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Determinants of Islamic and Conventional Banking Insolvency Risk in Indonesia

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ABSTRACT

The insolvency risk has an important part in the development and sustainability of the banking industry. The fall in financial parameters due to the Covid-19 outbreak suggests that banks are at risk of insolvency. The study aims to detect and assess developments in insolvency risk in Islamic and conventional banking between 2018 and 2023. The methods used were Z-score, X-score, G-score, and panel data regression. The results indicate that internal factors, namely Loans to Assets at the Top Four Conventional Commercial Banks (BUK), Cost Income Ratio at BUK, Income Diversity, and Total Assets at Islamic Commercial Banks (BUS), have a significant negative effect on the Z-score value. External factors, namely Gross Domestic Product at BUS and BUK, have a substantial negative effect, and Interest Rates at BUK have a significant positive effect on the Z-score value. Islamic and conventional banking must preserve the bank's health by increasing capital, retaining factors important to the Z-score, and conducting additional research with more diversified variables and objects to improve efficiency and stability. A more thorough theoretical model for recognizing and controlling insolvency risk in both kinds of banking can be created using these insights. The article's conclusions can help Indonesian banks create more effective risk management plans.

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INTRODUCTION

The banking industry is critical to the nation's economic development (Chen, et. al., 2021; Jahanger, et. al., 2022; Dewi et. al., 2023). Based on Banking Law Number 10 of 1998, Indonesian banking aspires to promote national development efforts by increasing equitable development, economic growth, and national stability, as well as improving community welfare (Ghoniyah & Hartono, 2020; Suzuki & Pramono, 2020; Mawardi, et. al., 2024). This legal framework enables ordinary conventional banks to operate two banking systems namely conventional and Islamic banking. One of the strategic initiatives banks can take to carry out their tasks and achieve their objectives is to ensure that their financial performance remains stable and growing, this is done to build and sustain public trust in banks (Jan, 2021; Zhang, et. al., 2022; Allioui & Mourdi, 2023).

One of the causes of banking instability is the 2019 Coronavirus disease (COVID-19) pandemic, which is wreaking havoc on the national and worldwide economies (Barua & Barua, 2020; Hakim, et. al., (2020); Fakhrunnas, et. al., 2022; Shabir, et. al., 2023). The Indonesian government's Large-Scale Social Restrictions program caused an economic recession, this impact can be observed in the form of economic growth, as measured by GDP (Olivia, et. al., 2020; Malahayati, et. al., 2021; Suryahadi, et. al., 2021). According to data from the Central Statistics Agency (2020), Indonesia's GDP declined by -2.17 percent in the first quarter; in the second and third quarters, it fell to -3.49 percent and -5.32 percent, respectively. Furthermore, rising global financial market uncertainties weakened the rupiah currency rate in the first quarter of 2020.

A dual banking system is one that adheres to two systems at the same time, namely Islamic and conventional bank (Hasan et. al. 2011; Alqahtani et. al., 2018). According to Nurhasanuddin (2017), with a substantial market share, Islamic banking will be able to boost profits while reducing risks. While Mehzabin et. al., (2023) found that operational efficiency has a greater impact on reducing insolvency risk than bank size. Nisar et. al., (2018) found that financial stability is determined by a bank's capacity to manage capital rather than total banking assets. Sukmana et. al., (2016) found that increased GDP growth can lead to a reduction in the quality of Islamic banking portfolios if it is not properly distributed across the banking sector. On the other hand, Mollah et. al., (2017) and Gjeçi et. al., (2023) found that Islamic bank also confronts obstacles in terms of limited financial products that adhere to Islamic values, resulting in lower credit guarantee requirements. If a bank cannot effectively manage its liquidity, it may suffer insolvency. In this regards, Nugraha et. al., (2021) revealed that banking operations have expanded into international markets, reducing the impact of risks on the domestic market.

Insolvency is defined as the scenario in which losses outweigh equity or capital (Cepec & Grajzl, 2020; Patel, et. al., 2022; bin Md Nor, et. al., 2024). Lapetit et. al. (2013) found that insolvency occurs when (CAR+ROA) ≤ 0. In this scenario, CAR is the capital adequacy ratio, which serves as a proxy for bank capital adequacy, ROA is the return on assets, which is used to calculate bank profitability, and insolvency defines the bank's wealth. On the othar hand, Darmayanti et. al., (2023) found that decline in interest rates

reduces interest income from BUK loans and increases the danger of bank insolvency. However, according to Dewi et. al., (2024) Islamic banking generates profits by sharing earnings and forbidding usury (interest). Nainggolan et. al., 2023 stated that the Islamic management board conducts more specialized risk evaluations for consumers, taking into account financial, ethical, and Islamic compliance factors. Furthermore, according to Mamatzakis et. al., (2023) found that CIR on Islamic bank has risk characteristics that differ from those of traditional banking. According to Yunike et. al., (2023) Islamic banks has significant capital and reserves to absorb operational losses and non-performing loans.

Priyadi, et. al., (2021), Naili & Lahrichi (2022a) and Naili & Lahrichi (2022b) found that the high amount of bank credit disbursed may result in a higher risk of bad credit, raising the possibility of bank insolvency. Al-Amri, et. al., (2021), Rico, et. al., (2021) and Kaya, (2022) found that the reasons of insolvency risk are classified as balance sheet and cash flow insolvency. While Anjani (2020) found that insolvency has a strong favorable effect on financial performance. Ikhsan et. al., (2021) found that revenue diversification during the COVID-19 pandemic had no significant effect on insolvency risk in Indonesian Islamic banks. Further, Lestari et. al., (2021) found that income diversification had no meaningful effect on insolvency risk in Indonesian conventional banks. Other criteria, such as operational efficiency, asset quality, and capital structure, are critical to determining bank stability. Meanwhile, Ganefi et. al., (2022) found that conventional banks with substantial capital, such as the huge scale of Bank institutions have a fairly consistent primary source of income, such as interest income from big, safe credit portfolios.

This study analyzed 8 Sharia Commercial Banks, 8 Conventional Commercial Banks in Indonesia between 2018 and 2023. In addition, researchers investigated how internal and external factors affected the insolvency risk of Islamic and conventional banks in Indonesia. Financial ratios such as Loans to Assets (LOA), Cost to Income Ratio (CIR), Income Diversity (ID), and Total Assets (TA) are considered internal bank components in this study. Banks' external factors also include macroeconomic indicators like gross domestic product (GDP) and interest rates (IR). Therefore, the aim of this study is to identify developments in bankruptcy risk in sharia and conventional banking in Indonesia, as well as to assess the determinants of insolvency risk based on internal and external factors in sharia and conventional banking in Indonesia between 2018 and 2023.

RESEARCH METHOD

The research uses secondary data in the form of panel data. Data are sourced from the Financial Services Authority (OJK), the Central Statistics Agency (BPS), and Bank Indonesia. This study also incorporates data from linked literature, journals, publications, and pertinent papers. This study employed a non-probability sampling method known as purposive sampling with the following criteria to select a sample of Sharia Commercial Banks and Conventional Commercial Banks registered with the OJK, published entire

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annual financial reports for the years 2018–2023. This study used 8 Sharia Commercial Banks, 8 Conventional Commercial Banks and 4 top Conventional Commercial Banks, which does not engage in Islamic finance activities. It has the same total asset value as Sharia Commercial Banks under bank regulations, is classified as Commercial Bank Business Activity (BUKU) group 2 to 3 by OJK Regulation Number 6/POJK.03/2016, which includes commercial banks with core capital ranging from 1 to 30 trillion rupiahs. When compared to Bank Groups by Core Capital (KBMI), the BUKU grouping corresponds to KBMI 2 (6 to 14 trillion rupiah) or KBMI 3 (14 to 70 trillion rupiah). Top Four of Conventional Commercial Banks has the same core capital as KBMI 4 (more than 70 trillion rupiah) and seeks to better understand variances in capital availability to address risks and their potential impact on financial system stability.

This study's data was analyzed and processed utilizing descriptive and quantitative methods. Z-score, X-score, and G-score are used to assess banking insolvency risk. Panel data analysis is utilized to investigate the causes of BUK and BUS insolvency risk in Indonesia. Gujarati (2012) found that there are three ways to estimating panel data: pooled less square (PLS), fixed effect model (FEM), and random effect model (REM). The Z-score value may be estimated in panel data, unlike the X-score and G-score values, which cannot. Data was collected and processed using Eviews and Microsoft Excel software. The regression model used in this study is a projection of the model developed by Cihak et. al. (2010). The data gathered for independent variables is in different units. As a result, the units of the seven variables will be equal to facilitate data processing and interpretation. Several variables in different units will be transformed to natural logarithms. However, variables having percentage units do not need to be translated into natural logarithms, therefore all variables have the same units. The research model used for panel data regression has the following specifications:

$$LnZ\_Score_{it} = c + \alpha_1 LTA_{it} + \alpha_2 CIR_{it} + \alpha_3 INDIV_{it} + \alpha_4 Ln\_Asset_{it} + \alpha_5 GDP_t + \alpha_6 IR_t + \varepsilon_t \quad (1)$$

$$LnZ\_Score_{it} = c + \beta_1 LTA_{it} + \beta_2 CIR_{it} + \beta_3 INDIV_{it} + \beta_4 Ln\_Asset_{it} + \beta_5 GDP_t + \beta_6 IR_t + \varepsilon_t \quad (2)$$

$$LnZ\_Score_{it} = c + \beta_1 LTA_{it} + \beta_2 CIR_{it} + \beta_3 INDIV_{it} + \beta_4 Ln\_Asset_{it} + \beta_5 GDP_t + \beta_6 IR_t + \varepsilon_t \quad (3)$$

Note:

c	: Intercept
α_1- α_9	: Slop BUS
β_1-β_9	: Slop BUK
ε	: Error term
LnZ_Score	: Natural logarithm Z-score
LnAsset	: Natural logarithm Total Assets
LTA	: Loans to assets bank (percent)
INDIV	: Income diversity bank (percent)
CIR	: Cost to income ratio bank (percent)
GDP	: Gross Domestic Product (percent)

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IR : Interest Rate (percent)
ln : Natural logarithm
i : Individual-i
t : Time period-t

Hypothesis

According to Bank Indonesia Regulation Number 7/2/PBI/2005, productive assets or assets are the provision of bank funds to generate income in the form of credit, securities, interbank fund placements, acceptance bills, and claims for securities purchased with an agreement to resell them (reverse repurchase agreement), derivative claims, investments, administrative account transactions, and other forms of providing funds that can be equated with them. Total assets might be viewed as a bank's size.

According to Dendawijaya (2009) Loans to Assets (LTA) is a ratio that measures a bank's ability to meet loan demand by comparing its total assets. The higher the LTA ratio the greater the bank's insolvency risk. This is due to the increased usage of bank assets in credit financing, which results in more severe risks for banks to bear. Therefore, H_1: Loans to Assets (LTA) has a negative effect on Z-score.

On the other hand, the Cost to Income Ratio (CIR) indicates how much of a company's operational costs are used to generate revenue from commercial activities performed by the bank (Dendawijaya, 2009). The CIR ratio can be used to assess a bank's efficiency and competence. The lower a bank's CIR ratio, the lower its bankruptcy level, resulting in increased financial management efficiency. Therefore, H_2: CIR has a negative effect on Z-score.

While Putra & Muharam (2016) defines diversification as a chance to earn profits other than interest income or Non-Interest Income (NON). Cihak et. al. (2007) found that banks that diversify to increase income can minimize bank risk. The NET (Net Interest Income) variable is calculated by subtracting total interest income from total interest expense. Meanwhile, the NON variable is calculated by summing net income from commissions, trading profits or losses, and other non-interest revenue. Net Operating Income (NOI) represents the total value of NET and NON. The Income Diversity (INDIV) has a value range of 0.50 to 1.00. An INDIV score of 0.50 represents the greatest level of diversity, while an INDIV value of 1.00 indicates the least amount of income diversification. Therefore, H_3: INDIV has a negative effect on Z-score.

Further, Putra & Muharam (2016) found that using assets as a proxy for firm size has an impact on banking performance and business. Banks with a huge size will have greater resources. This may make it easier to manage hazards and business operations. Therefore, H_4: Total Assets has a positive effect on Z-score.

On the other hand, gross domestic product (GDP) is the total national revenue and expenditure derived from the production of goods and services. GDP is sometimes defined as the total market value of all final goods and services produced in a country during a given period (Mankiw, 2018). National income indicators, such as Gross National Product (PNB) and GDP, are used to calculate the amount of economic growth.

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Absolute GDP measurements are used to quantify economic growth. GDP growth can be used to determine the distribution of banking funding because a high GDP shows that the purchasing power of the population in that country has increased, resulting in more income and profits for banks. As a result, the likelihood of banks suffering insolvency risk is low (Cihak et. al., 2007). GDP is one of the external factors utilized in this study since it is based on a number of criteria, including data availability, relevance, ease of measurement, and the significance of its impact on Indonesian banking risk (Cihak et. al., 2007). Therefore, H_5: GDP has a negative effect on Z-score.

Further, Cihak et. al. (2007) found that interest rates can have an impact on banking stability, either positively or negatively. When actual interest rates rise, the commitments that the bank must carry at maturity grow, increasing the risk that the bank will be unable to meet its obligations (Nurtjahjo et. al., 2022). Meanwhile, an increase in actual interest rates can encourage consumers to save more money in the bank by offering a higher reward for client deposits, potentially increasing bank profitability. Interest rates are included as an external component in this study because they have a substantial impact on data availability, relevance, and simplicity of measurement for Indonesian banking risk (Cihak et. al., 2007). Therefore, H_6: Interest Rate has a positive effect on Z-score.

Several models for assessing financial ratios and estimating a company's insolvency risk have been created. These analytic models include the Zmijewski (X-Score), Grover (G-Score), and Wieprow & Gawlik (Z-Score) models. This study compares the three models to see how accurate the outcomes of each prediction model are with actual bank conditions, as the financial ratios used to compute insolvency risk estimates vary. Lapetit et. al. (2013) found that the Z-score is the best indicator for assessing the level of insolvency risk.

Altman (1968) introduced the Z-score model. Ten years later, Edward revised this model with Richard G. Haldeman and Paul Narayanan, dubbed the Time-Varying Z-score model by Lapetit and Strobel. The Time-Varying Z-score is the most effective risk indicator in the banking empirical literature for predicting bank insolvency (Lepetit et. al., 2013). According to Novika, et. al., (2022), the average (μ) represents the center of a data set whether sorted from smallest to greatest or vice versa. The Z-score value will rise when ROA and CAR rise and the ROA standard deviation falls.

$$Z_{it} = \frac{\pi_{car,it} + \pi_{roa,it}}{\sigma_{roa,it}}$$

Information :

Z_{it} : time-varying Z-score
πcar_{it} : avarege of CAR
πroa_{it} : avarage of ROA
σroa_{it} : standard deviation of ROA

RESULT AND DISCUSSION

Banking plays an important function in the economy as an intermediary between parties with excess funds and those that require funds. Differences in characteristics exist

between Islamic and conventional banking in the intermediation role. In operational activities, traditional banking relies on risk transfer, whereas Islamic banking relies on risk or profit and loss sharing (Hasan et. al. 2011). The qualities of Islamic banking are thought to have spared the financial industry from a crisis several years ago. During the 2008 global financial crisis, Islamic banking outperformed mainstream banking in terms of stability. However, Alqahtani et. al. (2018) found that Islamic banking remains riskier and more unstable than conventional banking. Islamic banking survived the initial period of the global financial crisis, but had greater instability than conventional banking following the crisis. This is owing to the small size of islamic banking enterprises, which leads to the belief that islamic banking operates in an environment with higher costs and risks.

According to Law Number 37 of 2004 on bankruptcy and the delay of debt payment responsibilities, insolvency risk refers to the circumstance in which a bank is unable to pay. Companies in this position are referred to as insolvent. Remy (2016) found that the reasons of insolvency risk are classified as balance sheet and cash flow insolvency. Balance sheet bankruptcy happens when a corporation or individual's obligations surpass the total worth of its assets. Meanwhile, cash flow insolvency happens when a corporation or individual's asset value exceeds its entire debt yet is unable to repay the debt when due. While Anjani (2020) found that insolvency has a strong favorable effect on financial performance.

A dual banking system is one that adheres to two systems at the same time, namely Islamic and conventional banking, which are both applied to a country (Alqahtani et. al., 2018). According to Law Number 21 of 2008 on Islamic banks, Islamic banking encompasses all aspects of Islamic banks and business units, including institutions, commercial operations, and methods and processes for conducting business. Islamic banks are classified into three types: Islamic Commercial Banks (BUS), Islamic Peoples' Financing Banks (BPRS), and Islamic Business Units. Islamic commercial banks is an Islamic bank that specializes on payment traffic. According to Law Number 21 of 2008, conventional banks engage in typical operational activities. The use of an interest system is considered conventional in this scenario. It is classified as either conventional commercial banks or rural banks (BUK). it is a traditional bank that primarily provides payment services.

This study used the Z-score, X-score, and G-score values to assess the evolution of banking bankruptcy risk in Indonesia. Descriptive analysis provides an overview of data features for estimating insolvency risk. Table 1 describes the evolution of bankruptcy risk for BUS, BUK, and the Top Four of using the Z-score, X-score, and G-score proxy values. The average values for the three Z-score models are 93.18, 57.48, and 50.27. A greater Z-score value is considered as a lower insolvency risk. The greatest BUS Z-score was 611.90 by Bank Muamalat Indonesia in 2023, while the lowest was 7.49 by Bank KB Bukopin Syariah in 2019. In 2018, Bank DBS Indonesia had the lowest BUK Z-score of 15.83, while Bank ICBC had the BUK Z-score. The highest figure was 144.48 in 2023. In addition, BUK Top Four earned the greatest score of 198 in 2023, while BNI had the

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lowest at 21.57 in 2020. BUS has a higher Z-score compared to other banks. This shows that BUS has better circumstances, having the greatest average value in the Z-score model.

Table 1. Result of Descriptive statistics test

Bank	BUS			BUK			BUK Top Four		
	Z-Score	X-Score	G-Score	Z-Score	X-Score	G-Score	Z-Score	X-Score	G-Score
Mean	93.18	-8.3	0.36	57.48	-5.87	0.23	50.27	-13.6	0.22
Max	611.9	25.4	0.94	144.48	1.45	0.78	198.22	-2,3	0.36
Min	7.49	-61.7	0.06	15.83	-18.44	-0.24	21.57	-20	-0.003
SD	105.89	3.63	0.05	27.61	1.40	0.03	19.32	0.71	0.039
N	8	8	8	8	8	8	4	4	4

Source: The Financial Services Authority (OJK) reports (2024)

Based on the table 1, the Zmijewski X-score model for BUS, BUK, and BUK Top Four has average values of -8.33, -5.87, and -13.6. Banks with an X-score < 0 are considered safe. BUK Top Four gets the highest X-score since its overall liabilities exceed those of the other banks. The X-score model indicates that the BUK Top Four has better conditions, as evidenced by their lowest average score. This suggests that the BUK Top Four have the greatest ability to avoid insolvency risk. The Grover G-score model for BUS, BUK, and the Top Four Conventional Commercial Banks (BUK) yields average values of 0.36, 0.23, and 0.22. Banks identified as distress zones have a G score ≤ -0.02. The score for enterprises in the safe zone is G ≥ 0.01. The G-score model indicates better conditions on BUS, with the highest average value. The G-score findings suggest that BUS outperformed BUK and the BUK Top Four . This means that the bank is the least likely to experience insolvency.

On the other hand, table 2 shows the panel data regression estimation findings for BUS, BUK, and the BUK Top Four. The Z-score is the dependent variable, whereas the independent variables are internal and external factors influencing insolvency risk. According to the regression estimation results of the REM model in Table 2, the coefficient of determination (R^2) on BUS is 0.775608, indicating that this research model can explain 77.56 percent of changes in the Z-score, while other variables outside the model explain the remaining 22.44 percent. Aside from that, the F-statistic test on the model reveals that the probability value of 0.0000 is less than the actual level of 5%, implying that independent variable all have a substantial effect on the BUS Z-score at the same time. The t-statistical test findings indicate that each variable with a probability value less than 0.05 has a significant influence on the BUS Z-Score.

The REM model regression estimation on BUK gives a coefficient of determination (R^2) of 0.748489. This suggests that the independent variable may explain 74.84 percent of the dependent variable's diversity, with other variables outside the model accounting for the remaining 25.16 percent. The results of the F-statistical test on the BUK model yield a probability value of 0.0000, which is less than the actual level of 5%. This suggests that the independent factors all have a substantial effect on the BUK Z-

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score. The t-statistical test findings demonstrate that each variable with a probability value less than 0.05 has a marginally significant influence on the BUK Z-Score.

Table 2. Panel data regression estimation results

Depedent Variable	Independent Variable : Z-score					
	BUS		BUK		BUK Top Four	
	Coeficient	T Value	Coeficient	T Value	Coeficient	T Value
C	7.3698	1.4593	6.5241	2.0302	4.0146	1.7627
GDP	-0.2213***	-1.770	-0.1792**	-2.7363	-0.0905	-1.0697
Interest Rate	0.2321	0.4709	0.3559***	1.8007	0.2736	1.6022
LTA	-0.7922	-9012	-0.3817	-1.2615	-0.3132***	-3.6439
CIR	-0.5187	-1.0764	-0.3530***	-1.9092	-0.0477	-0.4251
INDIV	-0.0620	-0.8297	-0.0106	-0.1159	0.1183	0.7650
Total Assets	0.1730***	1.8065	0.0446	0.3741	0.0372	0.4422

Description: *significant at 10% level, **significant at 5% level, ***significant at 1% level, t statistic
Source: Eviews (2024)

Gujarati (2004) found that if there is a warning that the variance in the Hausman test is invalid, the research must apply the results of the prior test, namely FEM. The FEM model regression estimation on BUK Top Four yielded a coefficient of determination (R^2) of 0.921286. This suggests that the independent variable may explain 92.12 percent of the dependent variable's diversity, with other variables outside the model accounting for the remaining 7.88 percent. The F-statistics test yielded a probability value of 0.0000, which is less than the real level of 5%, showing that the independent variables all have a significant effect on the Z-score. The t-statistical test results indicate that each variable with a probability value less than 0.05 has a significant influence on the BUK Top Four Z-Score.

The Loans to Assets (LTA) variable has a significance level of 1% and a coefficient of -0.3132 on the Top Four BUK. Furthermore, LTA has little impact on BUS and BUK. Partial test findings demonstrate a negative association between the LTA variable and the BUK Top Four Z-score. This suggests that a 1% increase in LTA reduces the BUK Top Four Z-Score by 31.32 percent. This arises because the high amount of bank credit disbursed may result in a higher risk of bad credit, raising the possibility of bank insolvency (Cihak et. al., 2007). The Islamic Management Board conducts more specialized risk evaluations for consumers, taking into account financial, ethical, and Islamic compliance factors. This enables Islamic banking to lower bankruptcy risk by conducting a more comprehensive and long-term risk assessment (Nainggolan et. al., 2023). BUK boasts a more diverse asset portfolio. This can help to lower the danger of insolvency and strengthen BUK's financial stability. Furthermore, operational efficiency can assist mitigate the risks associated with a large loan portfolio (Dendawijaya, 2009). These findings are according to the hypothesis.

The Cost to Income Ratio (CIR) variable has a significance level of 1% and a coefficient of -0.3530 on BUK. Meanwhile, CIR has little significance for the BUS or

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BUK Top Four . Partial test findings suggest that CIR has a negative link with BUK's Z-score. This suggests that a 1 percent rise in CIR reduces the BUK Z-Score by 35.30 percent. The lower the Z-Score, the greater the likelihood of bank insolvency. This arises because a loss in bank efficiency leads operational expenses to exceed income, increasing the danger of bank collapse (Cihak et. al., 2007). In addition, CIR on BUS has risk characteristics that differ from those of traditional banking. BUS is frequently more cautious in financing and risk management, which reduces the impact of CIR on insolvency risk (Mamatzakis et. al., 2023). Furthermore, BUK Top Four has significant capital and reserves to absorb operational losses and non-performing loans. Because of their solid capital structure and significant reserves for impairment losses, the Top Four of BUK can endure financial crises without becoming insolvent (Yunike et. al., 2023), these findings are according to the hypothesis.

The Income Diversity (INDIV) variable's estimation findings are insignificant for BUS, BUK, and the BUK Top Four . Islamic banking operates according to Sharia rules, which prohibit interest *(usury)*, speculation *(maysir)*, and uncertainty *(gharar)*. This concept limits the types of financial products that Islamic banks may utilize. Islamic banking, for example, cannot invest in conventional bonds with fixed interest rates or shares of companies that engage in Sharia-compliant activity. Ikhsan et. al. (2021) found that revenue diversification during the Covid-19 pandemic had no significant effect on insolvency risk in Indonesian Islamic banks. This occurs because income diversification prioritizes profitability over minimizing Islamic banking risks. Lestari et. al. (2021) found that income diversification had no meaningful effect on insolvency risk in Indonesian conventional banks. Other criteria, such as operational efficiency, asset quality, and capital structure, are critical to determining bank stability. Meanwhile, conventional banks with substantial capital, such as the BUK Top Four, have a fairly consistent primary source of income, such as interest income from big, safe credit portfolios (Ganefi et al., 2022). These findings are not according to the hypothesis.

Total Assets reveals that BUS has a significance level of 1% and a coefficient of 0.1730. Meanwhile, the Total Assets variable is small for BUK and the Top Four. Partial test findings demonstrate a favorable association between Total Assets and the BUS Z-score. This means that every 1% increase in Total Assets raises the BUS Z-Score by 0.1730%. The greater the Z-Score, the lesser the likelihood of banking insolvency. This suggests that BUS can maintain stability as assets grow. With a substantial market share, Islamic banking will be able to boost profits while reducing risks (Nurhasanuddin, 2017).

Meanwhile, Total Assets in BUK are minor since other factors, such as operational efficiency and capital structure, have a greater impact on insolvency risk. Mehzabin et. al. (2023) found that operational efficiency has a greater impact on reducing insolvency risk than bank size. Furthermore, Top Four BUK's capital structure is more solid than that of other banks, allowing banks to avoid financial shocks without facing large bankruptcy concerns. Financial stability is determined by a bank's capacity to manage capital rather than total banking assets (Nisar et. al., 2018). These findings are according to the hypothesis.

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On the other hand, the Gross Domestic Product (GDP) variable has a significance level of 1% with a coefficient of -0.2213 on BUS and 1% with a coefficient of -0.1792 on BUK. Meanwhile, GDP has no substantial impact on the BUK Top Four Z-score. The partial test findings demonstrate that the GDP variable has a negative correlation with the Z-scores for BUS and BUK. This suggests that a one-percent rise in GDP growth reduces the Z-Score by 22.13 percent for BUS and 17.92 percent for BUK. An increase in GDP growth may impair the quality of the Islamic banking portfolio if it is not properly dispersed across the banking sector. Increased GDP growth can lead to a reduction in the quality of Islamic banking portfolios if it is not properly distributed across the banking sector (Sukmana et. al., 2016). BUS also confronts obstacles in terms of limited financial products that adhere to Islamic values (Mollah et. al., 2017), resulting in lower credit guarantee requirements (Gjeçi et. al., 2023). If a bank cannot effectively manage its liquidity, it may suffer insolvency. However, the Top Four BUK's have a more diverse lending portfolio and more consistent income, allowing the bank to have no meaningful impact on macroeconomic conditions (Cihak et. al., 2010). These findings are according to the hypothesis.

Interest rates have a significance level of 1% and a coefficient of 0.3559 on BUK. Interest rates on the BUS and BUK Top Four are not substantial. Partial test findings reveal that interest rates are positively correlated with the BUK Z-score. This means that every 1% increment raises BUK's Z-Score by 35.39%. The decline in interest rates reduces interest income from BUK loans and increases the danger of bank insolvency. Furthermore, banks will attempt to retain profitability by providing loans to debtors with a greater risk profile (Darmayanti et. al., 2023). Islamic banking generates profits by sharing earnings and forbidding interest *(usury)*. Islamic banks must avoid speculative and high-risk transactions to ensure financial stability (Dewi et. al., 2024). BUK Top Four has a large core capital base, therefore the bank stays stable despite decreased interest revenue. Banking operations have expanded into international markets, reducing the impact of risks on the domestic market (Nugraha et. al., 2021). These findings are according to the hypothesis.

CONCLUSION

From 2018 to 2023, the development of insolvency risk in Islamic and conventional banking in Indonesia is fairly good in terms of Z-score, X-score, and G-score values. BUS indicates better conditions with the greatest average value in the Z-score and G-score models, whereas the X-score model reveals better conditions in the BUK Top Four with the lowest average. The estimation findings demonstrate that the Z-score value is negatively related to insolvency risk, which is influenced simultaneously and strongly by all independent variables in the model. Internal factors, specifically Loans to Assets at BUK Top Four, have a significant negative effect, Cost Income Ratio at BUK has an important negative effect, Business Portfolio has no significant influence, and Total Assets at BUS have a significant positive effect on Z-score value. External factors,

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specifically GDP at BUS and BUK have a large negative effect, whereas interest rates at BUK have an important positive impact on the Z-score value.

Despite of the compelling results, this study acknowledges a research limitation. Future research should include more independent variables, research objects such as Islamic business units, people's credit banks, or other non-bank financial industries, as well as research periods, in order to produce stronger research models and meaningful outcomes.

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