RESEARCH ARTICLE
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Simulation Of Optimal Portfolio Using Single Index Model And Markowitz Model On Lq-45 Index Shares For 2018

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The essence of portfolio formation is to reduce risk by means of diversification, namely allocating a number of funds to various investment alternatives that are negatively correlated. To select returns in a portfolio, you can use the Single Index Model and the Markowitz Model. This study was conducted with the aim of comparing the calculation of which company portfolios can provide a good rate of return with a small risk using the Single Index and Markowitz Model based on the sector of the company. So that the results of this study can provide recommendations to investors in decision making on portfolio selection. The research was conducted on companies indexed by LQ 45 on the Indonesia Stock Exchange. The research period is to use companies indexed by LQ 45 in 2018 for two periods.

Keyword: Simulation,Single Indeks Model,LQ 45,Markowitz

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INTRODUCTION

The Capital Market is a market that brings together parties that offer and require long-term funds, both debt securities (bonds), equity (stocks), mutual funds, derivative instruments and other instruments. The capital market is a means of funding for companies and other institutions and as a means of investing activities. The capital market facilitates various facilities and infrastructure for buying and selling long-term instruments and other related activities. The capital market is a place for trading securities that has been carried out in an organized manner. A system structured to bring together sellers and buyers of securities, through intermediaries and direct investors.

Stock Exchange is an institution that provides system facilities to bring together sellers and buyers of long-term securities between various companies with the aim of trading company securities that have been listed on the stock exchange. The number of companies currently listed on the stock exchange is 562 companies. Securities companies or often referred to as securities companies are parties that conduct business as underwriters, securities brokers or investment managers. In the Indonesian Stock Exchange, there are currently 108 securities companies that are members and carry out their activities, both as underwriters, securities brokers and investment managers. The existence of the capital market is very helpful for economic players in finding alternative funding for business activities and investors who want to invest their funds. One of them is stock investment in companies that have been listed on the Indonesia Stock Exchange.

When a person decides to invest in financial assets such as stocks, he expects that in the future, the benefits obtained from investing activities are referred to as returns. The expected return on investment is a compensation for the opportunity cost and the risk of decreasing purchasing power due to the influence of inflation (Tandelilin, 2001). In the context of investment, returns are the returns obtained from investment returns. Returns are divided into two, namely the yield that has occurred which is calculated based on historical data and the two returns that are expected to be obtained by investors in the future. The expected returns are simply the weighted average of various historical returns. The weighing factor is the probability of each return, while the portfolio return is the weighted average of the expected single share returns (Halim, 2005).

Errors in stock selection will affect the provision of returns, so that the returns obtained from the portfolio are not as expected. To obtain the desired portfolio, investors must carry out an analysis that provides the maximum return. A rational investor will choose a portfolio that will provide the maximum return on a certain risk. A portfolio is a combination or combination or set of assets, both in the form of real assets and financial assets owned by investors. (Tandelilin, 2010) The essence of portfolio formation is to reduce risk by means of diversification, namely allocating a number of funds to various investment alternatives that are negatively correlated. To select returns in a portfolio, you can use a model Single Index and Markowitz Model.

The index model or factor model assumes that a security's yield is sensitive to changes in a variety of factors. The index model seeks to include the major economic forces that can systematically move the prices of all securities. The single index model or the one-factor model assumes that the yields between two or more securities will be correlated i.e. they will move together and have the same reaction to one factor, namely the JCI Composite Stock Price Index). (Halim, 2018)

Markowitz or multi-index models have more potential in an effort to estimate expected return, standard deviation and effect covariance more accurately than single index models. Because the actual return of securities is not only sensitive to changes in the JCI, it means that there is a possibility that more than one factor can influence it. Multi index models assume that there are other factors besides the IHSG that can influence the correlation between effects, for example the risk-free interest rate (Halim, 2005).

The LQ45 Stock Index is a stock market index on the Indonesia Stock Exchange (IDX) consisting of 45 issuers with the largest market capitalization and the highest transaction value on the regular market in the last 12 months. Issuers can only be listed on LQ45 shares if they have been listed on the IDX for at least three months, and have high financial conditions and growth prospects. Therefore, the issuers in the LQ45 stock list are often referred to as superior stocks or favorite stocks. (https://www.seputarforex.com/saham/lq_45) l.

METHOD (FOR RESEARCH ARTICLE)

TYPES OF RESEARCH

This research is a descriptive study, namely "Research conducted to determine the independent variables, either one or more (independent) variables without making comparisons, or connecting with other variables". Descriptive research is "Research that is directed to provide symptoms, facts, or events in a systematic and accurate manner, regarding the characteristics of a particular population or area".

The approach used in this study is a quantitative approach, because the main data used in this study are numeric data. "Quantitative data is data in the form of numbers, or qualitative data that is extrapolated." This research uses data in the form of a list of monthly stock closing prices, monthly Composite Stock Price Index (IHSG) and BI interest rates for the period 2018. The data will be processed or processed using formulas from several theories which will then be analyzed and described so that it can a conclusion is reached.

POPULATION AND SAMPLES

The population in this study were all companies included in the LQ-45 index for the 2018 period, namely 45 companies. From 45 companies, it will be seen whether they are active in stock trading in the last 1 year or not. Then we will classify the calculations based on the company's industrial sector.

TYPES AND DATA SOURCES

The data collected is in the form of secondary data obtained from the Indonesia Stock Exchange Corner and from the Bank Indonesia website during 2018.Secondary data is the source of

research data obtained through intermediary media or indirectly in the form of books, records, existing evidence, or archives. both published and not publicly published. The data required is the closing price of shares every month, the BI Rate and the Composite Stock Price Index each month during 2018.

VARIABLES

An operational definition is a definition based on the observable characteristics of what is being defined or changing the concepts that describe observable behaviors or symptoms that can be tested and verified. Some of the indicators used in assessing the optimal portfolio are as follows:

Actual Return is a historical return that has occurred and can also be called a realize return. To get stock returns, many methods are used, such as probabilty returns and non-probability returns and dividends.

Expected Return is the rate of return expected by an investor

Shares Variance is a measurement of the risk of return expected by investors on certain stocks.

Alpha is a linear relationship between actual stock returns and market actual returns (IHSG). This alpha is used to calculate Variance Error (ei).

Beta is the slope of the linear relationship between actual stock returns. Beta is also called systematic risk or risk that cannot be diversified through portfolio formation.

Variance Error Residual, namely the unsystematic risk of a stock

Cut Off Rate calculates which stocks can provide optimal value.

DATA ANALYSIS

The data analysis technique in this study uses the Single Index model analysis, which is able to calculate manually or calculate using Ms. Excel in calculating the optimal portfolio of stocks. (Prasetyo, 2017) The data analysis technique carried out is as follows:

Single Index Model

Calculating the return on the realization of each share by calculating the dividend per montH

$$R_{i,t} = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Calculating Expected Return

$$E(R) = \sum \frac{Ri}{n}$$

Calculating Stock Variance

Variants can be calculated by the following formula:

$$\sigma i^2 = \sum_{n-1}^{n} (Ri - \frac{E(Ri)2}{n-1}$$

Calculating Alpha

Alpha is used to calculate the error variance.

Manually alpha can be calculated as follows:

$$\propto_i = R_i - \beta_i x R_m$$

Calculating Stock Beta

Beta can be manually calculated using the following formula:

$$\beta_i = \frac{\sigma im}{\sigma m}$$

Calculating Stock Residual Variance Error

$$e_i = R_i - \propto_i - (\beta_i x R_{m)}$$

Calculating Excess Return

Excess Return $= R_i - R_f$

Calculating Excess Return to Beta

ERB $= E(R_{i)} - \frac{Rf}{\beta i}$

Sort of Excess Return to Beta

Calculating the Value of Ai and Bi for each of the ith securities as follows:

Ai = $\frac{E(Ri) - R(Br).\beta i}{\sigma ei}$

Bi = $\frac{\beta i}{\sigma ei}$

Calculating the size of the proportion for each security after the securities that make up the optimal portfolio can be determined

Wi = $\frac{Zi}{\sum Zj}$

Markowitz indeks Model

By using a simple linear regression equation will be used to calculate the factors that are thought to affect stock prices. (Eka Pratiwi, Dzulkirom, & Farah Azizah, 2014). This Markowitz Index Model can be done in several steps, namely:

Calculate the return on individual stock realization

Calculate the expected return on individual stocks

Calculating Standard Deviation and Variance

Calculating Covarian

Calculating the Correlation Coefficient

Calculating the Portfolio's Expected Return

Calculating the Standard Deviation of the Portfolio

RESULTS AND DISCUSSION

Gambaran Umum Perusahaan

Setelah dilakukan pengamatan maka sampel yang digunakan dalam penelitian ini berjumlah 37 perusahaan yang aktif melakukan perdagangan saham dalam 1 tahun terakhir. Data perusahaan tersebut dirangkum dalam Tabel 4.1 berikut:

[Table 4.1 about here.]

Tahap Perhitungan Model Single Indeks

Tabulasi Data diperlukan untuk mempermudah peneliti dalam mengolah data penelitian ini,Adapun data yang diolah dalam bentuk harga penutupan saham ,Indeks Harga Saham Gabungan dan Suku Bunga Bank Indonesia terangkum dalam tabel-tabel di bawah ini :

[Table 4.2 about here.]

[Table 4.3 about here.]

[Table 4.4 about here.]

[Table 4.5 about here.]

[Table 4.6 about here.]

[Table 4.7 about here.]

[Table 4.8 about here.]

[Table 4.9 about here.]

Actual Return

Actual Return is a historical return that has occurred and can also be called a realize return. The formula for calculating Actual Return is as follows:

$$R_{i,t} = \frac{P_t - P_{t-1}}{P_{t-1}}$$

[Table 5.0 about here.]

[Table 5.1 about here.]

[Table 5.2 about here.]

[Table 5.3 about here.]

[Table 5.4 about here.]

[Table 5.5 about here.]

[Table 5.6 about here.]

[Table 5.7 about here.]

Calculation of Expected Return, Stock and Market Variance, Calculating Stock Alpha and Beta, Calculating Variance Error

[Table 5.8 about here.]

[Table 5.9 about here.]

[Table 5.11 about here.]

[Table 5.12 about here.]

[Table 5.13 about here.]

[Table 5.14 about here.]

[Table 5.15 about here.]

Calculation of Excess Return, ERB, Calculating Cut of Rate, Sorting Shares based on ERB, Determining Cut off

Rate and Determining Shares which are included in the Optimal Portfolio

[Table 5.16 about here.]

[Table 5.17 about here.]

[Table 5.18 about here.]

[Table 5.19 about here.]

[Table 5.20 about here.]

[Table 5.21 about here.]

[Table 5.22 about here.]

[Table 5.23 about here.]

From the results of calculations using the Single Index Model above, it is found that the optimal portfolio component is for property companies, all companies are optimal, this is evidenced by the calculation of Excess Return to Beta is greater than the Cut of Point value of the optimal portfolio combination, then for mining companies there is 2 that are optimal, namely INCO and PTBA, there is only one trade company that is optimal, namely UNTR, almost all of its share components are optimal except for Bank Mandiri, for Misc Ind. Companies there are SRIL and Basic Ind. BRPT, SMGR, INKP. Infrastructure companies are JSMR, PGAS and TLKM and the last combination is the consumer sector, there is only 1 company, namely KLBF.

It can be concluded that in the calculation of the optimal portfolio calculation simulation using the Single Model Index, the best taken by consumers is the property company because all companies have a very good level of return and risk in the preparation of optimal portfolios. If consumers want to combine various types of portfolios, they can combine portfolios in property companies with finance companies, or it can be with Basic Ind and Infrastructure companies, all of which provide high returns for investors.

Markowitz Model

The Markowitz model is a method that can be used as an alternative by investors as a basis for making investment decisions. The basic components in calculations using the Markowitz Model are less than calculations using the Single Index Model. The following is the calculation of stock composition using the Markowitz model.

[Table 5.24 about here.]

[Table 5.25 about here.]

[Table 5.26 about here.]

[Table 5.27 about here.]

[Table 5.28 about here.]

[Table 5.29 about here.]

[Table 5.30 about here.]

[Table 5.31 about here.]

From calculations using the Markowitz model, it can be seen that the company that has the highest realization return of all companies is in the Mining Company, namely Aneka Tambang (ANTM) and the Basic Ind. Company, namely Indocement Tunggal Perkasa (INTP). Portfolio in this case does not directly combine one stock with another stock and not only considers the aspects of return and risk, but also considers the covariance and correlation coefficient of these stocks. The correlation coefficient is a calculation that describes the movements between stocks which are combined to determine the effect between stocks.

However, in terms of calculation for the proportion of optimal portfolio-forming stock funds using the Markowitz method, it is known that the stocks that form a high optimal portfolio are property companies by WIKA, Mining Companies

by ANTM, INCO, PTBA, Trade Companies, all companies are optimal, and the optimal Ind. Misc Sector. is ASII, the optimal finance companies are BBCA, BBRI and BMRI. The optimal Basic Ind companies are BRPT, SMGR, WSBP while the infrastructure company is PGAS and finally the Consumer companies are GGRM, ICBP, INDF and UNVR.

CONCLUSIONS

Based on the 45 companies that were included in the LQ 45 Index in 2018, it turned out that there were 37 companies that could be included in the criteria for the sample company because in the two periods the company was actively listing on the Indonesia Stock Exchange. According to calculations using the Single Index Model of 37 companies that form an optimal portfolio, there are 20 companies with the highest proportion in the property sector where all companies are optimal, then the finance sector almost all of the companies form an optimal portfolio except for Bank Mandiri, then underneath there is the Infrastructure sector, Basic Industry, Misc Industry, Mining, Trade, and Consumer.

If the calculation uses the Markowitz model, there are 22 companies whose portfolio formation is good. This is clearly different from the two analyzes of the calculations. The optimal portfolio formation from the calculation results of the Markowitz method is the Trade, Finance, Basic-Inc, Mining, Consumer, Property, Misc Ind and Infrastructure sectors. This proves that if the calculation or simulation uses two methods, namely the single index model method and the Markowitz method, the results are different, because in Markowitz theory there are other factors that must be considered in the formation of an optimal portfolio, not only on the Composite Stock Price Index.

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Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

LIST OF TABLES

TABLE 4.1 / Data perusahaan masuk LQ45 Tahun 2018

No	Sektor	Nama Saham
1.	Property	1. ADHI 2. BSDE 3. PT.PP 4. WIKA 5. WSKT
2.	Mining	1. ADRO 2. ANTM 3. INCO 4. PTBA
3.	Trade	1. AKRA 2. LPPF 3. MNCN 4. SCMA 5. UNTR
4.	Misc Ind	1. ASII 2. SRIL
5.	Finance	1. BBCA 2. BBNI 3. BBRI 4. BBTN 5. BMRI
6.	Basic Ind	1. BRPT 2. INTP 3. SMGR 4. WSBP 5. TPIA
7.	Infrastruktur	1. EXCL 2. INDY 3. JSMR 4. PGAS 5. TLKM
8.	Consumer	1. GGRM 2. HMSP 3. ICBP 4. INDF 5. KLBF 6. UNVR

Sumber : www.idx.go.id

TABLE 4.2 / Data Closing Price Sektor Property

Bulan	**Close Price**						
	PROPERTY						
	ADHI	BSDE	PT.PP	WIKA	WSKT	IHSG	RF
Jan-18	2230	1820	3130	2080	2830	6650	4.25%
Feb-18	2480	1935	3100	1925	2910	6600	4.25%
Mar-18	2070	1780	2610	1680	2470	6690	4.25%
Apr-18	1880	1690	2430	1585	2210	5650	4.50%
Mei-18	1945	1705	2580	1670	2320	5650	4.75%
Jun-18	1790	1565	1995	1325	1925	5620	5.25%
Jul-18	1605	1350	2080	1550	2120	5800	5.25%
Agu-18	1490	1200	1900	1550	1895	5900	5.50%
Sep-18	1390	1155	1525	1365	1700	5650	5.75%
Okt-18	1125	1100	1330	1100	1440	5650	5.75%
Nov-18	1565	1350	1855	1505	1560	6150	6.00%
Des-18	1585	1255	1805	1655	1680	6600	6.00%
Jan-19	1630	1330	2340	1895	1975	6650	6.00%

TABLE 4.3 / Data Closing Price Sektor Mining

Bulan	**Close Price**					
	MINING					
	ADRO	ANTM	INCO	PTBA	IHSG	RF
Jan-18	2450	915	3750	3400	6650	4.25%
Feb-18	2350	955	3390	3170	6600	4.25%
Mar-18	2130	775	2790	2940	6690	4.25%
Apr-18	1835	845	3160	3240	5650	4.50%
Mei-18	1885	865	3860	3800	5650	4.75%
Jun-18	1790	890	4040	3970	5620	5.25%
Jul-18	1905	915	4370	4480	5800	5.25%
Agu-18	1865	5220	3800	4050	5900	5.50%
Sep-18	1835	5070	3710	4320	5650	5.75%
Okt-18	1650	4080	2920	4250	5650	5.75%
Nov-18	1285	3690	3030	4020	6150	6.00%
Des-18	1215	4590	3260	4300	6600	6.00%
Jan-19	1390	1930	3850	4310	6650	6.00%

TABLE 4.4 / Data Closing Price Sektor Trade

Bulan	**Close Price**						
	TRADE						
	AKRA	LPPF	MNCN	SCMA	UNTR	IHSG	RF
Jan18	6225	11125	1525	710	38900	6650	4.25%
Feb18	6100	10650	1535	675	35600	6600	4.25%
Mar18	5675	10950	1415	630	32000	6690	4.25%
Apr18	4900	10350	1325	590	34100	5650	4.50%
Mei18	4920	9150	1200	560	35050	5650	4.75%
Jun18	4300	8800	920	530	31600	5620	5.25%
Jul18	4210	8025	985	515	35250	5800	5.25%
Agu18	3610	7500	905	515	34400	5900	5.50%
Sep18	3670	6925	805	515	33000	5650	5.75%
Okt18	3460	4850	780	478	33500	5650	5.75%
Nov18	3900	4750	790	590	27500	6150	6.00%
Des18	4290	5600	690	620	27350	6600	6.00%
Jan19	5250	7000	845	650	25725	6650	6.00%

TABLE 4.5 / Data Closing Price Sektor Finance

Bulan	**Close Price**						
	FINANCE						
	BBCA	BBNI	BBRI	BBTN	BMRI	IHSG	RF
Jan18	22725	9400	3700	3660	8150	6650	4.25%
Feb18	23175	9725	3780	3740	8300	6600	4.25%
Mar18	23300	8675	3600	3800	7675	6690	4.25%
Apr18	22100	8050	3220	3110	7125	5650	4.50%
Mei18	22700	8475	3080	3050	7050	5650	4.75%
Jun18	21475	7050	2840	2450	6850	5620	5.25%
Jul18	23275	7400	3070	2360	6650	5800	5.25%
Agu18	24800	7800	3180	2750	6900	5900	5.50%
Sep18	24150	7400	3150	2630	6725	5650	5.75%
Okt18	23650	7325	3150	2120	6850	5650	5.75%
Nov18	26050	8500	3620	2670	7400	6150	6.00%
Des18	26000	8800	3660	2540	7375	6600	6.00%
Jan19	28175	9075	3850	2740	7450	6650	6.00%

TABLE 4.6 / Data Closing Price Sektor Basic Industri

Bulan	**Close Price**							
	BASIC-IND							
	BRPT	INTP	SMGR	WSBP	INKP	TPIA	IHSG	RF
Jan18	2640	4470	11150	474	9275	4525	6650	4.25%
Feb18	2620	4320	11125	480	10750	4150	6600	4.25%
Mar18	2310	3530	10350	414	11000	4225	6690	4.25%
Apr18	2470	3410	9650	404	12200	4050	5650	4.50%
Mei18	2120	3740	8400	402	14700	5850	5650	4.75%
Jun18	1980	3420	7125	366	18800	5800	5620	5.25%
Jul18	1815	3600	7600	428	19200	5000	5800	5.25%
Agu18	1715	3270	9450	390	19100	5500	5900	5.50%
Sep18	1840	2800	9925	358	17250	4920	5650	5.75%
Okt18	1875	2240	9000	318	12725	4510	5650	5.75%
Nov18	2110	1800	12025	350	10800	5225	6150	6.00%
Des18	2390	1585	11500	376	11350	5225	6600	6.00%
Jan19	2610	2130	12675	384	12000	5575	6650	6.00%

TABLE 4.7 / Data Closing Price Sektor Misc- Industry

Bulan	Close Price			
	MISC – IND			
	ASII	SRIL	IHSG	RF
Jan-18	8500	382	6650	4.25%
Feb-18	8075	336	6600	4.25%
Mar-18	7300	334	6690	4.25%
Apr-18	7150	342	5650	4.50%
Mei-18	6900	344	5650	4.75%
Jun-18	6600	344	5620	5.25%
Jul-18	7150	342	5800	5.25%
Agu-18	7250	344	5900	5.50%
Sep-18	7350	344	5650	5.75%
Okt-18	7900	362	5650	5.75%
Nov-18	8550	360	6150	6.00%
Des-18	8225	358	6600	6.00%
Jan-19	8450	340	6650	6.00%

TABLE 4.8 / Data Closing Price Sektor Infrastruktur

Bulan	**Close Price**						
	INFRASTRUKTUR						
	EXCL	INDY	JSMR	PGAS	TLKM	IHSG	RF
Jan18	2950	4470	5700	2810	2990	6650	4.25%
Feb18	2950	4220	5250	2870	4000	6600	4.25%
Mar18	2520	2520	4580	2200	2600	6690	4.25%
Apr18	2120	2410	4270	1965	2520	5650	4.50%
Mei18	2100	2740	4450	2070	2520	5650	4.75%
Jun18	2320	2420	4780	1995	2750	5620	5.25%
Jul18	2750	2800	4850	1700	2570	5800	5.25%
Agu18	2150	2270	4520	2140	2480	5900	5.50%
Sep18	2750	2800	4470	2250	2640	5650	5.75%
Okt18	2540	2260	4150	2220	2550	5650	5.75%
Nov18	1950	1800	4120	1955	2680	6150	6.00%
Des18	1875	1585	4250	2120	2750	6600	6.00%
Jan19	2170	2720	4920	2570	2900	6650	6.00%

TABLE 4.9 / Data Closing Price Sektor Consumer

Bulan	**Close Price**							
	CONSUMER							
	GGRM	HMSP	ICBP	INDF	KLBF	UNVR	IHSG	RF
Jan18	81000	4900	8725	7750	1885	54400	6650	4.25%
Feb18	79750	4820	8975	7575	1800	52900	6600	4.25%
Mar18	72475	2960	8275	7200	1500	49525	6690	4.25%
Apr18	62225	2540	8675	6975	1505	48250	5650	4.50%
Mei18	68500	2750	8700	7075	1270	45800	5650	4.75%
Jun18	87250	2580	8725	4650	1220	48100	5620	5.25%
Jul18	75150	2840	8675	4250	1295	42250	5800	5.25%
Agu18	72000	2820	8525	4275	1345	42350	5900	5.50%
Sep18	74050	2850	8925	5900	1380	47025	5650	5.75%
Okt18	72200	2720	8550	5975	1370	42225	5650	5.75%
Nov18	82000	2680	10450	6800	1325	42250	6150	6.00%
Des18	82625	2710	10150	7450	1320	45400	6600	6.00%
Jan19	82650	2820	10775	7750	1600	50000	6650	6.00%

TABLE 5.0 / Actual Return Perusahaan Property

Bulan	Actual Return					IHSG	RF
	PROPERTY						
	ADHI	BSDE	PT.PP	WIKA	WSKT		
Jan18	0,1121	0,0632	-0,0096	-0,0745	0,0283	-0,0075	0,0035
Feb18	-0,1653	-0,0801	-0,1581	-0,1273	-0,1	0,0136	0,0035
Mar18	-0,0918	-0,0506	-0,0690	-0,0565	-0,1053	-0,1555	0,0035
Apr18	0,0346	0,0089	0,0617	0,0536	0,0498	0	0,0038
Mei18	-0,0797	-0,0821	-0,2267	-0,2066	-0,1703	-0,0053	0,0040
Jun18	-0,1034	-0,1374	0,0426	0,1698	0,1013	0,0320	0,0044
Jul18	-0,0717	-0,1111	-0,0865	0	-0,1061	0,0172	0,0044
Agu18	-0,0671	-0,0375	-0,1974	-0,1194	-0,1029	-0,0424	0,0046
Sep18	-0,1906	-0,0476	-0,1279	-0,1941	-0,1529	0	0,0048
Okt18	0,3911	0,2273	0,3947	0,3682	0,0833	0,0885	0,0048
Nov18	0,0128	-0,0704	-0,0270	0,0997	0,0769	0,0732	0,0050
Des18	0,0284	0,0598	0,2964	0,1450	0,1756	0,0076	0,0050

TABLE 5.1 / Actual Return Perusahaan Mining

Bulan	Actual Return				IHSG	RF
	MINING					
	ADRO	ANTM	INCO	PTBA		
Jan18	-0,0408	0,0437	-0,0960	-0,0676	-0,0075	0,0035
Feb18	-0,0936	-0,1885	-0,1770	-0,0726	0,0136	0,0035
Mar18	-0,1385	0,0903	0,1326	0,1020	-0,1555	0,0035
Apr18	0,0272	0,0237	0,2215	0,1728	0	0,0038
Mei18	-0,0504	0,0289	0,0466	0,0447	-0,0053	0,0040
Jun18	0,0642	0,0281	0,0817	0,1285	0,0320	0,0044
Jul18	-0,0210	4,7049	-0,1304	-0,0960	0,0172	0,0044
Agu18	-0,0161	-0,0287	-0,0237	0,0667	-0,0424	0,0046
Sep18	-0,1008	-0,1953	-0,2129	-0,0162	0	0,0048
Okt18	-0,2212	-0,0956	0,0377	-0,0541	0,0885	0,0048
Nov18	-0,0545	0,2439	0,0759	0,0697	0,0732	0,0050
Des18	0,1440	-0,5795	0,1810	0,0023	0,0076	0,0050

TABLE 5.2 / Actual Return Trade

Bulan	Actual Return					IHSG	RF
	TRADE						
	AKRA	LPPF	MNCN	SCMA	UNTR		
Jan18	-0,0201	-0,0427	0,0066	-0,0493	-0,0848	-0,0075	0,0035
Feb18	-0,0697	0,0282	-0,0782	-0,0667	-0,1011	0,0136	0,0035
Mar18	-0,1366	-0,0548	-0,0636	-0,0635	0,0656	-0,1555	0,0035
Apr18	0,0041	-0,1159	-0,0943	-0,0508	0,0279	0	0,0038
Mei18	-0,1260	-0,0383	-0,2333	-0,0536	-0,0984	-0,0053	0,0040
Jun18	-0,0209	-0,0881	0,0707	-0,0283	0,1155	0,0320	0,0044
Jul18	-0,1425	-0,0654	-0,0812	0	-0,0241	0,0172	0,0044
Agu18	0,0166	-0,0767	-0,1105	0	-0,0407	-0,0424	0,0046
Sep18	-0,0572	-0,2996	-0,0311	-0,0718	0,0152	0	0,0048
Okt18	0,1272	-0,0206	0,0128	0,2343	-0,1791	0,0885	0,0048
Nov18	0,1000	0,1789	-0,1266	0,0508	-0,0055	0,0732	0,0050
Des18	0,2238	0,2500	0,2246	0,0484	-0,0594	0,0076	0,0050

TABLE 5.3 / Actual Return Finance

Bulan	Actual Return					IHSG	RF
	FINANCE						
	BBCA	BBNI	BBRI	BBTN	BMRI		
Jan18	0,0198	0,0346	0,0216	0,0219	0,0184	-0,0075	0,0035
Feb18	0,0054	-0,1080	-0,0476	0,0160	-0,0753	0,0136	0,0035
Mar18	-0,0515	-0,0720	-0,1056	-0,1816	-0,0717	-0,1555	0,0035
Apr18	0,0271	0,0528	-0,0435	-0,0193	-0,0105	0	0,0038
Mei18	-0,0540	-0,1681	-0,0779	-0,1967	-0,0284	-0,0053	0,0040
Jun18	0,0838	0,0496	0,0810	-0,0367	-0,0292	0,0320	0,0044
Jul18	0,0655	0,0541	0,0358	0,1653	0,0376	0,0172	0,0044
Agu18	-0,0262	-0,0513	-0,0094	-0,0436	-0,0254	-0,0424	0,0046
Sep18	-0,0207	-0,0101	0	-0,1939	0,0186	0	0,0048
Okt18	0,1015	0,1604	0,1492	0,2594	0,0803	0,0885	0,0048
Nov18	-0,0019	0,0353	0,0110	-0,0487	-0,0034	0,0732	0,0050
Des18	0,0837	0,0313	0,0519	0,0787	0,0102	0,0076	0,0050

TABLE 5.4 / Actual Return MISC-IND

Bulan	Actual Return		IHSG	RF
	MISC - IND			
	ASII	SRIL		
Jan18	-0,0500	-0,1204	-0,0075	0,0035
Feb18	-0,0960	-0,0060	0,0136	0,0035
Mar18	-0,0205	0,0240	-0,1555	0,0035
Apr18	-0,0350	0,0058	0	0,0038
Mei18	-0,0435	0	-0,0053	0,0040
Jun18	0,0833	-0,0058	0,0320	0,0044
Jul18	0,0140	0,0058	0,0172	0,0044
Agu18	0,0138	0	-0,0424	0,0046
Sep18	0,0748	0,0523	0	0,0048
Okt18	0,0823	-0,0055	0,0885	0,0048
Nov18	-0,0380	-0,0056	0,0732	0,0050
Des18	0,0274	-0,0503	0,0076	0,0050

TABLE 5.5 / Actual Return Basic-Ind Tahun 2018

Bulan	Actual Return						IHSG	RF
	BASIC-IND							
	BRPT	INTP	SMGR	WSBP	INKP	TPIA		
Jan	-0,0076	-0,0336	-0,0022	0,0127	0,1590	-0,0829	-0,0075	0,0035
Feb	-0,1183	-0,1829	-0,0697	-0,1375	0,0233	0,0181	0,0136	0,0035
Mar	0,0693	-0,0340	-0,0676	-0,0242	0,1091	-0,0414	-0,1555	0,0035
Apr	-0,1417	0,0968	-0,1295	-0,0050	0,2049	0,4444	0	0,0038
Mei	-0,0660	-0,0856	-0,1518	-0,0896	0,2789	-0,0085	-0,0053	0,0040
Jun	-0,0833	0,0526	0,0667	0,1694	0,0213	-0,1379	0,0320	0,0044
Jul	-0,0551	-0,0917	0,2434	-0,0888	-0,0052	0,1000	0,0172	0,0044
Agu	0,0729	-0,1437	0,0503	-0,0821	-0,0969	-0,1055	-0,0424	0,0046
Sep	0,0190	-0,2000	-0,0932	-0,1117	-0,2623	-0,0833	0	0,0048
Okt	0,1253	-0,1964	0,3361	0,1006	-0,1513	0,1585	0,0885	0,0048
Nov	0,1327	-0,1194	-0,0437	0,0743	0,0509	0	0,0732	0,0050
Des	0,0921	0,3438	0,1022	0,0213	0,0573	0,0670	0,0076	0,0050

TABLE 5.6 / Actual Return Perusahaan Infrastruktur

Bulan	Actual Return					IHSG	RF
	INFRASTRUKTUR						
	EXCL	INDY	JSMR	PGAS	TLKM		
Jan-18	0,0000	-0,0559	-0,0789	0,0214	0,3378	-0,0075	0,0035
Feb-18	-0,1458	-0,4028	-0,1276	-0,2334	-0,3500	0,0136	0,0035
Mar-18	-0,1587	-0,0437	-0,0677	-0,1068	-0,0308	-0,1555	0,0035
Apr-18	-0,0094	0,1369	0,0422	0,0534	0	0	0,0038
Mei-18	0,1048	-0,1168	0,0742	-0,0362	0,0913	-0,0053	0,0040
Jun-18	0,1853	0,1570	0,0146	-0,1479	-0,0655	0,0320	0,0044
Jul-18	-0,2182	-0,1893	-0,0680	0,2588	-0,0350	0,0172	0,0044
Agu-18	0,2791	0,2335	-0,0111	0,0514	0,0645	-0,0424	0,0046
Sep-18	-0,0764	-0,1929	-0,0716	-0,0133	-0,0341	0	0,0048
Okt-18	-0,2323	-0,2035	-0,0072	-0,1194	0,0510	0,0885	0,0048
Nov-18	-0,0385	-0,1194	0,0316	0,0844	0,0261	0,0732	0,0050
Des-18	0,1573	0,7161	0,1576	0,2123	0,0545	0,0076	0,0050

TABLE 5.7 / Actual Return Perusahaan Consumer

Bulan	Actual return						IHSG	RF
	CONSUMER							
	GGRM	HMSP	ICBP	INDF	KLBF	UNVR		
Jan-18	-0,0154	-0,0163	0,0287	-0,0226	-0,0451	-0,0276	-0,0075	0,0035
Feb-18	-0,0912	-0,3859	-0,0780	-0,0495	-0,1667	-0,0638	0,0136	0,0425
Mar-18	-0,1414	-0,1419	0,0483	-0,0313	0,0033	-0,0257	-0,1555	0,0425
Apr-18	0,1008	0,0827	0,0029	0,0143	-0,1561	-0,0508	0	0,0450
Mei-18	0,2737	-0,0618	0,0029	-0,3428	-0,0394	0,0502	-0,0053	0,0475
Jun-18	-0,1387	0,1008	-0,0057	-0,0860	0,0615	-0,1216	0,0320	0,0525
Jul-18	-0,0419	-0,0070	-0,0173	0,0059	0,0386	0,0024	0,0172	0,0525
Agu-18	0,0285	0,0106	0,0469	0,3801	0,0260	0,1104	-0,0424	0,0550
Sep-18	-0,0250	-0,0456	-0,0420	0,0127	-0,0072	-0,1021	0	0,0575
Okt-18	0,1357	-0,0147	0,2222	0,1381	-0,0328	0,0006	0,0885	0,0575
Nov-18	0,0076	0,0112	-0,0287	0,0956	-0,0038	0,0746	0,0732	0,0600
Des-18	0,0003	0,0406	0,0616	0,0403	0,2121	0,1013	0,0076	0,0600

TABLE 5.8 / Perusahaan Property

	ADHI	BSDE	PT.PP	WIKA	WSKT
E(R)	-0,0159	-0,0215	-0,0089	0,0048	-0,0228
σ^2	0,0219539	0,0091103	0,0327595	0,0264597	0,0132645
α	-0,0179045	-0,0222574	-0,011234	0,0021839	-0,0243561
β	1,1285	0,4387	1,3119	1,4740	0,8732
σ_{ei}^2	-0,0179045	-0,0222574	-0,011234	0,0021839	-0,0243561
ER	0,1086	0,0596	-0,0131	-0,0781	0,0247
Rata-rata ER		0,0204			
ERB	0,0180	0,0464	0,0155	0,0138	0,0233
Ai	-0,0202045	-0,0097633	-0,014739	0,0032189	-0,0212676
Bi	0,0177763	0,0106783	0,0081365	0,0003454	0,0254542
Ci	-0,0198516	-0,0096602	-0,01462	0,0032178	-0,0207397
C*	0,0032178				

TABLE 5.9 / Perusahaan Mining

	ADRO	ANTM	INCO	PTBA
E(R)	-0,0418	0,3397	0,0114	0,0234
σ^2	0,0082987	1,770252	0,018111	0,006983
α	-0,041854	0,336856	0,011904	0,024104
β	0,0400	1,5662	-0,2741	-0,4201
σ_{ei}^2	-0,041854	0,336856	0,011904	0,024104
ER	-0,0444	0,0402	-0,0995	-0,0712
Rata-rata ER		-0,0437		
ERB	-1,0919	-0,0279	0,1596	0,1041
Ai	-0,0017	0,5276	-0,0033	-0,0101
Bi	-0,0016	-4,0643	0,0009	0,0056
Ci	-0,0017	-0,1722	-0,0033	-0,0101
C*	-0,001679			

TABLE 5.11 / Perusahaan Finance

	BBCA	**BBNI**	**BBRI**	**BBTN**	**BMRI**
E(R)	0,0194	0,0007	0,0055	-0,0149	-0,0066
σ^2	0,002662626	0,007097	0,00454	0,017845	0,00178
α	0,01840111	-0,0007	0,00406	-0,01727	-0,00735
β	0,5446	0,7864	0,8319	1,3043	0,4414
σ_{ei}^2	0,01840111	-0,0007	0,00406	-0,01727	-0,00735
ER	0,0163	0,0310	0,0181	0,0183	0,0149
Rata-rata ER		0,0197			
ERB	0,0362	0,0251	0,0237	0,0151	0,0447
Ai	0,010022056	-0,00055	0,003378	-0,02253	-0,00325
Bi	0,009356274	1,98E-05	0,000696	0,019741	0,001211
Ci	0,009929156	-0,00055	0,003375	-0,02209	-0,00324
C*	0,009929156				

TABLE 5.12 / Perusahaan Misc-Ind

	ASII	**SIRIL**
E(R)	0,0010	-0,0088
σ^2	0,003093828	0,0016342
α	0,000632332	-0,008619
β	0,2331	-0,0999
σ_{ei}^2	0,000632332	-0,008619
ER	-0,0535	-0,1240
Rata-rata ER		-0,0888
ERB	-0,3807	0,8884
Ai	0,00014742	0,000861
Bi	-1,05033E-06	8,361E-05
Ci	0,00014742	0,0008609
C*	0,000860931	

TABLE 5.13 / Perusahaan Basic-Ind

	BRPT	INTP	SMGR	WSBP	INKP	TPIA
E(R)	0,0033	-0,0495	0,0201	-0,0134	0,0324	0,0274
σ^2	0,008384	0,02216	0,020387	0,00812	0,021028	0,02285279
α	0,003145	-0,04894	0,018254	-0,01445	0,033496	0,026359346
β	0,0674	-0,3131	1,0177	0,5991	-0,6022	0,5662
σ_{ei}^2	0,003145	-0,04894	0,018254	-0,01445	0,033496	0,026359
ER	-0,0111	-0,0371	-0,0058	0,0091	0,1555	-0,0864
Rata-rata ER		0,0221				
ERB	0,3281	-0,0707	0,0217	0,0369	-0,0367	0,0391
Ai	0,000212	0,015322	0,018577	-0,00866	-0,02017	0,014924255
Bi	3,01E-05	-0,0339	0,01533	0,005652	-0,03055	0,017783783
Ci	0,000212	0,015859	0,018297	-0,00861	-0,02081	0,014663
C*	0,018297					

TABLE 5.14 / Perusahaan Infrastruktur

	EXCL	INDY	JSMR	PGAS	TLKM
E(R)	-0,0127	-0,0067	-0,0093	0,0021	0,0092
σ^2	0,02511823	0,076653	0,005777	0,019049	0,021831
α	-0,0123116	-0,00555	-0,00985	0,001691	0,009237
β	-0,2312	-0,6618	0,2898	0,2006	-0,0444
σ_{ei}^2	-0,0123116	-0,00555	-0,00985	0,001691	0,009237
ER	-0,0035	-0,0559	-0,0789	0,2526	0,9996
Rata-rata ER		0,2228			
ERB	-0,9635	-0,3366	0,7688	1,1102	-5,0200
Ai	0,00284643	0,003673	-0,00286	0,000339	-0,00041
Bi	-0,0001573	-9,1E-05	0,000126	2,58E-06	-1,7E-05
Ci	0,00284688	0,003673	-0,00285	0,000339	-0,00041
C*	0,00367314				

TABLE 5.15 / Perusahaan Consumer

	BRPT	INTP	SMGR	WSBP	INKP	TPIA
E(R)	0,0078	-0,0356	0,0201	0,0129	-0,0091	-0,0043
σ^2	0,01282	0,014928	0,005224	0,025128	0,008903	0,005299532
α	0,006635	-0,03652	0,019866	0,012613	-0,00904	-0,004385396
β	0,6241	0,5028	0,1551	0,1632	-0,0513	0,0223
σ_{ei}^2	0,006635	-0,03652	0,019866	0,012613	-0,00904	-0,004385
ER	-0,0579	-0,0588	-0,0138	-0,0651	-0,0876	-0,0701
Rata-rata ER		-0,0567				
ERB	-0,0908	-0,1127	-0,3654	-0,3471	1,1047	-2,5392
Ai	0,004141	-0,01836	0,00308	0,002059	0,000464	-0,000097849
Bi	-0,00048	-0,01183	-0,00108	-0,00046	7,4E-05	-0,000007574
Ci	0,004143	-0,01858	0,003084	0,00206	0,000464	-0,000098
C*	0,004143					

TABLE 5.16 / Perusahaan Property

Emiten	α	β	σ_{ei}^2	ERB	Ci	C*	Kesimpulan	Zi	Wi	α_{pi}	β_{pi}	σ_{ep}^2
ADHI	-0,0179045	1,1285	-0,01790	0,0180	-0,0198516	0,003218	Optimal	-0,9338	-0,2913	0,005215	-0,32867	0,005215
BSDE	-0,0222574	0,4387	-0,02226	0,0464	-0,0096602	0,003218	Optimal	-0,8509	-0,2654	0,005907	-0,11642	0,005907
PT.PP	-0,0112344	1,3119	-0,01123	0,0155	-0,0146196	0,003218	Optimal	-1,4356	-0,4478	0,005031	-0,58747	0,005031
WIKA	0,0021839	1,4740	0,00218	0,0138	0,0032178	0,003218	Optimal	7,1465	2,2291	0,004868	3,285567	0,004868
WSKT	-0,0243561	0,8732	-0,02436	0,0233	-0,0207397	0,003218	Optimal	-0,7202	-0,2246	0,005471	-0,19614	0,005471
Maximum					0,0032178	-	-	3,2061	1	0,026492	2,056867	0,026492

E(Rm)	0,0018
SIM=E(Rp)	0,03018
σ_m^2	0,00340
σ_p^2	0,040862

TABLE 5.17 / Perusahaan Mining

Emiten	α	β	σ_{ei}^2	ERB	Ci	C*	Kesimpulan	Zi	Wi	α_{pi}	β_{pi}	σ_{ep}^2
ADRO	-0,041854	0,0400	-0,04185	-1,0919	-0,0017	-0,0017	-	1,0432	-0,2251	0,009422	-0,00901	0,009422
ANTM	0,3368555	1,5662	0,33686	-0,0279	-0,1722	-0,0017	-	-0,1220	0,0263	0,008869	0,041236	0,008869
INCO	0,0119044	-0,2741	0,01190	0,1596	-0,0033	-0,0017	Optimal	-3,7120	0,8010	0,009535	-0,21952	0,009535
PTBA	0,0241039	-0,4201	0,02410	0,1041	-0,0101	-0,0017	Optimal	-1,8434	0,3978	0,009588	-0,16711	0,009588
Maximum					-0,0017			-4,6342	1,0000	0,037414	-0,35441	0,037414
									E(Rm)		0,0043	
									SIM=E(Rp)		0,03590	
									σ_m^2		0,00340	
									σ_p^2		0,037840	

TABLE 5.18 / Perusahaan Trade

Emiten	α	β	σ^2_{ei}	ERB	Ci	C*	Kesimpulan	Zi	Wi	a_{pi}	β_{pi}	σ^2_{ep}
AKRA	-0,0101	0,9253	-0,01010	-0,04497	-0,0094	0,0155	-	5,5393	0,3100	-0,0031	0,2868	-0,0031
LPPF	-0,02974	0,5522	-0,02974	-0,07536	-0,0166	0,0155	-	1,6874	0,0944	-0,0028	0,0521	-0,0028
MNCN	-0,04245	0,2461	-0,04245	-0,16905	-0,0106	0,0155	-	1,0701	0,0599	-0,0025	0,0147	-0,0025
SCMA	-0,00568	0,8249	-0,00568	-0,05044	-0,0047	0,0155	-	9,5728	0,5357	-0,0030	0,4419	-0,0030
UNTR	-0,02981	-0,5263	-0,02981	1,395882	0,0155	0,0155	Optimal	24,3686	1,3637	-0,0407	-0,7177	-0,0407
Maximum					0,0155			17,8696	1,0000	-0,0115	0,7956	-0,0115
										E(Rm)	0,0018	
										SIM=E(Rp)	-0,01010	
										σ^2_m	0,00340	
										σ^2_p	-0,0094	

TABLE 5.19 / Perusahaan Finance

Emiten	α	β	σ_{ei}^2	ERB	Ci	C*	Kesimpulan	Zi	Wi	α_{pi}	β_{pi}	σ_{ep}^2
BBCA	0,018401	0,5446	0,01840	0,03619	0,0099	0,0099	Optimal	0,7773	0,0053	0,0001	0,0029	0,0001
BBNI	-0,0007	0,7864	-0,00070	0,025063	-0,0006	0,0099	Optimal	-16,8967	-0,1143	0,0001	-0,0899	0,0001
BBRI	0,00406	0,8319	0,00406	0,023693	0,0034	0,0099	Optimal	2,8203	0,0191	0,0001	0,0159	0,0001
BBTN	-0,01727	1,3043	-0,01727	0,015112	-0,0221	0,0099	Optimal	-0,3914	-0,0026	0,0000	-0,0035	0,0000
BMRI	-0,00735	0,4414	-0,00735	-2,68071	-0,0032	0,0099	-	161,5079	1,0926	-0,0080	0,4822	-0,0080
Maximum					0,0099			147,8174	1,0000	-0,0077	0,4076	-0,0077
										E(Rm)	0,0018	
										SIM=E(Rp)	-0,00700	
										σ_m^2	0,00340	
										σ_p^2	-0,0072	

TABLE 5.20 / Perusahaan Misc-Ind

Emiten	α	β	σ_{ei}^2	ERB	Ci	C*	Kesimpulan	Zi	Wi	α_{pi}	β_{pi}	σ_{ep}^2
ASHI	0,000632	0,2331	0,00063	-0,3806822	0,0001	0,0001	-	-140,4096	1,0791	0,0007	0,2516	0,0007
SIRIL	-0,00862	-0,0999	-0,00862	0,8884046	0,0000	0,0001	Optimal	10,2958	-0,0791	0,0007	0,0079	0,0007
Maximum					0,0001			-130,1138	1,0000	0,0014	0,2595	0,0014
										E(Rm)	0,0018	
										SIM=E(Rp)	0,00183	
										σ_m^2	0,00340	
										σ_p^2	0,0016	

TABLE 2.21 / Perusahaan Basic Ind

Emiten	α	β	σ^2_{ei}	ERB	Ci	C*	esimpulan	Zi	Wi	α_{pi}	β_{pi}	σ^2_{ep}
BRPT	0,003145338	0,0674	0,00315	0,328145	0,0002	0,0183	Optimal	6,6408	0,0493	0,0002	0,0033	0,0002
INTP	-0,04893926	-0,3131	-0,04894	-0,07066	0,0159	0,0183	-	-0,5691	-0,0042	0,0002	0,0013	0,0002
SMGR	0,018254221	1,0177	0,01825	1,211825	0,0183	0,0183	Optimal	66,5408	0,4942	0,0090	0,5029	0,0090
WSBP	-0,01444611	0,5991	-0,01445	-1,53127	-0,0086	0,0183	-	64,2675	0,4773	-0,0069	0,2860	-0,0069
INKP	0,033496384	-0,6022	0,03350	0,142268	-0,0208	0,0183	Optimal	-2,2288	-0,0166	-0,0006	0,0100	-0,0006
TPIA	0,026359346	0,5662	0,02636	-0,25599	0,0147	0,0183		-5,8914	-0,0438	-0,0012	-0,0248	-0,0012
Maximum					0,0183			134,6512	1,0000	0,0019	0,8035	0,0019
										E(Rm)	0,0018	
										SIM=E(Rp)	0,00337	
										σ^2_m	0,00340	
										σ^2_p	0,0041	

TABLE 5.22 / Perusahaan Infrastruktur

Emiten	α	β	σ_{ei}^2	ERB	Ci	C*	Kesimpulan	Zi	Wi	a_{pi}	β_{pi}	σ_{ep}^2
EXCL	-0,01231	-0,2312	-0,01231	-0,96347	0,0028	0,0037	-	-18,1621	-0,3629	0,0045	0,0839	0,0045
INDY	-0,00555	-0,6618	-0,00555	-0,33657	0,0037	0,0037	-	-40,5791	-0,8107	0,0045	0,5366	0,0045
JSMR	-0,00985	0,2898	-0,00985	0,76878	-0,0029	0,0037	Optimal	-22,4985	-0,4495	0,0044	-0,1302	0,0044
PGAS	0,001691	0,2006	0,00169	1,110208	0,0003	0,0037	Optimal	131,2938	2,6230	0,0044	0,5263	0,0044
TLKM	0,009237	-0,0444	0,00924	24,11567	-0,0004	0,0037	Optimal	-115,8323	-2,3141	-0,0214	0,1027	-0,0214
Maximum					0,0037			50,0540	1,0000	0,0178	1,0165	0,0178
										E(Rm)	0,0018	
										SIM=E(Rp)	0,01965	
										σ_m^2	0,00340	
										σ_p^2	0,0213	

TABLE 5.23 / Perusahaan Consumer

Emiten	α	β	σ_{ei}^2	ERB	Ci	C*	Kesimpulan	Zi	Wi	α_{pi}	β_{pi}	σ_{ep}^2
GGRM	0,006635	0,6241	0,00664	-0,09078	0,0041	0,0041	-	-8,9286	0,1061	0,0007	0,0662	0,0007
HMSP	-0,03652	0,5028	-0,03652	-0,11269	-0,0186	0,0041	-	1,6085	-0,0191	0,0007	-0,0096	0,0007
ICBP	0,019866	0,1551	0,01987	-2,85188	0,0031	0,0041	-	-22,2914	0,2649	0,0053	0,0411	0,0053
INDF	0,012613	0,1632	0,01261	-4,49177	0,0021	0,0041	-	-58,1827	0,6914	0,0087	0,1129	0,0087
KLBF	-0,00904	-0,0513	-0,00904	0,646808	0,0005	0,0041	Optimal	3,6462	-0,0433	0,0004	0,0022	0,0004
UNVR	-0,00439	0,0223	-0,00439	0,808519	-0,0001	0,0041		-4,0926	0,0486	-0,0002	0,0011	-0,0002
Maximum					0,0041			-84,1481	1,0000	0,0158	0,2128	0,0158

E(Rm)	0,0018
SIM=E(Rp)	0,01616
σ_m^2	0,00340
σ_p^2	0,0159

TABLE 5.24 / Perusahaan Property

Emiten	E(Ri)	σi^2	Cov	ρ	E(Rp)	$\sigma_p{}^2$	Wi
ADHI	-0,0684	0,0865	0,0849	0,9672	0,01992	0,2909	-0,2913
BSDE	-0,0930	0,0759	0,0865	0,9231	0,02467	0,30171	-0,2654
PTPP	-0,0602	0,0986	0,1014	0,9683	0,02696	0,31715	-0,4478
WIKA	-0,0462	0,0947	0,0879	0,9574	-0,10306	0,29786	2,2291
WSKT	-0,0585	0,0758	0,0802	0,9141	0,01313	0,29063	-0,2246

TABLE 5.25 / Perusahaan Trade

Emiten	E(Ri)	σi^2	Cov	ρ	E(Rp)	$\sigma_p{}^2$	Wi
AKRA	-0,0705	0,0795	0,0795	0,9302	-0,0218	0,2865	0,3100
LPPF	-0,0554	0,0783	0,0717	0,8701	-0,0052	0,2822	0,0944
MNCN	-0,0991	0,0739	0,0727	0,9121	-0,0059	0,2781	0,0599
SCMA	-0,0437	0,0733	0,0676	0,8716	-0,0234	0,2741	0,5357
UNTR	-0,0929	0,0700	0,0697	0,8624	-0,1267	0,2790	1,3637

TABLE 5.26 / Perusahaan Mining

Emiten	E(Ri)	σi^2	Cov	ρ	E(Rp)	$\sigma_p{}^2$	Wi
ADRO	-0,0801	0,0668	0,0939	0,2523	0,01803	0,99003	-0,2251
ANTM	0,2466	1,7648	0,0433	0,1027	0,00648	0,99097	0,0263
INCO	-0,0283	0,0860	0,0810	0,9494	-0,02264	0,28881	0,8010
PTBA	0,0401	0,0721	0,0691	0,9188	0,01597	0,27567	0,3978

TABLE 5.27 / Perusahaan Finance

Emiten	E(Ri)	σi^2	Cov	ρ	E(Rp)	$\sigma_p{}^2$	Wi
BBCA	-0,0552	0,0759	0,0803	0,9821	-0,00029	0,28021	0,0053
BBNI	-0,0500	0,0751	0,0786	0,9860	0,00572	0,27684	-0,1143
BBRI	-0,0297	0,0721	0,0795	0,9484	-0,00057	0,28483	0,0191
BBTN	-0,0703	0,0831	0,0752	0,9270	0,00018	0,28005	-0,0026
BMRI	-0,0472	0,0675	0,0766	0,9882	-0,05152	0,27306	1,0926

TABLE 5.28 / Perusahaan Misc-Ind

Emiten	E(Ri)	σi^2	Cov	ρ	E(Rp)	$\sigma_p{}^2$	Wi
ASII	-0,0675	0,0732	0,0758	0,9780	-0,0728	0,2729	1,0791
SRIL	-0,0757	0,0700	0,0758	0,9780	0,0060	0,2729	-0,0791

TABLE 5.29 / Perusahaan Basic Ind

Emiten	E(Ri)	σi^2	Cov	ρ	E(Rp)	$\sigma_p{}^2$	Wi
BRPT	-0,0669	0,0787	0,0516	0,6924	-0,00330	0,28077	0,0493
INTP	0,0933	0,0601	0,0507	0,6317	-0,00039	0,28833	-0,0042
SMGR	-0,0358	0,0915	0,0772	0,8956	-0,01768	0,28902	0,4942
WSBP	-0,0272	0,0691	0,0730	0,8363	-0,01298	0,29132	0,4773
INKP	-0,0387	0,0940	0,0864	0,8415	0,00064	0,31401	-0,0166
TPIA	-0,0464	0,0956	0,0749	0,7969	0,00203	0,30122	-0,0438

TABLE 5.30 / Perusahaan Infrastruktur

Emiten	E(Ri)	σi^2	Cov	ρ	E(Rp)	$\sigma_p{}^2$	Wi
EXCL	-0,0591	0,0887	0,1033	0,8542	0,0214	0,3452	-0,3629
INDY	-0,0598	0,1404	0,0901	0,8167	0,0485	0,3339	-0,8107
JSMR	-0,0749	0,0739	0,0789	0,9086	0,0337	0,2895	-0,4495
PGAS	-0,0471	0,0869	0,0813	0,8673	-0,1236	0,3007	2,6230
TLKM	-0,0040	0,0860	0,0772	0,8153	0,0093	0,3028	-2,3141

TABLE 5.31 / Perusahaan Consumer

Emiten	E(Ri)	σi^2	Cov	ρ	E(Rp)	$\sigma_p{}^2$	Wi
GGRM	-0,0330	0,0804	0,0727	0,8631	-0,0035	0,2849	0,1061
HMSP	-0,0668	0,0752	0,0748	0,9010	0,0013	0,2824	-0,0191
ICBP	-0,0515	0,0781	0,0825	0,8817	-0,0136	0,3005	0,2649
INDF	-0,0538	0,0955	0,0782	0,8467	-0,0372	0,2989	0,6914
KLBF	-0,0658	0,0762	0,0772	0,9473	0,0029	0,2797	-0,0433
UNVR	-0,0715	0,0743	0,0780	0,9319	-0,0035	0,2842	0,0486