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Stock Portfolio Analysis of Agribusiness Companies on Indonesia Stock Exchange

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Abstract
Stock portfolio analysis is the analysis conducted by diversifying or selective combining shares in investment, with a portfolio of risks to be minimized. The purpose of this study is to find out the formation of optimal portfolios using the Capital Asset Pricing Model (CAPM) model approach and Arbitrage Pricing Model (APT). With both models, an investor will be able to find out the composition of stocks, especially shares of companies engaged in agribusiness, as well as directly to find out the proportion of each stock and its risks and benefits arising from the formation of the portfolio. The results showed that by using the CAPM and APT models in the calculation of the formation of optimal portfolios in stocks excange Agribusiness, produces a portfolio with stocks composision 3 froms, namely AALI, TBLA and UNSP. APT model approach shows a greater value than the CAPM models, the highest return value can be generated is 14.088% while that may happen is losses -0268% while the CAPM models yield the highest return rate of 5.74% and the losses will be experienced by -14.54 %. significant difference in outcome is caused from the different assumptions of the models above. From these results should be expected investors to take investment decisions of agribusiness firms stocks in the Indonesia Stock Exchange with respect to the results obtained from the approach to the CAPM and APT models, in addition to the results obtained from both models are also investors give the attention of fundamental and technical factors companies that investors are not wrong and more confident in make investment decisions.

Keywords: Stock, Indonesia Stock Exchange, Corporate Agribusiness Firms, CAPM, APT and Optimal Portfolio.

Introduction

The agricultural sector has a very important role in the Indonesian economy, be it in economic growth, state foreign exchange receipts, meeting food needs, and employment. In 2006 the contribution of the agricultural sector in the formation of gross domestic product (GDP) was 14.14%, occupying the third position after the trade sector of 16.89%, and the processing industry sector of 27.84% (BPS 2006).

In terms of employment, the agricultural sector has a very strategic role, where of the 95.5 million people who work around 42.05 percent are workers in the agricultural sector (BPS 2006). In addition, the agricultural sector is an important provider of raw materials for industrial purposes, especially the food and beverage processing industry (agro-industry). The agricultural sector is also a major pillar in supporting the country's

food security through its contribution to the adequacy of consumption of most Indonesians, especially in food needs.

The agricultural sector is a sector that has a significant role in Indonesia's economic development. Apart from being a sector that is able to provide food for the Indonesian population, agriculture is also able to absorb 46.5% of the total labor force in Indonesia, and is able to contribute 14.7% to GNP (BPS, 2010). The performance of agribusiness stocks on the stock exchange shows rapid growth, this is shown by the graph of the movement of the agricultural sector index that is high on the stock exchange when compared to other sectors or with the movement of JCI in the same vulnerable time.

Agribusiness companies tend to generate greater returns than other companies or issuers. So that the feasibility of investing in the agricultural sector, especially in the form of shares, will have an impact on the investment results generated. Investing, especially in the stock exchange, an investor will generally buy or invest his money not only in one stock but in several existing stocks, this is so that investors can achieve optimal returns while minimizing risk through diversification, and it is expected that the results of the combination can minimize the level of risk owned by each asset.

This collection of assets is called a Portfolio. A stock portfolio is a linear combination of assets in the form of stocks and in the formation of a portfolio, an investor seeks to maximize the expected return (expected return) of investments with a certain level of risk (Fabozzi, 1995). The problem that arises before the portfolio is formed is how many stocks are needed to compile a portfolio in order to form an optimal portfolio, besides that from 22 agribusiness companies, what stocks are considered appropriate in the formation of the portfolio and not only that, other questions arise, as well as what proportion will be given to each share selected by the Investor so that the return obtained can provide optimal results from each stock that selected, with the aim of minimizing existing risks.

Based on several problems that arise when forming an optimal portfolio, of course, there are several ways used to solve the above problems, one of which is by using a balance model, where this model can understand how investors behave as a whole, and how the mechanism of price formation and market returns in a simpler form.

The Balance Model can also help to understand how to determine the relevant risk to an asset, as well as the relationship of risk and expected return for an asset when the market is in equilibrium condition, the equilibrium model used is 1. Capital Asset pricing Model (CAPM), is a model that relates the expected rate of return of a risky asset with the risk of the asset in balanced market conditions (Husnan, 2001). 2. Arbitrage Pricing Theory (APT), based on the view that the expected return for a security will be influenced by several risk factors. Based on the two models used, it is expected to be able to analyze existing problems and be able to determine the optimal stock portfolio of agribusiness companies listed on the IDX.

With the increasing number of existing investment styles and supported by agribusiness company data entering the stock exchange, it will be a momentum for the development of the agricultural sector on the stock exchange, so that with more capital absorbed from the public through share purchases, it is expected that agribusiness companies listed on the IDX will grow and encourage other agribusiness companies to join the stock exchange.

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Method

Time and Location of Research

This research was conducted on twenty-two agribusiness companies listed on the Indonesia Stock Exchange through the yahoo/finance website, and www.idx.com. The location determination is carried out deliberately with the consideration that agribusiness companies listed on the Indonesia Stock Exchange have gone public so that data collection is easy to do through websites on the internet. The data used in the study started from January 2009 to June 2012.

Data Types and Sources

The types of data used in this study are quantitative and qualitative data. Quantitative data is data in the form of numbers in the closing stock price every month from 2009 to 2012. Other quantitative data are foreign exchange rates, SBI interest rates, inflation rates from 2009-2012. The data sources used in this study are all secondary data obtained through several sources, such data as well as documents and archives such as data on foreign exchange rates, SBI interest rates and inflation rates. Where the data is used as an analytical factor that affects stock prices. Data obtained from JSX Monthly Statistics through www.idx.co.id include stock price reports and monthly Composite Stock Price Index, from 2007 to 2012 for twenty-two agribusiness companies listed on the Indonesia Stock Exchange.

Data Analysis Methods

The collected data then determines the return of a single stock, from each stock used as research. In determining the amount of return for each stock per period, the formula for calculating the return of a single stock is used as follows:

$$R = \frac{P_1}{P_0} - 1 \qquad (1)$$

Keterangan :

P_1 = harga saham

P_0 = Merupakan harga saham sebelumnya

R = Merupakan *return* saham tunggal perperiode

To analyze stock normality, a normality test is used to find out whether the data spreads following a normal spread or not. The test was carried out using one of the normality tests, namely the Kolmogorov-Smirnov test with a signification level (α) of 5% which states that; H0: normally distributed data and H1: non-normally distributed data. Reject H0 if the p-value < the α value taken.

In determining the optimal portfolio, this study uses two approaches from the balance method, namely CAPM (Capital Asset Pricing Model) and APT (Arbitrage Pricing Theory), basically both approaches are used to calculate the expected return of a stock, but by combining with the covariance and beta value of each stock in the portfolio,

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the composition or proportion of each stock in the portfolio can be determined. To determine the stocks in the portfolio, first determine the beta value or risk of CAPM or APT. CAPM unites all macro factors into one factor, namely portfolio market return, which is reflected with the Composite Stock Price Index (JCI) as a macro factor determining the return of each stock.

Calculating the value of the covariance between stock returns and market returns, where this aims to obtain the beta value of the stock, so that from the beta value obtained the expected return value of each stock. To calculate the return, the CAPM and APT formulas are used as follows.

Figure 1. Formulas CAPM and APT

$$E(R_i) = R_{BR} + \beta_i \times [E(R_m) - R_{BR}] \qquad (2)$$

Keterangan :

$E(R_i)$ = Harga Harapan *Return* sekuritas ke i

R_{BR} = *Return* Aktiva bebas risiko (SBI)

β_i = Koefisien yang mengukur perubahan R_i akibat dari perubahan R_m

$E(R_m)$ = Harga harapan *return* pasar

Rumus perhitungan dengan m*odel APT adalah sebagai berikut ;*

$$E(R_i) = a_0 + b_{i1}\overline{F}_1 + b_{i2}\overline{F}_2 + \ldots\ldots\ldots + b_{in}\overline{F}_n \qquad (3)$$

Keterangan :

$E(R_i)$ = *Return* yang diharapkan dari sekuritas i

a_0 = *Return* yang diharapkan dari sekuritas i bila risiko sistematis sebesar nol

b_{in} = koefisien yang menunjukan besarnya pengaruh faktor n terhadap *return* sekuritas i

$\overline{F}$ = Premi risiko untuk sebuah factor (Misalnya premi risiko untuk F_1 adalah $E(F_1) - a_0$

Sedangkan untuk menentukan return yang diharapkan dari portofolio digunakan rumus berikut :

$$R_p = \sum_{i=1}^{N} w_i R_i$$

Keterangan ;

w_i adalah bobot sekuritas ke-i dalam portofolio, i = 1, ..., N

R_i adalah *return* sekuritas ke-i dalam portofolio, i = 1,..., N

R_p adalah *return* portofolio

Results and Discussion

Optimal Portfolio Share Composition in Agribusiness Company Subsector

The composition of shares is obtained from combining calculation assumptions with CAPM and APT models. Of the 18 agribusiness companies that were the object of research, only three stocks met the assumptions of the two models, the shares were PT. Astra Arga Lestari Tbk (AALI), PT. Bakrie Sumatra Plantations Tbk (UNSP), and PT.

Tunas Baru Lampung Tbk (TBLA). The composition of the three stocks, all of which come from the plantation subsector. The initial assumption of stock selection begins with determining the return value of a single stock whether it is normally distributed or not, to determine the normal distribution of return for each share, one of the normality tests is used, namely the Kolmogorov Smirnov Test with a level of significance (α) more than 5%. The purpose of this test is to avoid selecting stocks whose single stock return value fluctuates, this has a tendency for price games to occur in one of the agribusiness stocks and cause the market to go out of balance. Of all the agribusiness sector stocks tested, only a few stocks whose values met the normality test, these stocks include, but of the few stocks that meet the first assumption, have not been able to meet the assumptions contained in the APT model, where the model states the level of return expectations is influenced by several market-forming factors. To realize this assumption, the value of the return of a single stock is regressed with the results of the extraction of analysis factors. By regressing the two values, it can be known whether the two values have a relationship or not, if there is a relationship, it is concluded that the return value of a single stock is influenced by factors forming market prices. From the regression results in the calculations in Chapter 5, only 3 stocks are related. The three stocks include AALI, UNSP and TBLA, so that in the process of determining the expected return value of the stock portfolio, the three stocks above are used. In general, the valuation of stocks from the agribusiness sector is still relatively cheap with a sectoral price-to-earnings ratio (PER) of around 18.62 times. The valuation of agri stocks that have large capitalization is also recorded to be relatively cheap, this encourages these three stocks to be excellent on the stock exchange, especially agribusiness stocks in the agricultural sector.

Proportion of Stocks in Portfolio with CAPM and APT Model

After determining the composition of shares in the formation of a portfolio of agribusiness company shares, then determine the proportion of investment in each stock, so that from this process can be known the expected return of the portfolio formed. The calculation process shows the value of the proportion of each stock in the portfolio with the APT and CAPM models. When viewed the proportion produced by both models, for the APT model it is assumed that there is a short sell in the portfolio, this is shown from the negative value of one of the proportions contained in the portfolio. Short sell value aims to generate returns exceeding the return generated from the invested value, where investors / traders borrow funds (on margin) to sell shares (which are not yet owned) at high prices in the hope of buying back and returning shares to their brokers when the shares fall, so this assumption allows adding value to the investment by borrowing capital and in the hope that the proceeds from borrowing can cover the value of the loan itself. The proportion of each stock using the CAPM and APT models, shown in table 1.

Table 1. Value of Proportion of Shares of Agribusiness Companies with CAPM and APT Models

Saham	Proporis	
	CAPM	APT
AALI	25.04%	77,91%

TBLA	35.64%	35,92%
UNSP	39.32%	-13,73%

The proportion produced from the two balance models, both CAPM and APT has significant differences, these differences include shortsales in the proportion of APT shares by emphasizing the proportion of PT Astra Agro Lestari (AALI) shares and a quarter of the proportion is given to PT Tunas Baru Lampung (TBLA) shares, this indicates that AALI shares are very worth buying, and Based on Bloomberg data, the PER value of Astra Agro Lestari's shares was recorded at 16.8 times, the highest compared to other agribusiness stocks.

Unlike the case with the CAPM model whose portfolio proportion focuses on shares of PT. Bakrie Sumatra Plantations Tbk. (UNSP), but the difference in the proportion of each stock is not too significant, as is the case in the APT model. 3.3 Return and Risk of Stock Portfolio with CAPM and APT Model From the results of research on the formation of stock portfolios of agribusiness sector companies, it shows that the value of return and risk obtained by using the CAPM and APT approach models have different results from each other. The three stocks including AALI, TBLA and UNSP meet the assumptions of both balance models, namely CAPM and APT.

From the composition and proportion of shares obtained through the calculation process using assumptions in CAPM and APT, the expected return and risk of agribusiness company stock portfolios can be determined in value. For the calculation of the stock portfolio using the CAPM model produces an expected return of -4.40%, while the risk obtained is 10.14% so that the expected profit range from the formation of this portfolio is -4.40% ± 10.14%. The highest expected profit obtained is 5.74% and the lower limit profit is - 14.54% of the investment value spent by the investor.

Especially for calculations with the CAPM model, the return value generated is negative or loses from the value of portfolio investment, but when combined with the value of risk, the expected profit level with risks that can occur or not occur, amounting to -14.54% to 5.74% of the investment value. While the calculation process using the APT model produces an expected profit rate of 6.91% and the risk that is likely to arise from this model of 7.178%, from the return and risk above the expected profit range from the portfolio of 6.91% ± 7.178%, where the highest profit obtained is 14.088% and the lower limit profit is -0.268%, of the value invested by investors.

Conclusion

The portfolio of agribusiness stocks produced with the CAPM and APT models is three stocks. The entire shares of the agribusiness sector came from the plantation subsector, namely AALI, TBLA and UNSP. The selection of the three shares because they meet all the assumptions contained in CAPM and APT, these assumptions include; a. The return on a single share resulting from the three stocks is normally distributed with a significant level of 5%. The resulting single stock return correlates with factor analysis (the result of extracting factors that affect stock prices).

The proportion generated by the formed stock portfolio using the CAPM and APT models is AALI at 25.04%, TBLA at 35.64% and UNSP at 39.32% while the proportion

generated by the APT Model is AALI shares at 77.91%, TBLA shares at 35.92% and UNSP shares at -13.73%. The composite of the results of the analysis above tends to prioritize stocks from subsectors of companies engaged in plantations, compared to other subsectors.

The expected profit generated from the agribusiness stock portfolio using the CAPM model is = -4.40% ± 10.14%, where the highest profit obtained is 5.74% and the lower limit profit is -14.54% while with the calculation results using the APT model of 6.91% ± 7.178%, where the highest profit obtained is 14.088% and the lower limit profit is -0.268%

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