

FEASIBILITY ANALYSIS OF STOCK INVESTMENT USING CAPM AND RVAR APPROACH (Study on Automotive and Component Companies on IDX 2014 – 2018)

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ABSTRACT

The purpose of this research is to assist investors know which stocks offer the simplest for the minimum amount of risk. Descriptive method with quantitative approach went to conduct this research with purposive sampling technique used. There are 10 companies taken from 13 automotive and component companies. The findings of the CAPM method reveal that there are 2 companies that include efficient stocks, namely BRAM and MASA. From the results of the RVAR method, there are 4 highest stocks, namely BRAM, MASA, INDS and ASII.

Keywords: *CAPM, RVAR, The Stock Investment.*

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1. Introduction

Introduction In the modern economic era, competition in the business world in Indonesia, especially the automotive and component sectors, is getting tougher and tighter. The automotive and component industry in Indonesia is a significant pillar in the country's manufacturing sector, because many well-known automotive industries are reopening manufacturing plants by increasing their production capacity. Due to technological advances that are growing, many companies in the automotive and component sectors are competing in developing their technology in order to attract public interest in the products they produce. Investors are required to know in advance which investment to take because if an investor does not control the market price, it will result in risk. Changes in stock prices or the occurrence of instability in the market are things that must be controlled by an investor, so that investors do not make wrong decisions.

In a stock investment decision making contains uncertainty or risk. An investor will indeed seek a greater profit than the risk. However, investors must be observant in minimizing risk. If the level of risk to be faced is very large, the profit to be obtained is very high as well.

Conversely, if the level of risk faced is very minimal, the profits will be very minimal as well. "One strategy that investors can use to minimize this risk is to use diversification (combination) of various securities in their investments, or in other words form a portfolio. A stock portfolio is an investment that consists of various stocks of different industries with the expectation that if the price of one stock decreases, while the other increases, so that the investment does not experience a loss. CAPM and RVAR are methods for selecting investments with high returns and low risks. [1]

The main purpose of the (CAPM) method is to reduce risky investments and be able to compare return predictions and be able to calculate a risk that cannot be diversified in a portfolio. Another method of selecting superior stocks is the (RVAR) method. "The Reward to Variability Ratio (RVAR) method measures stock performance by dividing Excess R by the deviation quality of the securities to be obtained so that it becomes the best securities rating that can be obtained. when selected". [2]

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2. Literature review

A. Investment

Investment activity is actually an activity that is full of uncertainty about something that will happen in the future, because investment is an activity of investors who invest their capital now in the hope of obtaining income or profit levels in the future during the life of the investment. "Investment is a commitment to a number of funds or other resources carried out at this time, with the aim of obtaining a number of benefits in the future".

Investment is placing money or funds in the hope of obtaining additional or certain benefits for the money or funds. Investment can be divided into two, namely investment in the form of real assets and investment in the form of financial assets (financial assets). Real assets are tangible assets such as gold, silver, diamonds, art items, and real estate. Financial assets are securities which are basically claims on real assets controlled by an institution.

B. Stock

Shares are proof of ownership of capital/funds in a company, paper that clearly states the nominal value, name of the company, accompanied by rights and obligations explained to each holder, and inventory that is ready to be sold.

The definition of shares is a certificate that shows proof of company ownership. Shares are a form of ownership of a company. Having one share of a company shows the right to the company's income and wealth. Shares are one of the securities that are easily transferable.

Shares can be defined as a sign of participation or ownership of a person or entity in a company or limited liability company. Shares are securities in the form of certificates that show proof of ownership of a company. The more shares owned by a person in a company, it means that the amount of money given to the company is also higher, as well as the control of that person in the company is higher.

C. Capital asset Pricing Model (CAPM)

An understanding of the Capital Asset Pricing Model (CAPM) method or the Capital Asset Pricing Model was first raised in the mid-1960s, pioneered by William F. Sharpe, Lintner and Mossin.[3]

Capital Asset Pricing Model (CAPM) is an equilibrium asset pricing model which states that the expected return on certain securities is a positive linear function of the sensitivity of securities to changes in market portfolio returns.

Several other financial experts define CAPM as follows; Capital Asset Pricing Model (CAPM) or capital asset pricing model is the relationship between risk and the expected level of profit of a company. Furthermore, this model explains that the profit rate of an asset or stock is equivalent to the risk-free rate of return plus a risk premium. The risk premium is the amount above the risk-free rate that an investor seeks before he puts money in a risky asset. [4]

D. Reward To Variability Ratio (RVAR)

This performance measurement is called the Sharpe Measure (Sharpe Measure) or also called the reward to variability ratio (RVAR). This Sharpe index bases its calculations on the concept of the capital market

line as a benchmark. , namely by dividing the portfolio risk premium by its standard deviation. Thus, the Sharpe Health Index can be used to measure the risk premium for each risk unit in the portfolio. The higher the Sharpe Index, the better the portfolio performance. Mathematically, the Sharpe Index can be formulated as follows: [5]

$$RVAR = \frac{R_p - R_f}{\text{Standard deviation}}$$

Information :

RVAR = *Reward to Variability Ratio*

R_p = *Return portofolio*

R_f = *Return free rateatau*

The performance of mutual funds is seen from Rp. Rp. 1,000,000.00, namely the average return of each share which has been deducted by the return free rate, which is obtained from the interest rate of Bank Indonesia Certificates. This investment return is used to describe the predicted future return. While the standard deviation of the mutual fund portfolio shows the size of the change in the return of a mutual fund to the return of the mutual fund in question. A high return alone is not necessarily a good investment return. A low return can also be a good investment return if this low return is caused by low risk. Therefore, the calculated return needs to be adjusted to the risks that must be borne. [6]

3. Research methods

A. Research Object

The author uses an industry that is engaged in the Automotive and Components sector which is listed on the Indonesia Stock Exchange (IDX) in 2014 – 2018 as the object of research.

B. Type of Research

The type of research used is descriptive research using a quantitative approach. In this study using CAPM and RVAR analysis to analyze "the feasibility of stock investment in manufacturing companies in the Automotive and Components sector in 2014-2018".

C. Population

In this research, the population used is the automotive and component sector companies listed on the IDX in 2014 - 2018. There are 13 automotive and component companies listed on the IDX which are included in the automotive and component industry sector.

D. Sample

By drawing a sample to be studied, the researcher uses a purposive sampling technique (the desired criteria). These criteria include, automotive and component sector companies listed on the IDX for the period 2014 – 2018, Publishing complete data in the form of annual reports consistently from 2014 – 2018, Publishing Annual Reports that have been audited during 2014 – 2018, Automotive and component companies that publish and publish audited financial reports for 2014 – 2018, automotive and component companies that have complete stock price data from 2014 - 2018. From a total population of 13 companies in the automotive and component sector, there are 10 companies in the

automotive and component sector that became the criteria for selecting the sample.

E. Data Type

The type of data used in this study uses quantitative data which includes 10 company data including the automotive and component sectors from 2014 to 2018, Closing prices, (BI rate) and (JCI).

F. Data Source

In the research, it was obtained from data sources (IDX) for the period 2014 – 2015 traced on the web www.idx.co.id. www.bei.co.id, www.finance.yahoo.com, Research literature studies and books that support research calculations.

G. Data Analysis Techniques

In this study, the data analysis technique used is Microsoft Office Excel 2010. The stages in data analysis include;

Capital Asset Pricing Model (CAPM)

This analysis technique performs several calculations, including:

1. Calculating the rate of return on individual shares. According to (Jogiyanto, 2009, 111)

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

2. Calculate the risk-free rate of return. According to (Husnan, 2005, 176)

$$R_f = \sum \frac{R_f}{N}$$

3. Calculate the market rate of return. According to (Fahmi, 2011, 138)

$$R_m = (IHSg_t - IHSg_{(t-1)}) / IHSg_{(t-1)}$$

4. Calculate the beta of each individual stock. According to (Tandelilin, 2010, p. 132)

$$\beta_i = \frac{\sigma_{iM}}{\sigma^2 M}$$

5. Calculate the expected Return. According to (Jogiyanto, 2012, 499)

$$E(R_i) = R_f + \beta_i \cdot [E(R_m) - R_f]$$

6. Drawing (SML)

7. Classify stocks efficiently and make decisions.

Reward to variability ratio (RVAR)

In making a decision, investors need a technique so that they are not wrong in choosing an investment decision. The RVAR method can help investors in making investment decisions. This method can be calculated by calculating the excess return for each individual stock, calculating the variability as measured by standard deviation, calculating the reward to variability ratio and grouping the company's shares with the highest value and being the first choice to invest in.

4. Results and Discussion

A. Calculation of individual stock returns

PT. Astra International Tbk (ASII) was used as one of the samples for calculating Ri. With the calculation, namely:

$$\begin{aligned} R_{\text{Januari}2014} &= \frac{P_{\text{Jan}2014} - P_{\text{Des}2013}}{P_{\text{Des}2013}} \\ &= \frac{6425 - 6800}{6800} \\ &= -0,0551 \end{aligned}$$

$$\begin{aligned} E(R_i) &= \frac{\sum R_i}{n} \\ &= \frac{0,3166}{60} \\ &= 0,005 \end{aligned}$$

Based on the calculation results above, it can be seen if ASII shows a positive difference (capital gain). And it can be seen that based on the calculation above, out of 10 companies there are 5 companies called positive difference (capital gain) namely ASII, BRAM, INSD, MASA and PRAS companies and there are 5 companies called negative difference (capital loss) namely AUTO, GDYR, IMAS, LPIN, and SMSM.

B. Calculating Risk Free (Rf)

To calculate Rf, we use monthly interest rate data from 2014 to 2018 for 5 years. Based on data collection, it shows that the risk-free rate of return from 2014 to 2018 fluctuated. Calculation of the risk-free average (Rf) for the period 2014 – 2018 is 0.062% per year. The result is divided by 12 months to get risk free (Rf) per month, which is 0.005%.

C. Calculating the market profit rate (Rm)

Market Return (Rm) is obtained from the calculation of the Jakarta Composite Index (JCI) per month for the 2014-2018 period. Based on the formula proposed by (Fahmi, 2011:138) as follows;

$$\begin{aligned} R_{m \text{ Jan } 2014} &= \frac{IHSg_{\text{Jan}2014} - IHSg_{\text{Des}2013}}{IHSg_{\text{Des}2013}} \\ &= \frac{4418,76 - 4274,18}{4274,18} \\ &= 0,033826 \end{aligned}$$

For the following month the calculation of Rm is the same as the calculation above. And for the calculation of E(Rm), σ_m^2 and σ_m .

$$\begin{aligned} E(R_m) &= \frac{\sum_{t=1}^n R_m}{n} \\ &= \frac{0,400456}{60} \\ &= 0,006674 \end{aligned}$$

$$\begin{aligned} \sigma_m^2 &= \frac{\sum_{t=1}^n [R_m - E(R_m)]^2}{n} \\ &= \frac{0,055797788}{60} \\ &= 0,00093 \end{aligned}$$

$$\begin{aligned} \sigma_m &= \sqrt{\sigma_m^2} \\ \sigma_m &= \sqrt{0,00093} = 0,030495 \end{aligned}$$

The expected market return [E(Rm)] obtained in the 2014-2018 period is 0.667%, which comes from the total E(Rm) of 0.4004% divided by the total number of months in the observation period, which is 60 months. Based on the above calculations, among the three calculations, namely Rf, Rm and E(Rm) have the difference between Rf and Rm of (0.005052 - 0.006674267) or -0.16%.

D. Calculating beta (β)

The relationship (β) can be used to find the value of a share.

The results of the calculation of the beta of each company as follows:

Table 1. The relationship (β)

No	Kode	Covarian (R_m-R_i)	σ_{im}^2	β
1	ASII	0,001462	0,00093	1,571936
2	AUTO	0,00118	0,00093	1,268927
3	BRAM	-0,0014	0,00093	-1,50954
4	GDYR	0,000751	0,00093	0,807758
5	IMAS	-0,00123	0,00093	-1,32548
6	INDS	0,00104	0,00093	1,117963
7	LPIN	3,37E-05	0,00093	0,036253
8	MASA	-0,00114	0,00093	-1,22564
9	PRAS	0,000262	0,00093	0,282267
10	SMSM	0,000955	0,00093	1,026522

Based on table 1 above, it shows that there are 10 automotive and component companies listed on the Indonesia Stock Exchange (IDX) in 2014 – 2018. From the results of the study, there are 4 shares of aggressive companies ($\beta > 1$) and 6 stocks of companies that are defensive ($\beta < 1$).

E. Calculating the expected rate of return [E(Ri)] using the CAPM . method

In this study, the high and low value of is directly proportional to the expected stock return. If on a stock is high it means the stock [E(Ri)] is high too. If the value of is low then the expected return is also low. Based on the research results of PT. Indo Kordsa (BRAM) has the lowest value of 0.509%. It can be said that BRAM stock is a stock with small risk which is less sensitive to changes in market price because [E(Ri)] shows 0.002% which means it is low. Astra Indonesia (ASII) has the highest value of 1.571% with E(Ri) also the highest at 0.007%, this shows ASII has the greatest risk and has a very active sensitivity to market changes.

Table 2. Expected return E(Ri) 2014 – 2018

No	Kode	Rf	B	E (Rm)	E (Ri)
1	A SII	0,005	1,571	0,006	0,007
2	AUTO	0,005	1,268	0,006	0,007
3	BRAM	0,005	-1,509	0,006	0,002
4	GDYR	0,005	0,807	0,006	0,006
5	IMAS	0,005	-1,325	0,006	0,002
6	INDS	0,005	1,117	0,006	0,006
7	LPIN	0,005	0,036	0,006	0,005
8	MASA	0,005	-1,225	0,006	0,003
9	PRAS	0,005	0,282	0,006	0,005
10	SMSM	0,005	1,026	0,006	0,006
No	Kode	Rf	B	E (Rm)	E (Ri)
1	A SII	0,005	1,571	0,006	0,007
2	AUTO	0,005	1,268	0,006	0,007
3	BRAM	0,005	-1,509	0,006	0,002
4	GDYR	0,005	0,807	0,006	0,006
5	IMAS	0,005	-1,325	0,006	0,002
6	INDS	0,005	1,117	0,006	0,006
7	LPIN	0,005	0,036	0,006	0,005
8	MASA	0,005	-1,225	0,006	0,003
9	PRAS	0,005	0,282	0,006	0,005
10	SMSM	0,005	1,026	0,006	0,006

Based on the table above, it can be drawn using SML (Security Market Graph)

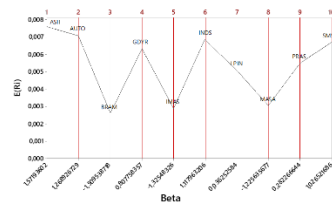


Figure 1. SML graphics

Based on the SML graph, it can be concluded that the greater the level of risk (β), the greater the expected return. This shows that there is a unidirectional relationship between beta and E(Ri).

F. Classification of efficiency stocks and investment decisions



Figure 2. SML graphics

Based on the graph above, it can be seen the results of calculations using the CAPM method. Whereas BRAM and MASA are companies that are categorized as efficient stocks because the calculation results show the value of $R_i < E(R_i)$, efficient stocks can be called overvalued stocks. As for stocks that are not efficient, there are ASII, AUTO, GDYR, IMAS, INDS, LPIN, PRAS and SMSM.

G. Calculating the order of the highest stock ranking using the (RVAR) method

In the process of obtaining the desired shares, researchers can use RVAR as a method of measuring stocks with the highest to lowest ratings. and components are shares of PT Astra International Tbk (ASII) with the following calculation:

$$R_p = \frac{P \text{ jan}2014 - P \text{ des}2013}{P \text{ des}2013} = \frac{6425 - 6800}{6800} = -0,0551$$

$$E(R_p) = \frac{\sum R_p}{n} = \frac{0,3166}{60} = 0,005$$

Furthermore, before calculating the highest stock rating with RVAR, it is necessary to calculate the standard deviation. standard deviation can be calculated by the formula:

$$\sigma_p^2 = \frac{\sum_{t=1}^n [R_p - E(R_p)]^2}{n}$$

$$\sigma = \sqrt{\sigma_p^2}$$

The following is an example of calculating the standard deviation of PT Astra International Tbk (ASII) shares as follows:

$$\sigma_p^2 = \frac{\sum_{t=1}^n [R_p - E(R_p)]^2}{n} = \frac{0,2458213}{60} = 0,004097023$$

$$\begin{aligned}\Sigma &= \sqrt{\sigma p^2} \\ &= \sqrt{0,004097023} \\ &= 0,064007989\end{aligned}$$

For other company calculations use the same formula as above. After calculating the standard deviation, the next step is to calculate the performance of stock investments using the Reward to Variability Ratio (RVAR) method using the following formula .

$$RVAR = \frac{R_i - R_f}{\sigma_{TR}}$$

The following is an example of calculating the Reward to Variability Ratio of Astra International Tbk (ASII) as follows:

$$\begin{aligned}RVAR &= \frac{(0,005277 - 0,0050525)}{0,0064008} \\ &= 0,03507\end{aligned}$$

Based on the results of the calculation of the performance of PT Astra International Tbk (ASII) with the RVAR method of 0.03507. The results of this calculation show that the stock is positive, meaning that ASII is above the risk-free investment performance of SBI. The following is the result of calculating the highest stock rating using RVAR:

Table 3. Stock performance calculation 2014 – 2018

KODE	Rp	Rf	Exces Return (Rp-Rf)	Σp	RVAR (ExcR/StdDev)
ASII	0.005277	0.0050525	0.0002245	0.0064008	0.035073741
AUTO	0.01044	0.0050525	0.0154925	0.092672	-0.16717563
BRAM	0.044281	0.0050525	0.0392285	0.236196	0.166084523
GDYR	0.00574	0.0050525	0.0107925	0.181284	-0.05953366
IMAS	0.00366	0.0050525	0.0087125	0.159459	-0.054637869
INDS	0.006813	0.0050525	0.0017605	0.14258	0.012347454
LPIN	0.00474	0.0050525	0.0097925	0.151461	0.064653607
MASA	0.039875	0.0050525	0.0348225	0.277816	0.125343753
PRAS	0.002049	0.0050525	0.0030035	0.084386	-0.035592397
SMSM	0.00041	0.0050525	0.0054625	0.123057	-0.044389998

Based on table 3, the results of calculating the performance of automotive and component stocks in 2014 – 2018 using the RVAR method, the results show that there are 4 stocks with positive results and 6 negative stocks. Stocks with a positive RVAR value indicate that the resulting return exceeds the risk-free investment (SBI). Stocks that have positive performance are (BRAM), (MASA), (INDS) and (ASII). While stocks have negative performance, namely (PRAS), (SMSM), (IMAS), (GDYR), (LPIN) and (AUTO).

H. Ranking the highest stock and investment decisions

The method approach (RVAR) can sort the order of the highest to lowest stocks. By dividing the excess R with the standard deviation of the stock. The first decision to invest in stocks if a stock has the highest value is the result of the RVAR method.

I. Order of stock ranking by

Table 4. Reward to Variability Ratio (RVAR)

KODE	Rp	Rf	Exces Return	Σm	RVAR	Peringkat
BRAM	0.044	0.005	0.039	0.236	0.166	1
MASA	0.039	0.005	0.034	0.277	0.125	2
INDS	0.006	0.005	0.001	0.142	0.012	3
ASII	0.005	0.005	0.000	0.006	0.035	4
PRAS	0.002	0.005	-0.003	0.084	0.035	5
SMSM	0.000	0.005	-0.005	0.123	0.044	6
IMAS	0.003	0.005	-0.008	0.159	0.054	7
GDYR	0.005	0.005	-0.010	0.181	0.059	8
LPIN	0.004	0.005	-0.009	0.151	0.064	9
AUTO	0.010	0.005	-0.015	0.092	0.167	10

Based on table 4, the stock ratings from the highest to the lowest are BRAM, MASA, INDS, ASII, PRAS, SMSM, IMAS, GDYR, LPIN and AUTO.

5. Conclusion

Based on the CAPM method, there is a linear relationship between systematic risk and the expected return. There are 2 company stocks that are included in the efficient stock category and 8 companies that are in the inefficient stock category out of 10. ASII, AUTO, INDS, SMSM stocks are aggressive stocks with a value of > 1. While the shares of GDYR, LPIN, PRAS, BRAM, IMAS and MASA have a value of < 1. Based on the RVAR method, various RVAR values are obtained. There are positive and negative values. The featured stock is determined based on the highest RVAR value.

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