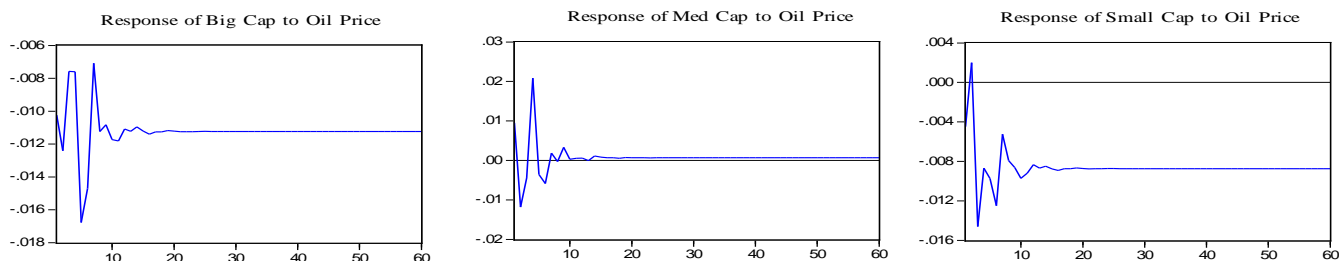

Figure 7: The The results of the impulse response test with world oil price to stock return real estate and property subsector with big, medium, and small capitalization

Forecast Error Decomposition of Variance (FEVD) Analysis. The variable that contributes a big percentage in property and real estate subsector is indeed the stock return, both on the big cap, med cap, and small cap, as seen in Figure 8. Other factors also play a pivotal role over time, due to the influence of macroeconomic changes, which take time to affect other variables.

Figure 8: The result *forecasting error variance decomposition* test on stock return model of real estate and property subsector with a large, medium and small market capitalisation

The loan to value policy which is described through dummy variable provides the biggest contribution on the stock return, because the stipulation of the policy provides influences to consumer demand on subprime mortgages, that will signficantly bring both positive and negative effects to the company's profit. Information regarding the loan to value policy that is conveyed to public will affect the investors' decision. It requires 55 months to observe the long-term effects. The longer the period of observation will give more precise result, which at the end describes the stock return of property and real estate subsector experiences a decline.

Following loan to value policy, inflation also demonstrates a big contribution. If there is a rise in the inflation value, there is a trend for decreased investment allocation by the public because the money for daily consumption also increases. Inflation is in the range between 3%-9% during 2010-2014. This is based on the research of Vanya (2014) that inflation brings a great contribution and is steadily increasing until the end of the period. World oil price variable also plays a major role. The rising of oil price is based on increasing demand rather than the reduced supply, thus the increasing price either directly or indirectly encourages the increase of the stock return.

Investors can decide to invest in a stock with large market capitalization, small and medium enterprises, in which each has different degrees of return. The smaller the market capitalization is, the more the variables which can affect the return of the shares. Stocks with large capitalization have the same potential of risk, but also generate higher return. Small-capitalization issuers can set up strategies to improve their performance after identifying the variables that could affect their total shareholder return. The observation will help in anticipating and reducing the losses that can be borne due shocks on a variable. The existence of a loan to value policy affects the return of issuers with a big market capitalization in the short-term and the return of issuers with a large and middle market capitalization in the long term. Investors' interest toward stock in real estate and property subsector is still high due to the confidence level of profit they will gain in the future.
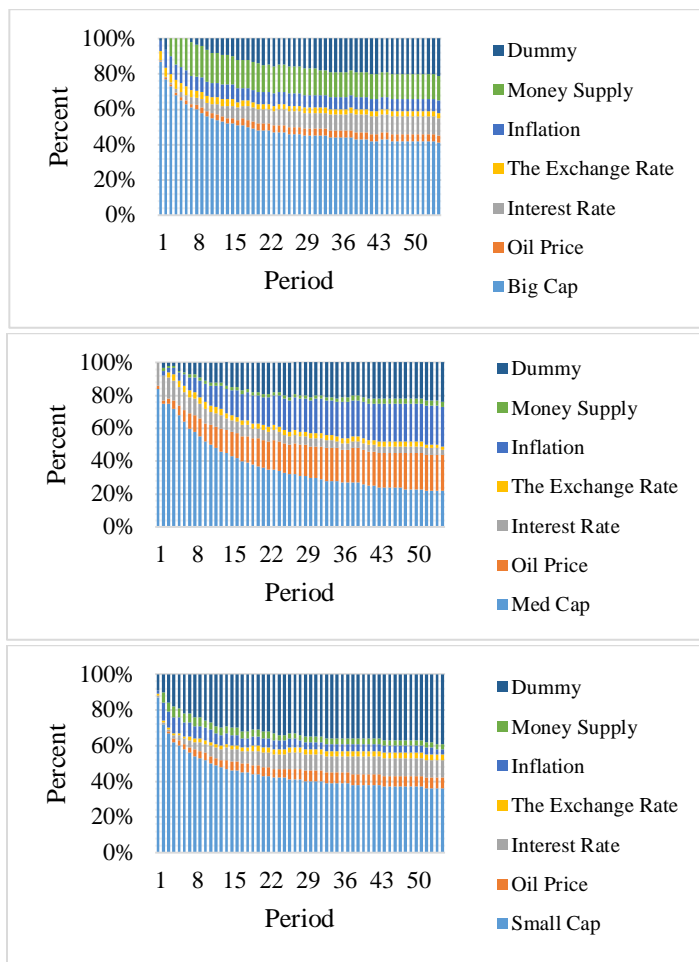
IV.   CONCLUSION

In the short term, the big cap stock return is affected by the stock return and loan to value policy. Med cap stock return is influenced by the stock return itself. Small cap stock return is influenced by the stock return, inflation, interest rates, and the money supply. For the long-term, big-cap stock return is influenced by inflation, money supply, world oil price, and loan to value policy. The med cap stock return is affected by inflation, interest rates, the exchange rate of rupiah against USD, the amount of money supply, world oil price and loan to value policy. The loan to value policy does not meet the goals to be achieved by Bank Indonesia, so the institution needs a new policy or other supporting factors. Investors who are risk takers can benefit from stocks with a large market capitalization to earn capital gains. For further research, it is recommended to add other macroeconomic variables, such as GDP, money supply, and other factors.

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