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About Madic 8 2023

Management Dynamics Conference (MADIC) ke-8 adalah seminar nasional yang diselenggarakan oleh Fakultas Ekonomi dan Bisnis Universitas Hasanuddin bekerja sama dengan Forum Pengelola Jurnal Manajemen (FPJM). Tema seminar *"**Penguatan Manajemen UMKM sebagai Motor Penggerak Pemulihan Ekonomi Nasional**"*. Konferensi ini bertujuan untuk menghimpun berbagai pandangan dan pengalaman empiris dari para praktisi dan akademisi ekonomi mengenai penguatan UMKM sebagai pilar ekonomi utama serta memberikan solusi untuk tujuan ketahanan keberlanjutan (SDGs) Indonesia. Para akademisi, praktisi, peneliti telah berkontribusi dalam pengembangan penelitian manajemen dengan berpartisipasi dalam MADIC 8.

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Sambutan Dekan Fakultas Ekonomi dan Bisnis Universitas Hasanuddin

Selamat datang di Management Dynamics Conference (MADIC) ke-8 diadakan pada tanggal 16 – 17 maret 20223 di Makassar, Indonesia. Konferensi ini diselenggarakan untuk mempromosikan diskusi antara berbagai pemangku kepentingan tentang, manajemen dan bidang ekonomi. Kali ini, Fakultas Ekonomi dan Bisnis, Universitas Hasanuddin menjadi tuan rumah bekerja sama dengan Forum Pengelola Jurnal Manajemen (FPJM). Melanjutkan tradisi menyatukan penelitian, pembuat kebijakan, akademisi dan berbagai pemangku kepentingan untuk mempresentasikan dan mendiskusikan isu terkini terkait perkembangan ekonomi nasional. Untuk memperkuat pembahasan tentang manajemen, ekonomi dan bidang akuntansi, kami sepakat mengangkat topik konferensi tahun ini berjudul "***Penguatan Manajemen UMKM sebagai Motor Penggerak Pemulihan Ekonomi Nasional***". Untuk memberikan informasi terbaru mengenai topik kepada pembaca dan peserta, kami ingin menyampaikan apresiasi dan terima kasih kepada 3 narasumber dihadirkan dalam acara ini yaitu M. Fankar Umran CEO BRI Insurane, Causa Iman Karana Kepala Perwakilan Bank Indonesia Provinsi Sulawesi Selatan, dan Darwisman Kepala OJK Regional Sulampapua atas wawasan dan dukungan mereka selama konferensi. Kami berharap acara ini sangat mendorong diskusi tentang peningkatan kualitas UMKM di Indonesia. Selain itu kami ingin menyampaikan terima kasih dan dukungan kami kepada

Terakhir, kami ingin mengucapkan terima kasih sekali lagi atas kontribusi dan kerja sama yang sangat baik di antara kami para peserta konferensi. Selain itu, kami mengucapkan terima kasih atas kerjasama semua pihak panitia dalam menyelenggarakan konferensi. Kami berharap dapat bekerja sama dengan semua pemangku kepentingan yang terlibat dalam acara ini. Kami berharap proses ini akan menyediakan berbagai manuskrip unggulan yang dapat memberikan kontribusi besar dalam bidang ekonomi, manajemen dan akuntansi.

Prof.Dr.Abd. Rahman Kadir, M.Si., CIPM
Dekan Fakultas Ekonomi dan Bisnis
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Sambutan Ketua panitia Management Dynamic Conference ke - 8

Saya sangat senang bahwa acara Management Dynamic Conference ke-8 dengan tema "Penguatan Manajemen UMKM sebagai Motor Penggerak Pemulihan Ekonomi Nasional" telah terlaksana dengan sukses. Semoga acara ini memberikan banyak manfaat dan inspirasi bagi semua peserta yang hadir.

Saya ingin mengucapkan selamat dan mengapresiasi seluruh panitia yang telah bekerja keras dan dedikasi tinggi dalam menyelenggarakan acara ini. Tanpa upaya mereka, acara ini tidak akan mungkin terwujud. Terima kasih atas kerja keras dan komitmen yang telah diberikan.

Selain itu, saya juga ingin mengucapkan terima kasih kepada narasumber yang telah berbagi pengetahuan dan pengalaman mereka dalam mendukung penguatan manajemen UMKM. Kontribusi mereka sangat berharga dan saya berharap peserta dapat mengambil manfaat yang besar dari presentasi dan diskusi yang telah dilakukan.

Saya berharap bahwa acara ini menjadi awal dari langkah-langkah konkret dalam memperkuat sektor UMKM sebagai motor penggerak pemulihan ekonomi nasional. Mari kita terus bekerja sama, berinovasi, dan berkolaborasi dalam mendukung pertumbuhan UMKM dan memajukan ekonomi kita.

Terima kasih kepada semua yang telah berpartisipasi dalam acara ini, termasuk peserta, narasumber, dan semua pihak yang telah memberikan dukungan. Semoga kita dapat melanjutkan semangat dan energi positif ini untuk memperkuat sektor UMKM dan membangun ekonomi yang lebih kuat.

Sekali lagi, selamat atas kesuksesan acara Management Dynamic Conference ke-8. Semoga langkah-langkah yang dihasilkan dari acara ini dapat memberikan dampak yang positif bagi penguatan manajemen UMKM dan pemulihan ekonomi nasional.

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NALISIS PEMBENTUKAN PORTOFOLIO OPTIMAL DENGAN SINGLE INDEX MODEL (SIM) PADA PERUSAHAAN TERINDEKS LQ45 PERIODE 2020 – 2022

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Abstract

This study aims to form an optimal portfolio of company shares contained in the LQ-45 Index for a two-year period, namely June 2020 - June 2022 with a closing price per month. The samples used were taken from four companies that were always active and consistently listed on the LQ-45 Index during the 2020-2022 period, namely PT. Telkom Indonesia, PT. Vale Indonesia, PT. HM. Sampoerna and PT. Gudang Garam with the method used is the Single Index Model. The results of the study show that of the four sample companies, there are two companies that are included in the optimal portfolio, namely Telkom Indonesia, period of June 2021 – June 2022 and Vale Indonesia,June 2020 – June 2021 period. Portfolios formed using the Single Index Model method are able to provide higher returns greater than market returns in the two periods and smaller portfolio risk than market risk in the 2020-2021 period.

Key Word: Optimal Portfolio, Single Index Model, Index LQ-45

Abstrak

Penelitian ini bertujuan untuk membentuk portofolio optimal dari saham-saham perusahaan yang terdapat dalam Indeks LQ-45 selama periode dua tahun, yaitu Juni 2020 - Juni 2022 dengan harga penutupan per bulan. Sampel yang digunakan diambil dari empat perusahaan yang selalu aktif dan terdaftar secara konsisten dalam Indeks LQ-45 selama periode 2020-2022, yaitu PT. Telkom Indonesia, PT. Vale Indonesia, PT. HM. Sampoerna, dan PT. Gudang Garam dengan metode yang digunakan adalah Single Index Model. Hasil penelitian menunjukkan bahwa dari empat perusahaan sampel, terdapat dua perusahaan yang termasuk dalam portofolio optimal, yaitu Telkom Indonesia, periode Juni 2021 - Juni 2022, dan Vale Indonesia, periode Juni 2020 - Juni 2021. Portofolio yang terbentuk menggunakan metode Single Index Model mampu memberikan tingkat pengembalian yang lebih tinggi dibandingkan tingkat pengembalian pasar pada kedua periode tersebut, serta risiko portofolio yang lebih kecil dibandingkan risiko pasar pada periode 2020-2021.

Kata Kunci: Optimal Portfolio, Single Index Model, Index LQ-45

1. INTRODUCTION

Amid the threat of a global recession and an increase in Bank Indonesia's benchmark interest rate, people tend to save funds in investment instruments, the performance of issuers of shares in technology services, mining and cigarette companies continues to increase in line with economic recovery activities. Based on the development of the sector's stock index, quite a lot of investors will consider shares of technology services, mining and cigarette companies in their investment portfolios. In this observation the company sample used is PT. Telkom Indonesia, PT. Vale, PT. HM Sampoerna and PT. Gudang Garam. Stock investment does have a high risk, but stock investment is very attractive to investors.

Based on data from the Indonesian Central Securities Depository (KSEI), in August 2022 the number of Indonesian capital market investors was 9.54 million investors. This number has increased by 27.38% compared to data in November 2021 which amounted to 7.48 million investors and this figure has increased eightfold since 5 years ago. Data from the Financial Services Authority states that nearly 60% of the total investors in the capital market are millennials and generations Z who is under 30 years old. The number of capital market investors continues to grow in line with increasing public awareness in investing supported by the ease of obtaining information due to developments in digital technology.

Investment is a commitment to a number of funds or other resources that are carried out at this time, with the aim of obtaining future profits which are better known as expected returns. Return on investment consists of two components, namely yield and capital gain (loss). Yield is a return component that reflects the cash flow or income obtained periodically in an investment. Meanwhile, capital gain (loss) is an increase (decrease) in the price of a security (can be in the form of stocks or long-term debt), which can provide a profit (loss) for investors. In other words, capital gains (losses) can be interpreted as changes in security prices (Tandelilin 2010:2).

Investors can invest by buying a number of shares at this time in the hope of benefiting from rising stock prices or dividends in the future. In investing, investors tend to avoid risk (risk averse), so they prefer to invest by looking for the smallest risk value with the greatest return value.

The relationship between risk and return on investment is a linear or unidirectional relationship, so that the greater the risk of an asset, the higher the expected return. This affects the attitude of investors in investing, where investors' decisions about risk will depend on investors' preferences for the risks they can accept. Investors who are more willing to take risks will choose to invest in assets that have a higher risk, followed by a higher expected return. Vice versa, investors who do not want to take high risks, of course, cannot expect returns that are too high (Tandelilin 2010:11).

Investing is done to obtain greater and more useful results (Gitman, 2015). Investment risk cannot be avoided as long as investors invest in risky assets, but investment risk can be reduced in one way, namely by forming an optimal portfolio. An

investment portfolio is a collection of assets, such as stocks, debentures, securities and securities (The World Bank, 2014). Portfolio can also be interpreted as a combination of several assets invested by investors (Hartono, 2013). In forming a portfolio that is in line with investment objectives, investors always want to maximize expected return by looking for a portfolio that has the lowest risk with a certain rate of return, a portfolio with characteristics like this is called an efficient portfolio, while the portfolio that investors choose from the many choices in an efficient portfolio is called optimal portfolio (Tandelilin, 2010).

To reduce the risk in investment, it is necessary to diversify in the formation of the portfolio. Portfolio diversification is the selection of a combination of a number of assets in such a way that investment risk can be minimized without reducing the expected return. The combination of a number of these assets is in line with Henry Markowitz's principle, namely "Don't put all your eggs in one basket". If translated, this sentence means don't put all your eggs in one basket. However, in the investment concept, the Markowitz principle can be interpreted as "don't invest all the funds we have in just one asset, because if the asset fails, then all the funds that have been invested will disappear" (Tandelilin 2010).

The principle of investment diversification can be divided into random diversification and Markowitz diversification. Random diversification is also often called naïve diversification, which means that investors invest randomly in different types of stocks or in different types of assets in the hope that investment risk can be reduced. Even though in the context of a portfolio, the more shares added to the portfolio, the greater the risk reduction benefits that will be obtained. However, the diversification benefits obtained by adding a number of shares will progressively decrease when it reaches the peak of a number of shares and after that the benefits will not give meaningful impact.

Diversification that is more efficient than random diversification is diversification based on the model developed by Henry Markowitz known as Markowitz diversification. In contrast to random diversification, diversification using the Markowitz model forms a portfolio by considering the covariance and negative correlation coefficients between assets (Tandelilin 2010).

Portfolio formation using the Markowitz model with complex covariance calculations was later developed by William Sharpe with a Single Index Model that links the returns of each stock to market returns (Tandelilin 2010). Compiling an optimal portfolio using the Single Index Model method is simpler to do in determining which stocks will produce optimal returns and minimal risk (Jogiyanto: 2014). The Single Index Model is based on the observation that the price of a security fluctuates in the direction of the market price index so that when the stock price index rises, stocks generally experience a price increase and vice versa stock prices will decrease if the stock price index decreases (Hartono, 2017). The formation of an optimal portfolio with a single index model is based on a comparison of the Excess Return to Beta (ERB) value with the Cut of Rate (C_i) for each stock. Stocks with Excess Return to Beta (ERB) greater than Cut of Rate (C_i) can be categorized as stocks in the optimal portfolio, while stocks with

Cut of Rate (C_i) greater than Excess Return to Beta (ERB) then these stocks cannot categorized as stocks in the optimal portfolio (Darmawan and Purnawati, 2015).

Referring to the financial reports released by the Indonesia Stock Exchange, HMSP increased its net profit by 15% to IDR 83.39 T compared to the realization in kw III 2021. Looking at the market potential and future business opportunities, this company's shares are promising for investors to include in their investment portfolio. On the other hand, from the banking sector, based on the financial statements of Bank BCA at the end of 2021, a net profit of 31.4 trillion was supported by customer trust and the ease and reliability of banking transactions offered by Bank BCA (BCA, 2022). Looking at the market potential and future business opportunities, this company's stock is promising for investors to include in their investment portfolio.

PT. Telkom Indonesia is one of the BUMN company with good performance. Referring to the initial 2022 consolidated financial statements of PT. Telkom Indonesia grew 3.6% to Rp. 72 trillion compared to the 2021 period and earned a net profit of Rp. 13.3 trillion. Looking at the market potential and future business opportunities, this company's stock is promising for investors to include in their investment portfolio. Based on the financial statements of PT. Vale Indonesia in the third quarter of 2022 on the IDX production volume increased by 39% compared to the second quarter of 2022. Looking at the market potential and future business opportunities, this company's shares are promising for investors to include in their investment portfolio.

Based on this background, the authors conducted research to analyze the optimal portfolio formation in multi-sector companies included in the LQ-45 index in the period 2020 to 2022.

2. Methodology

The method used in this study is the Single Index Model. The Single Index Model can solve the problems of individual and institutional investors in compiling optimal portfolios (Mohith et al., 2017). Compiling an optimal portfolio using the Single Index Model method is simpler to do in determining stocks that will produce optimal returns and minimal risk (Jogiyanto: 2014). The Single Index Model is based on the observation that the price of a security fluctuates in the direction of the market price index so that when the stock price index rises, stocks generally experience a price increase and vice versa stock prices will decrease if the stock price index decreases (Hartono, 2017).

The formation of an optimal portfolio with a single index model is based on a comparison of the Excess Return to Beta (ERB) value with the Cut of Rate (C_i) for each stock. Stocks with Excess Return to Beta (ERB) greater than Cut of Rate (C_i) can be categorized as stocks in the optimal portfolio, while stocks with Cut of Rate (C_i) greater than Excess Return to Beta (ERB) then these stocks cannot categorized as stocks in the optimal portfolio (Darmawan and Purnawati, 2015). Excess return to beta (ERB) is the excess of stock returns over risk free asset returns (risk free rate) as measured using beta and Cutt off rate (Ci) is the result of output between market variants and premium return

on variance error stock market variance at sensitivity individually to the stock variance error.

The Markowitz portfolio model uses complex covariance calculations then simplified by William Sharpe with the Single Index Model. The Single Index Model connects the calculation of asset returns to the market index. Systematically, the Single Index Model is as follows (Tandelilin, 2010):

$$Ri = \alpha i + \beta i\, R_M + e_i$$

Where:

Ri	= return security *i*
R_M	= return market
αi	= alpha security *i*
βi	= beta security *i*
e_i	= residual error

The formation of an optimal portfolio with a single index model is based on a comparison of the Excess Return to Beta (ERB) value with the Cut of Rate (C_i) for each stock. Systematically this ratio is expressed as follows (Hartono, 2014):

$$ERBi = \frac{E(Ri) - RBR}{\beta i}$$

Where:

ERBi	= *Excess return to beta* i
E(Ri)	= *Expected return*
RBR	= Risk Free Rate
βi	= Beta security i

Excess return is the difference between expected return and risk-free asset return. ERB (Excess Return to Beta) measures the difference between expected return and risk-free return to beta.

This study uses secondary data. Secondary data is data that has been collected from other parties or data collection agencies and has been published. The research data was obtained by means of documentation in the form of closing prices for shares of companies in the energy and banking sub-sectors in the period 2020 – 2022. The data taken was in the form of time series data, namely data collected from time to time to describe a development of a situation or event. Other supporting data were then obtained from the research literature and literature review.

3. Analysis and Result

a) Return

In this study, there are two return values that are calculated, namely actual stock returns and excess returns. The expected return value of E(Ri) is each calculated using closing price data per month (closing price) for the four selected company stocks during the period June 2020 – June 2022.

Tabel 1.
Data Actual Return and Excess Return June 2020 – June 2021

No.	Stock Code	Actual Return	Excess Return
1.	HMSP	-0,0327	-0,0359
2.	TLKM	0,0039	0,0007
3.	INCO	0,0351	0,0319
4.	GGRM	-0,0020	-0,0052

Tabel 2.
Data Actual Return and Excess Return Juni 2021 – Juni 2022

No.	Stcok Code	Actual Return	Excess Return
1.	HMSP	-0,0176	-0,0205
2.	TLKM	0,0130	0,0101
3.	INCO	-0,0067	-0,0097
4.	GGRM	0,0022	-0,0007

The expected return value is the expected return on each stock and is calculated using the average monthly return approach, with the following formula:

$$\bar{R}i = \alpha i + \beta i \, \bar{R}m + e$$

In this equation αi is the intercept and βi is the parameter coefficient $\bar{R}m$ with e being the residual.

The value of the excess return is the excess profit when investing in selected stocks compared to risk free. Stocks with negative returns indicate that the company during the study period tends to experience a decline in stock prices. Stocks with positive returns indicate that the company during the study period tends to experience an increase in stock prices.

b) Expected Market Return (E(Rm))

In this study, the market used is the LQ-45 Index with the results of calculating a market return of 0.0134 in June 2020 - June 2021 and 0.0094 in the period June 2021 - June 2022. This shows that the market return in the period June 2020 - June 2021 is higher than in the period June 2021 – June 2022.

c) Beta (βi) Saham

Beta (βi) for each security (Ri) to market return (Rm) to be included in the portfolio can be calculated using the following formula:

$$Ri = \alpha i + \beta i \, Rm + \varepsilon$$

Tabel 3.
Beta and Alpha Period June 2020 – June 2021

No.	Stock code	Beta (βi)	Alpha (α)
1.	HMSP	0,7096	-0,0423
2.	TLKM	1,1156	-0,0111
3.	INCO	0,2275	0,0320
4.	GGRM	0,1539	-0,0041

5.	Index LQ-45	1	0

Tabel 4.
Beta and Alpha Periode June 2021 – June 2022

No.	Stock Kode	Beta (βi)	Alpha (α)
1.	HMSP	0,6092	-0,0233
2.	TLKM	0,8367	0,0052
3.	INCO	0,2472	-0,0091
4.	GGRM	-0,3151	0,0052
5.	Index LQ-45	1	0

The beta value can indicate sensitivity to market movements, so the higher the sensitivity to beta stock movements, the positive value will be. The beta of a stock with a high value can indicate a high level of stock risk and vice versa, if the beta of a stock with a low value can indicate a low risk level of the stock. Beta also shows the risk relationship of a stock return to the actual market. The β calculation should be 1 at LQ-45. While Alpha shows the difference between the actual investment return and the expected investment return or a benchmark for certain market risk (beta). Calculation of α should be 0 in LQ-45.

From the data of the four sample companies used, information can be obtained that the shares of PT. Telekomunikasi Indonesia during the two periods June 2020 – June 2021 and June 2021 – June 2022 has the largest beta (β) value of the three other companies, from this data it can be seen that the level of investment risk in PT. Telekonunikai Indonesia is higher than the other three companies.

d) Risk Free

Below is BI & Days repo Rate Data from June 2020 – June 2022

BI 7 Days Repo Rate Period 2020 - 2022

.	te	7 Days RR	te	7 Days RR
	05/2020	0%	05/2021	0%
	06/2020	5%	06/2021	0%
	07/2020	0%	07/2021	0%
	08/2020	0%	08/2021	0%
	09/2020	0%	09/2021	0%
	10/2020	0%	10/2021	0%
	11/2020	5%	11/2021	0%
	12/2020	5%	12/2021	0%
	01/2021	5%	01/2022	0%
	02/2021	0%	02/2022	0%
	03/2021	0%	03/2022	0%
	04/2021	0%	04/2022	0%
	05/2021	0%	05/2022	0%
	06/2021	0%	06/2022	0%

Based on BI 7 Days Repo Rate data, it can be obtained that in the period June 2020 - June 2021 the average risk-free return on assets is 0.0031 and in the period June 2021 - June 2022 the average risk-free return on assets is 0.0029. It can be seen that there was a decrease in the average risk-free asset return of 0.0002 during these two periods.

e) Varians

The variance is a measure of the risk of the expected return for each stock in the portfolio, market and risk free. The following is the variance data from the four sample companies for two periods.

Tabel 6.
Varians Period June 2020 – June 2021

No.	Stock Code	June 2020 – June 2021	June 2021 – June 2022
1.	HMSP	0,0049	0,0051
2.	TLKM	0,0082	0,0026
3.	INCO	0,0024	0,0017
4.	GGRM	0,0122	0,0143
5.	Index LQ-45	0,0034	0,0017
6.	BI 7 Days RR	0,0000	0,0000

Variance is a risk so it can be seen that the Risk Free value is close to 0 or very small (risk free). In the market and stocks have a greater value of variance (risk) with a greater expected return when compared to risk free, so that the formation of an optimal portfolio is used to minimize risk and maximize profits obtained in investing.

From the data of the four sample companies above, it can be seen that during the two observation periods of PT. Gudang Garam tends to have a greater risk when compared to the other three companies. Meanwhile PT. Vale Indonesia with stock code INCO during the two observation periods has a smaller risk compared to the other three sample companies.

f) Unsystematic Risk

Unsystematic risk or unsystematic risk can be calculated by the following equation:

$$\sigma^2 ei = \frac{1}{t} \sum_{i=1}^{i} [\mathrm{Ri} - (\alpha \mathrm{i} + \beta \mathrm{i}\ \mathrm{Rmt})^{2}]$$

Based on sample company data taken during the observation period, it can be seen that the value of unsystematic risk is shown in Table 7.

Tabel 7.
Unsystematic Risk

No.	Stock Code	June 2020 – June 2021	June 2021 – June 2022
1.	HMSP	0,0066	0,0057
2.	TLKM	0,0124	0,0039
3.	INCO	0,0025	0,0018
4.	GGRM	0,0123	0,0144

Unsystematic risk or specific risk (company risk) is a risk that is not related to changes in the market as a whole, this refers to changes in the company's micro condition and with portfolio management this can be minimized by diversifying assets in the portfolio.

Based on the data in Table 7. Unsystematic Risk, it is known that during the two observation periods PT. Gudang Garam has a higher unsystematic risk value than the other three sample companies with a larger value in the second year of observation. Meanwhile PT. Vale Indonesia (INCO) has the smallest unsystematic risk value when compared to other companies.

g) Ai

The value of Ai can be calculated using the following formula:

$$Ai = \frac{E(Ri) - \beta i}{\sigma ei^2}$$

Where:

E(Ri) = expected return

Bi = Beta

σei^2 = unsystematic risk

Based on the sample company data taken during the observation period, the Ai value can be seen in the following table:

Tabel 8. Nilai Ai

No.	Stock Code	Period 2021	Period 2022
1.	HMSP	-3,8540	-2,1924
2.	TLKM	0,0645	2,1853
3.	INCO	2,8637	-1,3456
4.	GGRM	-0,0645	0,0155

h) Bi

The value of Bi can be calculated by the following equation:

$$Bi = \frac{\beta^2}{\sigma ei^2}$$

Where:

B = beta

σei^2 = unsystematic risk

Based on sample company data taken during the observation period, the value of Bi can be seen in the following table:

Tabel 9. Bi

No.	Stock Code	Period 2021	Period 2022
1.	HMSP	76,204	65,1277
2.	TLKM	100,147	181,0216
3.	INCO	20,401	34,4180
4.	GGRM	1,920	6,8708

i) Ci and C* (C Cut Of)

Ci is the quotient of the market variance and return for the stock variance error with the market variance and the sensitivity of individual stocks to variance errors. Ci can

be calculated by the following equation:

$$Ci = \frac{varians\ market * Ai}{(1+varians\ market * Bi)}$$

Based on data from the four sample companies taken during the observation period, the Ci value can be seen in the following table:

Tabel 9. Ci

No.	Stock Code	Period 2021	Period 2022
1.	HMSP	-0,0104	-0,00342
2.	TLKM	0,0002	0,00289
3.	INCO	0,0090	-0,00221
4.	GGRM	-0,0002	0,00003

The C* (C cut of point) value is taken from the largest Ci value, namely 0.0090 in the 2021 period and 0.00289 in the 2022 period.

j) ERB (Excess Return to Beta)

ERB is the difference between expected returns and risk-free returns and is used to measure stock returns to non-diversified risk units as measured by the Beta value. ERB can be calculated by the following formula:

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

Where:
ERBi = Excess Return to Beta security-i
E(Ri) = expected return
Rf = risk free (7 Days BI Repo Rate)
βi = beta –i

Based on the data of the four sample companies taken during the observation period, the ERB values can be seen in the following table:

Tabel 9. ERB

No.	Stock Code	Period 2021	Period 2022
1.	HMSP	-0,0506	-0,0337
2.	TLKM	0,0006	0,0121
3.	INCO	0,1404	-0,0391
4.	GGRM	-0,0336	0,0023

a) Optimal Portofolio Single Index Model

To determine which stocks will be included in the optimal portfolio, we must know which stocks have an ERB value greater than C* for making a decision whether these stocks are optimal or not. Stocks with ERB values > C* can be included in the optimal portfolio and conversely stocks with ERB values < C* will not be included in the optimal portfolio.

Based on data from the four sample companies taken during the observation period,

the ERB and C* values can be seen in Table 9 and Table 10 as follows:

Tabel 9.
Optimal Portfolio Stock of 2021

Stock Code	ERB	C*	Result
HMSP	-0,0506	0,0090	-
TLKM	0,0006	0,0090	-
INCO	0,1404	0,0090	Optimal
GGRM	-0,0336	0,0090	-

Tabel 10.
Optimal Portfolio Stock of 2022

Stock Code	ERB	C*	Result
HMSP	-0,0337	0,00289	-
TLKM	0,0121	0,00289	Optimal
INCO	-0,0391	0,00289	-
GGRM	0,0023	0,00289	-

b) Zi

Zi value can be calculated by the following equation:

$$Zi = \frac{\beta i}{\sigma ei^2}(ERB - C*)$$

βi = beta security
σei² = unsystematics risk
ERBi = Excess return to beta
C* = Cut Off Point

Based on the sample company data, the Zi value can be determined in Table 11 below:

Tabel 11.
Securities of Portfolio Optimal Period 2022

Period	Optimal Portfolio Stock	Zi
2021	INCO	11,7751
2022	TLKM	1,9866

c) Wi

Wi is the weight (weight) or the amount of funds that will be allocated for each security. The total Wi in the optimal portfolio must be 1, Wi can be determined by the following equation:

$$Wi = \frac{Zi}{Sum\ Zi}$$

Zi = Z security
Sum Zi = Sum Zi

d) Alpha (α) Portofolio

Alpha Portfolio can be calculated by the following equation:

$$\alpha p = Wi * \alpha i$$

Where:
alpha i = alpha i
Wi = Weight

Based on observational data, it was obtained that the α value of the portfolio in the 2021 period was 0.0320 and in the 2022 period it was 0.0052.

e) Beta (β) Portfolio

The beta (β) value of the portfolio can be calculated by the following equation:

$$\beta pi = Wi * \beta i$$

where:
βpi = beta
Wi = weight

Based on observational data, it was obtained that the β value of the portfolio in the 2021 period was 0.2275 and in the 2022 period it was 0.8367.

f) Unsystematic Risk Portofolio

The optimal portfolio unsystematic risk can be calculated by the following equation:

$$\sigma^2 epi = Wi * ei$$

$\sigma^2 epi$ = unsistematics risk
Wi = Weight

Based on observational data, it was obtained that the unsystematic risk portfolio value in the 2021 period was 0.0025 and in the 2022 period it was 0.0039.

g) Weight

Observations in the 2020 -2021 period can be seen that only PT. Vale Indonesia / INCO that meets the criteria for an optimal portfolio, so that the weight of the stock is 100%. In the period 2021 – 2022 only shares of PT. Telekomunikasi Indonesia which meets the criteria for forming an optimal portfolio, so that the weight of the shares is 100%.

h) Return and Risk Optimal Portfolio Single Index Model

Based on the data obtained in the previous section, it can be seen that the optimal portfolio formation with the Single Index Model of four stock samples produces the data in the following table:

Table 12.
Single Index Model Period June 2020 – June 2021

Optimal	Stock	E(Return	E(Return	Varians	Varians

Stock	Weight	Market)	Portofolio)	Market	Portofolio
INCO	100%	0,0134 (1,34%)	,0351 (3,51%)	0,0034 (0,34%)	0,0027 (0,27%)

Based on the data in Table 12. The Single Index Model for the period June 2020 – June 2021 it is known that the optimal portfolio formation with the Single Index Model succeeded in giving a greater Portfolio Return of 3.51% when compared to a Market Return of 1.34% and producing Portfolio Risk which is smaller, which is 0.27% when compared to the larger Market Risk, which is 0.34%.

Table 13.
Single Index Model Period June 2021 – June 2022

timal Stock	ck Weight	Return Market)	Return Portofolio)	rians arket	rians rtofolio
KM	0%	094 94%)	130 3%)	017 17%)	051 51%)

Based on the data in Table 13. The Single Index Model for the period June 2021 – June 2022 it is known that the optimal portfolio formation with the Single Index Model results in a larger Portfolio Return of 1.3% when compared to a Market Return of 0.94%, but this portfolio generates a greater risk of 0.51% when compared to Market Risk which is only 0.17%.

4. Conclusion

Based on the calculation and analysis of the optimal portfolio using the Single Index Model method on PT. Vale Indonesia, PT. Telekomunikasi Indonesia, PT. HM. Sampoerna, PT. Gudang Garam for the June 2020 – June 2022 period, it is known that there is one share that meets the optimal criteria for the June 2020 – June 2021 period, namely PT. Vale Indonesia (INCO) with a proportion of 100% INCO shares in a portfolio with a Single Index in the formation of an optimal portfolio is proven to be able to provide a greater return on the optimal portfolio of 3.51% when compared to a market return of 1.34% and succeeded in reducing the risk value portfolio which is 0.27% compared to market risk of 0.34%.

In the period June 2021 - June 2022 there is one stock that meets the optimal criteria, namely PT. Telekomunikasi Indonesia with a 100% proportion of TLKM shares in the optimal portfolio succeeded in increasing the portfolio return by 1.3% when compared to the market return of 0.94% but failed to reduce this risk due to the portfolio risk value of 0.51% where this value is higher large when compared to market risk of 0.17%.

FURTHER RESEARCH

The period used in this observation has a vulnerability of two years, namely the period June 2020 – June 2021 and June 2021 – June 2022 which are considered capable of representing the current conditions, but the observation period can be extended to give better results. The company shares used in this observation took four sample companies,

namely PT. Vale Indonesia, PT. Telekomunikasi Indonesia, PT. HM. Sampoerna, PT. Gudang Garam, to provide better research results, can expand the sample of companies used in the observations.

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MODEL ANTESEDEN DALAM MEMBENTUK LOYALITAS KOGNITIF PADA PELANGGAN INDIHOME DI KOTA BANDUNG

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Abstract

The development of information and communication technology is currently very fast. One of the developments in information and communication technology is the internet. Indihome as one of the largest internet service provider products in Indonesia. The purpose of this study was to analyze and explain the effect of perceived value, technical satisfaction, functional satisfaction, loyalty attitudes, and loyalty behavior in forming cognitive loyalty. This type of research is a quantitative survey, with verification research methods. The sample in this study used 400 people as respondents where the respondents were users of indihome products in the city of Bandung. Data collection techniques using kueisoner and then distributed using google form. The sampling technique was purposive sampling with several respondents' criteria. Data analysis using