Exponentially Weighted Moving Average (EWMA) in PT Astra Agro Lestari Tbk and PT Aneka TambangTbk

Darman Saputra
Department of Mangement
Universitas Bangka Belitung
Indonesia
saputradarman1988@gmail.com

Hidayati
Department of Mangement
Universitas Bangka Belitung
Indonesia

Khairiansyah
Department of Mangement
Universitas Bangka Belitung
Indonesia

Abstract—Exponentially Weighted Moving Average Method the standard deviation calculation described in the previous section assumes that the data volatility is constant (homoscedastic) and can not be applied to unstable (heteroscedastic) data volatility. Therefore, one of the approaches to deal with the volatility of non-constant (heteroscedastic) data is the Exponentially Weighted Moving Average (EWMA) method developed. Data collection The data used in this study is daily stock price data from several stocks, namely PT. Agro Lestari (Persero) and Aneka Tambang Tbk which then will be sought stock return. Period of share data used from March 27, 2013 to March 27, 2014. From the result of VaR analysis shows that the risk of buying AALI shares is bigger that is 1050,25274 compared to buying ANTM stock that is equal to 49,763,766 in year 2013-2014, so this is one of the reference in decision of share in 2014 - 2015. Assessing VaR this can be a strategy in the company's decision to take stock portfolio policies other.

Keywords—Coagulation, Heteroskidastity, VaR, EWMA, AALI, ANTM

I. INTRODUCTION

PT Astra Agro Lestari Tbk (the Company) started to develop the plantation industry in Indonesia since more than 30 years ago. The company started its investment in the field of cassava plantation, after which developed the rubber plant, then in 1984, from now on the cultivation of oil palm plantation in Riau Province. At present, the company continues to grow and is currently one of the best oil palm plantation companies and one of the largest companies in Indonesia with a manageable area of 297,011 hectares spread over the islands of Sumatra, Kalimantan and Sulawesi.

Company's move to maintain the company's sustainability, in addition to managing oil palm plantations, the Company also develops a related downstream industry. The Company has operated a palm oil production company or the public wants to buy shares of the company. Growing company PT Astra Agro Lestari then not one of the companies or the public wants to buy shares of the company. ANTAM was established as a State-owned Enterprise in 1968 through mergers of several national mining companies producing single commodities. To support the financing of the ferronickel expansion project, in 1997 ANTAM offered 35% of its shares to the public and listed them on the Indonesia Stock Exchange. In 1999, ANTAM listed its shares in Australia with foreign exempt entity status and in 2002 this status was upgraded to ASX Listing with more stringent conditions.

AALI and ANTM companies are expected to develop the potential of existing shares in a company. Stock buyers can see the development of the business world in the company both

II. METHODS

Calculation of stock return value
To calculate the return value on each stock using the following formula:

\[ R = \frac{(P_t - P_{t-1})}{P_{t-1}} \]

Determine the standard deviation
Using the standard deviation of daily stock returns, we calculate the risk level using the equation:

\[ \sigma = \sqrt{\left(\sum_{i=1}^{n}(R - \bar{R})^2\right)/(n-1)} \]

The correlation coefficient represents the relationship between return of a stock and other stock returns. The value of the correlation coefficient can be calculated using the equation:

\[ \rho_{AB} = \frac{COV_{R_AR_B}}{\sigma_A\sigma_B} \]
III. RESULTS AND DISCUSSION

Sample data used in this research is closing price (closing price) some shares of company owned by PT. Astra Argo Lestari (Persero) (AALI) engaged in oil palm plantation and PT. Aneka Tambang Tbk (ANTM) engaged in mining for one trading year (261 business days) starting from March 27, 2013 to March 27, 2014. The company is a big company that dominates the Indonesian market so it becomes a target for investment land.

From the above data obtained that the value of Volatility Ewma to-t is equal to 0.025081. Based on the above table we get the VaR value with EWMA Volatility for one period ahead at 95% confidence level is 1008.095. The value is relative to AALI stock price on March 28, 2013. So the potential losses that will be experienced by investors amounted to 1008,095 / share of shares for one period ahead.

From the above data obtained that the value of Volatility Ewma to-t is equal to 0.023464. Based on the above table obtained value of VaR with EWMA Volatility for one period ahead at 95% confidence level is equal to 44.71593. The value is relative to AALI’s share price on March 28, 2013. So the potential losses that will be experienced by investors amounted to 44.71593 / share for one period ahead.

IV. CONCLUSIONS

From the result of VaR analysis shows that the risk of buying AALI shares is bigger that is 1050,25274 compared to buying ANTM stock that is equal to 49,7633,766 in year 2013-2014, so this is one of the reference in decision of share in 2014 - 2015. Assessing VaR this can be a strategy in the company's decision to take stock portfolio policies other.

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TABLE 1. RESULTS OF AALI SHARE VaR

| Mean Logreturn | Mean Return | Lambda | Alfa |
|----------------|-------------|--------|------|
| 0.00122        | 0.00157     | 0.99   | 0.05 |

| Std Logreturn | EWMA Volatility | VaR dengan Log Return Berdistribusi Normal |
|---------------|-----------------|------------------------------------------|
| 0.026411      |                | 1050,25274                               |
| VaR dengan EWMA Volatility | 1008,095       |

TABLE 2. RESULTS OF AALI SHARE VaR

| Mean Logreturn | Mean Return | Lambda | Alfa |
|----------------|-------------|--------|------|
| -0.00081       | -0.00045    | 0.99   | 0.05 |

| Std Logreturn | EWMA Volatility | VaR dengan Log Return Berdistribusi Normal |
|---------------|-----------------|------------------------------------------|
| 0.026521      |                 | 49,7633,766                              |
| VaR dengan EWMA Volatility | 44,71593       |