Indonesian Journal of Artificial Intelligence and Data Mining (IJAIDM)
Vol. 4, No. 1, March 2021, pp. 44 – 53
p-ISSN: 2614-3372 | e-ISSN: 2614-6150

Clustering Analysis of Financial Distress on Tourism Sector Companies Go-Public Due to LSSR

[1]Ahmad Firman Maulana, [2]Camelia Iltazami Ulva, [3]Fath Esa Prasanti Kusuma, [4]Faza Budiarti, [5]Moh. Fadli Hidayat Dj Makaraseng, [6]Nyoman Putri Pradievy Syanthi, [7]Rani Nooraeni
[1,2,3,4,5,6,7]Politeknik Statistika STIS
Email: [1]firmanmaulano123@gmail.com, [2]iltazami.camelia@gmail.com, [3]fathesa09@gmail.com, [4]faza.budiarti@gmail.com, [5]muhammadfadli875.mf@gmail.com, [6]putripradievy@gmail.com, [7]raninoor@stis.ac.id

Article Info

Article history:
Received Nov 06th, 2020
Revised Jan 20th, 2021
Accepted March 23th, 2021

Keyword:
Analysis Cluster
Financial Ratio
Financial Distress
LSSR
K-Means

ABSTRACT

Large-Scale Social Restriction Policy (LSSR) to prevent the spread of COVID-19 has a big impact on economic activities, one of which is activities in the tourism sector. Restrictions on outdoor activities reduce the productivity of companies that can lead to bankruptcy. By knowing the financial condition of the company, we can predict whether the company will experience financial pressures or not. This paper tries to analyze the grouping of 100 companies in the tourism sector before (the first quarter of 2020) and after (the second quarter of 2020) the application of LSSR conditions. This paper uses the K-Means grouping method and the financial ratio of each company. Then, the variables in the analysis are Return on Asset (ROA), Total Asset Turn Over Ratio (TATO), Debt to Equity Ratio (DER), and Price to Earning Ratio (PER). The results showed that in the second quarter of 2020 or after the implementation of LSSR, almost all companies tend to be in a financially depressed condition. The number of companies that are under financial pressure after the implementation of this policy is 98 companies.

Corresponding Author:
Rani Nooraeni
Politeknik Statistika STIS
Jalan Otto Iskandardinata no 64C, 13330
Email: raninoor@stis.ac.id

DOI: http://dx.doi.org/10.24014/ijaidm.v4i1.11303

1. INTRODUCTION

The Large-Scale Social Restriction (LSSR) policy to prevent the spread of COVID-19 has had a major impact on various areas of Indonesian people's lives. One of them is the economy. According to Central Bureau of Statistics (BPS) data, Indonesia's economic growth experience the largest decline in the second quarter of 2020 for the last two decades. Many economic actors suffer from this limitation, including companies in various sectors. The prohibition to carry out economic activities outside the home has stopped many company activities.

One of the economic sectors affected is the tourism sector. Of course, it will also have an impact on other sectors related to tourism activities because the tourism sector is multisector, multidimensional and multidisciplinary [1]. Based on figure 1, it can be seen that national GDP experience a negative growth rate in the second quarter of 2020 due to the restriction policy. Tourism sector dependance on human mobility has made the transportation and warehousing business experience the most significant decline among other sectors, namely by 29.22%. In addition, the result of reduced activities in the tourism sector also lead to a decrease in the growth rate of the business field providing accommodation and food and drink to reach 22.35%.

Since the spread of COVID-19, the government stopped flights to and from China as of February 5, 2020. This has affected Indonesia's tourism sector as many travel and airline companies have suffered losses due to flight stoppages from China [2]. According to statistic data, the number of foreign tourist arrivals since February has tended to decline. The highest decline was in April at 66.3%. Not only in Indonesia, but the tourism sector in Hong Kong and Thailand is also estimated to be the most affected, followed by Vietnam,

Singapore and Malaysia [3]. It is feared that a large decline in the growth rate of the tourism sector will occur due to the large number of companies in this sector experiencing financial distress.

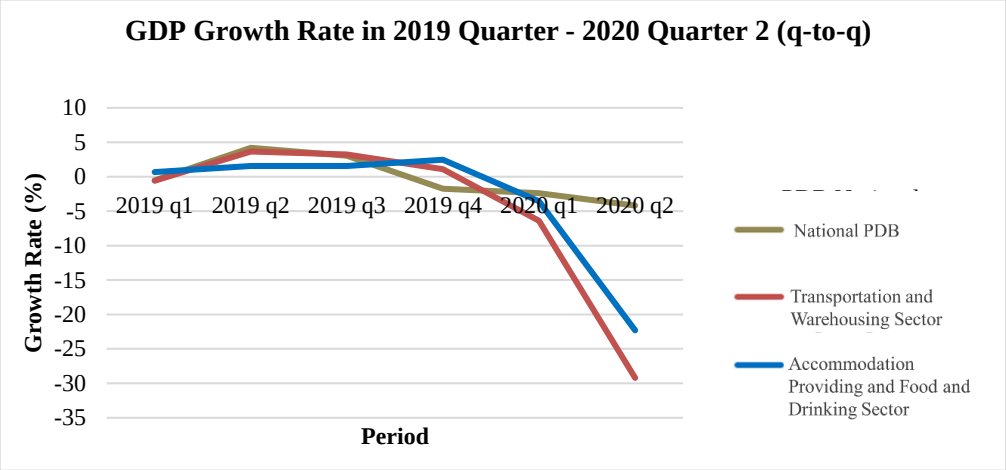

Figure 1. GDP Growth Rate Quarterly 2019-2020
(Source: Central Bureau of Statistics)

Financial distress is a company condition towards bankruptcy. Financial distress can be defined as the stage of decline in financial conditions that occurred prior to bankruptcy or liquidation [14]. By analyzing financial distress, both the government and companies can anticipate the possibility of bankruptcy. In addition, shareholders can make decisions regarding their invested capital.

Many studies have been conducted to classify companies experiencing financial distress. Firdausi, et al. Conducted a comparative study of the k-means and fuzzy c-means methods to classify financial distress in the go-public manufacturing industry in Indonesia [7]. The variable used in this study refers to the Altman Z-Score Formula which has been used to measure the bankruptcy of manufacturing companies in the world. The variable in question consists of Working Capital to Total Assets representing Liquidity Ratio, Retained Earnings to Total Assets and EBIT to Total Assets representing the Profitability Ratio, Book Value of Equity to Book Value of Total Debt representing Valuation Ratio, and Sales to Total Assets representing Activity Ratio. From this research, it is found that the K-Means method is better than the Fuzzy C-Means because it has smaller SSE (Sum of Square Error) and icdrate (internal cluster dispersion rate) values.

Based on the background and considering previous research, this study focuses on the analysis of the grouping of go public companies in the tourism sector (the accommodation and food and beverage sector and the transportation sector) that have the potential to experience financial distress and non-financial distress in the first quarter of 2020 (before the implementation of the restriction) and second quarter 2020 (after the implementation of the restriction). The grouping of companies is based on four financial ratios, namely the ratio of profitability, solvency, activity, and valuation using the k-means method.

2. RESEARCH METHOD

2.1. Large-Scale Social Restriction

Large-Scale Social Restrictions (LSSR) are enforced in several regions in Indonesia in an effort to prevent the possible spread of COVID-19. The restriction rules are issued by the government in Government Regulation No. 21 of 2020, besides that there is also a Minister of Health Regulation No. 9 of 2020 issued by the Ministry of Health. Large-Scale Social Restrictions is implemented when the number of cases and/or the number of deaths due to disease increases and spreads significantly and rapidly to several areas. The restriction in an area is implemented based on the request of the governor, regent, or mayor. The implementation of the restriction includes deactivating school and workplace activities other than offices or strategic agencies; restrictions on religious activities; restrictions on activities in public facilities except supermarkets, markets etc.; restrictions on social and cultural activities; restrictions on the mode of transportation and restrictions on other activities specifically related to defense and security aspects. LSSR is implemented during the longest incubation period (14 days) and can be extended if there is evidence of spread.

2.2. Tourism Sector

The World Tourism Organization (WTO) defines tourism as an activity of individuals or groups who travel to a place that is outside their custom or environment to stay for no more than one consecutive year for pleasure, leisure, business and other purposes. In relation to economic activities, the tourism sector includes all

human activities related to tourism starting from the business field of providing transportation, accommodation, to eating and drinking.

The tourism industry can be interpreted as an association of companies that are jointly engaged in tourism to produce goods and services that are expected or needed by tourists on their journey. The scope of the tourism industry includes a variety of economic activities, including:

1. Restaurant (Food and Beverages Provision)
   In the field of providing food and drink, business actors need to pay attention to food service techniques, nutritional content and cleanliness of the restaurant environment to keep food hygienic. This field is very important because it relates to meeting the basic needs of tourists during their travels.
2. Lodging (Accommodation)
   In the field of accommodation, business actors can provide services to tourists in the form of a place to stay or stay for a moment, while the tourists travel. Examples are hotels, motels, resorts, condominiums, guest houses, and bed and breakfasts.
3. Transportation
   In the transportation sector, business actors (which can be travel agents or local tour operators) can provide services to tourists in the form of tourist transportation facilities and infrastructure to mobilize from one place to another. Examples are cars, motorbikes, buses, planes, trains, boats and bicycles.

2.3. Financial Distress

Financial distress is a company condition towards bankruptcy. According to Platt, financial distress can be defined as the stage of decline in financial conditions that occurs before bankruptcy or liquidation [14]. When viewed from financial conditions, there are three conditions that cause financial distress, namely the factor of insufficient capital or lack of capital, the amount of debt and interest expenses and suffering losses [15]. These three aspects are interrelated. A company can be said to be in financial distress or financial difficulties if the company has had a negative net profit for several years [16].

2.4. Analysis Financial Ratio

Analysis financial ratios are an activity of comparing the numbers in the financial statements by dividing one number by another. Comparisons can be made between one component and the components in one financial report or between components in the financial statements. Then the figures being compared can be figures in one period or several periods [12]. Analysis financial ratios are a method that can be used to analyze financial reports [4].

1. Profitability Ratio
   The profitability ratio is the ratio used to assess the company's ability to seek profit. This ratio also provides a measure of the level of management effectiveness of a company. This is shown by the profit generated from sales and investment income [12]. Profitability ratios are generally measured from the ratio of Profit Margin or Profit Margin on Sales, Return on Investment (ROI), Return on Assets (ROA), and Return on Equity (ROE). In this study, the profitability ratio is measured using the analysis of profit calculations or Return on Assets (ROA). ROA is a ratio used to measure the efficiency of a company in generating profits using all economic resources and assets owned. The profit referred to in this ratio is net profit after deducting interest and tax expenses. The higher the ROA the company has, the better the company's performance in generating net income. The formula for calculating ROA is as follows.

$$ROA = \frac{Net\ Income}{Total\ Assets} \quad (1)$$

2. Valuation Ratio
   The valuation ratio is a measure that relates the relationship between the market price of ordinary shares and company earnings with the book value of these shares [12]. This ratio can provide guidance to management on how investors assess the company's performance and its prospects in the future. Valuation ratios can be measured using Price to Earning Ratio (PER), Price to Cash Flow Ratio (PCFR), and Price to Cash Flow Ratio (PCFR), Price to Book Value Ratio (PBVR). In this study, the valuation ratio is measured using Price Earning Ratio (PER). PER is the ratio between the market price of shares and earnings per share. The higher the PER value, the expected profit growth will also increase. If this ratio is lower than the ratio of similar companies, this indicates that investing in the company's shares is riskier than the company average.

$$PER = \frac{Regular\ Closing\ Price}{EPS} \quad (2)$$

3. Activity-based Ratio
   The activity ratio or also known as the asset utilization ratio is the ratio used to assess the company's ability to carry out its daily activities by measuring the level of efficiency in the use of its resources. In addition, this ratio is also used to assess the effectiveness and intensity of the company in generating sales. Commonly used activity ratios include Inventory Turnover, Account Receivable Turnover, Working Capital Turnover, and Total Assets Turnover [9]. In this study, the activity ratio is measured using Total Assets Turnover Ratio. with the following formula.

$$TATO = \frac{Sales}{Total\ Asset} \quad (3)$$

   The lower the TATO ratio value, the more likely the company will experience financial distress.

4. Solvability Ratio
   The solvency ratio is the ratio used to measure the extent to which the company's assets are financed with debt [12]. It means how much debt burden the company bears compared to its assets. In a broad sense, it is said that the solvency ratio is used to measure the company's ability to pay all of its obligations, both short and long term, if the company is liquidated. The solvency ratio consists of Debt to Asset Ratio (DAR) and Debt to Equity Ratio (DER). In this study, the profitability ratio is measured using the Debt to Equity Ratio.

$$DER = \frac{Total\ Debt}{Total\ Equity} \quad (4)$$

   This ratio is useful for knowing the amount of funds provided by the borrower (creditor) and the company owner. In other words, this ratio serves to determine each rupiah of own capital that is used for debt collateral.

2.5. K-Means Clustering Method

K-Means Clustering is an unsupervised clustering method which is often used in data mining. The k-means method divides data into several groups (clusters) so that data that has the same characteristics are grouped into the same cluster, while between clusters have different characteristics [5]. The group determination in this method is based on the level of proximity of the object to the center point (centroid) which is calculated by the distance calculation method. How to calculate the distance between objects and the centroid point can use the Minkowski distance calculation formula as follows [11]:

$$d(x,y) = \left[\sum_{i=1}^{p} |x_i - y_i|^m\right]^{1/m} \quad (5)$$

where:
m : 1, to calculate Manhattan range
m : 2, to calculate Euclidean range
x, y : analyzed data

According to Pramana et al, (2018), the general way the k-means algorithm works is as follows:
1. Determining the number of cluster (k),
2. Choosing k centroid points randomly,
3. Grouping objects into a number of k clusters based on the smallest distance between the centroid and the object,
4. Updating the centroid point value after forming k clusters,
5. Repeating steps (3) and (4) until the centroid point value does not change.

2.6. Data and Data Source

This study uses secondary data obtained from the publication of the Indonesia Stock Exchange (IBX). The data consists of 27 companies in the food and beverage category, 40 companies in the transportation category, and 33 companies in the tourism, restaurant, hotel category. The variables used in this study are the company's financial ratios consisting of Return on Assets (ROA) as a measure that describes the profitability ratio, Total Assets Turnover Ratio (TATO) as a measure that describes the activity ratio, Debt to Equity Ratio (DER) as a measure describes the solvency ratio, and Price Earning Ratio (PER) as a measure that describes the valuation ratio. The data used is data for the first quarter of 2019 to the second quarter of 2020. The data for the first quarter and second quarter of 2020 are assumed to describe the conditions before and after the implementation of The Large-Scale Social Restriction policy.

The analytical method used in this research is the K-Means clustering method with the help of software R 4.0.2 Statistics. Here is the stage of data analysis:

1. Collecting dan preprocessing data.
2. Exploring data on four financial ratios for the first quarter of 2019 to the second quarter of 2020.
3. Clustering of companies using the K-Means with the number of groups is two (k = 2).
4. Analyzing the results of company clustering in the first and second quarters of 2019 and 2020.
5. Drawing conclusions.

3. RESULT AND ANALYSIS

3.1. Financial Ratios General Description

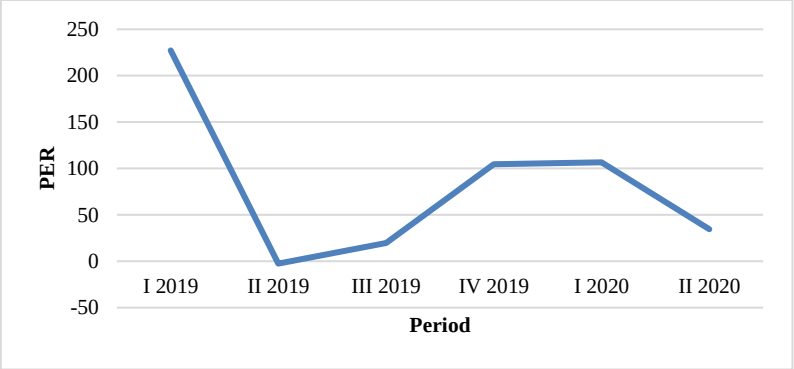

Figure 2. The Average Price Earning Ratio (PER) Tourism Company Quarterly
(Source: Indonesian Stock Exchange (IDX))

Price Earning Ratio is one of the basic measures in measuring the valuation ratio. This PER shows the comparison between the share price and the company's net income. Based on Figure 2, in the last six periods the PER value has fluctuated. In the second quarter of 2019 and 2020, the PER value decreased compared to the previous quarter. Even in 2019 there was a very significant decrease, namely in the previous quarter the value was 227.23 to negative 2.55. This means that in the second quarter of 2019, companies in the tourism sector experienced a drastic decline in profit growth. Even so, in the third quarter 2019 until first quarter 2020 tourism sector companies returned to increase the net profit from -2.55 to 106.59. However, in the second quarter of 2020 tthe PER value of companies in the tourism sector decreased reaching 34.62.

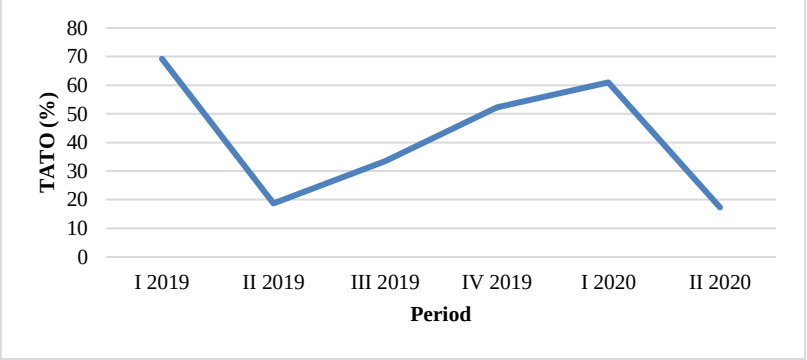

Figure 3. The Average Total Asset Turnover Ratio (TATO) Tourism Company Quarterly
(Source: Indonesian Stock Exchange (IDX))

Total Asset Turnover Ratio (TATO) is a ratio that shows the effectiveness of the use of all company assets in order to generate income. The higher the TATO value, the greater the change in profit the company gets. Figure 3 shows that the average TATO for tourism sector companies in the second quarter of 2020 is the lowest TATO compared to the previous five quarters. In the first quarter of 2019, the average TATO of tourism sector companies was 69.22 percent. Then it dropped dramatically in the following quarter to reach 18.74 percent. There was an increase in the average TATO from the second quarter of 2019 to the first quarter of 2020. However, in the second quarter of 2020 it fell to the lowest point in the last six periods, namely 17.3 percent. It is estimated that the decline in the second quarter of 2020 will be the impact of the implementation of the restriction policy.

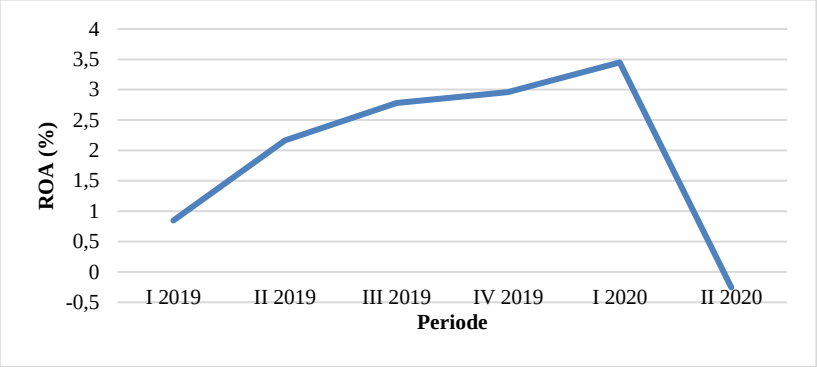

Figure 4. The Average Return on Asset (ROA) Tourism Company Quarterly
(Source: Indonesian Stock Exchange (IDX))

Return on Asset is a profitability ratio that shows a company's efficiency in generating profits. The higher the ROA value, the higher the resulting profit. Based on Figure 4, it can be seen that the average ROA value of tourism sector companies from the first quarter of 2019 to the first quarter of 2020 has increased continuously from 0.84 percent to 3.45 percent. Meanwhile, from the first quarter of 2020 to the second quarter of 2020, it experienced a significant decline reaching -0.26 percent. This shows that the tourism sector companies have decreased their ability to earn profits. It is estimated that this decline is due to the LSSR policy.

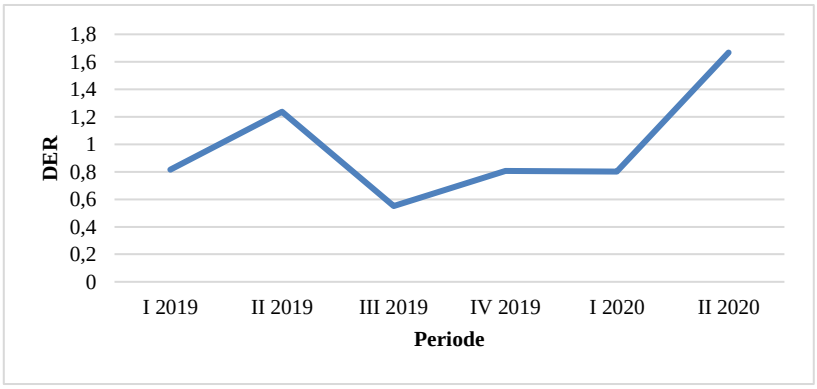

Figure 5. The Average Debt to Equity Ratio (DER) Tourism Company Quarterly
(Source: Indonesian Stock Exchange (IDX))

Debt to Equity Ratio (DER) is a solvency ratio. DER is useful for assessing how much the company's capital is financed by debt. The smaller the ratio, the better the company's condition because the capital to guarantee current debt is still quite large. From Figure 5 above, it can be seen that the average DER value in the last six periods has fluctuated, this shows the instability of the ability of tourism sector companies to pay their obligations. In the second and fourth quarters of 2019 and the second quarter of 2020, there was an increase from the previous period. This means that the condition of the company's ability to pay off debt in that period is worse than the previous period. The weakest condition of the company's ability to pay debt occurred in the second quarter of 2020, which was indicated by the highest average DER value of 1.67. This condition is thought to have occurred due to the enactment of the restriction policy.

3.2. Clustering Results

After processing the data using the K-Means method, the results of the grouping of 100 go-public companies in the tourism sector were obtained in the first quarter for conditions before restriction and the second quarter of 2020 for conditions after the restriction. In addition, clustering was carried out in the first and second quarters of 2019 as a basis for consideration of the grouping pattern in the conditions before and after the restriction.

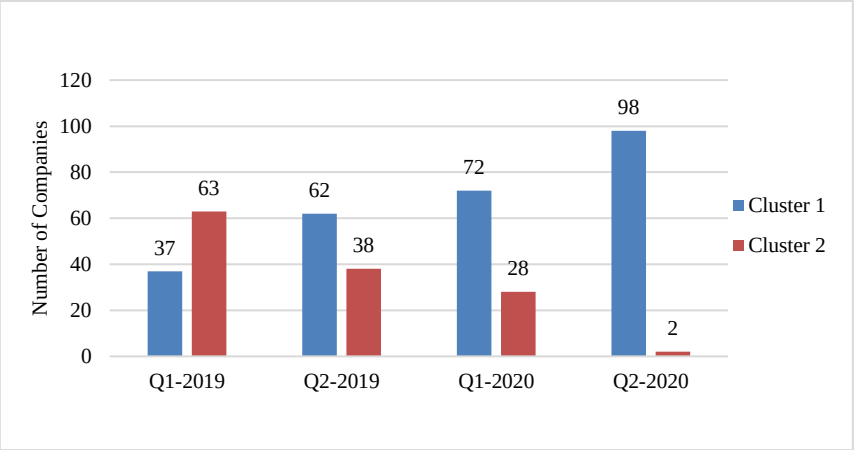

Figure 6. Results of Go-Public Companies Grouping in the Tourism Sector
(Source: The Results of Writer's Data Processing)

In the first quarter of 2019, there were 37 companies belonging to cluster 1 and the remaining 63 in cluster 2.In contrast, in the second quarter, 62 companies were classified as cluster 1 and 38 companies were classified into cluster 2.From the results of the grouping, it can be stated that there is an increase about double the number of members in cluster 1 from quarter I to quarter II 2019. Then in the first quarter of 2020, conditions before the LSSR, the number of members of cluster 1 was 72 companies and the remaining 28 were classified as cluster 2. Whereas in the second quarter, the conditions after LSSR, as many as 98 companies in cluster 1 and only 2 companies belonging to cluster 2. The imbalance in the number of members between cluster 1 and cluster 2 after LSSR tends to be greater than in the previous period.

Then from the results of the grouping, identification is carried out based on the assessment of each financial ratio, the higher the value, the better or vice versa. So that the financial distress company group and the non-financial distress company group are obtained. Based on the existing theory, the higher the value of the TATO, PER, and ROA ratios, the better the company's financial condition. Meanwhile, the higher the DER financial ratio, the worse the company's financial condition. So that the results of cluster identification are obtained as follows:

Table 1. Cluster Identification Results

Year	Cluster 1	Cluster 2
Q1-2019	Financial Distress	Non-Financial Distress
Q2-2019	Financial Distress	Non-Financial Distress
Q1-2020	Financial Distress	Non-Financial Distress
Q2-2020	Financial Distress	Non-Financial Distress

Source: The Results of Writer's Data Processing

The grouping is divided into financial distress and non financial distress. The non-financial distress group is a group that has better financial ratios than financial distress. The financial distress group includes companies that have the potential to experience conditions leading to bankruptcy. Based on Table 1, it can be seen that in the first and second quarters of 2019 and the first and second quarters of 2020, cluster 2 has better financial ratios than cluster 1. This occurs because the value of the financial ratios of TATO, PER, DER, and The ROA in clusters 1 and 2 is quite large, thus forming a financial capacity limit that separates the two groups. Cluster 1 has lower TATO, PER, and ROA values and a higher DER value than cluster 2. Overall, cluster 1 is a group of companies that have the potential to experience financial distress and cluster 2 is a group of companies that do not have the potential to experience financial distress. In the first quarter of 2020, cluster 1 was dominated by companies in the transportation category and in the tourism, restaurant & hotel category, while cluster 2 was dominated by companies in the food and drink category. In contrast to the conditions in the

second quarter of 2020, almost all transportation category companies are included in cluster 1 and the rest are in cluster 2, while for other company categories all are in cluster 1.

If seen again in Figure 6, the company's movement from cluster 2 (non-financial distress) to cluster 1 (financial distress) in the second quarter of 2020, which occurred significantly, is thought to be the result of the LSSR policy. The LSSR policy forces companies to reduce their activities so that company productivity decreases. Furthermore, a decrease in company productivity causes the company's revenue to decrease or even stop. This resulted in a decline in earnings as indicated by the average ROA which fell from 3.45 to negative 0.256. Even though the company's income is reduced or even non-existent, the company still has to make expenses, such as paying employee salaries or wages. So that companies will increase debt to meet these needs. The increase in corporate debt was reflected in the increase in DER value, which was two times that of the first quarter, before the LSSR. If the company's financial condition gets worse, the company has the potential to experience financial distress.

4. CONCLUSION

The results of clustering of go public companies in the tourism sector using the K-Means method were obtained in the first quarter of 2020, the number of members of cluster 1 was 72 and cluster 2 was 28 companies. Whereas in the second quarter of 2020, the number of members of cluster 1 was 98 and cluster 2 was 2 companies. After analyzing the four financial ratios of the 100 companies, the results show that the financial ratios in cluster 1 have a lower pattern than the companies in cluster 2, or it can be said that cluster 1 shows tourism sector companies that have more potential to experience financial distress than companies in the cluster. 2. In the second quarter of 2020 or in the conditions after the implementation of the LSSR, there was a significant movement of companies from cluster 2 (non-financial distress) to cluster 1 (financial distress). During this quarter, almost all companies tend to experience financial distress.

REFERENCES

[1] Badan Pusat Statistik. (2018). Cakupan Aktivitas Pariwisata Dalam Klasifikasi Baku Lapangan Usaha Indonesia (KBLI) 2015. Jakarta: BPS.
[2] Budiyanti, E. (2020). Dampak Virus Corona Terhadap Sektor Perdagangan Dan Pariwisata Indonesia. Info Singkat XII,(4).
[3] Christian, Michael and Hidayat, Firman. (2020). Dampak Coronavirus Terhadap Ekonomi Global. Perkembangan Ekonomi Keuangan dan Kerja Sama Internasional - Edisi I: 87-112.
[4] Prastowo, D., & Rifka, J. (2015). Analisis Laporan Keuangan, Yogyakarta. UPP STIM YKPN.
[5] Ediyanto, M. N. M., & Satyahadewi, N. (2013). "Pengklasifikasian Karakteristik Dengan Metode K-Means Cluster Analysis". BIMASTER, 2(02).
[6] Exchange, Indonesia Stock.(2020). "IDX Statistics."
[7] Firdausi, N., Wessiani, N. A., & Santosa, B. (2015). Analisis Financial Distress Dengan Pendekatan Data Mining Pada Industri Manufaktur Go Public Di Indonesia. Jurnal ITS. Surabaya.
[8] Harahap, S. S. (2001). Analisa kritis atas laporan keuangan. RajaGrafindo Persada.
[9] Hasibuan, Rensi. (2019).Penentuan Variabel Pembeda Financial Distress untuk Menggolongkan Perusahaan Green Industry Tahun 2017. Skripsi Politeknik Statistika STIS: not published.
[10] Edy, I., & Muhammad, F. (2015). Advanced Clustering: Teori dan Aplikasi. Dee Publish: Jakarta.
[11] Johnson, R. A., & Wichern, D. W. (2002). Applied Multivariate Statistical Analysis (Vol. 5, No. 8). Upper Saddle River, NJ: Prentice hall.
[12] Kasmir, S. E. MM. (2016). Analisis Laporan Keuangan. Jakarta: Rajawali Pers. 2016.
[13] Pramana, S., Yuniarto, B., Mariyah, S., Santoso, I., & Nooraeni, R. (2018). Data Mining dengan R Konsep Serta Implementasi. Jakarta: InMedia.
[14] Platt, H. D., & Platt, M. B. (2002). Predicting Corporate Financial Distress: Reflections on Choice-Based Sample Bias. Journal of Economics and Finance, 26(2), 184-199.
[15] Rodoni, A. Dan Ali, Herni. (2010). Manajemen Keuangan. Edisi Pertama. Jakarta: Mitra Wacana Media.
[16] Whitaker, R. B. (1999). The Early Stages of Financial Distress. Journal of Economics and Finance, 23(2), 123-132.

BIBLIOGRAPHY OF AUTHORS

Ahmad Firman Maulana was born in Jombang, Jawa Timur, 11st January 2000. Graduated from MI Syafi'iyah in 2012, continued to MTs Akselerasi Amanatul Ummah Mojokerto and graduated in 2014. After that he continued to SMA Trensains Tebuireng 2 and graduated in 2017. Currently he is studying at the Polytechnic Statistics STIS, Department of Statistics.

Camelia Iltazami Ulva was born in Jember, 7th December 1999. Graduated from SDN Ajung 3. In 2012 continued to SMPN 2 Jember Mojokerto and graduated in 2015. After that, she continued to MAN 3 Malang and graduated in 2017. Currently she is studying at the Polytechnic Statistics STIS, Department of Statistics.

Fath Esa Prasanti Kusuma was born in Temanggung, 3rd September 1998. Graduated from SDN 1 Traji, in 2011, continued to SMPN 2 Temanggung Mojokerto and graduated in 2014. After that, she continued to SMAN 1 Temanggung and graduated in 2017. Currently she is studying at the Polytechnic Statistics STIS, Department of Statistics.

Faza Budiarti was born in Cianjur, 12nd June 1990. Graduated from SDN Perumnas 2 in 2002 continued to SMPN 1 Karangtengah Mojokerto and graduated in 2005. After that she continued to SMAN 1 Cianjur and graduated in 2008. Currently she is studying at the Polytechnic Statistics STIS, Department of Statistics.

Moh. Fadli Hidayat DJ Makaraseng was born in Palu, 11st December 1998. Graduated from SDN Inpres Palupi in 2011, continued to SMPN 3 Palu and graduated in 2014. After that he continued to SMA Al-Azhar Mandiri Palu and graduated in 2017. Currently he is studying at the Polytechnic Statistics STIS, Department of Statistics.

Nyoman Putri Pradievy Syanthi was born in Bandung, 16th July 1999. Graduated from SDN 2 Ubung in 2011, continued to SMPN 3 Denpasar and graduated in 2014. After that she continued to SMAN 3 Denpasar and graduated in 2017. Currently she is studying at the Polytechnic Statistics STIS, Department of Statistics.

Rani Nooraeni, Graduated from Polytechnic Statistics STIS, Jakarta. Obtained the M.Stat Degree at Padjajaran University and worked at BPS since early 2007. After that she was assigned to the Polytechnic Statistics STIS from 2015 until now.