



# PREDICTING THE FINANCIAL FAILURE OF COMMERCIAL BANKS USING THE KIDA MODEL AND SHERROD MODEL. (AN ANALYTICAL STUDY IN A NUMBER OF IRAQI COMMERCIAL ) (BANKS)

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<p><b>Received:</b> 26<sup>th</sup> January 2023 <b>Accepted:</b> 26<sup>th</sup> February 2023 <b>Published:</b> 30<sup>th</sup> March 2023</p>	<p>The research aims to shed light on the financial failure that commercial banks may experience at the end of their financial decline stages as a result of their exposure to various and sequential financial risks, starting with the risk of liquidity and ending with the risk of bankruptcy and liquidation. Among these models are the Kida model and the Sherrod model. The research reached a set of conclusions, the most important of which is that all commercial banks are in the research sample listed in the Iraq Stock Exchange, according to the models (Kida) and (Sherrod), in the case of safety from financial failure, except for the Bank of Baghdad, the United Bank for Investment, and the Mansour Investment Bank, which are threatened with financial failure.</p> <p>Based on the conclusions, the researcher presented a set of recommendations that are consistent with these conclusions, the most important of which is the need to direct financial banks to use mathematical models to predict financial failure as a tool for early warning about the state of the research sample bank.</p>

**Keywords:** Financial failure, (Kida) model, (Sherrod) model.

## INTRODUCTION:

The banking sector is essential for economic growth. In addition to the interdependence and wide overlap between the banking sector and other sectors of the economy, it has become necessary to follow all the fluctuations and changes that occur in the banking sector because any failure or decline in banks and their activities will affect the rest of the sectors through the repercussions and results of these changes.

In view of the potential damage that may be inflicted on all sectors and entities related to the banking sector, including investors, official bodies, and lenders, the process of predicting the financial failure of banks listed in the stock market was a very important issue. The main objective of the financial analysis is to provide the concerned groups with

information and data about the financial position of the bank and to predict the performance of the bank during a certain period in order to assist in the financial planning process of the bank, to verify the extent of the bank's success or failure in achieving the goals, to obtain indicators indicating whether the bank's policies are sound or need to be modified, and then to help in the decision-making process within the bank. One of the most important and common financial analysis tools are the financial ratios, which express the mathematical relationship between two values or two or more items in the financial statements and thus allow the situation to be assessed. The financial ratios of the bank and its performance during a specific period were compared by making comparisons between the financial ratios of a particular bank and the financial ratios of similar



banks. Through analyzing the financial ratios of banks, it was able to compare the performance of the bank and its financial position and determine its performance trends in successive periods of time. Among the most prominent uses of financial ratio analysis is the evaluation of the financial performance of banks. Despite this, the financial default in banks is one of the problems that many try to deal with cautiously because of the danger it represents to the banks' business. his obligations to creditors and the fulfillment of his debts.

## **RESEARCH METHODOLOGY**

### **Search Problem:**

Most of the depositors and investors in the stock markets suffer from several problems, most notably the abundance of fear and anxiety from investing in the banking sector because of the risk of default and the inability to pay its obligations towards others. Because the frequent stumbling and failure of listed banks leads investors to refrain from entering the financial markets, and this in turn leads to negative effects on the banking and financial sector on the one hand and on the national economy on the other, as financial markets and banks are a major component of the economy.

Hence, the research problem can be formulated with the following question:

Is there an ability to predict the financial failure of the banks listed in the financial market to reassure depositors and investors?

### **The Importance of Research:**

The importance of the research boils down to highlighting the dangers associated with the failure of banks listed in the stock markets and their impact on the financial positions of depositors and investors dealing in those markets, which in turn affects the national economy as a whole. From this point of view,

the presence of mathematical models capable of predicting the financial position of banks helps to draw attention to the surrounding dangers before they occur, and it will benefit all participants in the financial statements of companies, including investors in the financial assets of these banks or dealers in the stock market, which enhances confidence in them and the consequent decisions serve the financial sector and the national economy.

### **Research Objectives:**

The research aims to reach:

1. Know the concept of financial failure.
2. When do commercial banks reach the stage of financial failure?
3. Measuring the degree of financial failure in commercial banks within the research sample
4. The possibility of applying the Kida model in commercial banks
5. The possibility of applying the Sherrod model to commercial banks

### **Research Hypotheses:**

For the purpose of answering the research questions and reaching the research objectives, the following research hypotheses were adopted:

1. All commercial banks reach financial failure in the last stages of their lives.
2. The commercial banks and the research sample face financial failure.
3. The Kida model cannot be used to measure the degree of financial failure in commercial banks.
4. The Sherrod model cannot be used to measure the degree of financial failure in commercial banks.

### **Research Sample:**

A sample of eight commercial banks listed on the Iraq Stock Exchange was selected based on a number of standards and indicators and their financial data published in the year 2020, as shown in Table No. 1.

Table No. 1: The research sample banks

No.	Name of the bank	Bank code	Establishment of the bank
1	Iraqi Commercial Bank	BCOI	February 11, 1992
2	Baghdad Bank	BBOB	February 18, 1992
3	Iraqi Investment Bank	BIBI	July 13, 1993
4	United Bank for Investment	BUND	August 20, 1994



5	The National Bank of Iraq	BNOI	March 28, 1995
6	Sumer Commercial Bank	BSUC	May 26, 1999
7	Ashur International Bank	BASH	September 22, 2005
8	Mansour Investment Bank	BMNS	September 13, 2005

Source: (Iraq Stock Exchange, [www.isx-iq.net](http://www.isx-iq.net))

## LITERATURE REVIEW

### First: What is the prediction of financial failure?

The word prediction in the language has been derived from the origin of the verb news, and it means the news, so the news is the news, the predictor is the informer, and prediction means news of the unseen and knowledge of the future. And setting the appropriate possibilities for those events, taking into account the internal and external effects of the institution (Akaer & Khashan,2019:116), financial failure is one of the serious matters that financial activities in institutions are exposed to, and the reasons for its occurrence are many, including internal and external factors, whose symptoms appear in the form of liquidity imbalance and weakness. Financial structure and a decrease in profitability, all of which lead to bankruptcy and liquidation (Mhmood,2021:181), and financial failure is also defined as the inability of pedestrian revenues to cover all costs, including the cost of financing capital, which leads to legal liquidation when the value of book assets becomes less From the value of book obligations so that the company reaches bankruptcy as a result of the establishment's inability to pay its debts (Bulut,2018:177) or the bank's inability to continue providing its services to customers (Duc, at.el.,2019:1), how much financial failure is defined as the inability of the bank's revenues to cover all costs, including the cost of capital, and the inability of management to achieve a return on invested capital commensurate with those investments (Qader,2020:368)?

It can be clarified about the terms (financial default, financial hardship) in financial and accounting thought as follows:

1. Financial Distress: It is represented in the situation in which the bank is exposed to a state of lack of liquidity and the accumulation of losses for a number of years as a result of wrong administrative and

financial decisions, and this is also due to its inability to adapt to the laws and decisions that regulate its activity. financially if it has achieved losses for three consecutive years (Seddik,2017:4).

2. Financial insolvency: it refers to the weakness of the bank's financial suitability and the bank's inability to pay its obligations (Abdul Rahman,2011:32). Financial hardship takes two forms:

❖ Financial insolvency (technical): It is the first manifestation of insolvency in which the bank is unable to meet its due obligations even though its assets exceed its obligations. This concept is usually called a liquidity crisis, as the bank faces its inability to meet its immediate cash needs for a period of time starting from one day. It may continue, and in this case, it is called "temporary financial default, and in this case the bank can overcome the crisis without having to reach bankruptcy by selling its assets to cover its due and urgent obligations (Juma & Abd,2016:24).

❖ Real financial hardship Real insolvency is the second manifestation of financial failure in which financial stumbling is continuous, i.e., the bank is unable to meet its due obligations and the value of its obligations exceeds the value of its assets; in some cases, the bank may not succeed in obtaining the financing necessary for treatment as another solution (Juma & Abd,2016:25).

### Second: Financial Failure Stages:

#### **The Financial Failure Process Goes Through the Following Stages:**

1. Emergence stage: There is no doubt that the company does not suddenly begin to deteriorate. Rather, there are a set of indicators that can be addressed by the management, such as the change in demand for products, the continuous rise in indirect costs, the obsolescence of production methods, the increase in competition, the decrease in credit facilities, the increase in burdens, and the weakness of



capital. Working money at this stage, the return on assets is less than the moderate percentage of the company, and it is preferable to discover the problem at this stage (Seddik,2017:10).

2. The financial deficit stage: This stage occurs when the administration notices a financial default and when the company is not able to meet its necessary cash needs. In this stage, the company's assets exceed its liabilities, but the problem is the inability to convert the assets into cash to cover the outstanding debts. (Ross, et al.,2002:857)

3. The stage of financial insolvency: This stage lies in the company's inability to exploit its normal policy to obtain the required cash and use it to meet its due liabilities and achieve the required growth. It becomes unable to pay its expenses, and insolvency arises as a result of the significant decrease in the cash balance available to the company in order to increase liabilities, which means that if the company was able to convert non-cash assets into cash within a specified period, it would be able to escape from the expected failure (Al-Murshidi,2018:258).

4.The stage of total failure: This stage is considered crucial in the life of the company, as the company cannot avoid admitting failure if all attempts by the company's management to obtain additional financing end, and here the total liabilities exceed the value of the assets, which means complete failure and bankruptcy (Goedan,1971:348).

5. The stage of declaring or confirming bankruptcy: it is the last stage in which legal measures are taken to protect the rights of lenders, and thus the institution is declared bankrupt.

declining and deteriorating profitability for consecutive periods.

- Lack of competition with imported or locally manufactured products
- Imbalance and confusion in the capital structure and the high rate of borrowing, particularly short-term

Since:

Variable	variable symbol	relative weight
Net profit after interest and tax/total assets	X1	1.04
Shareholders' equity/total liabilities	X2	0.42
Current assets/current liabilities	X3	0.461
Sales/total assets	X4	0.453
cash/total assets	X5	0.271

Source: (Mohammed & Alsunaidi,2021:15)

- Low control over working capital
- The continuous increase in the volume of debt
- Lack of control over useless activities in the institution (Shani,2020:165).

### **Third: The Causes of Financial Failure:**

Most of the studies that were exposed to the causes of financial failure focused on the fact that they are due to several factors, the most important of which are: (Al-Khayat,2014:14); (Robbins,1994:314); (Gup,1983:237); intense competition; and the inability of banks to cuckoo in the face of competitors.

1. The economic factors represented by the local economic conditions of the environment in which the company operates, as well as the international economic conditions.
2. Weak management of banks and their lack of knowledge.
3. The high cost of financing sources.
4. Accumulated losses.
5. The phenomenon of globalization and its great influence on the failure of many companies due to the dominance of giant companies on the markets of many countries, especially developing countries, led to the bankruptcy of many companies.
6. The rapid technological developments and the inability of companies to keep pace with them.

### **Fourth: Models Used to Measure Financial Failure Indicators:**

#### **1- Model: 1980 Kida**

It is one of the important quantitative models for predicting financial failure, which Kida reached in 1980, as the model relied on the method of multiple discriminatory analysis to choose five financial ratios that were able to apply with an accuracy of 91%, and this model was represented by the following equation (Seddik,2017:10), (Al-Hamdani,2018:95).

$$Z = 1.04X1 + 0.42X2 + 0.461X3 + 0.463X4 + 0.271X5$$



What distinguishes this model from other models is that it relies on a different criterion to judge the success or failure of the bank, as the bank is viewed as a failed bank if the value of Z resulting from the equation is negative, and the lower this value, the greater the probability of failure. Conversely, if a positive Z value appears, the bank's probability of failure is weak, meaning it is among the successful banks, and the higher this value, the lower the probability of failure for it.

And if:

Z = negative; the probability of financial failure of the bank is high (the bank is failing).

Since:

variable	ratio type	variable symbol	relative weight
Working capital/total assets	liquidity	X1	17
Current assets/total assets	liquidity	X2	9
Total equity / total assets	to lift	X3	3.5
Total assets/total liabilities	to lift	X5	1.2
Total property rights/total fixed assets	to lift	X6	0.10

Source: (Mohammed & Alsunaidi,2021:16)

It is noted from the above model that it focused on three main ratios: liquidity ratios with a weight of 26, profitability ratios with a weight of 20, and financial leverage ratios with a weight of 4.8. This means that the bulk of this model is represented in liquidity ratios and financial leverage ratios. Before banks in credit analysis, and thus Sherrod also sees that they fulfill the desired requirements in granting

Z = positive; the probability of financial failure of the bank is low (the bank is successful).

## 2. Model: Sherrod

It is considered one of the most important modern models for predicting financial failure, and the model relies on six independent financial indicators in addition to the relative weights of the excellence function coefficients that were given to these variables according to the following formula: (Arkan,2015:240).

$$Z = 17X1 + 9X2 + 3.5X3 + 20X4 + 1.2X5 + 0.10X6$$

loans if the risk ratio is weak or decline if the opposite is found, so Sherrod classified the level of project quality into five categories according to the degree of risk or the level of failure of the bank, through which it is possible to know the extent The degree of risk to which loan grantors may be exposed is shown in Table 2.

Class	The Degree of Risk and The Level of Failure	Z value
The first category	Unfailing (Excellent)	<b><math>Z \geq 25</math></b>
Category two	Low probability of failure (low risk)	<b><math>25 &gt; Z \geq 20</math></b>
The third category	Hard to predict failure (medium risk)	<b><math>20 &gt; Z \geq 5</math></b>
Fourth category	Prone to fail (high risk)	<b><math>5 &gt; Z \geq 5-</math></b>
Fifth category	Highly Fail Prone (Very High Risk)	<b><math>5 - &gt; Z</math></b>

Source:(Arkan,2015:74)

## PRACTICAL RESULTS

### Analysis And Assessment of The Financial Failure of Commercial Banks:

For the purpose of measuring financial failure using the (Kida) and (Sherrod) models, the commercial banks in the Iraq Stock Exchange were chosen as the study sample population, and then a research comparison was made between the two models in terms of the reliability and accuracy of measurement for each model on the one hand and the degree of congruence between the two models on the other.

The following is the output of the application for each model:

First: Analysis of The Value of The Prediction Function Z According to The Kida Model for The Research Sample

It is clear from Table 3 that the results of the financial ratios calculated according to the Kida model on the data of commercial banks, the study sample that made up the model, are as follows:

Table (3) shows the results of the Kida model's financial ratios for the research sample in 2020.

No.	Bank code	X1	X2	X3	X4	X5
1	<b>BCOI</b>	0.057	0.995	1.964	0.023	0.650
2	<b>BBOB</b>	0.014	0.244	0.945	0.012	0.729
3	<b>BIBI</b>	0.008	0.866	1.816	0.029	0.626
4	<b>BUND</b>	0.002	0.768	0.484	0.015	0.036
5	<b>BNOI</b>	0.002	0.524	1.437	0.030	0.493
6	<b>BSUC</b>	0.003	3.743	4.249	0.012	0.752
7	<b>BASH</b>	0.031	1.365	2.226	0.005	0.883
8	<b>BMNS</b>	0.005	0.286	0.124	0.012	0.871

**Source: Prepared by the researcher**

Table 4: Analysis of the value of the prediction function Z according to the Kida model for the research sample for the year 2020

Bank Code	Bank Name	Kida Model Equation	Z Value	The Bank's Position on Forecasting
<b>BCOI</b>	Iraqi Commercial Bank	$(1.04*0.057)+(0.42*0.995)+(0.461*1.964) + (0.463*0.023) + (0.271*0.650)$	2.107	Successful
<b>BBOB</b>	Baghdad Bank	$1.04X1 + 0.42X2 + 0.461X3 + 0.463X4 + 0.271X5$	0.889	Threatening
<b>BIBI</b>	Iraqi Investment Bank	$1.04X1 + 0.42X2 + 0.461X3 + 0.463X4 + 0.271X5$	1.472	Successful
<b>BUND</b>	United Bank for Investment	$1.04X1 + 0.42X2 + 0.461X3 + 0.463X4 + 0.271X5$	0.523	Threatening
<b>BNOI</b>	The National Bank of Iraq	$1.04X1 + 0.42X2 + 0.461X3 + 0.463X4 + 0.271X5$	1.056	Successful
<b>BSUC</b>	Sumer Commercial Bank	$1.04X1 + 0.42X2 + 0.461X3 + 0.463X4 + 0.271X5$	3.773	Successful
<b>BASH</b>	Ashur International Bank	$1.04X1 + 0.42X2 + 0.461X3 + 0.463X4 + 0.271X5$	2.164	Successful
<b>BMNS</b>	Mansour Investment Bank	$1.04X1 + 0.42X2 + 0.461X3 + 0.463X4 + 0.271X5$	0.473	Threatening

**Source: Prepared by the researcher**

The Kida model was applied to the data of Iraqi commercial banks for the year 2020, the study sample, to predict financial failure, which is shown in Table 4. From the positive (Z) value for all banks, it becomes clear to us that all banks in the study sample have a low probability of financial failure, that is, they are successful, unless they differ in the probability ratio, so we find that the most successful banks are the Sumer Commercial Bank, followed by the Ashur International Bank, and then the Iraqi Commercial Bank, as the values of (Z) for them reached (3.773,

2.164, and 2.107, respectively). Successful banks, but their success rate is lower than the rest of the banks in the research sample, as the values of Z for them were (0.473, 0.523, 0.889), respectively.

**Second: Analysis of the value of the prediction function Z according to the Sherrod model for the research sample:**

Table 5 shows the results of the financial ratios calculated according to the Sherrod model on the data of commercial banks in the study sample that made up the model, as follows:

Table (5) The results of the financial ratios of the Sherrod model for the research sample during the year 2020

Bank Code	X1	X2	X3	X4	X5	X6
<b>BCOI</b>	0.405	0.984	0.498	0.065	1.995	93.264
<b>BBOB</b>	0.176	0.945	0.196	0.018	1.244	4.989
<b>BIBI</b>	0.001	0.973	0.464	0.009	1.866	17.204
<b>BUND</b>	0.429	0.209	0.434	0.001	1.767	2.049
<b>BNOI</b>	0.279	0.942	0.343	0.027	1.524	17.042
<b>BSUC</b>	0.750	0.895	0.789	0.003	4.743	9.034
<b>BASH</b>	0.527	0.942	0.577	0.040	2.365	13.766
<b>BMNS</b>	0.001	0.967	0.222	0.006	1.285	9.988

Source: Prepared by the researcher

Table (6) Analysis of the value of the prediction function Z according to the Sherrod model for the research sample for the year 2020

Bank code	Bank name	Sherrod model equation	Z value	The bank's position on forecasting
BCOI	Iraqi Commercial Bank	$(1.04*0.057)+(0.42*0.995)+(0.461*1.964)+(0.463*0.023)+(0.271*0.650)$	30.522	The bank is not subject to bankruptcy
BBOB	Baghdad Bank	$1.04X1 + 0.42X2 + 0.461X3 + 0.463X4 + 0.271X5$	14.543	Threatening
BIBI	Iraqi Investment Bank	$1.04X1 + 0.42X2 + 0.461X3 + 0.463X4 + 0.271X5$	14.542	Successful
BUND	United Bank for Investment	$1.04X1 + 0.42X2 + 0.461X3 + 0.463X4 + 0.271X5$	13.046	Threatening
BNOI	The National Bank of Iraq	$1.04X1 + 0.42X2 + 0.461X3 + 0.463X4 + 0.271X5$	18.529	Successful
BSUC	Sumer Commercial Bank	$1.04X1 + 0.42X2 + 0.461X3 + 0.463X4 + 0.271X5$	30.251	The bank is not subject to bankruptcy
BASH	Ashur International Bank	$1.04X1 + 0.42X2 + 0.461X3 + 0.463X4 + 0.271X5$	24.498	Successful
BMNS	Mansour Investment Bank	$1.04X1 + 0.42X2 + 0.461X3 + 0.463X4 + 0.271X5$	12.158	Threatening

Source: Prepared by the researcher

The Sherrod model was applied to the data of Iraqi commercial banks for the year 2020, the study sample, to predict financial failure, which is shown in Table (6). From the value of (Z), the Commercial Bank of Iraq obtained the highest value of (30.522), which represents the degree of ability to continue as well as its distance from failure. Financial, followed by Sumer Commercial Bank with a ratio of (30.251), and Al-Mansour Investment Bank occupies a positive value for (z), which amounted to (12.158), because the value of Z calculated for the research sample according to this model is positive for all Iraqi commercial banks listed on the Iraq Stock Exchange, so All Iraqi commercial

banks, the study sample, are safe from financial failure, but some of us are vulnerable, and They differ in the probability ratio, so we find that the best successful banks are the Sumer Commercial Bank, followed by the Ashur International Bank, then the Iraqi Commercial Bank, as the value of (Z) for them reached (3.773, 2.164, and 2.107), respectively; either Al-Mansour Bank for Investment or the United Bank for Investment, then the Bank of Baghdad, are successful banks, but their success rate is lower than the rest of the banks in the research sample, as the value of (Z) for them was (0.473, 0.523, and 0.889, respectively).



## **CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusions:**

From the theoretical review of the research and its analytical side, a number of conclusions were reached, as follows:

1. The financial failure prediction models give a clear picture of the current and future situation of the research sample banks, and in addition to that, the application and development of these models helps the bank's departments detect early cases of financial failure.
2. Most of the models that have been developed to predict financial failure share a number of financial ratios, and the models that have a high predictive ability depend on information to evaluate the future banking situation.
3. Financial failure is one of the negative phenomena that financial institutions and banks may be exposed to when they exit the market.
4. All the commercial banks in the research sample listed in the Iraq Stock Exchange are in a state of safety from financial failure according to the Kida model, except for the Bank of Baghdad, the United Bank for Investment, and Al-Mansour Investment Bank, which are threatened with financial failure.
5. All the commercial banks in the research sample listed in the Iraq Stock Exchange are safe from financial failure according to the Sherrod model, except for the Bank of Baghdad, the United Bank for Investment, and Al-Mansour Investment Bank, which are paved with financial failure.

### **Recommendations:**

A set of recommendations were reached, which are as follows:

1. Creating risk management departments, departments, or units whose main task is to analyze and explore risk sites and address them from the financial and administrative perspectives
2. The necessity of early detection of cases of financial failure in order to expedite their treatment before they exacerbate.
3. The need to direct financial banks to use mathematical models to predict financial failure as a tool for early warning about the state of the bank
4. The need for banks, especially financial ones, to adopt new options or services such as leasing, construction, and investing to expand operations and reduce financial failure.
5. Urging investors and lenders in the financial market to use models of financial failure to know the financial position of the bank before making an investment decision.

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