The Effect of Company Performance on Stock Returns in the LQ45 Stock Cluster in 2020-2022

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Abstract. In the Indonesian capital market, various securities are traded, but stock investors dominate. The LQ45 index illustrates the Indonesian capital market condition is better than the JCI (Jakarta Composite Index). Stocks on the LQ45 index have large market capitalization, high liquidity, and good company fundamentals, but have varying returns. Variations in stock returns on the LQ45 Index from time to time can make it difficult for investors to invest, so it is necessary to group stock returns that have the same pattern. The method used is time series clustering in the 2020-2022 period. Furthermore, the logistic regression analysis is used to determine the effect of company performance that is consistent in the LQ45 index on stock return status. The results show that the selected algorithm for clustering was K-Means with 2 optimal numbers of clusters characterized as lagging stock and leading stock. Then, company stocks in the LQ45 index for the 2020-2022 period tend to be classified as leading stocks if they have a low Debt to Equity Ratio but have a high Net Profit Margin and Price Earnings Ratio.

1. Introduction

The capital market has several roles, among others companies can carry out production activities and the government can finance various activities by utilizing funding originating from the capital market to create an increase in the economy and people's welfare. In addition, when viewed from an investor's perspective, the capital market can assist investors in making investments because it provides a wide selection of investment instruments that provide optimal returns [1]. According to [2], there are several types of securities that are traded, including stocks, bonds, and debentures. Even though there are various securities (investment instruments) that are traded, the number of stock investors dominates the capital market. This can be seen in Figure 1 that from 2019 to June 2022, the number of stock investors dominates the capital market compared to the investor's number of other investment instruments.

Figure 1. Development of the Number of Investors in Indonesia from 2019 to June 2022.

Several stock indexes are formed to classify company shares that are listed on the Indonesia Stock Exchange according to certain criteria. [3] explains that the stock index that describes the movement of all stocks in Indonesia is the JCI (Jakarta Composite Index). However, according to [1], the JCI cannot represent actual conditions in the capital market because it takes into account stocks that are not actively traded. Unlike the JCI, the LQ45 index can better describe the condition of the Indonesian capital market because it consists of stocks that are liquid or actively traded.

LQ45 stock index is a stock index that describes the movement of a group of stocks with large market capitalization and high liquidity followed by good company fundamentals [3]. The higher the liquidity of a stock, indicates that the stock is more frequently traded or the higher the investor demand for the stock [4]. Then, stocks with large market capitalizations do not mean that these stocks provide high returns in a short time, but these stocks have low-risk characteristics due to relatively stable prices [5]. Then the company's fundamental measurements is a measure that can be used to describe the performance of a company [6]. Fundamental measurements are obtained from fundamental analysis, which is an evaluation of a company's financial performance [7].

Even though the stocks included in the LQ45 index are stocks with large market capitalization and high liquidity and are followed by good company fundamentals, these stocks are still affected by several things, such as information circulating (news) in the form of bad news or good news. One example can be seen in Figure 2, namely, there was a sharp decline in the LQ45 index in March 2020 so the LQ45 index return in March 2020 was -21.42% [8]. Whereas in December 2019 the LQ45 index return could reach 6.03% [8]. After March 2020, the LQ45 index experienced an increase that was no bigger than the previous decline. Then the LQ45 index tends to increase until the end of 2020 until early 2021. However, the LQ45 index experienced a decline in mid-2021. This is followed by an increase again at the end of 2021 and this increase tends to be stable until 2022. These events illustrate the occurrence of fluctuations in the LQ45 index.

Figure 2. LQ45 index closing price movement for the period 02 January 2020 to 30 June 2022.

In addition to fluctuations in the LQ45 index, the stocks included in the index have varied returns. In the LQ45 2022 fact sheet published by the Indonesia Stock Exchange, stocks that are included in the LQ45 index are classified based on their returns. Stock returns on the LQ45 index for 2022 (year to date) include Leading Stocks and Lagging Stocks. The highest return on Leading Stock reached 127.47% and the highest return on Lagging Stock was only -5.04%. With the variations in returns on stocks that are included in the LQ45 index, investors need to pay attention to these variations when investing in the LQ45 index.

Investors want to get the highest return possible [1]. However, there is a linear relationship between returns and risks borne by investors [1]. Therefore, investors need to pay attention to the returns and risks of the shares of companies where investors will invest. The level of risk in stocks that are included in the LQ45 index tends to be low because prices are relatively stable. However, when viewed from the return side, the stocks in the LQ45 index have varied returns. The non-uniform returns on stocks that are included in the LQ45 index from time to time can make it difficult for investors to invest, so it is necessary to group stock returns that have the same pattern in the LQ45 index. [9] conducted research on grouping stock price fluctuations using the K-Medoids algorithm with a distance measure, namely Dynamic Time Wraping (DTW). Then [10] grouped stocks using the K-Means algorithm based on the percentage of daily stock price movements and financial ratios in companies that are members of the Standard and Poor's 500 (S&P 500) index.

Furthermore, an analysis was carried out to determine the influence of the fundamentals or performance of each company that is consistently incorporated in the LQ45 index on stock returns status. Research by [11] concluded that the variables Return on Assets, Price to Earnings, and Earnings per Share have a significant positive effect on stock returns of non-financial companies listed on the Karachi Stock Exchange (KSE) for the 2007-2017. Research from [12] states that the variables Current Ratio, Net Profit Margin, Price to Book Value, and Return on Equity have a significant positive effect on stock returns while the Debt to Equity Ratio has a significant negative effect on stock returns of Engineering and Construction companies listed on the Indonesia Stock Exchange for the 2015-2019. The two studies mentioned above, used panel data regression analysis, but because this study used a categorical dependent variable, this study will use a logistic regression analysis method such as research conducted by [13] which states that debt ratio and book value per stock has a significant effect on the performance of company shares on the Jordanian Stock Exchange in the 2014-2015.

Based on research [10], [14], analysis of the capital market can be done by grouping stock price movements. However, research [10], [14] does not examine the differences in the influence of a variable so that these stock groups are formed. Furthermore, research on the influence of financial ratios on stock returns [11], [15], [16] does not examine the existence of variations in returns in the stock studied.

Therefore, this research will group stock returns of companies that are members of the LQ45 index, which is then followed by a study of the influence of company financial ratios on stock returns.

Based on the description above, there are two objectives in this study. First, group company stocks that are consistently included in the LQ45 index for the 2020-2022 period according to their historical return patterns. Second, to find out the effect of company performance on the status of company stock returns that are consistently included in the LQ45 index for the 2020-2022 period.

2. Method

2.1. Theoretical basis

2.1.1. Return. The return can be interpreted as gains or losses from investing. In stock investment, return consists of dividends and capital gains [1]. In general, dividends are distributed once a year [17]. Because this study uses quarterly data, stock returns only consist of capital gains. The return can be formulated as follows [1]:

$$Return = \frac{P_t - P_{t-1}}{P_{t-1}} x\ 100\% \quad (8)$$

Where:
P_t : Stock price t-th period
P_{t-1} : Stock price $(t-1)$-th period

2.1.2. Signaling Theory. The Signaling Theory is that the manager of a company will give a signal to investors by using the accounts in the financial statements to inform investors that the company is experiencing increased growth in the future [18]. If investors believe the signal, the stock price will increase so that the shareholders will benefit. Based on the Signaling Theory, it is stated that the returns (profits) of investors are influenced by the numbers in the company's financial statements. The financial statements inform about the company's performance [19].

2.1.3. CAMELS. CAMEL is a rating system used to evaluate financial performance and then developed into CAMELS. CAMELS consists of several components, namely Capital, Assets, Management, Earnings, Liquidity, and Sensitivity to Market Risk [20]. The first, Capital is the ownership of company assets that have been reduced by debt [21]. The Capital component can be evaluated by the financial ratio of Debt to Equity Ratio [22]. If the Debt to Equity Ratio value is greater, the amount of capital from company owners that can be used as collateral for debt will be smaller [23]. Then, Assets are resources owned by the company that are utilized now and in the future [21]. The Asset component can be evaluated by measuring the Total Asset Turnover Ratio [24]. Furthermore, Management is human activity in supervising and leading the running of a business entity. Management focuses on administration, integrating people, money, and materials into operating units. The management component can be evaluated using Profit Per Employee [22]. Then, Earnings describe the income generated by operational activities [22]. The earnings component can be evaluated by measuring Return on Assets, Net Profit Margin [22], and Earnings per Share [25]. If the value of Return on Assets is greater, the net profit obtained from the utilization of the company's total assets will also be higher and vice versa. If the value of the Net Profit Margin is higher, the net profit generated from net sales will also be higher. Then Earning per Share describes the success of the management of a company to provide benefits to common shareholders [23]. Furthermore, the liquidity of a company measures its ability to meet the short-term debt of the company. The liquidity component can be evaluated with Current Ratio [19]. Finally, Sensitivity to Market Risk describes the extent to which changes in interest rates, foreign exchange rates, commodity prices, and stock prices can impact income [20]. The sensitivity component to market risk can be evaluated using Price Earnings Ratio. The Price Earnings Ratio shows how much the market is willing to pay for the company's earnings. The higher the Price Earnings Ratio, the higher the market is willing to pay company income [22].

2.2. Analysis Method

The time series clustering method is used because the data being clustered is time series data. The following are the stages of the cluster analysis:

1. Prepare daily return data for stocks that are included consistently in the LQ45 index for the period of the 2020-2022.
2. Indicate the correct algorithm used by making a boxplot.
3. Determine the similarity measure. In this study, the similarity measure used is the Dynamic Time Warping (DTW) distance. DTW is preferred over Euclidean distance because if there is a small distortion in time, Euclidean distance can fail to produce the correct similarity measure [26]. For example there is a time series $Y_1 = (y_{11}, y_{12}, \ldots, y_{1G})$ with length G and a time series $Y_2 = (y_{21}, y_{22}, \ldots, y_{2H})$ with length H, then the DTW distance formula is formed using a matrix $\boldsymbol{D}$ which can be defined as follows [27]:
   - First row:
   $$D(1,j) = \sum_{m=1}^{j} c(y_{11}, y_{2m}), j \in [1,H] \quad (2)$$
   - First column:
   $$D(i,1) = \sum_{m=1}^{i} c(y_{1m}, y_{21}), i \in [1,G] \quad (3)$$
   - For other elements:
   $$D(i,j) = min\{D(i-1,j-1), D(i-1,j), D(i,j-1)\} + c(y_{1i}, y_{2j}), i \in [1,G], j \in [1,H] \quad (9)$$

   Where:

   $D(i,j)$: Elements of the accumulated distance matrix in the i-th row and j-th column

   $c(y_{1i}, y_{2j})$: The distance between objects Y_1 in the i-th row and object Y_2 in the j-th column

   Warping paths can be found by selecting the smallest distance between $D(i-1,j-1)$, $D(i-1,j)$, $D(i,j-1)$ starting from point $P_{end} = (G, H)$ to $P_{start} = (1,1)$.
4. Perform cluster analysis using the K-Means and K-Medoids algorithms.

   The K-Means algorithm stages based on [28], 1) sets the initial K centroid, the selection of K objects is done randomly [29], 2) assigns objects to clusters with the nearest centroid, 3) recalculating the centroids in the clusters that receive new objects and the clusters that lost these objects, 4) repeat in step 2 until no more reassignments are made or it has converged. The convergent criterion that is often used is to minimize the value of the sum squared error [30]. The sum-squared error formula is
   $$SSE = \sum_{j=1}^{K} \sum_{y \varepsilon C_j} \|Y - \bar{Y}_j\|^2 \quad (10)$$

   Where:

   SSE : Sum squared error
   K : Number of clusters
   C_j : j-th cluster
   Y : Objects in the j-th cluster
   $\bar{Y}_j$: The average of the j-th cluster

   K-Medoids algorithm based on [30], namely 1) randomly select k objects as the initial medoid, 2) assign each remaining object to the cluster that has the closest medoid, 3) in each cluster, make a selection nonmedoid object which is then referred to as $O_{nonmedoid}$, 4) calculates the cost of replacing the current medoid with $O_{nonmedoid}$, the cost in question is the difference in the sum square error if the current medoid is replaced by $O_{nonmedoid}$. If the cost is negative then $O_{nonmedoid}$ becomes the medoid and replaces the current medoid. Mathematically the cost can be written as follows:
   $$Cost = SSE_{nonmedoid} - SSE_{current} \quad (11)$$

   Where:

   $Cost$: Cost of medoid replacement

$SSE_{nonmedoid}$: sum square error with medoids are $O_{nonmedoid}$
$SSE_{current}$: sum square error with medoids are current medoid

Formulas of sum square error that is:

$$SSE = \sum_{j=1}^{K} \sum_{o \epsilon C_j} |Y - Y_{medoid(j)}|^2 \quad (12)$$

Where:

SSE : Sum square errors
K : Number of clusters
C_j : j-th cluster
Y : Objects in the j-th cluster
$Y_{medoid(j)}$: Medoid of the j-th cluster

Step 5) Do iteration from step 2 until there is no change (convergent).

5. After that, perform cluster validation using several indices, namely the Silhouette Index, Calinski-Harabasz Index, and Davies-Bouldin Index.
6. The final stage is to characterize the clusters that are formed.

Then the analysis is continued with binary logistic regression. Binary logistic regression is used because the data on the dependent variable, namely return status, is dichotomous. Stages of binary logistic regression analysis:

1. Calculating model parameter estimates using the Maximum Likelihood Estimators. The binary logistic regression model formed in this study is as follows:

$$g(x) = \alpha + \beta_1 DER + \beta_2 ROA + \beta_3 NPM + \beta_4 EPS + \beta_5 PER \quad (13)$$

2. Testing the goodness of fit of the model in equation (8) using the Hosmer-Lemeshow Test.
3. Simultaneously test the significance of the parameters in equation (8) using the Likelihood Ratio Test.
4. Partially test the significance of the parameters in equation (8) using the Wald test.
5. Interpretation of odds ratio values
   The Interpretation of the odds ratio is a change of 1 unit of the independent variable, so the tendency to occur $y = 1$ is estimated to increase e^{β} times [31].

2.3. Data and Data Sources

This study uses secondary data consisting of companies that are consistently included in the LQ45 index for the second quarter of 2020 until the second quarter of 2022. The variable used is daily stock returns as the basis for grouping. Then to see the effect of company performance on stock return status, financial ratios will be used namely, Debt to Equity Ratio representing the Capital dimension. Return on Assets, Net Profit Margin, and Earnings per Share represent the Earnings dimension. Price Earnings Ratio represents the Sensitivity to Market Risk dimension. These financial ratios are limited to the dimensions of Capital, Earnings, and Sensitivity to Market Risk. This is intended to assist investors in seeing the company's performance in which these ratios have been published by the Indonesia Stock Exchange and the securities company PT Ajaib Sekuritas Asia. Then these data are sourced from Yahoo Finance, Ajaib.co.id, and the Indonesian Stock Exchange.

3. Results and Discussion

Stocks that are included in the LQ45 index are company shares that have good company performance or fundamentals. However, based on Figure 3, it can be seen that several patterns of stock returns tend to be higher than other stocks, it is indicated that there are differences in the characteristics of stock returns even though these stocks are consistently on the LQ45 index. To group stock return patterns from time to time, the time series clustering analysis method is used.

Before clustering the stocks of LQ45 index, a description of the data distribution is first carried out to indicate the appropriate grouping algorithm to use. Based on the boxplot formed in Figure 4, it can be seen that several observations are classified as influential outliers or extreme outliers in the

distribution of company stock data in the LQ45 index, including ANTM, BBTN, ERAA, PTPP, and WIKA. Therefore, an indication of the appropriate clustering algorithm to use is K-Medoids.

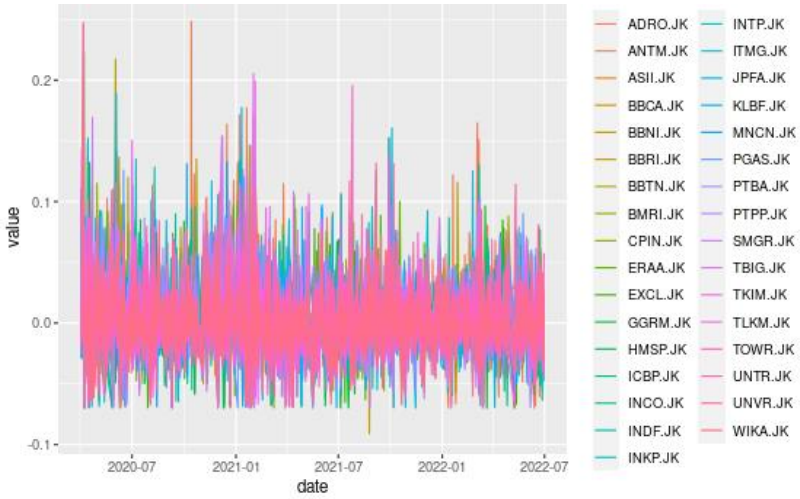

Figure 37. Movement of daily returns for stocks in the LQ45 Index for the 2020-2022.

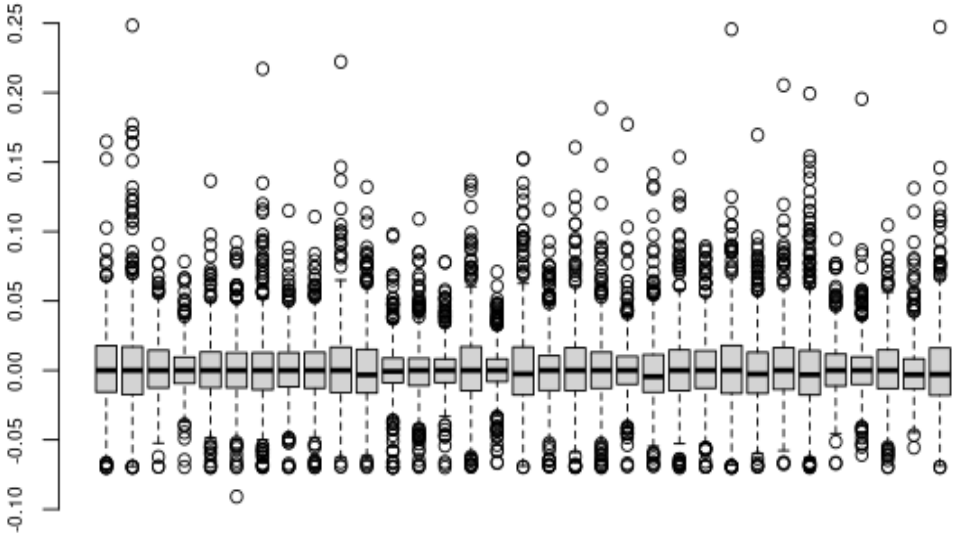

Figure 4. Boxplot of daily returns for each company's stock listed in the LQ45 index for the 2020-2022.

By using the K-Means and K-Medoids algorithms, grouping is carried out by the number of clusters 2 and 3. The consideration of using the number of clusters 2 and 3 is that the number of company shares included in the LQ45 index is not too large, consisting only of 33 shares. Furthermore, the optimal number of clusters is determined by the value of the Silhouette Index and the Calinski-Harabasz Index is large but has a small Davies-Bouldin Index value. Based on Table 1, on the K-Means algorithm, it can be seen that the Silhouette Index and Calinski-Harabasz Index values are greater in the number of clusters 2 than in the number of clusters 3. However, the Davies-Bouldin Index values in the number of clusters 3 are smaller than in the number of clusters 2. By considering these three indices, it was decided that the optimal number of clusters in the K-Means algorithm is 2 clusters.

Then based on Table 1, on the K-Medoids algorithm, it can be seen that the Silhouette Index and Calinski-Harabasz Index values are greater in the number of clusters 2 than in the number of clusters 3. However, the Davies-Bouldin Index value in the number of clusters 3 is smaller than in the number of clusters 2. By considering the three indices, it was decided that the optimal number of clusters in the K-Medoids algorithm is 2 clusters.

Table 1. Silhouettes Index, Calinski-Harabasz Index, and Davies-Bouldin Index values on K-Means and K-Medoids algorithms.

	K-Means		K-Medoids	
	k=2	k=3	k=2	k=3
Sil	0.133	-0.029	0.051	-0.029
CH	10.022	2.138	2.852	0.988
DB	2.320	1.002	1.789	0.985

Next, a comparison is made between the K-Means and K-Medoids algorithms with 2 clusters. Based on Table 2, it can be seen that the Silhouettes Index and Calinski-Harabasz Index values are greater in the K-Means algorithm than in K-Medoids algorithm. However, the Davies-Bouldin Index value in the K-Medoids algorithm is smaller than in K-Means algorithm. By considering these three indexes, the algorithm for clustering stocks in the LQ45 index based on their return value that is appropriate is the K-Means algorithm with 2 clusters.

Table 2. Silhouettes Index, Calinski-Harabasz Index, and Davies-Bouldin Index values of the K-Means and K-Medoids algorithms with 2 clusters.

	K-Means	K-Medoids
Sil	0.133	0.051
CH	10.022	2.852
DB	2.320	1.789

After the clusters are formed, further characterization is carried out for each cluster. In this study, the characterization was carried out with the help of plot formation. The plot formed is the average daily return and the standard deviation of that return. The standard deviation is defined as the volatility of the company's stock. The most commonly used measure of stock return volatility is the standard deviation [32]. Volatility measurements are carried out to calculate investment risk [1]. The following is the characterization plot.

In Figure 5, namely the characterization with the K-Means algorithm shows a clear difference in clusters between cluster 1 and cluster 2. In contrast to the results of the characterization using the K-Medoids algorithm, in Figure 6, there is an overlap between the clusters. Therefore, by considering the Silhouette Index, Calinski-Harabasz Index, and Davies-Bouldin Index and considering the results of the characterization of the clusters formed, the appropriate algorithm in this study is the K-Means algorithm with 2 clusters. This also shows that due to observations those in the form of influential outliers are small, including ANTM, BBTN, ERAA, PTPP, and WIKA so they do not affect K-Means's performance in creating clusters on the LQ45 index based on daily stock returns.

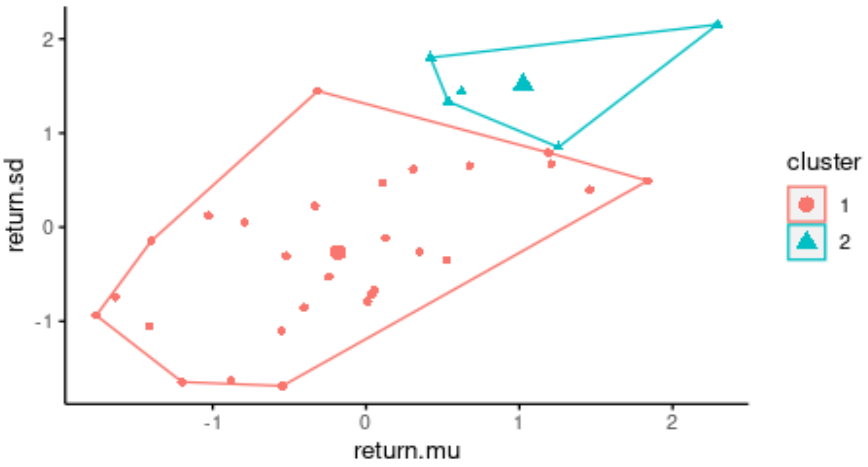

Figure 5. The plot of the standard deviation of returns and the average return of company shares included in the LQ45 index for the 2020-2022 using the K-Means algorithm.

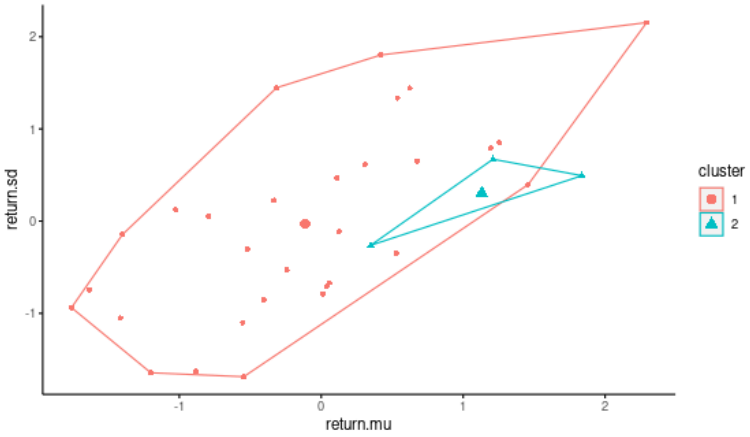

Figure 68. The plot of the standard deviation of returns and the average return of company shares included in the LQ45 index for the 2020-2022 using the K-Medoids algorithm.

Grouping stock returns using the K-Means algorithm with 2 clusters, based on Figure 5, it can be seen that cluster 1 is a stock cluster with a lower average return followed by a lower risk than cluster 2. This risk is illustrated by the standard deviation of cluster 1 which tends to be lower than cluster 2. Then cluster 2 has the characteristics of a high average return and higher risk than the cluster 1. Therefore, the results of clustering the LQ45 index stock returns in cluster 1 are characterized as lagging stock and cluster 2 is characterized as leading stock. Furthermore, the members of each cluster are formed as follows:

lagging stock cluster : ADRO, ASII, BBCA, BBNI, BBRI, BBTN, BMRI, CPIN, ERAA, EXCL, GGRM, HMSP, ICBP, INDF, INTP, ITMG, JPFA, KLBF, MNCN, PGAS, PTBA, SMGR, TBIG, TLKM, TOWR, UNTR, UNVR, WIKA

leading stock cluster : ANTM, INCO, INKP, PTPP, TKIM.

To see the effect of company performance on the status of company stock returns that are consistently incorporated in the LQ45 index for the 2020-2022 period, the binary logistic regression analysis method is used. Based on Table 3, regarding the goodness of fit test, it is known that the test statistic value is less than $\chi^2_{(0.05;8)}(0.8028 < 15.5073)$ and the p-value is greater than the level of significance

$(0.9992 > 0.05)$ so it was decided to fail to reject H_0. Therefore, it was concluded that the stock return status regression model that was formed was appropriate.

Table 3. Goodness of Fit Test Results.

$\hat{C}$	df	χ^2_{table}	p-value
0.8028	8	15.5073	0.9992

Based on Table 4, regarding the simultaneous test, it is known that the value is G^2 more than $\chi^2_{(0,05;5)}$ $(14.0107 > 11.0705)$ and the p-value is less than the level of significance $(0.0155 < 0.05)$ so that it can be decided to Reject H_0. Based on this, it can be stated that there is at least one financial ratio variable (Debt to Equity Ratio, Return on Assets, Net Profit Margin, Earnings per Share, and Price Earnings Ratio) which has a significant effect on the status of company stock returns that are consistently incorporated in the LQ45 index on the period 2020-2022.

Table 4. Simultaneous Test Results.

G^2	df	χ^2_{table}	p-value
14.0107	5	11.0705	0.0155

Then, the following results of partial test were obtained:

Table 5. Partial Parameter Test Results.

Dimensions	Variable	Coefficient	P-values
Capital	Debt to Equity Ratio (DER)	-3.3597	0.0351 [a]
Earnings	Return on Assets (ROA)	-2.6638	0.1225
Earnings	Net Profit Margin (NPM)	0.3479	0.0496 [a]
Earnings	Earnings per Share (EPS)	0.0013	0.2189
Sensitivity to Market Risk	Price Earnings Ratio (PER)	0.2042	0.0396 [a]

[a] Significant at the 5% significance level

Based on Table 5 it is known that the Debt to Equity Ratio variable has a p-value of less than 0.05, which is 0.0351. Therefore, it can be stated that the Debt to Equity Ratio has a significant effect on the status of company stock returns that are consistently included in the LQ45 index in 2020-2022. Then the odds ratio value from the Debt to Equity Ratio variable is $e^{-3.3597} = 0.0347$, meaning that the lower value of the Debt to Equity Ratio, the more likely a company's shares to become the leading stock will be $\frac{1}{0.0347} = 28.8184$ times greater, assuming other variables are constant. This is in line with the findings of [12] and [33] which state that the Debt to Equity Ratio has a negative and significant effect on stock returns. Then [34] also stated that the higher the Debt to Equity Ratio value, the lower the stock return rate due to higher risk from investors, this risk is due to debt interest expenses which are the responsibility of the company.

Then in Table 5, it is known that the Net Profit Margin variable has a p-value of less than 0.05, which is equal to 0.0496. So, it can be stated that the Net Profit Margin variable has a significant influence on the status of company stock returns that are consistently included in the LQ45 index in 2020-2022. The odds ratio value from the variable Net Profit Margin is $e^{0.3479} = 1.4161$, meaning that for every 1% increase in the value of the Net Profit Margin, the chance of a company's stock becoming a leading stock will be 1.4161 times greater, assuming other variables are constant. This statement is supported by research from [35] and [12] which states that Net Profit Margin has a significant positive effect on stock returns.

Then the Price Earnings Ratio variable in Table 5, it is known that the p-value obtained is less than 0.05, namely 0.0396. So, it can be stated that the variable Price Earnings Ratio has a significant effect on the status of company stock returns that are consistently included in the LQ45 index in 2020-2022. The odds ratio value of the Price Earnings Ratio variable is $e^{0.2042} = 1.2265$, meaning that the higher of the Price Earnings Ratio value, the possibility of a company's stock becoming the leading stock will

be 1.2265 times greater, assuming other variables are constant. Research that supports this statement is research from [11], [36], and [37] which states that the Price Earnings Ratio has a positive and significant influence on stock returns.

4. Conclusion

Based on the results and discussion, this study concludes that the appropriate clustering algorithm for grouping stocks in the LQ45 index for the 2020-2022 period is K-Means with 2 clusters. The first cluster consists of 28 company shares which are a cluster of lagging stocks with low returns and low risk. Then the second cluster consists of 5 company shares which are the leading stock cluster with high return rates accompanied by high risks. Furthermore, company shares in the LQ45 index for the 2020-2022 period tend to be classified as leading stocks if they have a low Debt to Equity Ratio but have a high Net Profit Margin and Price Earnings Ratio. Then the Debt to Equity Ratio variable has the greatest tendency to influence stocks in the LQ45 index for the 2020-2022 period to become leading stocks.

Suggestions that can be given through this research for investors are investing in LQ45 index stocks with high return rates accompanied by high risks can be considering stocks that are members of the leading stock cluster. Meanwhile, investments in stocks with low returns accompanied by low risk can be considering stocks belonging to the lagging stock cluster. Then to get an optimal return on investment in the LQ45 index, investors can focus on the financial ratios Debt to Equity Ratio, Net Profit Margin, and Price Earnings Ratio. In a sense, investors can invest in company shares with a lower Debt to Equity Ratio but have a higher Net Profit Margin and Price Earnings Ratio.

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