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THE COMPARISON OF APPLYING SINGLE INDEX MODEL AND CAPITAL ASSET PRICING MODEL BY MEANS ACHIEVING OPTIMAL PORTFOLIO

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Abstract: The aim of this research is to analyse the comparison of applying Single Index Model and Capital Asset Pricing Model by means of achieving the Optimal Portfolio towards registered Issuers which are listed on the Liquid Index 45 (LQ45). The observation has been conducted for 60 months, since February 2014 until January 2019. Quantitative approach has been used to analyse 45 companies as the total number of population of the research. There have been chosen 26 companies (issuers) as the sample of the research through *Purposive Sampling Technique* out of 45 companies. *Single Index Model* and *CAPM* have been used as the tools of analysis in this research. The results of the research show that portfolio is formed by *Single Index Model* because it considers all aspects of the economy which cause a security which may avoid from losses. Meanwhile, *Capital Asset Pricing Model* only considers particular risk in an efficient portfolio combinations. Needless to say, it would be better for investors to use *Single Index Model* in order to gain the most valueable achievement on investment yield value.
Keywords: Optimal Portfolio, Single Index Model (SIM), and Capital Asset Pricing Model (CAPM)

Abstrak: Tujuan dari penelitian ini adalah untuk menganalisis perbandingan penerapan Model Indeks Tunggal dan Model Penetapan Harga Modal dengan cara mencapai Portofolio Optimal terhadap Emiten terdaftar yang terdaftar di Liquid Index 45 (LQ45). Pengamatan telah dilakukan selama 60 bulan, sejak Februari 2014 hingga Januari 2019. Pendekatan kuantitatif telah digunakan untuk menganalisis 45 perusahaan sebagai jumlah total populasi penelitian. Telah dipilih 26 perusahaan (emiten) sebagai sampel penelitian melalui Purposive Sampling Technique dari 45 perusahaan. Model Indeks Tunggal dan CAPM telah digunakan sebagai alat analisis dalam penelitian ini. Hasil penelitian menunjukkan bahwa portofolio dibentuk oleh Model Indeks Tunggal karena mempertimbangkan semua aspek ekonomi yang menyebabkan keamanan yang dapat terhindar dari kerugian. Sementara itu, Capital Priet Asset Model hanya mempertimbangkan risiko tertentu dalam kombinasi portofolio yang efisien. Tidak perlu dikatakan, akan lebih baik bagi investor untuk menggunakan Model Indeks Tunggal untuk mendapatkan pencapaian yang paling bernilai pada nilai hasil investasi.
Kata kunci: Portofolio Optimal, Model Indeks Tunggal (SIM), dan Model Harga Aset Modal (CAPM)

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INTRODUCTION

An investment decision will always be in relation to two things, *returns* and *risks*. The rational investor invests their funds in efficient shares, it is high return with low-risk investments (Abdilah and Rahayu, 2014). In a way to reduce investment risk, a good investor will not only depend on only one stock. However, they will spread out by means of ditributing their funds to more than one stocks, of course, highly preferences stocks. It could be a good solution to suffer great losses, because if one of the stocks price falls, others will not be down. It means that investors will save from suffering a great losses..

Investment risk can be reduced by applying concept of asset diversification through allocating them in any types of stocks which leads to form portfolio. Of course, the rational investor will opt optimal portfolio among the other existing portfolios (Muttaqin and Tandika, 2018).In fact, optimal portfolio can be conduted through *Single Index Model* and *CAPM* (Yuliansyah, 2018). In this case, the thing that makes a great concern is the securities that have been included in Liquid Market Index 45 (LQ45) which still experience price decline. This condition seems unusual because the value of securities that have been included in Liquid Market Index 45 (LQ45) are considered as the most profitable securities. The following is the LQ45 movements from January 2014 until January 2019:

Picture 1. LQ45 movements, January 2014 - January 2019

Based on the picture above, we can see that Market Index of LQ45 booked its decline in the middle of 2015 and in the beginning of 2018, however, it was getting better in the following month. This fact proves a thing that, although portfolio divercification has been completed by the investors, still, risk becomes the term that can be avoided as well (Husnan, 2015). As long as the investments do not have any coeficient correlation in relation to its negative profit value perfectly, the level of profit fluctuation becomes the thing that cannot be ignored on it portfolio.

It is in line with the research that has been conducted by Rahmadin et al., (2014). The conducted research result has been explained by means of achieving the portfolio becomes

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optimal which in accordance with Single Index Model to LQ45 stocks that have met the criteria to complete optimal portfolio, there have been found 6 out of 25 stocks that could encourage the accomplishment of optimal portfolio. They are; UNVR, TLKM, KLBF, JSMR, ASII, and CPIN with 25,96%, 25,98%, 37,17%, 9,75%, 0,66%, and 0,48% proportion of each funds distribution. The protfolio that has been completed by those 6 shares itself is able to contribute an *expected return* with 2,30% value and 0,09% risk level. However, the result of the research that has been conducted by Rahmadin in 2014 is a little different with the research that has been conducted by Darmawan and Purnawati in 2015. There has been found a difference between both. In accordance with the previous research which has been carried out by Darmawan dan Purnawati (2015), it shows that lists of shares that has completed the optimal portfolio of LQ45 are UNVR with 75.42% proportion of funds, JSMR with 10.17% allocation of funds, and BBCA with 14.42% funds proportion. In addition, they also explain that the level of expected return of the portfolio is 2.67% with 1.24% risk level.

Besides, there is a knowledge contribution which discuss about the accomplishment of the optimality of portfolio which in line with the Single Index Model as the research that has been conducted by Mahadwartha and Gunawan (2016). The result shows that the optimal portfolio consists of SMGR, ASII,ICBP, KLBF, TLKM, AKRA, BMTR, JSMR, MNCN, SSIA, WIKA, ASII, ASRI, UNVR, ICBP, and it is can be used only for 6 months period. This optimal portfolio has booked the profit at the level of 0,242% for a week with 1,122 as beta value. They also add that The best portfolios are mostly daily portfolios with high volatility or aggressive portfolios.

Furthermore, Setiawan (2017) has conducted a research in relation to the optimal portfolio with the same Model as well. The research was conducted from 2013 until 2016, with 26 shares have been selected as sample of the research. Based on the calculation which used Single Index Model, there have been obtained a result which shows 17 shares that have included and categorized the fulfillment of portfoili which achieve the term of optimal, for instances; BSDE, CPIN, UNVR, INTP, AALI, AKRA, ICBP, GGRM, LSIP, BBCA,BBRI, INDF, KLBF, JSMR, BBNI, LPKR, and UNTR. It also proves the condition where shares that have included in the protfolio are the share that have a higher value of *ERB* value than *Ci* their gaining values. However, for those share which do not include in portfolio means shares which have lower values of ERB than their obtaining values of *Ci*. This condition leads rational investors will use

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Single Index Model in a way to opt shares and to achieve the optimal portfolio accomplishment in Indonesia Stock Exchange. This research also suggests that, it would be better for the investors to figuree out through analysing the *ERB* and *Ci* value in order to opt share that would be joining in the optimal portfolio, and would be better not to have only attention on trading volume level for the main consideration of any investments.

In addition, the result in relation to the optimal portfolio has been contributed by Prabowo (2013) in the form of a research as well. He has conducted a research related to shares portfolio by using CAPM and Markowitz, where shares which have formed by using CAPM are based on those *coefficient of variation* (CV). It is in line with Christiana and Fadhila (2018) who have conducted a research in relation to implementing Single Index Model by means of achieving the optimality of portfolio. The results shows that, both the *xpected return* and the *Excess To Beta* (ERB) are feasible and included in the optimal portfolio.

At last, another research which used Single Index Model and CAPM has been conducted by Yuliansyah (2018). The result shows that Single Index Model is able to create the efficient and the optimal portfolio (ADRO, TLKM) with 21,54% fund proportion to ADRO and 78,46% to TLKM. Add, by using CPAM method there have been found that 10 share are able to produce the efficient portfolio (LISP, ASII, ICBP, INDE, ADRO, KLBF, TKLM, , WIKA, UNTR, and UNVR) with greater individual return than its expected returns.

Based on the explanation above, it invites curiousity to conduct a research in relation to figure out, which securities that would be the most optimal and efficient in Market Share Index LQ45 by using *Single Index Model* and CAPM, in addition, what stocks combination that would create the most efficient and optimal portfolio?

Theoretical Framework And Hypothesis

The Optimal Portfolio

The efficient protfolio do not guarantee as the optimal portfolio. The efficient portfolio will only always consider its expected return factors or its risk level factors. On the other hand, the optimal portfolio will always consider the combination between the expected return factors and the best opt form its risk level (Jogiyanto, 2017: 367). The following will be value as the knowledge as the path by means of determining required criteria of portfolio to be optimal:: a). If the condition of *Excess Return to Beta* (ERB) value is ≥ than *Ci*, it is to say that securities

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are categirized to be included into the optimal portfolio. b).If the condition of *Excess Return to Beta* (ERB) valueis < than Ci, *Ci*, it can be said that the securities are required to take role as part of optimal portfolio.

Single Index Model

The *Single Index Model assumes that* the price of a security will be fluctuated with the index market price. In other words, the share price tends to be increasing if the index market price is increasing as well. Vice versa, when the index stock price falls , most stocks will ecperience a price decline. In other words, the returns of the scurity itself has the correlation with the climate change in the stock market, especially to the change of market value (in Jogiyanto, 2017).

Capital Asset Pricing Model (CAPM)

CAPM believes that risks level which concernerd by the investors is only a kind of systematic risks, because they assume that any kinds of risks cannot be avoided even by diversification. CAPM has been mostly used to estimate the relationship between the *expected return* and the risk level to a particular asset. According to Zubir (2011:197), CAPM has two main functions, they are: a). It functions as the reference or *benchmark* in re-evaluating investment, especially its *rate of return.* b). It can be applied to analyse value of *expected return* of certain asset that is not or has not been traded in the market.

Research Hypothesis

Forming Optimal Portfolio Using Single Index Model Method

An investment decision will always be in relation to returns and risks. The rational investors will invest their funds in efficient stocks-they are stocks which have great returns with lower risk level. They also will invest their funds to the optimal portfolio which consists of BBCA, SMGR, LPKR, and INDF (Abdilah and Rahayu, 2014). However, the investor himself must have a great concern and attention to two fundamental things, they are; the level of returns and risks level. In lowering the risk level, the investors may diversify their investments by compiling the 38 LQ45 non-financial company shares using Single Index Model. It leads precentage of return value becomes 0,242% per seven days and beta1,222. The best portfolios are mostly daily portfolios with high volatility or aggressive portfolios (Mahadwartha and Gunawan, 2016). It leads the hypothesis as the following:

H_1 : The Optimal Portfolios are Formed by Single Index Model Calculation Methods.

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Forming the Optimal Portfolio Using CPAM

CAPM assumes that risks level which concernerd by the investors is only a kind of systematic risks, because they assume that any kinds of risks cannot be avoided even by diversification (Zubir, 2011:197). It is in line with the statement that is explained by Jogiyanto (2017:285), who argues that risks are always related to deviation value of the received outcome with the expected returns. The greater deviation, it leads the greater risk that should be taken by the investors. CPAM itself can be used as one of the technique to opt stocks and decide which stocks are categorized as *undervalued*, *overvalued, and fairvalued* stocks. It is also can be used as one of the methods in making investment decision in the Capital Market. There has been found that there is a positive returns in calculating by using CAPM (Waryani, 2009). This leads the hypothesis as the following:

H_2 : The Optimal Portfolios are Formed by Capital Asset Pricing Model Calculation Methods.

Forming the Portfolio between Single Index Model *and* CAPM Methods.

One of the stocks portfolios analysis perviously has been conducted by Setiawan (2010) by using *Simple Criteria for Optimal Portofolio Selection* (SCOPS), which its result shows that the selected stocks have the vlaue of *Excess return to beta* (ERB) > C* (*cut of rate*). This result is in line with the concept of the research that has been conducted itself, which explains that there have been found a level-up reteurns although, still, there is a small risk existed. If the whole stocks are deversified, there will be greater returns and risk will be getting lower. According to Firdaus, *et.al* (2018), risks which existed in the combination of optimal portfolio risiko are lower than in the individual stock. It is supported by the fact which shows that the returns value based on calculation of the combination of optimal portfolio is 0.03645 and the value of risk level that the investors take is 0.0124. another research which used Single Index Model and CAPM has been conducted by Yuliansyah (2018). The result shows that Single Index Model is able to create the efficient and the optimal portfolio (ADRO, TLKM) with 21,54% fund proportion to ADRO and 78,46% to TLKM. Add, by using CPAM method there have been found that 10 share are able to produce the efficient portfolio (ADRO, ASII, ICBP, INDE, KLBF, LSIP, TKLM, UNTR, UNVR, and WIKA) with greater individual return than its expected returns. This leads the hypothesis as the following:

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H_3: There Have Been Found a Difference between Applying Single Index Model and CAPM by means of Achieving Portfolio Becomes Pptimal

METHOD

SIM or which is well known as Single Index Model and CAPM or *Capital Asset Pricing Model* (CAPM) are used by means of giving an analysis in relation to which securities that could form the optimal portfolio in Index Market Stock of Liquid 45 (ILQ45) since February 2014 until January 2019 in the Indonesia Stock Exchange. The data has been taken from the companies which include in Index Market Stock of Liquid 45 (ILQ45) in the form of monthly closing prices of stocks of the Composite Stock Price Index and the monthly interest rate of the Bank of Indonesia.

The sampling technique that has been used in this research is *Purposive Sampling* as a nonprobability sampling technique with certain considerations and criteria. (Sugiyono, 2016). The sample criteria which fulfill requirements of the research are companies which registered and legally presented on Indonesia Stocks Exchange which include in the Liquid Index Market Stocks 45 (LQ45) and continuously analysed since February 2014 until January 2019. The data analysis has been determined below:

1. *Single Index Model*

a. The calculation of securities return (Harjito and Martono, 2013):

$$Return = \frac{P_t - P_{t-1}}{P_{t-1}}$$

where:
Return : the total return obtained by the investors
P_t : period of *t* price (selling price)
P_{t-1} : period of *t-1* price (purchase price)

b. Calculation of Expected Return:

$$E(R_i) = \sum_{J=1}^{M} P_{ij} \, . R_{ij}$$

This formula is used when the probability can not be estimated by investors (Husnan, 2015):

$$E(R_i) = \frac{\sum_{i=1}^{N} R_{ij}}{N}$$

where:
$E(R_i)$: amount level of expected return
M : number of cases which possibly occured
P_{ij} : probability gaining yield in *i* investment

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R_{ij} : level of amount of yield in *i* investment
N : periods

c. The formula in calculating Market Return::

$$R_M = \frac{IHSG_t - IHSG_{t-1}}{IHSG_{t-1}}$$

where:
R_M : Market *Return*
$IHSG_t$: IDX Composite in the *t* period.
$IHSG_{t-1}$: Previous Composite Stock Price Index (IDX Composite)

d. The calculation of Expected Market Return::

$$E(R_M) = \frac{\sum R_M}{n}$$

where:
$E(R_M)$: expected market return
R_M : market *return*
N : number of periods of market *return*

e. The formula in calculating the interest rate:

$$R_f = \frac{\sum_{j-1}^{n} interest\ rate}{n}$$

where:
R_f : *return* of interest rate of free-risk investment
N : number of periods

f. The formula in calculating risk (Husnan, 2015):

$$\sigma_i^2 = \sum_{j=1}^{N} \frac{\left[R_{ij} - E(R_i)\right]^2}{N}$$

$$\sigma_i = \sqrt{\sigma_i^2}$$

where:
σ_i^2 : variant of *return* of *i* stock
σ_i : deviation standard of *i* stock
R_{ij} : realized *return* on *i* stock
$E(R_i)$: *i* stock value of expected *return*
N : periods of realized return stocks

g. The formula in calculating market return variant (Husnan, 2015):

$$\sigma_M^2 = \frac{\sum_{i=1}^{n}[R_M - E(R_M)]^2}{n}$$

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$$\sigma_M = \sqrt{\sigma_M^2}$$

where:
σ_M^2 : variant of market *return*
σ_M : market deviation standard
R_M : realized market *return*
R_M : expected market *return*
n : number of periods of realized marke *return*

h. Rumus untuk menilai kovarian:

$$Cov_{iM} = [R_i - E(R_i)].[R_M - E(R_M)]$$

where:
Cov_{iM} : kovarian antara saham i dengan pasar
R_i : realized r*eturn* on *i* stock
R_M : realized market *return*
$E(R_i)$: *i* stock value of its expected return
$E(R_M)$: expected market *return*

i. Value of beta can be figured out with the following formula:

$$\beta_i = \frac{Cov_{iM}}{\sigma_M^2}$$

where:
β_i : value of *beta of stock*
σ_M^2 : market return variant
Cov_{iM} : covariant between *i* stock and market

j. The formula to determine Alpha (Zubir, 2011):

$$\alpha_i = E(R_i) - [\beta_i \, . \, E(R_M)]$$

where:
α_i : alpha on *i* stock
B_i : value of beta on *i* stock
$E(R_i)$: *i* stock expected *return*
$E(R_M)$: value of expected return of market

k. The formula in calculating variant of residual error:

Residual error as random variable with expected value, 0 or $E(e_i) = 0$ (Jogiyanto, 2017, on page: 409). The formula is as follows (Jogiyanto, 2017: 415):

$$e_i = R_i - \alpha_i - \beta_i \, . \, R_M$$

$$E(e_i) = \frac{\sum(e_i)}{n-1}$$

$$\sigma_{ei}^2 = \frac{\sum_{i=1}^{n}[e_i - E(e_i)]^2}{n-1}$$

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where:
e_i : residual error
R_i : realized *return* on *i* stock
R_M : market realized *return*
α_i : alpha on *i* stock
$E(e_i)$: expected residual error
β_i : beta on *i* stock
σ_{ei}^2 : residual error variant on *i* stock
n : number of observation periods

l. Calculating *Excess Return to Beta* (ERB)

Excess return to beta (ERB) is a gap of return which is expected and the return asset which is risk-free, which means value of ERB is able to measures the excess of relative return towards a risk unit that cannot be deiversified that measured by beta. (Jogiyanto, 2017: 430):

$$ERB_i = \frac{E(R_i) - R_{BR}}{\beta_i}$$

where:
ERB_i : value of *i* stock on its *Excess Return to Beta*
$E(R_i)$: expected *return* on *i* stock
R_{BR} : *risk free rate*
β_i : value of beta on *i* stock

m. The Formula in Determining *Cut Off Rate* (C_i)

Cut off rate or cut off point (C_i) can be measured based on characteristics of *return* and risk from those stock which include in the optimal portfolio (Zubir, 2011). *Cut off rate* becomes the limit point merupakan titikwhich used to measure value of stocks which can encourage the optimal portfolio. (Jogiyanto, 2017:430). Measuring the value of A_i and B_i for each security should be conducted first, then, calculating C_i (cut off point), by using the following formula (Jogiyanto (2017):

$$A_i = \frac{[E(R_i) - R_{BR}] . \beta_i}{\sigma_{ei}^2}$$

$$B_i = \frac{\beta_i^2}{\sigma_{ei}^2}$$

$$C_i = \frac{\sigma_M^2 . \sum_{j=1}^{i} A_i}{1 + \sigma_M^2 . \sum_{j=1}^{i} B_i}$$

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$$C_i = \frac{\sigma_M^2 \sum_{j=1}^{i} \frac{[E(R_i) - R_{BR}] . \beta_i}{\sigma_{ei}^2}}{1 + \sigma_M^2 \sum_{j=1}^{i} \frac{\beta_i^2}{\sigma_{ei}^2}}$$

where:
$E(R_i)$: value of *i* security return which is expected
R_{BR} : value of rate ofn risk-free
β_i : *i* security value of beta
σ_{ei}^2 : residual error variant of *i* security
C_i : *Cut off point*
σ_M^2 : variant of market index return

n. The formula in Determining funds proportion on stocks:

Funds proportion is the amount of funds which belongs to investor that will be invested in any securities. (Jogiyanto, 2017:434):

$$w_i = \frac{Z_i}{\sum_{j=1}^{k} Z_i}$$

In order to obtain the value of Z_i can be determined by using the following formula:

$$Z_i = \frac{\beta_i}{\sigma_{ei}^2}(ERB_i - C_i)$$

where:
w_i : proportion of funds on *i* security
Z_i : scale of proportion on *i* stock
β_i : beta *i* security
σ_{ei}^2 : residual error variant *i* security
ERB_i : *i* security of *excess return to beta*
C_i : greatest value of point which is cut off

o. The formula in calculating *alpha* and *beta* of the portfolio:

p.

$$\beta_p = \sum_{i=1}^{n} w_i \beta_i$$

$$\alpha_p = \sum_{i=1}^{n} w_i \alpha_i$$

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where:
αi : value of alpha of securities
αp : value of alpha of portfolio
βi : value of beta of securities
βp : value of beta of portfolio
wi : funds proportion of securities

2. Capital Asset Pricing Model

The analysis by using CPAM method is actually almost the same as the *Single Index Model method.* The main difference is that CAPM todes not calculate the ERB and the cut off rate, and proportion of funds that should be considered and calculated by the investors. The technique in analysing data by using CPAM is as follows (Jogiyanto, 2017:575:

$$Ri,t = RBR,t + \beta i\,[RM,t - RBR,t] + ei,t$$

where:
$R_{i,t}$: monthly realized *return* realisasi on *i* security
$R_{BR,t}$: monthly risk-free *return*
B_i : beta on *i* stock
$R_{M,t}$: monthly market *return*
$e_{i,t}$: monthly residual error on *i* security

RESULTS

This research has opted 26 companies as sample of the research out of 45 existed companies. They are: ADHI (Adhi Karya (Persero) Tbk, ADRO (Adaro Energy Tbk), AKRA (AKR Corporindo Tbk), ASII (Astra International Tbk), BBCA (Bank Central Asia Tbk), BBNI (Bank Negara Indonesia (Persero) Tbk), BBRI (Bank Rakyat Indonesia (Persero) Tbk), BSDE (Bank Mandiri (Persero) Tbk), GGRM (Gudang Garam Tbk), ICBP (Gudang Garam Tbk), INDF (Indofood Sukses Makmur Tbk), INTP (Indocement Tunggal Prakarsa Tbk), JSMR (Jasa Marga (Persero) Tbk), KLBF (Kalbe Farma Tbk), LPKR (Lippo Karawaci Tbk), MNCN (Media Nusantara Citra Tbk), PGAS (Perusahaan Gas Negara Tbk), PTBA (Bukit Asam Tbk), PTPP (PP (Persero) Tbk), SMGR (Semen Indonesia (Persero) Tbk), TLKM (Semen Indonesia (Persero) Tbk), UNTR (United Tractors Tbk), UNVR (Unilever Indonesia Tbk), WIKA (Wijaya Karya (Persero) Tbk), and WSKT (Wijaya Karya (Persero) Tbk).

In fact, based on the process of data analysis, there have been found that, there only 5 companies (issuers) out of 26 companies which are able to encourage achievement portfolio becomes optimal. In order to determine the weight scale, there should be a consideration on proportion of funds (capital) that is planned to be invested in the most valuable securities.

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Based on the process of analysis and calculation that have been conducted using *Single Index Model,*through considering the weight scale of funds proportion which equals to calculation of beta value, residual error variant, value of beta on its *excess return,* and calculating rate of *cut off*. There have been found proportion of funds on 5 securities as the following table:

Tabel 1. Funds Proportion, Expected *Return, and* Risk on Portfolio Combination

No.	Kode Saham	wi	E(Rp)	σp
1	PTPP	5.90%	0.000584	0.000048
2	BBCA	63.55%	0.011875	0.007863
3	WSKT	12.37%	0.003654	0.001063
4	GGRM	12.27%	0.001671	0.000156
5	UNVR	5.90%	0.000654	0.000035
	Jumlah	**100.00%**	**0.018438**	**0.009164**

Source: the data has been processed by researchers, 2019

Based on the above table, there have been found that the proportion of funds from several securities are less than 10%. This condition will not give a significant effect to the combination of portfolio itself. It can be seen that because the funds proportion proporsi are considered less and they will not gain a satisfying gain of yield. It is to say that there should be a combination of securities which can encourage achievemnt as expected by investors, it is great *return* value with lower risk

Tabel 3. Funds Proportion, Expected *Return, and* Risk in Portfolio Combinations.

No.	Kode Saham	wi	E(Rp)	σp
1	PTPP	7.22%	0.000584	0.000048
2	BBCA	77.67%	0.011875	0.007863
3	WSKT	15.12%	0.003654	0.001063
	Jumlah	**100.00%**	**0.016113**	**0.008974**

Source: the data has been processed by researchers, 2019

Tabel 4. Funds Proportion, Expected *Return, and* Risk in Portfolio Combinations.

No.	Kode Saham	wi	E(Rp)	σp
1	BBCA	72.06%	0.011875	0.007863
2	WSKT	14.03%	0.003654	0.001063
3	GGRM	13.92%	0.001671	0.000156
	Jumlah	**100.00%**	**0.017201**	**0.009081**

Source: the data has been processed by researchers, 2019

Based on the calculation on securities that has been conducted, the results shows that: *First*, there are 5 combinations of securities that can encourage optimal portfolio because thos securities reach 0.018438 value or (1.84%) on expected return with 0.009164 atau (0.91%)

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value of risk level. *Second*, the combinations of 3 securities value 0.016113 or (1.61%) on the expected return with 0.008974 or (0.9%) risk level. *Third*, *the combinations of 3 securities* values 0.017201 or (1.72%) expected return value with 0.009081 or (0.91%) risk level.

The portfolio which formed by 3 securities has a different expected return value and, of course, has different risk level as well. It is because different ccombinations of each securities that support the form of portfolio itself. The Portfolio combination as has been shown on table 4.3, has been formed by the highest value of *excees return to beta* (ERB). Meanwhile, the portfolio combination as has been shown on table 4.4 has been formed based on several considerations, like: funds proportion which can be allocated more, by means of gaining the greatest *return* yield. The fewer securities opted, the lower return that will be obtained as well. This result is in line with Halim (2005), who argues that the more number of securities in a combination in the portfolio, the lower risk existed.

The analysis by using CAPM compares the expected rate of return ($E(R_i)$) and the realized return (Ri).The level or rate expected return ($E(R_i)$) itself is becomes yield that will be obtained by the investors as the result of securities investments conducted. CAPM method has been applied by means of calculating rate of expected return using risk-free variable (Rf), average market return (E (Rm)) and systematic risk (β) which cannot be eliminated even by diversification.

The criteria in selecting securities that can support to be an efficient portfolioare the securities that have greater realized return than its return value which is expected ($R_i > E(R_i)$), meanwhile, for those securities that have lower realized return than its expected return ($R_i < E(R_i)$) are actegorized as the unefficient securities, and of course, they should be eliminated. The obtaining value of return which is expected of securities can be seen on the following table:

Tabel 5. The Calculation of Securities Expected *Return* Compared by Its Realized *Return*

No.	Code of Stocks	E(Ri)	Stocks Evaluation	Ri
1	WSKT	0,008383	Efficient	0,027874
2	BBCA	0,007104	Efficient	0,018686
3	PTPP	0,008422	Efficient	0,016554
4	BBNI	0,00857	Efficient	0,015526
5	GGRM	0,006542	Efficient	0,013616
6	ADRO	0,008277	Efficient	0,012058
7	UNVR	0,006443	Efficient	0,01078
8	TLKM	0,006183	Efficient	0,01068
9	ADHI	0,008123	Efficient	0,009243

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No.	Code of Stocks	E(Ri)	Stocks Evaluation	Ri
10	UNTR	0,006525	Efficient	0,007584
11	PTBA	0,006596	Efficient	0,007507
12	ASII	0,00803	Not Efficient	0,006652
13	AKRA	0,006482	Not Efficient	0,006427
14	WIKA	0,008838	Not Efficient	0,006288
15	ICBP	0,006144	Not Efficient	0,0045
16	INDF	0,007262	Not Efficient	0,00392
17	KLBF	0,007253	Not Efficient	0,003839
18	BBRI	0,008641	Not Efficient	0,002738
19	INTP	0,008169	Not Efficient	0,002233
20	BMRI	0,007744	Not Efficient	0,002024
21	SMGR	0,0081	Not Efficient	0,00182
22	JSMR	0,007467	Not Efficient	0,001813
23	BSDE	0,008184	Not Efficient	0,001771

Source: data has been processed by researchers, 2019

Based on the claculation by using CPAM method, there have been found that there are 11 securities that suitable for portfolio, and, which efficiently can be categorized as the candidates for investment. However, based on the table above, there have been found that 12 securities which are not efficient, because, those securities are not able to provide realized returns above the expected returns of investors. In fact, securities which categorized as efficient securities if the condition of the securities themselves have greater individual realized return value compares with return value which is expected ($R_i > E(R_i)$). The statement is in accordance with data that has been analsed that can be seen clearly on the above table. The table shows that security that has the highest individual realized *return* than the expected return value ($R_i > E(R_i)$), can be found on WSKT with 0.019491752 atau (1.95%) difference value between its realized return value and the expected return value. In addition, the security that has the lowest difference between realized return value and its expected return value *is* PTBA with 0.000910959 or (0.09%).

CONCLUSION

The analysis by using each method leads to securities combination which different between each other, and it leads difference to the amount of return as well. It occurs because there have been found steps differences in each method, one of the difference comes from CAPM menthod which assumes that diversification becomes the way of investors to reduce the risk. However, even deversification itself carries out perfectly, still, there will be systemic risk which is macro. Portfolio can be achieved opimally can be formed through appling Single

Index Model, its applied encourages considering whole aspects in economics which may lead a security to suffer losses. Meanwhile, the CAPM method only moves through considering certain risks in an efficient combination of portfolio. It would be better for investors to consider internal and external factors in their investments in order to avoid fatal mistakes which leads to suffer losses. As the information, this research has ignored companies that conduct kind of *right issue* activity, which leads different significant result at the end of each method applied, because of complexity on its method itself.

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