GPH-International Journal of Business Management
(E-ISSN 3027-0537 || P-ISSN 3027-0375)
Volume 09 | Issue 06 | June 2026
Published by: Global Publication House
DOI: https://doi.org/10.5281/zenodo.21335953
Available online at: www.gphjournal.org
Journal homepage: https://gphjournal.org/index.php/bm/index

Predicting Financial Distress and Assessing the Sustainability of Islamic Banks in Iraq: An Applied Study Using the Altman Z-score Model

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Abstract

This study aims to determine the extent to which the modified Altman model can predict the financial distress of Islamic banks in Iraq. Data was collected from the annual financial statements of eight Iraqi Islamic banks listed on the Iraq Stock Exchange, with complete financial statements available for the period 2020-2024. The study employed a descriptive (analytical) methodology and concluded that some Islamic banks are experiencing financial distress while others are performing well. The modified Altman model demonstrated a high predictive capability in identifying financial distress.

Keywords:

Financial distress, Altman Z-score model, Islamic banking continuity, Iraqi Islamic banks.

Introduction:

Islamic banks are among the most important pillars supporting the modern financial system, distinguished by their adherence to Sharia principles, which prohibit interest (riba) and encourage profit and loss sharing. These banks have played a vital role in financing economic activities, achieving sustainable development in various Islamic countries, and enhancing financial stability. With increasing competition in financial markets and rising risk levels resulting from global economic fluctuations, the sustainability of Iraqi Islamic banks has become a central concern for researchers and policymakers, as it represents a guarantee for the stability of the banking system and its ability to withstand crises. In this context, the importance of the Altman z-score model has emerged as an analytical and benchmarking tool that helps assess the financial position of banks and predict their viability and likelihood of financial distress. The automated application of this model to Islamic banks presents a fundamental methodological challenge, as its traditional components were not designed for an interest-free banking environment, thus reducing the accuracy of its results unless adapted to reflect the specificities of Sharia.

Section One: General Framework of the Study and Previous Studies

Problem: An examination of the reality of Iraqi Islamic banks reveals that they face increasing and complex challenges in maintaining their financial sustainability and avoiding the risk of default within a highly volatile economic and institutional environment. The study's problem

lies in the methodological and applied gap when attempting to assess this sustainability. Traditional financial forecasting and early warning tools, most notably the Altman Z-Score model, were primarily designed for conventional companies and institutions that rely on interest and leverage. This may produce misleading or inaccurate indicators when applied to Islamic banks, which are governed by exceptional Sharia and accounting principles (such as the absence of interest and the nature of absolute investment accounts based on the principle of profit and loss).

Thus, the research problem can be summarized in the following question:
Does the modified Altman Z-Score model possess the ability to predict financial distress and assess the sustainability of Iraqi Islamic banks?
Objectives: The objectives of this study are to determine the extent to which the modified Altman Z-Score model can predict financial distress and assess the viability of Iraqi Islamic banks. It also aims to classify these banks into clear categories based on the Altman Z-Score zones (safe, gray, and risky) according to the achieved values.

Importance: The importance of this study stems from several dimensions. It helps senior management in Islamic banks understand the impact of quantitative models for predicting financial distress on achieving operational continuity. It also supports decision-makers in making decisions related to risk management and provisioning. Furthermore, adopting accurate early warning models leads to increased confidence among depositors and investors in Islamic banks, which in turn attracts more capital and enhances their contribution to the Iraqi economy.
Hypotheses: The research hypothesis is as follows: The modified Altman Z-Score model for emerging markets possesses high accuracy and reliability in predicting financial distress and classifying Iraqi Islamic banks (the study sample) into zones (safe, gray, and risky).

Previous Studies:

1. A study by Khalaf and Abdul Wahid (2022) entitled "Assessing the Sustainability of Iraqi Banks Listed on the Iraq Stock Exchange Using Financial Failure Indicators." This research aims to determine the extent to which banks rely on financial analysis as a tool for predicting financial failure, and to assess the degree to which banks utilize financial analysis to predict future financial failure in all aspects. It also clarifies the importance of predicting financial failure in internal and external decision-making for banks, using a quantitative analytical approach. The study reached several conclusions, most notably: that financial failure is a negative phenomenon that banks may face. The results demonstrated that the Kida model is suitable for application to Iraqi banks and helps them predict their future. Furthermore, the study found weaknesses in the performance of some banks in the research sample, as evidenced by the negative indicators that emerged, indicating their vulnerability to financial failure.
2. A study with an incorrect source identified. The study, titled (Using the Altman z-2 Model to Predict Financial Distress - A Case Study of Condor Electronics and Iris Sat), aims to determine whether the activity of companies leads to failure and bankruptcy or prosperity. It also examines the financial health of companies and determines the accuracy of using the Altman model in distinguishing the study sample into distressed and non-distressed companies, using the descriptive analytical method. The study also reached a set of results, most notably: that the financial situation of Condor Electronics ranges between the stable and risk zone, while Iris Sat is distressed according to the Altman model, and the possibility of using the Altman model to distinguish between

the performance of companies and to differentiate between distressed and non-distressed companies, and that the Altman model is characterized by accuracy and ease in measuring financial performance and the probability of bankruptcy of companies.

3. A study (Marwa, 2021) entitled (Using the Altman zeta3 model to predict financial failure in economic institutions listed on the Qatar Stock Exchange). The research aims to identify the Altman zeta3 model and attempt to apply the Altman zeta3 model to economic institutions listed on the Qatar Stock Exchange, using the descriptive analytical approach. The study also reached a set of results, most notably: The Altman model is one of the modern models in predicting financial failure and has a high predictive ability. The financial ratios used in the Altman model were able to diagnose the financial situation of institutions and classify them into successful and failed institutions.

Similarities and differences:

1. The current study agrees with previous studies in its application of the modified Altman Z-Score financial failure prediction model to evaluate continuity.
2. The current study agrees with previous studies in using the descriptive analytical method based on financial indicators and ratios extracted from financial statements from annual reports.
3. The current study differs from previous studies in its direct application of the Altman Z-Score model to Iraqi Islamic banks.
4. The current study differs from previous studies in that it deals with a recent time period full of economic challenges in the Iraqi banking environment.

Section Two: Theoretical Framework

First Axis: The Concept of Financial Distress

First: Financial Distress: Researchers have differed in giving a unified definition of the financial imbalances that affect financial institutions, as there is a great deal of overlap in some terms such as financial distress, financial distress, and bankruptcy. Some say that they are one concept, while others have defined each of them separately. Aswad (2023, page 305) defined financial distress as: the inability of the institution to pay its obligations on time and the decrease or cessation of returns. This refers to a financial crisis that a bank faces due to its inability to meet its short-term financial obligations. Abdelsalam (2021, pp. 208-209) defines it as the bank's inability to meet customers' short-term demand for funds. This creates concerns among depositors about their money, leading them to withdraw their deposits. This, in turn, results in the bank's inability to meet its customers' liquidity needs. Rahi (2014, p. 120) also defines it this way. Bankruptcy, on the other hand, is defined by Al-Jubouri (2025, pp. 470-472) as a legal procedure applied when an institution ceases to meet its obligations to third parties on their due dates. In such cases, the institution is declared bankrupt by a court order issued by a specialized court in order to liquidate it and settle its obligations with the available financial resources. (Z., Wang, & Zhang, 2017, pp. 434-440) defined financial distress as a state of financial inadequacy affecting an institution and preventing it from conducting its business normally without external support. This negatively impacts its economic value. This situation begins when a bank fails to restructure its debts in accordance with its returns. This is a temporary technical glitch where the bank is unable to liquidate its assets, despite their existence. Its continuation leads to financial distress, which gradually develops until it becomes

unable to survive in the market, ultimately resulting in legal liquidation (bankruptcy). **Second:** Stages of Financial Distress.

There are several stages that financial distress goes through, as mentioned by (Sabrina, 2021, p. 10), (Wahiba, 2020, p. 215), and (Rihan, 2007, pp. 28-32). These stages can be explained as follows:

1. The Liquidity Shortage Stage: This stage is characterized by an increase in costs, leading to a decrease in added value. These costs result in a decrease in the institution's profitability, which in turn affects its self-financing. This leads to a lack of internal financial resources that the institution can resort to when it experiences a liquidity shortage.
2. The Operational Deficit Stage: If the liquidity shortage persists, the bank reaches the operational deficit stage and profits erode. The bank is then forced to liquidate some of its assets to cover outstanding debts.
3. The Total Insolvency Stage: This stage is considered a critical point in the bank's failure, where the crisis becomes structural and not merely a liquidity shortage. Management's attempts to obtain additional financing cease because its total liabilities exceed the value of its assets. 4. The stage of bankruptcy and liquidation: This is the stage in which the bank completely stops working and paying its obligations, and this will lead to a lawsuit being filed against it, which will push it to declare bankruptcy (Shaheen, 2011, p. 859).

Third: Causes of Financial Distress: Financial failure does not stem from a single cause. Rather, it results from a complex interplay of internal factors stemming from poor management efficiency and external factors imposed by the surrounding environment. These causes can be categorized as follows:

1. Internal Causes: (Khalaf & Abdelwahed, 2022, pp. 64-65) and (Lydiah & Kennedy, 2019, p. 129) mention a set of causes that lead to bank distress, which can be summarized as follows:

a. Weak and inefficient bank management
b. Weak oversight
c. Selection of a poor team lacking flexibility and adaptability
d. Accumulated losses

2. External Causes: (Al-Khamis, 2020, p. 28) and (Abuelgasim & Toumi, 2025, p. 7) state that Islamic banks are exposed to external factors that are difficult to control. These can be explained as follows:

a. The surrounding economic conditions within the bank and the unavailability of necessary financing sources for essential expansions
b. Intense competition
c. Sharp Fluctuations in Exchange Rates

3. Reasons Specific to Islamic Banks: Al-Fuqaha and Al-Saifi (2006, p. 10) and Awda (2022, pp. 468-479) stated that the nature of Islamic banking operations exposes it to numerous risks, which can be summarized as follows:

a- Sharia Compliance Risks: The risk of legal or regulatory penalties that a bank may face for non-compliance with laws, regulations, and instructions, leading to a sudden withdrawal of deposits and accelerating the transition from liquidity to structural collapse.
b- Islamic Financing Methods Risks: Most of the methods used by Islamic banks in their operations are still subject to intellectual debate regarding their legitimacy and fundamental principles from one school of thought to another, preventing their uniform application by these banks.

C- Risks of non-compliance with international standards: Islamic banks are part of the global banking system, so the Islamic banking sector must be in daily contact with Arab and international banks, and Islamic banks must adhere to international financial standards and develop their services and products in line with developments in international financial standards.

Fourth: Methods of Addressing Financial Failure

Al-Jayashi (2017, pp. 74-76), Al-Bayati (2022, pp. 24-25), and Hajjam (2016, p. 56) mentioned a set of methods and means for addressing financial failure, which can be summarized as follows:

1. Restructuring: This method involves the bank adopting a new strategy to correct the imbalance and ensure business continuity. Banks should rely on two types of restructuring: financial restructuring and administrative restructuring to ensure positive results and overcome financial failure.

2. Merger: The process of merging two or more banks to form a new entity to address financial failure. This is a proactive solution to avoid liquidation.

3. Changing the Legal Structure: Converting the bank to a more flexible structure that helps management make a number of decisions is considered a positive method for addressing financial distress.

4. Sale: When owners are unable to find solutions to address financial distress, they may sell the bank to another party. 5. Liquidation: When a bank reaches an advanced stage of financial failure and all previous methods prove ineffective, liquidation becomes necessary. This involves settling outstanding debts to creditors according to legal priority.

Fifth: The Continuity of Islamic Banks:

The concept of continuity is the cornerstone of all accounting and financial treatments for institutions, especially banks. It assumes whether the financial institution will continue its operations in the foreseeable future. Definitions and concepts related to continuity have varied depending on the researcher's perspective. Financial continuity is defined as the ability to withstand shocks—the bank's capacity to absorb economic, environmental, and operational shocks, including systemic shocks, and restore its stability in a short period. This capacity is achieved by maintaining sufficient capital and high-quality assets (Sheffi, 2015). Islamic governance scholars, such as Chapra, refer to it as the institutional quality of continuity. This refers to the quality of the bank's internal frameworks, including the effectiveness of the Sharia Supervisory Board and the efficiency of the Board of Directors, to ensure that all decisions support sustainable performance and compliance—a prerequisite for survival and market acceptance. (Chapra & Ahmed, 2002, p. 13) In advanced financial management literature, such as Stern Stewart's, sustainability is a concept that measures a bank's ability to generate returns exceeding the cost of invested capital over the long term. Sustainability here reflects the bank's ability to add real value to shareholders and society, not just to survive technically (Ali & AL-Taie, 2023, p. 155).

Second Axis: Models for Predicting Financial Failure

Model Altman's 1968 Z-score: Altman was the first to apply discriminant analysis to predict financial failure. His model is one of the most well-known and easily applicable models. The study sample included 66 industrial institutions, 33 struggling and 33 not struggling (Saida &

Saeeda, 2021, p. 236; Baharoun, 2022, p. 376). His model is based on five financial ratios, which can be shown in the following table:

Table No. (1) Financial Ratios Used in Altman's Model.

index	ratio	weighted
X1	Net Working Capital to Total Assets	1.2
X2	Retained Earnings to Total Assets	1.4
X3	Earnings Before Interest and Taxes to Total Assets	3.3
X4	Market Value of Shareholders' Equity to Total Liabilities	0.6
X5	Sales to Total Assets	0.999

Source: Prepared by the researcher

The model equation was as follows:
Z = 1.2 X1 + 1.4 X2 + 3.3 X3 + 0.6 X4 + 0.999 X5
The higher the index value, the stronger the financial position and the lower the probability of failure.

Kida Model 1981: The Kida model is based on five independent financial ratios. It uses discriminant analysis to classify observations into compatible categories in order to differentiate between failing and non-failing banks (Brody, 2020, p. 103; Ghodrati & Moghaddam, 2012, p. 57). The values are shown in the table below:

Table No. (2) Financial Ratios Constituting the Kida Model.

index	ratio	weighted
X1	Net Profit After Tax to Total Assets Ratio	1.042
X2	Shareholders' Equity to Total Liabilities Ratio	0.42
X3	Liquid Assets to Current Liabilities Ratio	0.461
X4	Sales to Total Assets Ratio	0.463
X5	Cash to Total Assets Ratio	0.271

Source: Prepared by the Researcher

The model equation was as follows:
Z = 1.042X1 + 0.42X2 - 0.461X3 - 0.463X4 + 0.271X5
If the project test result according to this model is positive, the project is considered safe from financial failure. However, if the result is negative, the project is at risk of financial failure. This model has demonstrated a high ability to predict financial failure. 95%
The Sherrod 1987 Model: This model is used to assess credit risk when granting bank loans, as well as to predict financial failure and the future viability of economic units (Haider Jaafar & Ibrahim, 2025, pp. 129-130). The model relies on six financial ratios, as shown in the following table:

Table No. (3) Financial Ratios Used in the Sherrod Model.

index	ratio	weight
X1	Net working capital to total assets	17
X2	Current assets to total assets	9
X3	Shareholders' equity to total assets	3.5
X4	Net profit before taxes to total assets	20
X5	Total assets to total liabilities	1.2
X6	Shareholders' equity to fixed assets	0.1

Source: Prepared by the researcher

The equation was as follows:
Z = 17X1 + 9X2 + 3.5X3 + 20X4 + 1.2X5 + 0.1X6
The higher the index value, the stronger the financial position.
Fourth: The Altman Z-score Model: This is a quantitative statistical model for predicting default or bankruptcy. It relies on the Multivariate Analysis (MDA) method to combine a set of financial ratios into a single Z-score. It is used to distinguish between struggling and sound institutions and to predict their probability of failure. (Saida & Saeeda, 2021, p. 236) In 1968, Edward Altman developed a multivariate model by applying it to a sample of 66 industrial companies, divided into 33 successful and 33 bankrupt companies. His equation was as follows:
Z = 1.2 X1 + 1.4 X2 + 3.3 X3 + 0.6 X4 + 0.999 X5.

In 1983, Altman further developed the model for privately held industrial companies not listed on the stock exchange. He replaced the market value of equity in the X4 index with book value, since unlisted companies do not have a market price per share. (Shafitranata, Chairunnisa, & Arshed, 2020, p. 236) The equation became:
Z` = 0.717 X1 + 0.847 X2 + 3.107 X3 + 0.420 X4 + 0.998 X5
In 1995, he modified the formula for the second time to suit emerging markets and non-industrial companies, deciding to remove the fifth variable, X5 (sales/assets), because it was too country-specific, making comparisons between different sectors inaccurate. (Hasan, 2023, p. 42) and (Qasim, 2020, p. 292) The equation then becomes:
Z" = 6.56 X1 + 3.26 X2 + 6.72 X3 + 1.05 X4

This study will adopt the modified Altman Z"-score model, as it is more suitable for the nature of banking operations, with some changes to the x3 and x4 indices. This formula has been used for Islamic banks in several previous studies, including (Shafitranata, Chairunnisa, & Arshed, 2020, p. 369), and applied to banks listed on stock exchanges, as in the study (Marwa, 2021, p. 53). The classification limits are:

- Z" > 2.6 Safe
- 2.6 > Z" >1.1 Gray
- Z" < 1.1 Risky

Section Three: Applied Aspects and Results Analysis

The financial analysis of the Z-score indicators will be presented. These indicators comprise four components: (working capital to total assets ratio, retained earnings to total assets ratio, pre-tax profit to total assets ratio, and market capitalization to total liabilities ratio). The analysis is as follows:

1. Financial Analysis of the Working Capital to Total Assets Ratio: The working capital to total assets ratio is one of the indicators in the Altman Z-score model, denoted as X1. Table (4) presents the results of dividing working capital by total assets for eight Iraqi Islamic banks listed on the Iraq Stock Exchange for the period (2020-2024). The sector average showed (0.2878) with a standard deviation of (0.2253). The best period was (2020), which achieved (0.4044), and the lowest period was (2022), which recorded an average of (0.2478), significantly lower than the sector average. The sector. As for the banks that achieved a percentage higher than the sector average, there were 5 banks, namely (Al-Thiqa International Islamic, Iraqi Islamic Investment and Development, Elaf Islamic, Al-Taif Islamic Investment and Finance, Noor Iraq Islamic Investment and Finance), and the lowest was a bank, which was (Al-Ataa Islamic Investment and Finance, Iraqi Islamic Commercial, Islamic Advisor for Investment and Finance).

Table (4) Working capital to total assets ratio for banks in the study sample for the period (2020-2024)

X1								
no	Bank Name	2020	2021	2022	2023	2024	Bank Average	Standard Deviation
1	Trust International Islamic	0.584	0.434	0.442	0.486	0.478	0.4848	0.0597
2	Iraqi Islamic Investment and Development Bank	0.293	0.253	0.172	0.98	0.993	0.5382	0.4481
3	Elaf Islamic	0.423	0.482	0.547	0.479	0.455	0.4772	0.0393
4	Al Taif Islamic Investment and Finance	0.521	0.397	0.352	0.314	0.179	0.3526	0.0940
5	Noor Iraq Islamic Investment and Finance	0.726	0.495	0.545	0.343	0.33	0.4878	0.1080
6	Al Ata'a Islamic Investment and Finance	0.0644	0.0882	0.1231	0.1367	0.1653	0.11554	0.0320
7	Iraqi Islamic Commercial Bank	0.1899	0.042	-0.0456	-0.0139	0.0179	0.03806	0.0381
8	Al Mustashar Islamic Investment and Finance	0.4343	-0.0535	-0.1524	-0.0184	-0.233	-0.00575	0.0973
Average period		0.4044	0.2672	0.2478	0.3383	0.2981	0.2878	
Standard Deviation		0.2153	0.2166	0.2656	0.3264	0.3651	0.2253	

Source: Prepared by the researcher

2. Financial analysis of the ratio of retained earnings to total assets: The ratio of retained earnings to total assets is one of the indicators of the Altman Z'score model and is denoted by the symbol X2. Table (5) shows the results of dividing retained earnings by total assets for 8 Iraqi Islamic banks listed on the Iraq Stock Exchange for the financial period 2020-2024. The sector average showed (0.0132) with a standard deviation of (0.0342), where the best period was the year (2020) as it recorded an average of (0.0279) and the lowest period was the year (2022) as it recorded an average of (-0.0025), which is much lower than the sector average. As

for the banks that achieved a percentage higher than the sector average, there were 4 banks: (Al-Thiqa International Islamic, Al-Taif
Islamic Investment and Finance, Noor Iraq Islamic Investment and Finance, Al-
Ataa Islamic Investment and Finance), and the lowest was 4 banks: (Al-Tijari Al-Iraqi Islamic, Al-Mustashar Al-Islami Investment and Finance, Al-Iraqi Islamic Investment and Development, Elaf Islamic).

Table (5) Retained earnings ratio to total assets for banks in the study sample for the period (2020-2024)

X2								
no	Bank Name	2020	2021	2022	2023	2024	Bank Average	Standard Deviation
1	Trust International Islamic	0.00025	0.00088-	0.117-	0.001-	0.009	0.0219-	0.0533
2	Iraqi Islamic Investment and Development Bank	0.032	0.008	0.015	0.036	0.033	0.0248	0.0124
3	Elaf Islamic	0.115	0.0017	0.0037	0.0093	0.017	0.0293	0.0482
4	Al Taif Islamic Investment and Finance	0.0103	0.0051	0.0054	0.0223	0.0071	0.01004	0.0072
5	Noor Iraq Islamic Investment and Finance	0.01	-0.005	0.009-	0.017-	0.024-	0.01-	0.0146
6	Al Ata'a Islamic Investment and Finance	0.0331-	0.0335-	0.0257-	0.0122-	0.0152-	0.0239-	0.0099
7	Iraqi Islamic Commercial Bank	0.0618	0.0851	0.1016	0.0902	0.0675	0.0812	0.0164
8	Al Mustashar Islamic Investment and Finance	0.0272	0.0271	0.0056	0.0116	0.0103	0.0164	0.0101
Average period		0.0279	0.0132	0.0025-	0.0174	0.0131	0.0138	
Standard Deviation		0.0445	0.0364	0.0597	0.0341	0.0283	0.0342	

Source: Prepared by the researcher

3. Financial analysis of the ratio of profits before taxes to total assets: The ratio of profits before taxes to total assets is one of the indicators of the Altman Z'score model and is denoted by the symbol X3. Table (6) shows the results of dividing profits before taxes by total assets for 8 Iraqi Islamic banks listed on the Iraq Stock Exchange for the financial period 2020-2024. The sector average showed (0.0135) with a standard deviation of (0.0157), where the best period was the year (2024) as it recorded an average of (0.0210) and the lowest period was the year (2021) as it recorded an average of (0.0050) which is much lower than the sector average. As for the banks that achieved a percentage higher than the sector average, there were 3 banks, namely (Iraqi Islamic Commercial Bank, Islamic Advisor for Investment and Finance, Iraqi Islamic Bank for Investment and Development), and the lowest were 5 banks, namely (Al-Thiqa International Islamic Bank, Al-Taif Islamic Bank for Investment and Finance, Noor Iraq Islamic Bank for Investment and Finance, Al-Ataa Islamic Bank for Investment and Finance, Elaf Islamic Bank).

Table (6) Profit before taxes ratio to total assets for banks in the study sample for the period (2020-2024)

X3								
no	Bank Name	2020	2021	2022	2023	2024	Bank Average	Standard Deviation
1	Trust International Islamic	0.019	0.001-	0.0056	0.002	0.0062	0.0064	0.0076
2	Iraqi Islamic Investment and Development Bank	0.022	0.012	0.019	0.042	0.041	0.0272	0.0135
3	Elaf Islamic	0.012	0.0021	0.0049	0.0076	0.0086	0.0070	0.0037
4	Al Taif Islamic Investment and Finance	0.0103	0.0021	0.0051	0.0226	0.0044	0.0089	0.0082
5	Noor Iraq Islamic Investment and Finance	0.0001	0.005-	0.004-	0.01-	0.0009-	0.0039-	0.0039
6	Al Ata'a Islamic Investment and Finance	-0.0044	0.0038	0.0034	0.0132	0.0004	0.0033	0.0064
7	Iraqi Islamic Commercial Bank	0.0654	0.0253	0.0229	0.0375	0.0754	0.0453	0.0238
8	Al Mustashar Islamic Investment and Finance	0.0232	0.00072	0.0051	0.0077	0.033	0.0139	0.0136
Average period		0.0184	0.0050	0.0077	0.0153	0.0210	0.0135	
Standard Deviation		0.0214	0.0095	0.0088	0.0177	0.0269	0.0157	

Source: Prepared by the researcher

4. Financial Analysis of the Market Capitalization to Total Liabilities Ratio: The market capitalization to total liabilities ratio is one of the indicators in the Altman Z-score model, denoted by X4. Table (7) presents the results of dividing the market capitalization by total liabilities for 8 Iraqi Islamic banks listed on the Iraq Stock Exchange for the financial period 2020-2024. The sector average was (0.7013) with a standard deviation of (0.5511). The best period was (2020) with a value of (1.0261), and the lowest period was (2023) with an average of (0.5155), which is significantly lower than the sector average. Five banks achieved a ratio exceeding the sector average: (Al-Thiqa International Islamic, Al-Taif Islamic Investment and Finance, Noor Iraq Islamic Investment and Finance, Iraqi Islamic Commercial, and Al-Mustashar Islamic Investment and Finance). The lowest-performing banks were (Al-Ataa Islamic Investment and Finance, Iraqi Islamic Investment and Development, and Elaf Islamic).

Table (7) Market value to total liabilities ratio for banks in the study sample for the period (2020-2024)

X4								
no	Bank Name	2020	2021	2022	2023	2024	Bank Average	Standard Deviation
1	Trust International Islamic	1.465	0.47	0.765	1.085	1.265	1.01	0.3966
2	Iraqi Islamic Investment and Development Bank	0.183	0.194	0.107	0.096	0.225	0.161	0.0566
3	Elaf Islamic	0.0018	0.0008	0.0009	0.0011	0.0012	0.0012	0.0004
4	Al Taif Islamic Investment and Finance	1.7483	0.9717	0.7989	0.6045	0.4237	0.9094	0.5120
5	Noor Iraq Islamic Investment and Finance	2.957	0.725	0.299	0.298	0.088	0.8734	1.1876
6	Al Ata'a Islamic Investment and Finance	0.1125	0.165	0.3317	0.1306	0.1732	0.1826	0.0869
7	Iraqi Islamic Commercial Bank	0.2583	0.7098	0.7011	1.1129	1.3573	0.8279	0.4231
8	Al Mustashar Islamic Investment and Finance	1.4835	3.4582	1.801	0.796	0.6864	1.6450	1.1156
Average period		1.0261	0.8368	0.6005	0.5155	0.5274	0.7013	
Standard Deviation		1.0580	1.1094	0.5712	0.4478	0.5285	0.5511	

Source: Prepared by the researcher

5. Financial Analysis of the Z-Score: The Altman Z-score is a test of the financial failure of institutions. Table (8) shows the Z-score results for 8 Iraqi Islamic banks listed on the Iraq Stock Exchange for the period (2020-2024). The overall sector average was (2.9453) with a standard deviation of (1.3083). It is noted that 5 banks achieved a score higher than the overall average. The best period was (2020), which recorded the highest average of (3.9455), while the lowest was (2022), which recorded an average of (2.4725), below the sector average. Five banks achieved a score higher than the aforementioned sector average, while 3 banks fell below it. The highest-scoring banks were (Al-Thiqa International Islamic, Iraqi Islamic Investment and Development, Elaf Islamic, Al-Taif Islamic Investment and Finance, and Noor Iraq Islamic Investment and Finance). The lowest-scoring banks were (Al-Ataa Islamic Investment and Finance, Iraqi Islamic Commercial, and Al-Mustashar Islamic Investment). (and financing) According to the standard value of Z'', there is one bank in the dangerous area throughout the study period, which is the Islamic Bank of Al-Ataa for Investment and Finance, and two successful banks throughout the study period, which are the International Islamic Trust Bank, Elaf Islamic Bank, and 4 banks that fluctuated between the safe, gray and dangerous areas, which are the Iraqi Islamic Bank for Investment and Development, Al-Taif Islamic Bank for

Investment and Finance, Noor Iraq Islamic Bank for Investment and Finance, Iraqi Islamic Commercial Bank, and Al-Mustashar Islamic Bank for Investment and Finance.

Table (8) Percentage value of the Altman Z''score model for the banks in the study sample for the period (2020-2024)

Z''score								
No	Bank Name	2020	2021	2022	2023	2024	Bank Average	Standard Deviation
1	Trust International Islamic	5.504	3.33	4.74	4.33	4.54	4.4888	0.7849
2	Iraqi Islamic Investment and Development Bank	2.37	1.96	1.43	6.93	7.13	3.964	2.8195
3	Elaf Islamic	3.24	3.19	3.63	3.23	3.11	3.28	0.2022
4	Al Taif Islamic Investment and Finance	5.35	3.65	3.2	2.92	1.67	3.358	1.33412
5	Noor Iraq Islamic Investment and Finance	7.9	3.95	3.83	2.44	2.17	4.058	2.2917
6	Al Ata'a Islamic Investment and Finance	0.4	0.66	1.09	1.08	1.21	0.888	0.3433
7	Iraqi Islamic Commercial Bank	2.15	1.46	0.92	1.62	2.27	1.684	0.5474
8	Al Mustashar Islamic Investment and Finance	4.65	3.37	0.94	0.8	0.55-	1.842	2.1119
Average period		3.9455	2.6963	2.4725	2.9188	2.6938	2.9453	
Standard Deviation		2.3698	1.1831	1.5404	1.9987	2.3142	1.3083	

Source: Prepared by the researcher

Results:

1. The study showed that the primary savior for banks that regained their balance was the solvency index x4, as increasing capital was the fastest way to escape the zone of financial failure.
2. The study proved the effectiveness of the Altman z`` score model in providing early warning signals, as the continuous decline in the Z`` values of Al-Ataa Islamic Bank was detected well before it reached the danger zone.
3. The study showed a direct relationship between operational efficiency x3 and cumulative profitability x2 and the stability of the Z`` value. Banks that recorded accumulated losses, such as Al-Ataa Islamic Bank, did not succeed in escaping the zone of financial failure throughout the study period.

Recommendations:

1. The study recommends that Islamic banks that recorded a decline in the solvency index x4 should strengthen their capital base (increase paid-up capital) and enhance equity to increase their ability to absorb future financial shocks. 2. The study recommends that the Islamic banks in the sample, which fall within the gray area, convert their illiquid assets into short-term investments to increase the value of the X1 index, which has the highest weighting in the equation.

3. The study recommends that Islamic banks adopt a prudent dividend policy and focus on strengthening retained earnings (X2) to bolster their capital buffers.

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