

EFFECT OF GOVERNMENT REGULATION ON IMPORT QUOTA OF MAIZE. CASE OF THE INDONESIAN ANIMAL FEED COMPANIES

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ABSTRACT: *Animal feed industry is one of the industries in Indonesia that fulfills the food demand of the community. The demand for food will always increase as the population grows. This unidirectional relationship allows the animal feed industry to have great potential of growth. High profitability appeals to investors because the expected return may result the excess. Investors will give the positive sentiment if the average actual return generated exceeds the expected return. Three factors model is able to show that excess return is influenced by risk premium, firm size and book to market ratio. This study was carried out to analyze Three Factors Model Fama-French's variables developed from CAPM Model by Fama-French in order to comprehend the effect of market, size and book to market ratio of stock return on animal feed industries in Indonesia Stock Exchange. The sample of this study are five firms from animal feed industries ranging from the period of January 2011 to December 2016. This study used model and analyzed by panel data regression with common effect model. On the result was found that market, SMB, HML, and dummy of Three Factors Model Fama-French in animal feed industries in Indonesia Stock Exchange are very fluctuative during the period of January 2011 to December 2016. The model indicated that market, size, book to market ratio and government regulation have the significant effect on the excess return of five firms.*

KEYWORDS: Animal Feed Industry, Indonesia Stock Exchange, Three Factors Model Fama-French

INTRODUCTION

Animal feed industry is one of supporting industries which fulfills the need for food in society. The need for food will be frequently increase as the growth of population. This unidirectional relation allows animal feed industry to have great chance to grow. The growth potential must be supported by the profitability escalation in the result. Profit rise is defined by cost efficiency and the production effectiveness conducted by companies in this industry. Nevertheless, those factors are still constrained by the fulfillment of main raw materials in the production of animal feed activities which is corn.

Animal feed company in particular needs the corn with water content of 15 percents. On the other hand, according to the Ministry of Agriculture, local corn producers generally produces the corn with moisture content averagely between 25 to 30 percents. It becomes the obstacle for animal feed companies in fulfilling the needs for quality corn. As the result, the companies in this industry are relying on imported corn to manage their needs.

Importing had became the solution for animal feed companies. However, The Ministry of Trade released the Regulation of Trade Ministry number 20 that restricts direct import by

animal feed company on April 2016. The importing of corn must performed through The Bureau of Logistics Matters and according to the approval from related Ministry. This regulation causes certain impediment for animal feed companies in searching for corn with specific qualification. Animal feed companies are obligated to use local corn as part of raw material. According to Ministry of Agriculture's projection, the demand for corn will have escalation in the future years.

The offer of local corn as raw material will have the biggest deficit in the year of 2020. This occurrence will cause the leap of corn price if the availability of corn is not gained. Government regulation in restricting corn importing process will also lead to the rise of its price because of over demand. The high- priced corn will effect operational cost of company. The rise of operational cost will impact company profitability.

Table 1 Average Return on Asset of Animal feed Companies listed in BEI on the period of 2011-2015

	2011	2012	2103	2014	2015
ROA (%)	0,017	0,065	0,093	0,013	-0,047

Source: IDX 2016 (treated)

Table 1 describes the average of ROA which is one of ratios in profitability. In table 1, the ROA value increased from 2011 to its peak in 2013, then decreased significantly to the negative level in 2015. This condition indicates that the current return on assets in animal feed companies is troubled. Government policy which tighten importing process of corn as raw material can cause more disruption of profitability condition of animal feed companies.

High profitability in a company will attract investors to purchase the stock. The company with high profitability is appealing to investors because the expected return have chance to be excrescent. Investors will grant positive sentiment if the average of actual return generated exceeds the expected return.

This study is aimed to analyze the development of animal feed companies and the influence of market, SMB, HML and restriction policy on corn importing to the stock return of animal feed companies listed in BEI on the period of 2011-2016 and explains the managerial implications of this study results.

Quota restriction policy on corn import as raw material for animal feed industry was started through Ministry of Agriculture Regulation number 57 year of 2015 concerning income and expenditure of plant- made feed and Ministry of Trade Regulation number 20 year of 2016 about corn importing. Both policies tend to be restricted factors in the maize import as raw materials for animal feed industry. By the application of this policy, the industrialist of animal feed industry in this case animal feed companies can not conduct importing activities unless by means of Logistics Matters Bureau with the approval of Ministry of Trade. The difficulty in obtaining imported corn as raw material for animal feed and the deficit productivity of local corn in the future years may encourage stock price fluctuation that will impact excess return for issuers in animal feed industry.

Stages of Data Processing

1. The calculation of return is used to calculate issuers' return (R_i) and market return (R_m) from indexes of animal feed sub-sector. The formula of return as follows:

$$R_i = \frac{P_t - P_{(t-1)}}{P_{(t-1)}}$$

$$R_m = \frac{I_t - I_{(t-1)}}{I_{(t-1)}}$$

Description :

R_i : stock return i histories (monthly)
 R_m : market return (monthly)
 P_t : closing price on month (t)
 $P_{(t-1)}$: closing price on month (t-1)
 I_t : indexes on month (t)
 $I_{(t-1)}$: indexes on month (t-1)

2. Risk free rate which is used in this research refers to the interest rate published by Bank of Indonesia which is interest rate of Bank Indonesia (BI rates).
3. Small minus big (SMB) is the return deviation of small stock portfolio (small firm size) with the return of big stock portfolio (small firm size). The determination of firm size criteria is based on the capitalization value of market every three months by the average of entire stocks, issuers who have capitalization above average number is defined as big and the issuers with capitalization below average number is defined as small.

The value of market capitalization is defined by this equation.

Market Capitalization = $P_t \times OS_t$

Description :

P_t : closing price (t)
 OS_t : circularize stock on month (t)

The formula of SMB as follows:

$$SMB = \frac{(SH + SM + SL) - (BH + BM + BL)}{3}$$

Description :

SMB : small minus big

SH	: small high
SM	: small medium
SL	: small low
BH	: big high
BM	: big medium
BL	: big low

4. High Minus Low (HML)

High minus low (HML) is return deviation of stock portfolio with book to market with low ratio. The determination of HML portfolio is constructed from BE/ ME ratio. BE/ ME ratio is classified into three classes, 25% highest ratio as high, medium in the next 50 % percents and the least 25 % as low.

The value of book to market ratio is determined by the following equation.

$$\text{Book to market ratio} = \frac{\text{BE}}{\text{ME}}$$

Description :

BE : value of stock equity book at the end of period month (t-1)

ME : stock price at the end of the period month (t-1)

The formula of HML as follows:

$$\text{HML} = \frac{(\text{SH} + \text{BH}) - (\text{SL} + \text{BL})}{2}$$

Description:

HML : high minus low

SH : small high

BH : big high

SL : small low

BL : big low

5. Risk Premium

Risk premium is frequently called as market. Risk premium will be found by using $(R_m - R_f)$ equation. R_m is the return of stock compilation from animal feed sub- sector and R_f is the interest rate of Bank Indonesia (BI rates).

6. Dummy

In this research, Dummy is the proxy of government policy which is the restriction of corn import since April 2016. Dummy is valued as one if the research period is done by

the time of the policy was applied on April 2016 and so forth. On contrary, dummy is valued as zero if the the period of data analysis was not at the time of this policy application.

7. Three Factors Model

The equation of Three Factors Model is as follows:

$$R_i - R_f = \alpha + \beta_i(R_m - R_f) + \gamma_1(SMB) + \gamma_2(HML) + \gamma_3D$$

Description:

R_i : stock return i

R_f : risk- free return

$R_i - R_f$: excess return

α : Constanța

β_i : beta of stock i (regression coefficient), if $\beta_i > 0$, means the rise of market risk premium that will cause excess return to increase.

γ_1 : regression coefficient SMB, if $\gamma_1 > 0$, means the rise of SMB will lead to the rise of excess return

γ_2 : regression coefficient HML, if $\gamma_2 > 0$, means the rise of HML will lead to the rise of excess return

γ_3 : regression coefficient, if $\gamma_3 > 0$, means if the crisis occurs will cause the rise of excess return

R_m : market return

$R_m - R_f$: market risk premium

SMB : small minus big

HML : high minus low

D : dummy of policy (D=1 at the time of policy implementation, D=0 before the implementation)

RESULT AND DISCUSSION

Trend of Excess Return in the animal Feed Sub- sector and IHSG Excess Return

Annual Excess Return which outcomed by issuers in animal feed sub- sector since 2011 until 2016 were significantly fluctuative. The movement pattern of excess return in this sub-sector tends to follow the pattern of IHSG excess return. However the rise and fall of excess return in this sub-sector is sharper than IHSG excess return. The fourth three months of 2014 is the lowest excess return point generated by animal feed industry with an excess return value - 0.230084. Different direction and movement in the final three months of 2016 is estimated due to the policy implementation of corn import restriction by the government. The condition of excess return of animal feed subsector and IHSG can be seen in Figure 1.



Figure 1 Trend of IHSG excess return and Animal Feed Sub-sector Indexes on the period of 2011-2016

Excess Return Trend of Animal Feed and SMB Sub- sector

Annual Excess Returns which are created by issuers on animal feed subsector since 2011 until 2016 encounter a significant fluctuation. The scheme of this subsector's excess return mobility tends to be inversely propotional to mobility of SMB. The difference of this mobility is caused by the animal feed industry which tend to be dominated by large cap company while SMB is a decrease of small cap shares by large cap shares. SMB value will be positive if the condition of small cap shares return has greater value than large cap shares return, otherwise SMB will have a negative value if small cap shares return has lower value compared to large cap shares return.

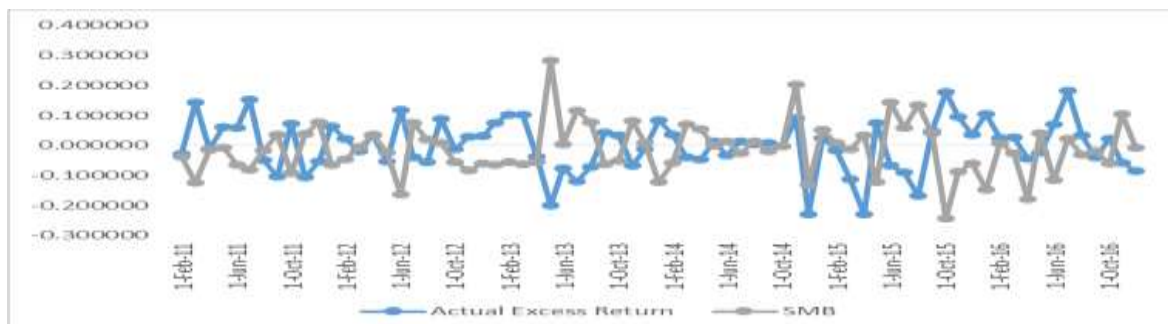


Figure 2 Excess Return Trend of Animal feed and SMB 2011-2016 periods

Excess Return Mobility of Animal Feed Sub- sector and HML Sub- sector

Annual Excess Returns which are created by issuers on animal feed sub- sector since 2011 until 2016 encounter a significant fluctuation. The scheme of this subsector excess return mobility tends to be inversely proportional to mobility of HML. The difference of this mobility is caused by the animal feed industry in Indonesia is dominated by the company having low ratio of book to market. HML is a decrease of shares having high ratio of book to market to shares having low ratio of book to market. HML value will be positive if the condition of shares having high ratio of BTM return have greater value than shares having low ratio of BTM, otherwise HML will have negative value if shares having high ratio of BTM return have lower value compared to shares having low ratio of BTM return.

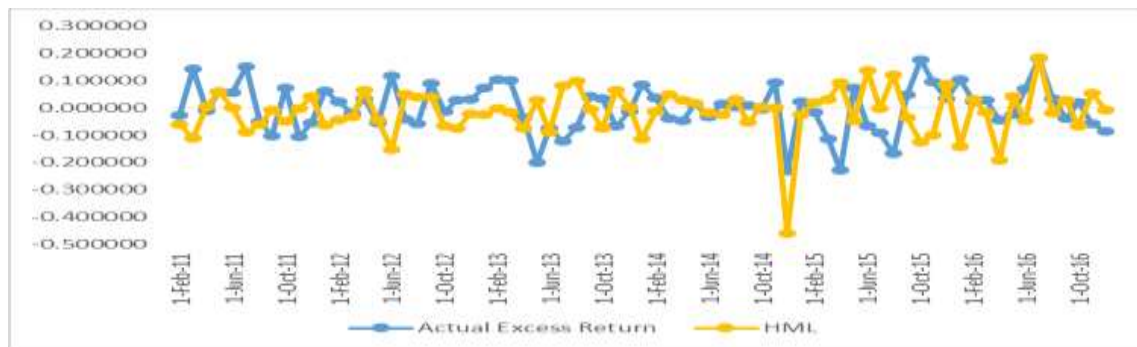


Figure 3 Excess Return Trend of Animal Feed and HML 2011-2016 periods

Actual Excess Return and Expected Excess Return Mobility of Animal Feed Sub- sector

The mobility from actual excess return actual which is happened with expected excess return in animal feed industry has almost same scheme overall. When increment happen to actual excess return then expected excess return will also increase, otherwise when decrease happen to actual excess return then expected return will also decrease. The highest value of actual excess return in animal feed companies (second quarter of 2016) is 0.182911 while the highest value of expected excess return (first quarter of 2013) is 0.094215. The lowest value of actual excess return of animal feed sub-sector in the fourth quarter of 2014 is -0.230084 while the lowest value of expected excess return in the third quarter of 2013 is -0.108022.



Figure 4 Actual Excess Return and Expected Excess Return Trend of Animal Feed Sub-sector 2011-2016 periods

Three Factors Model Analysis towards Excess Return of Animal Feed Sub- sector

Three factors model analysis towards animal feed sub-sector return is done by using variable of dummy which is policy enforcement of maize import restrictions. Equation of three factors model which will be tested in regress is:

$$\text{Model : } R_i - R_f = \alpha + \beta_1(R_{m(IHSG)} - R_f) + \text{SMB} + \text{HML} + \text{Dummy}$$

To perform the regress towards three factors in this research, classic assumption test was held previously. Classic assumption test's aim is to reveal the validity of data used. Classic assumption test which is done in this research consist of multicollinearity test, autocorrelation test and heteroscedasticity test.

Multicollinearity test for three factors model is done by Variance Inflation Factor (VIF) analysis. The result of VIF test has shown the VIF value in the amount of 1.176, 1.967, 1.806, and 1.037. The result of the test is shown that VIF value from model has a lower value than 5. This matter is shown that in this three factors model there is no multicollinearity problem.

Autocorrelation test in three factors model is done by Durbin-Watson test. The result of Durbin-Watson test in Model 1 shown a value in the amount of 1.918. The result of the test show a value in the amount of 1.918. The result of the test is shown a bigger value than D_u ($N=288, K=4$) = 1.82575 and less than $4-d_u$ ($N=288, K=4$) = 2.17425 which means there is no autocorrelation.

Heteroscedasticity test in three factors model is done by Breusch-Pagan LM. The result of the test is shown that the significant variable is on the significant range of 5 percent. The value of the test is 0.0000 under 5 percent so that there is no auto-correlation. The multiple regress tests are done to this model in order to reveal the relationship and impact between independent variable towards dependent variable. In this research, the dependent variable is return, while independent variables are market, SMB, HML, and Dummy.

To consider the regress tabulation method towards this model, it is important to analyze it using Chow test and LM test. Model tabulation or estimation produce multiple regress value as on Table 2 below.

Table 2 Multiple regress towards three factors model

<i>Model</i>	<i>Variable</i>	<i>Coefficient</i>	<i>t-Statistic</i>	<i>Prob.</i>	<i>R-Squared</i>	<i>Prob. (F-Stat)</i>
	<i>Market</i>	1.166923	8.458309	0.0000	0.508727	0.000000
	<i>SMB</i>	-0.523570	-6.325197	0.0000		
	<i>HML</i>	-0.333748	-4.322037	0.0000		
	<i>Dummy</i>	-0.033565	-2.105644	0.0359		
	<i>C</i>	0.012956	1.275209	0.2031		

Notes: in significant of critical value (5%)

The result of multiple regress on Tabel 2 above is shown that the value of R-squared from the model is 50.8727 percent. This is means that market, SMB, HML, and dummy variable used o explain the excess return variation in the model is 50.8727% while the rest is affected by other variable which is not include in the model. In the model used, also found coefficient value of market variable in the amount of 1.166923 which means that if increment happened from market in the amount of 1 unit, there will be also increment from excess return in the amount of 1.166923 unit. In the SMB variable, it is found a coefficient value in the mount of -0.523570 which means when increment of SMB happened in the amount of 1 unit, there will be excess return decrease of -0.523570 unit. The coefficient value found in HML variable is -0,333748 which means if increment of HML in amount of 1 unit happened, there will be a decrease from excess return in the amoung of -0.333748 unit. Dummy variable used in this model is policy of maize import restrictions. Dummy variable is used to observe the impact of maize import restrictions policy towards dependent variable. The coefficient result of dummy variable is -0.033565 which means when variable dummy is in the amount of 1 unit, there will be decrease of excess return in the amount of -0,033565 unit.

The previous research done by Yuningsih and Yударuddin (2007) is found that market, size, and book to market ratio are affected to shares return significantly. Based on the previous research, the finding of this research also shows that market, size, and book to market ratio are affected to shares return significantly. Pasaribu (2009) is also proved that three factors model prevail and has a significant influence towards expected stock return in BEI.

Drew et al (2005) did the test on three factors model fama and frech to The Shanghai Stock Exchange, and the result which is given is beta is not that significantly affected towards shares return while size and book to market ratio give significant influence towards shares return. The finding difference from Drew et al research with this research is the whole independent variable on fama and frech model give influence towards shares return of animal feed industry in Indonesia.

Irawan and Muhardi (2012) conclude that market, size, and book to market affected significantly positive towards shares return. The finding of this research has difference with the previous study where size and book to market ratio has negative significance. The difference might be caused by different industry. Animal feed industry in Indonesia tend to be dominated by large cap company with low ratio of book to market, so that the coefficient found to size variable and book to market ratio have the negative value.

Mohammad (2016) suggest the use of the modified Fama and French (1993) three factor asset pricing model in practical applications that require the estimation of expected returns in the UK equity market. Acheampong et al (2016) explain by using the Fama-French Three factor

model excess return on Ghana stock exchange were better explained than using Capital Asset Pricing Model (CAPM). Yeswanto and Mardani (2015) explain that the market return, firm size and book to market ratio have a significant effect on stock returns on the companies belonging to the group LQ 45. Rossi (2012) using Fama-French model on the Italian stock exchange found that size and beta show better explanation power on the excess return.

MANAGERIAL IMPLICATIONS

Mobility scheme between return and expected return which almost the same shows that the model used almost reflects the real condition of shares in the animal feed company. The finding of econometric measurement shows that SMB and HML variable have negative coefficient or inversely proportional towards excess return variable. That matter shows that animal feed industry in Indonesia tend to be dominated by big size company with low of book to market ratio's value so that the investor should not plant their shares into small size company with high ratio of book to market in order to have positive excess return value. The value of dummy variable coefficient which is maize import restrictions policy is negative which inversely proportional to excess return. The investors are better to anticipate this policy because it can decrease the excess return which will be obtained. As long as this policy is still applied, then the animal feed companies will be difficult to create high profitability. The value of risk premium coefficient which is positive shows that animal feed industry's excess return is inversely proportional to risk premium. The investor should see the development of interest rate and also IHSG return which are the components of risk premium so that they can obtain the expected return. The condition of animal feed company's shares which are registered in BEI 2011-2016 period shows the excess return fluctuation. This matter shows that those shares encounter incisive increase or decrease on certain periods. On the comparison graphic between animal feed sub- sector excess return and IHSG excess return is seen that the animal feed sub- sector excess return has more incisive increase and decrease compared to IHSG excess return. Based on this condition, the animal feed sub- sector industry's shares can be a choice for investor to invest their shares in a long term.

CONCLUSION AND SUGGESTION

The development of market, SMB (firm size), HML (book to market ration) to issuers of animal feed subsector is very fluctuative during 2011 until 2016 period. Market, SMB, and HML variable in the model of this research are altogether can explain the excess return variation in the amount of 50.8727 percent. Market and dummy variable of maize import restrictions policy is influenced significantly and positive. SMB and HML variable is influenced significantly and negative in both of model.

Further research about shares return in the animal feed subsector should add another variable in order to improve the contribution of variables in explaining shares return range. Another variables that can be added, such as leverage, dividen yield, or E/B (Earning to Book Value) ratio. Further research between animal feed subsector and another sectors in *Bursa Efek Indonesia* should be done too. The period of the research can also be extended so that it can produce a better findings in explaining shares return range.

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