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STOCK DIVERSIFICATION (PORTFOLIO) STRATEGY TO INCREASE INVESTMENT RETURNS AND REDUCE RISK

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Abstract

The purpose of this article is to explain diversification and portfolio risk and the impact of diversification on portfolio risk and determine the number of stocks that make up the optimal portfolio. The sampling technique is purposive sampling and the sample is taken from 5 stocks of the IDX Energy Sector industry. The analysis tool uses a correlation matrix, expected return and risk for individual stocks and portfolios (5 stocks) and the Unknown Population Standard Deviation (σ) Hypothesis Test. The results of this study are:

1) The correlaion matrix table shows that stocks have a positive correlation, meaning that the stock price movement is in the same direction, that is, when the price of one stock rises, the price of the other stock will rise. Of the five correlations that occur, the correlation between AKRA and ADRO stocks has the largest positive correlation coefficient.

And the correlation between MEDC and ADRO stocks has the smallest correlation coefficient.

2) In general, the expected return and risk performance of the portfolio is better than the performance of individual stocks. So by applying stock diversification, the return performance can be optimized, and risk can also be minimized.

3) From the results of the Hypothesis Test Population Standard Deviation (σ) is Unknown. The t statistic value of - 5.334 is in the area > - 0, 1771. Then the decision is that the null hypothesis (Ho) is rejected. This means H1 is accepted, i.e. the risk of stock diversification is smaller than the risk of individual stocks.

Keywords: *Capital Market, Diversification, Return, Risk, Shares, Investment, Portfolio*

INTRODUCTION

In the modern era, investment has become an inseparable element of everyday life. Capital owners prefer to invest their capital in physical assets (e.g., land, buildings, and machinery) and financial assets (e.g., stocks and bonds). The main goal behind every investment decision is to achieve optimal growth value and obtain maximum financial profits in the future.

Investment capital is gaining increasing importance, especially for countries that are experiencing development, such as Indonesia, as stated by Dhaniswara K. Harjono (2007). The emergence of the need for capital on a large scale to support development projects is a major challenge that is always faced.

Capital owners and investors always prefer to invest in countries that have legal certainty and certainty. One of the main factors that plays a central role in the context of legal protection for investment activities is the law in force in a country.

The legal system and regulations that protect investment activities provide justice, certainty and security for investors or capital owners. Investing will benefit more than current consumption. Most people believe that investing in these securities will generate profits commensurate with the capital they spend.

However, the main issue that is always the main consideration for investors when they decide to invest in financial instruments, such as shares, is risk. Based on these circumstances, Markowitz conducted a study called "Portfolio Choice" in 1952.

This research provides evidence showing that applying the principle of portfolio diversification, which involves combining various financial instruments into a single portfolio, can

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provide significant benefits in reducing overall risk. This approach proves its effectiveness in managing trading levels associated with financial investments.

METHOD

This research uses quantitative data to determine the relationship between stock diversification risk and individual stock risk. Secondary data is data obtained from various existing information or facts. In this article, the population that is the focus of the research is the LQ45 share group listed on the IDX in the period 2020 to 2022. By exploring secondary data from various related sources, in-depth analysis can be carried out to gain richer and deeper insights into performance and dynamics. LQ45 group of shares during the stated period. LQ45 shares are a group of shares consisting of 45 companies with the highest liquidity and market capitalization on the IDX. Therefore, the performance of these shares can be considered as a reflection or representation of the performance of the Indonesian capital market as a whole.

The purposive sampling method is a technique for taking samples which are used to obtain certain objectives to be achieved in the research. The aim of this research is to study how stock diversification risk impacts individual stock risk in companies in the fields of petroleum (MEDC), oil and gas (AKRA), coal (ITMG), coal (ADRO), renewable energy and solar energy (PTBA).

A sample size of five shares can be obtained based on the selection criteria. The Unknown Population Standard Deviation (σ) Hypothesis Test was used to analyze the data used in this article. The shares selected from the AmiBroker Application are based on the LQ-45 group, namely:

1) MEDC (PT. Medco Energi Internasional Tbk)
2) AKRA (PT AKR Corporindo Tbk)
3) ITMG (PT Indo Tambangraya Megah Tbk)
4) ADRO (PT Adaro Energy Indonesia Tbk)
5) PTBA (PT Bukit Asam Tbk)

RESULTS AND DISCUSSION

DATA ANALYSIS

Based on the data found, it can be summarized in table form as in the following table

Table 1. Data analysis Stock Market

No	Saham	Thn	Harga Akhir A (Pt)	Harga Awal A (Pt-1)	Dividen (D1)	W
1	MEDC	2022	Rp 1.015	Rp 468	Rp 24	0,2
		2021	Rp 555	Rp 600	Rp 15	
		2020	Rp 590	Rp 735	Rp 21	
2	AKRA	2022	Rp 1.400	Rp 825	Rp 75	0,2
		2021	Rp 825	Rp 640	Rp 145	
		2020	Rp 635	Rp 795	Rp 125	
3	ITMG	2022	Rp 39.025	Rp 19.350	Rp 10.544	0,2
		2021	Rp 20.400	Rp 13.800	Rp 4.258	
		2020	Rp 13.850	Rp 11.450	Rp 474	
4	ADRO	2022	Rp 3.850	Rp 2.170	Rp 491	0,2
		2021	Rp 2.250	Rp 1.430	Rp 301	
		2020	Rp 1.430	Rp 1.225	Rp 69	
5	PTBA	2022	Rp 3.690	Rp 2.660	Rp 1.094	0,2
		2021	Rp 2.710	Rp 2.810	Rp 688	
		2020	Rp 2.810	Rp 2.640	Rp 74	

Stock price trends

The stock price trend is shown by the CandleStick chart (candle chart) which is as follows:

1) MEDC (PT. Medco Energi Internasional Tbk)

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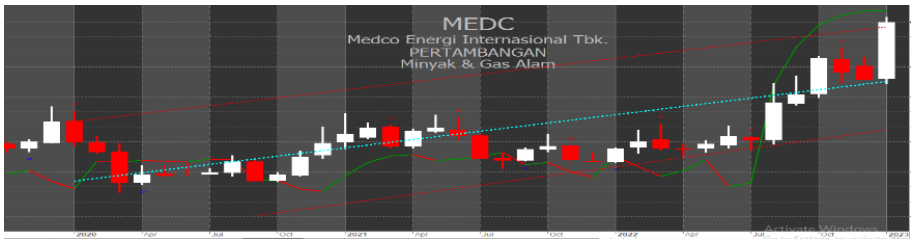

Figure 1. Candle Chart MEDC (PT. Medco Energi Internasional Tbk)

2) AKRA (PT AKR Corporindo Tbk)

Figure 2. Candle Chart AKRA (PT AKR Corporindo Tbk)

3) ITMG (PT Indo Tambangraya Megah Tbk)

Figure 3. Candle Chart ITMG (PT Indo Tambangraya Megah Tbk)

4) ADRO (PT Adaro Energy Indonesia Tbk)

Figure 4. Candle Chart ADRO (PT Adaro Energy Indonesia Tbk)

5) PTBA (PT Bukit Asam Tbk)

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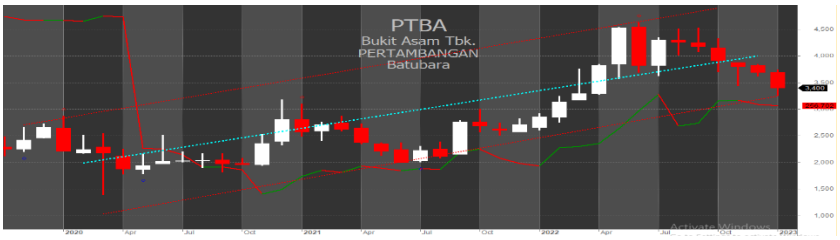

Figure 5. Candle Chart ADRO (PT Adaro Energy Indonesia Tbk)

From the stock charts of MEDC, AKRA, ITMG, ADRO, PTBA over the last 3 years shows a positive trend.

EXPECTED RETURN AND RISK ANALYSIS FOR INDIVIDUAL SHARE AND PORTFOLIO (5 SHARE)

Table 2. Risk Analysis Stock Market

No	Saham	Risiko (Varians)	
		Individual (1 SAHAM)	Portofolio (5 SAHAM)
1	MEDC	0,593	0,260
2	AKRA	0,180	
3	ITMG	0,434	
4	ADRO	0,361	
5	PTBA	0,143	

Table 3. Portfolio Return Calculation

PERHITUNGAN EXPECTED RETURN PORTOFOLIO E(Rp)

RUMUS :

$$E(R_p)=\sum_{i=1}^{n} W_i E(R_i)$$

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

No	SAHAM	W	E (Ri)	$E(R_p)=\sum_{i=1}^{n} W_i E(R_i)$
1	MEDC	0,2	0,33	0,53
2	AKRA	0,2	0,42	
3	ITMG	0,2	0,87	
4	ADRO	0,2	0,67	
5	PTBA	0,2	0,37	

Jadi :

$E(R_p)=$ 0,53

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Table 4. Recap of return and risk calculations

No	Saham	Individual (1 saham)		Portofolio (5 Saham)	
		E (Ri)	Var(Ri)	E (Rp)	Var(Rp)
1	MEDC	0,334	0,593		
2	AKRA	0,420	0,180		
3	ITMG	0,867	0,434	0,531	0,260
4	ADRO	0,669	0,361		
5	PTBA	0,367	0,143		

From these data, it appears as follows:
• ITMG shares have the largest Expected Return Value, namely 0,867.
MEDC shares have the smallest Expected Return Value, namely 0,334.
The Expected Return Portfolio value is 0,531, located between the largest (ITMG) and smallest (MEDC) values. Expected Return on MEDC, AKRA and PTBA shares is smaller than the portfolio value.
• MEDC shares have the greatest risk (Variance Value), namely 0,593.
PTBA shares have the smallest risk (Variance Value), namely 0,143.
The risk value (Variance) of the Portfolio is 0,260, located between the largest (MEDC) and the smallest (PTBA) values. The risk (Variance) of MEDC & ITMG shares is greater than the portfolio value.
• MEDC Shares' Expected Return is smaller than the portfolio, and the individual risk is greater than the portfolio. So individually MEDC shows that the expected return is greater but the risk is high.
• Expected Return on AKRA shares is smaller than the portfolio, and the individual risk is greater than the portfolio. So individually, Jakra SHOWS a smaller Expected Return but lower risk.
• Expected Return on ITMG shares is greater than the portfolio, and the individual risk is greater than the portfolio. So individually ITMG shows that its Expected Return is greater but the risk is high.
• Expected Return on ADRO shares is greater than the portfolio, and the individual risk is greater than the portfolio. So, individually, ADRO shows that its Expected Return is greater but the risk is greater
• PTBA Shares' Expected Return is greater than the portfolio, and the individual risk is greater than the portfolio. So individually PTBA shows a smaller Expected Return but the risk is large.
• In general, the expected return and risk performance of a portfolio is better than the performance of individual stocks. So by implementing stock diversification, return performance can be more optimal, and risk can also be minimized.
So that investors are more moderate in making decisions, meaning they should avoid decisions that are high risk and high return (High Risk Seeker).

SPSS APPLICATION - ONE SAMPLE T TEST
Diversification

Table 5. One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Varian	10	,27380	,105980	,033514

Table 6. One-Sample Test

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	Test Value = 0.274					
	t	df	Sig. (2-tailed)	Mean Difference	90% Confidence Interval of the Difference	
					Lower	Upper
Varian	-,006	9	,995	-,000200	-,06163	,06123

In the calculations it is known that the significance is 0.995

Individual

Table 7. One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Varian	5	,34220	,185520	,082967

Table 8. One-Sample Test

	Test Value = 0.342					
	t	df	Sig. (2-tailed)	Mean Difference	90% Confidence Interval of the Difference	
					Lower	Upper
Varian	,002	4	,998	,000200	-,17667	,17707

In the calculations it is known that it is significant at 0,998

Comparison of Diversification and Individuals with the SPSS Application seen from the significance (Sig), namely:

Diversification (Sig) => 0,995

Individual (Sig) => 0,998

Decision Rules

This is a two-sided hypothesis test. The significance level used is 0,10.

Degrees (of freedom df) is = 13

Table 9. Confidence interval

df	Interval Kepercayaan, CI										
	80%	81%	82%	83%	84%	85%	86%	87%	88%	89%	90%
	Tingkat Signifikansi untuk Uji Satu Sisi,α										
	0.100	0.095	0.090	0.085	0.080	0.075	0.070	0.065	0.060	0.055	0.050
	Tingkat Signifikansi untuk Uji Dua Sisi, α										
	0.20	0.19	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.10
1	3.078	3.251	3.442	3.655	3.895	4.165	4.474	4.829	5.242	5.730	6.314
2	1.886	1.953	2.026	2.104	2.189	2.282	2.383	2.495	2.620	2.760	2.920
3	1.638	1.688	1.741	1.798	1.859	1.924	1.995	2.072	2.156	2.249	2.353
4	1.533	1.577	1.623	1.671	1.723	1.778	1.838	1.902	1.971	2.048	2.132
5	1.476	1.516	1.558	1.602	1.649	1.699	1.753	1.810	1.873	1.941	2.015
6	1.440	1.478	1.517	1.559	1.603	1.650	1.700	1.754	1.812	1.874	1.943
7	1.415	1.451	1.489	1.529	1.572	1.617	1.664	1.715	1.770	1.830	1.895
8	1.397	1.432	1.469	1.508	1.549	1.592	1.638	1.687	1.740	1.797	1.860
9	1.383	1.418	1.454	1.492	1.532	1.574	1.619	1.666	1.718	1.773	1.833
10	1.372	1.406	1.442	1.479	1.518	1.559	1.603	1.650	1.700	1.754	1.812
11	1.363	1.397	1.432	1.468	1.507	1.548	1.591	1.636	1.686	1.738	1.796
12	1.356	1.389	1.424	1.460	1.498	1.538	1.580	1.626	1.674	1.726	1.782
13	1.350	1.383	1.417	1.453	1.490	1.530	1.572	1.616	1.664	1.715	1.771
14	1.345	1.377	1.411	1.447	1.484	1.523	1.565	1.609	1.656	1.706	1.761
15	1.341	1.373	1.406	1.441	1.478	1.517	1.558	1.602	1.649	1.699	1.753

The decision rules in this hypothesis test are:

H0 is not rejected if - 1.771 ≤ t count ≤ 1.771 or H0 is rejected if t count < - 1.771 or t count > 1.771

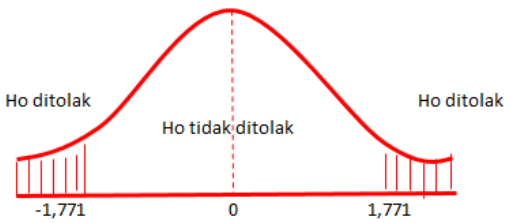

Figure 6. Hypothesis Test

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CONCLUSION

The results of the calculation of expected return and risk analysis for individual shares and portfolios (5 shares) state that H1 = there is no effect of diversification strategy on stock returns. This means that the diversification strategy is smaller than stock returns. The results of the calculation of expected return and risk analysis for individual shares and portfolios (5 shares) state that H2 = there is no effect of diversification strategy on stock risk. This means that the diversification strategy is smaller than the stock risk. The results of the calculation of expected return and risk analysis for individual shares and portfolios (5 shares) state that H3 = there is an influence of return on risk. This means that the stock return is greater than the stock risk.

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