ANALYSIS OF FINANCIAL DISTRESS AND ITS CORRELATION TO GROSS REGIONAL DOMESTIC PRODUCT (GRDP) DURING AND AFTER THE COVID-19 PANDEMIC (CASE STUDY OF REGIONAL DEVELOPMENT BANK IN JAVA ISLAND, INDONESIA)

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ABSTRACT

Financial performance applies to the financial condition of an industry in a given period. Financial distress refers to a situation of decline in an industry's financial status before the point of bankruptcy. The objective of the research is to utilize the Altman Z-Score approach to assess the financial performance and find its correlation to Gross Regional Domestic Product (GDRP) during and after the COVID-19 pandemic for five regional development banks in Java Island. This research uses secondary data obtained from annual reports of all banks and Indonesia's Central Statistics Agency from Q2 2020 until Q1 2023. Based on the calculated outcomes, all banks faced failure in all periods. Meanwhile, the correlation using Rank Spearman of Altman Z-Score with Gross Regional Domestic Product (GDRP) is varied for every bank. The correlations are significantly negative for Bank DKI, insignificant for Bank BJB, significantly positive for Bank Jateng and Bank DIY, and insignificant for Bank Jatim.

INTRODUCTION

The COVID-19 pandemic has significantly impacted the Indonesian economy, causing disruptions in business activities and affecting people's welfare. This has led to challenges in meeting credit obligations, particularly in the business sector, potentially resulting in a rise in Non-Performing Loans (NPL). Industries such as manufacturing, trade, transportation, accommodation, restaurants, and hotels are particularly vulnerable, facing disruptions across the supply chain, cash flow issues, and decreased.

performance, layoffs, and the threat of bankruptcy. The financial sector, including Regional Owned Enterprise Banks (BUMD), is also affected, with the NPL ratio of Regional Development Banks (BPD) having a direct correlation with the province's Gross Regional Domestic Product (GRDP). The widespread impact highlights the need for thorough credit risk evaluation and proactive measures to mitigate the risk of default in challenging economic conditions.
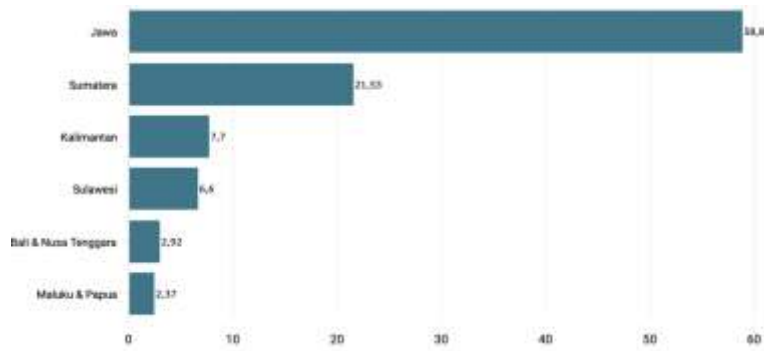
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Figure 1
GRDP Contribution and Economic Growth by Island in 2020
(Source:BPS, 2020)

The GRDP data reveals Java Island's substantial contribution of 58.88% to Indonesia's total, signifying its representative role in the national economy. The study concentrates on DKI Jakarta, West Java, Central Java, DIY, and East Java as key provinces for further analysis.
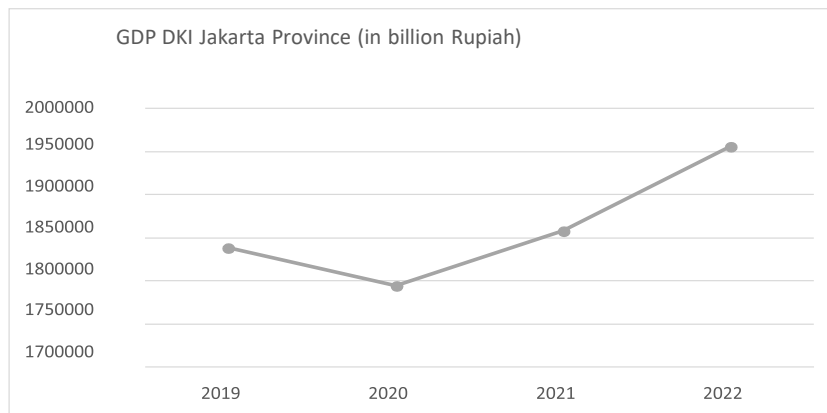

Figure 2
GRDP DKI Jakarta Province (in billion Rupiah)

DKI Jakarta, the economic center of Indonesia, recorded a substantial 1.9 quadrillion Rupiah Gross Regional Domestic Product (GRDP) in 2022. However, the 2.39% decline in 2020, amid COVID-19 restrictions, significantly impacted economic activity, particularly in the service sector.
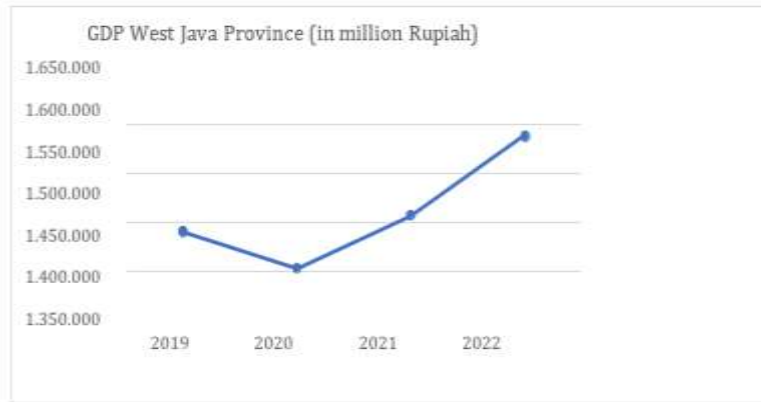
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Figure 3
GRDP Central Java Province (in million Rupiah)

In 2022, Central Java Province had a GRDP of approximately 1 quadrillion Rupiah and played a significant role in both the agriculture and manufacturing industries. Due to itsrich historical and cultural values, the province also holds a strong cultural significance in the national economy.
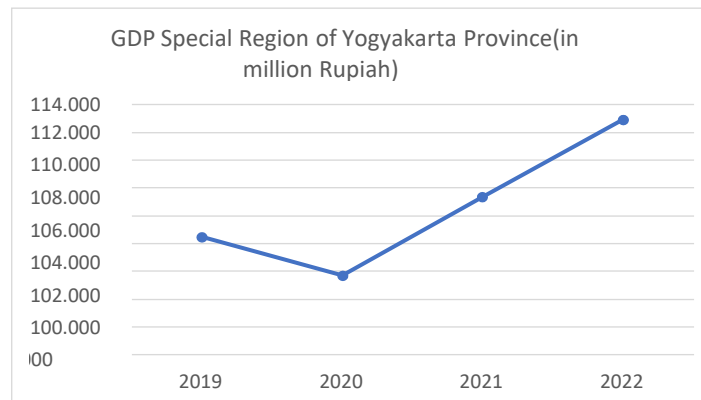

Figure 4
GRDP Special Region of Yogyakarta Province (in million Rupiah)

DIY (Yogyakarta Special Region) records the lowest GRDP on Java Island at around 144 quadrillion Rupiah in 2022, with a notable 2.65% decline in 2020 due to the significant impact of the COVID-19 pandemic. Despite its emphasis on education, arts, and culture, DIY has experienced a comparatively limited impact from the pandemic.
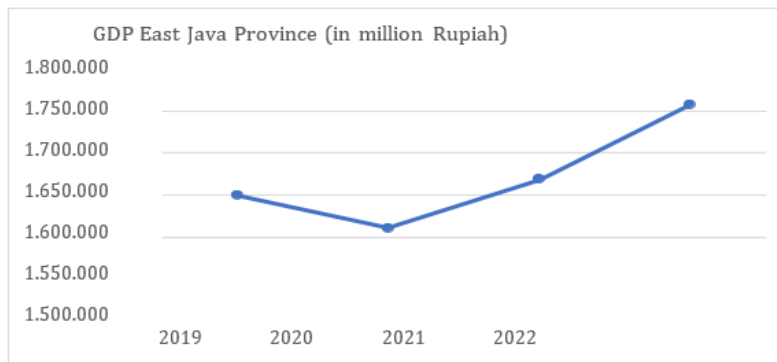
Figure 5
GRDP East Java Province (in million Rupiah)

In 2022, East Java achieved one of Indonesia's highest GRDPs at approximately 1.7 quadrillion Rupiah, driven by manufacturing, exports, and agriculture. The COVID-19 impact on these sectors affected East Java's overall economic output. Across Java, pandemic-induced economic decline resulted in income reductions for service and manufacturing workers, leading to pay cuts, unemployment, and layoffs. Micro and small businesses faced substantial hardship, directly impacting the financial health of regional banks, including Bank DKI, Bank BJB, Bank Jateng, BPD DIY, and Bank Jatim.

The years 2020 and 2021, dominated by the global COVID-19 pandemic, posed widespread challenges affecting global social and economic life, including infrastructure development. Figure 1.7 depicts the fluctuating revenue percentages of regionally owned banks in Java from Q2 2020 to Q4 2022, reflecting the substantial impact of the pandemic on the banking sector during this period.
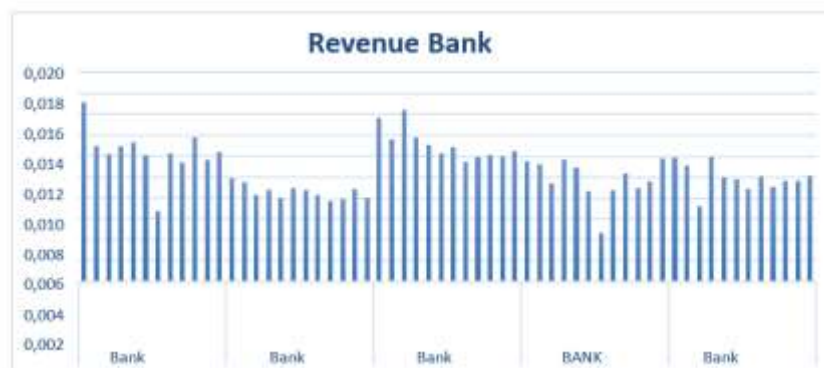

Figure 6
Total Regional Bank Revenue
(Source: Annual Report, 2023)

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BANK DKI faced a substantial decline in revenue in the final quarter of 2021 due to the COVID-19 pandemic but displayed a notable recovery in the first quarter of 2022 and further growth in the first quarter of 2023. Similar patterns of fluctuations were observed in Bank BJB and Bank Jateng, reflecting adaptive strategies during the economic shifts of the pandemic. Bank DIY demonstrated stable income, showcasing resilience in the face of economic challenges. Bank JATIM experienced income fluctuations, with recovery strategies maintaining stability until the first quarter of 2023. The research aims to assess the health of these banks during and after the COVID-19 pandemic, employing the Altman Z-Score method and exploring the correlation between financial distress and GRDP.

The research questions focus on evaluating the health condition of Bank DKI, Bank BJB, Bank Jateng, Bank DIY, and Bank Jatim using the Altman Z-Score method, and examining the correlation between financial distress and GRDP during and after the COVID-19 pandemic. The overarching research objective is to gain insights into the banks' health and understand the relationship between financial distress and regional economic conditions.

METHODS

This research adopts a quantitative approach, involving several key processes. Initially, the study identifies relevant accounts from quarterly financial statements spanning Q2 2020 to Q4 2022, along with post-COVID-19 pandemic financial statements in Q1 2023. Subsequently, it assesses the bankruptcy status or financial health of the selected companies using the Altman Z-Score model. The research further aims to analyze the correlation between the Altman Z-Score and the Gross Regional Domestic Product (GDP) of each regional development bank's operational area. The research design is illustrated in Figure 3.1. Data collection encompasses documentary data, including archived financial reports from the banks involved, and literature studies, drawing from academic books, research reports, theses, and relevant literature on financial statement analysis. Secondary data sources include annual and quarterly reports from Q2 2020 to Q1 2023 for Bank DKI, Bank BJB, Bank Jateng, Bank DIY, and Bank Jatim. Additionally, GDP data for the respective regions is sourced from Indonesia's Central Statistics Agency.

Data Analysis

Financial Distress Analysis

The research employs three methods—Altman Z-Score, Altman Z-Score for Banks, and Standardized Profits—to gauge financial distress in Islamic banks. Comparison of these methods as dependent variables aims to bolster research reliability and enable the development of predictive models for Islamic banks' financial conditions one year ahead. This evaluation may influence measurements of proactive measures by stakeholders and the impact of regulations such as the Basel Accords. Altman's Z-Score (1968) is chosen due to its widespread use, utilizing five ratios for each bank across 2020 to 2023. Results are not classified by Altman's criteria, opting for regression analysis over binary or logistic classification. The "Altman Z-Score for Banks" method

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(Jan and Marimuthu, 2015) is applied, focusing on Islamic banks as a service industry. This method, proven effective in predicting financial distress in various countries, employs four ratios for each bank during the years 2020 to 2023 (Kyriazopoulos Georgios, 2014; Sharma, 2013; Mamo, 2011).

$$z = 6.856 \, x1 + 3.26 \, x2 + 6.72 \, x3 + 1.05 \, x4$$

Altman Z-Score Formula

(Source: Kyriazopoulos Georgios, 2014; Sharma, 2013; Mamo, 2011)

Where Xn is the independent variable; x1, working capital / total assets; x2, retained earnings / total assets; x3, earnings before interest and taxes / total assets; x4, market valueof equity / total liabilities.

The probabilistic prediction of the financial distress of firms using LR was investigated by Ohlson (1980). Similar to Altman's Z-score, Ohlson's O-score is a financial distress statistic,as shown in Figure 3.2 below:
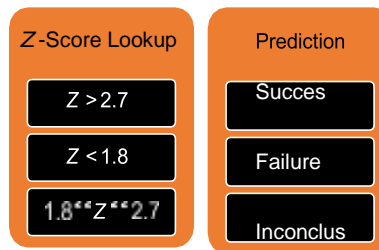

Figure 7
Classification using the Z-score model Altman, Ohlson (1980)

a. If a company's Z-score is greater than or equal to 2.7, it is in the success zone. This means that the company is unlikely to go bankrupt.
b. If the company's Z score is less than 1.8, it is in the bankruptcy zone. This means that the company is likely to go bankrupt.
c. If the company's Z_Score is between 1.8 and 2.7, it is in the inconclusive or 'uncertain' zone.
  This indicates that the company's Z-score value is in a range where it cannot be definitively classified as a company in financial difficulty or as a stable company.

Rank Spearman Correlation Test

Spearman's rank correlation, symbolized by rs or rho, is utilized to assess the level of association between ordinal variables from different data sources, with no requirement for normal distribution; the values range between -1 and 1, indicating no, positive, or negative correlation, respectively (Ghozali, 2013).

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Table 1
Correlations value

Positive Rho	Negative Rho	Category
0,9 ≤ rho < 1	-0,9 ≤ rho < -1	Very Strong
0,7 ≤ rho < 0,9	-0,7 ≤ rho < -0,9	Strong
0,5 ≤ rho < 0,7	-0,5 ≤ rho < -0,7	Moderate
0,3 ≤ rho < 0,5	-0,3 ≤ rho < -0,5	Weak
0 ≤ rho< 0,3	-0 ≤ rho < -0,3	Very Weak

The formula for finding the Spearman rank correlation can be described as follows:

$$rho = 1 - n(n2 - 1)$$

Description:
Rho: Spearman Rank Correlation
Coefficientd2: Squared rank
N: The amount of data (sample)

RESULTS
Financial Distress by "Altman Z-Score for Banks"

This section presents the Altman Z-Score model applied to regional development banks (BPD) on Java Island, including Bank DKI, Bank BJB, Bank Jateng, Bank Jatim, and Bank DIY, spanning from Q2 2020 to Q1 2023. Analyzing Bank DKI's Z-Score, the highest value occurred in Q2 2020 (0.73), while the lowest was in Q3 2022 (0.51). Despite rising Gross Regional Domestic Product (GRDP) in DKI Jakarta, the unimproved Z-Score indicates financial challenges for Bank DKI in aligning with regional economic trends.

Bank BJB's Z-Score fluctuated, with the highest in Q1 2023 (0.77) and the lowest in Q3 2020 (0.59). Notably, a significant decline in Q2 2020 to Q3 2020 was followed by a continuous increase until Q1 2023. Factors like credit exposure reduction and strengthened risk mitigation influenced these patterns.

Bank Jateng demonstrated improvement, with the highest Z-Score in Q1 2023 (0.91) and the lowest in Q3 2020 (0.59). Despite facing financial distress, Bank Jateng's ongoing enhancements, as reflected in Figure 4.3, contributed to an upward trend. Credit risk mitigation measures and maintaining consumer credit played key roles.

Bank DIY showcased positive trends, achieving the highest Z-Score in Q1 2023 (1.45) and the lowest in Q2 2021 (0.99). Despite experiencing financial distress, Bank DIY's consistent upward trend from Q2 2021 to Q1 2023 indicates resilience, supported by credit growth in the MSME sector.

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Bank Jatim, however, experienced financial distress throughout the observed period, with the highest Z-Score in Q1 2023 (0.92) and the lowest in Q2 2022 (0.75). Challenges included decreases in working capital and earnings before interest and tax. Credit growth and contraction in specific sectors contributed to the observed patterns.

In summary, the Altman Z-Score analysis reveals nuanced financial conditions for each bank, influenced by factors such as credit exposure, risk mitigation measures, and sector-specific challenges. The Z-Score fluctuations highlight the need for continuous monitoring and strategic adjustments to navigate dynamic economic landscapes.

Altman Z-Score and GRDP correlation

In the analysis of the Altman Z-Score model for Bank DKI about DKI Jakarta's Gross Regional Domestic Product (GRDP), a Spearman's correlation test was conducted for the period Q2 2020 to Q1 2023. The results reveal a statistically significant negative correlation (rho = -0.674, p = 0.016), indicating that as the Altman Z-Score, reflecting financial conditions, improves, DKI Jakarta's GRDP tends to decline. This inverse relationship may suggest that better financial conditions, as measured by the Altman Z-Score, are associated with lower economic growth in DKI Jakarta.

On the contrary, for Bank BJB in West Java, the correlation between the Altman Z-Score and West Java's GRDP is found to be statistically insignificant (rho = -0.063, p = 0.845). This lack of significance suggests that the financial distress, as measured by the Altman Z-Score, is not strongly related to fluctuations in West Java's economic growth. This outcome is attributed to the substantial presence of bank branches outside West Java, influencing credit distribution and minimizing the impact on the local economy.

Moving to Central Java, the Altman Z-Score model for Central Java banks demonstrates a statistically significant positive correlation with Central Java's GRDP (rho = 0.794, p = 0.002). This positive correlation implies that an improvement in financial conditions, as indicated by the Altman Z-Score, is associated with higher economic growth in Central Java.

For Bank DIY in DI Yogyakarta, the Altman Z-Score model shows a significant positive correlation with DI Yogyakarta's GRDP (rho = 0.777, p = 0.003). This suggests that better financial conditions, reflected in a higher Altman Z-Score, are positively related to economic growth in DI Yogyakarta.

In contrast, the Altman Z-Score model for Banks in East Java (BJTM) exhibits an insignificant correlation with East Java's GRDP (rho = -0.296, p = 0.351). This lack of significance implies that the financial distress indicated by the Altman Z-Score is not significantly associated with fluctuations in East Java's economic growth during the analyzed period. The low percentage of credit distribution by East Java BPD bank outside the region is cited as a possible explanation for this finding.

CONCLUSION

Based on the data provided on the Z-score values for Bank DKI, Bank BJB, Bank Jateng, Bank DIY, and Bank Jatim during and after the COVID-19 pandemic, we can draw some

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conclusions on the predicted financial distress of each bank during and after the COVID-pandemic, During the COVID-19 pandemic (Q1 2020 to Q4 2022), Bank DKI experienced fluctuations in its Z-Score value. The lowest value was recorded in Q3 2022, indicating pressure on financial performance during the period. After the pandemic (Q1 2023), Bank DKI's Z-Score value increased slightly but remained low compared to other banks. Predictions of financial distress are still relevant, and banks need to improve their financial performance, During the COVID-19 pandemic (Q1 2020 to Q4 2022), Bank BJB experienced fluctuations in its Z-Score value. The lowest value was recorded in Q3 2020, reflecting the challenges faced during the period. After the pandemic (Q1 2023), Bank BJB's Z-Score value increased slightly but remained low. Predictions of financial distress are still relevant, and banks need to improve their financial performance, Bank Jateng experienced fluctuations in its Z-Score value during the COVID-19 pandemic from Q1 2020 to Q4 2022, with the lowest value being recorded in Q3 2020. This suggests that there was pressure on the financial performance during this period. Following the COVID-19 pandemic in Q1 2023, Bank Jateng's Z-Score value increased, but it remains relatively low. Predictions of financial distress remain relevant, and banks must strive to improve their financial performance, Throughout the COVID-19 pandemic (period Q1 2020 to Q4 2022), Bank DIY experienced fluctuations in its Z-Score value, with the lowest value recorded in Q2 2021. This reflects the challenges faced during this period. Following the COVID-19 pandemic in Q1 2023, Bank DIY's Z-Score value significantly increased. It appears that Bank DIY has recovered better than other banks and has a more positive outlook, During the COVID-19 pandemic (Q1 2020 to Q4 2022), Bank Jatim experienced fluctuations in its Z-Score value. The lowest value was recorded in Q2 2022, reflecting the stress during the period. After the pandemic (Q1 2023), Bank Jatim's Z-Score value increased slightly but remained at a low level. Predictions of financial distress are still relevant, and banks need to improve their financial performance.

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