

## **Predicting Financial Failure and its Impact on Reducing Financial Risks the Mediating Role of the Financial Analysis Models**

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### **Abstract**

*The present study aimed to shed a light on the prediction of financial failure. It also aimed to identify the impact of the prediction of financial failure on financial risks. It also aimed to identify the mediating role of the financial analysis models. The descriptive analytical approach was adopted. Through using the Kida Model, the researcher of the present study analyzed the financial statements of five Jordanian public joint stock companies that were liquidated or under liquidation were reviewed for the three years preceding their liquidation. He found that the financial failure of companies can be predicted through using financial models, such as: Kida Model. He recommends obliging public joint-stock companies to measure the financial failure indicators in a regular manner. That should be done to enable companies to avoid incurring financial losses.*

**Keywords:** *Predicting financial failure, financial risks, financial analysis models.*

### **Introduction**

The financial stability of companies is considered one of the main indicators of the company's ability to handle challenges and generate profits. Having a high financial stability means that the probability of the company to face a financial failure is low.

The efficiency of financial activity is deemed as a significant factor affecting the ability of companies to survive. The mismanagement of a financial aspect may expose enterprises to a financial distress. That applies to all the kinds of companies, regardless of the nature of the activity or the legal form of the company (Abu Alia et al., 2021).

Financial distress is deemed as one of the most important challenges that may face companies. That's because financial distress has a major negative impact on decision makers, such as: investors, creditors, and others.

Companies are committed to issuing financial statements in pursuant to the accounting standards. Such financial statements serve as important sources of information for decision makers. Despite that, the information in the financial statements remains insufficient for the ones who want to have a clear and complete information about the facility and its future (Al Hamadani et al, 2013).

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#### Financial Failure:

Continuity is one of the main foundations for making financial statements in pursuant to the International Financial Reporting Standards (IFRS). It has been receiving major attention by financial statement auditors. There are certain cases in which the continuity of the company ends. Such cases include: the liquidation of the company or merging it with other companies (Momani and Shwayat, 2007).

Therefore, financial failure may affect the continuity of companies. It should be noted that such failure is considered a broad concept. There are several definitions for financial failure. All the definitions if such failure refer to the failure of the entity to pay its financial obligations. Al-Qaisi (2016) divides the reasons of financial failure into two types (i.e. external and internal reasons). Regarding the internal reasons, they include: the inefficiency of the administrative decisions that are related to the operational policies connected to production, purchasing, storage, selling, and pricing, debt collection, and the level of technological development, funding and investment. As for the external reasons, they include the unavailability of appropriate funding sources and their high cost. They also include: the increasing severity of the competition. They include: the pessimistic expectations of investors and analysts in the stock market.

Financial failure is a serious problem that is a threat to the financial activities of the entity. There are many reasons behind facing financial failure. All those reasons may lead eventually to facing bankruptcy and liquidation. It is a stage that the entity goes through. It is preceded by a financial decline. It may lead eventually to facing financial liquidation. Although entities desire achieving success. However, some entities face financial failure (Abu Shehab, 2018).

Financial failure may lead to facing a financial hardship. It refers to the inability of the entity to pay its financial obligations in full. Financial hardship may lead to a permanent suspension in the work or activity of the entity. It may lead to facing bankruptcy eventually. Financial failure refers to the failure of paying the financial obligations on their due dates. It is the result of a decrease in the returns of the entity. Such a decrease is attributed to having an accumulated losses. If the causes of such a decrease were addressed, the entity may not experience a financial failure (Kamal, 2014).

Predicting financial failure is essential because it has positive impacts on the decisions of stakeholders, such as: lenders and investors. It also reduces risks. It enables the entity to assess the severity of the future risks. Therefore, it has a great importance in the survival of the facility. It serves as an early warning of the problems that the entity is suffering from. Hence, it allows the entity to address the problems it is facing before it collapses. Failure to predict the financial failure may eventually lead to bankruptcy. Therefore, predicting financial failure is considered one of the most important administrative tasks in companies (Al-Khayyat, 2014).

#### Financial Risks:

Financial risk refers to the probability of incurring losses by an entity due to unpredictable or uncontrollable factors that affect the entity's income. Financial risks can be divided into several types. Such types may include: financing risk, liquidity risk investment risk, and etc... Such classification is based on the source of risk. Moreover, facing financial risks may lead to having fluctuations in the value of enterprise assets. It may lead to a drop in the income, or deterioration of financial conditions (Zhao et al, 2023).

Othman and Ismail (2021) add that there are several types of financial risks that entities may face. They classify the financial risks into five types. Such types include: capital adequacy risks, liquidity risks, interest rate risks, credit risks and exchange rate risks. Using artificial intelligence programs –including neural networks- may increase the accuracy in predicting the financial risk prediction. That shall increase the effectiveness

of managing financial risks. It shall also positively affect the financial performance of business entities. Such neural networks utilize data on the past and present. They analyze such pieces of data and connect them with each other.

There were several definitions for risks. For instance, the Committee of Sponsoring Organizations of the Treadway Commission (COSO) defines risks as events that negatively affect the extent to which the organization meets its goals. It adds that risks are affected by internal and external factors. Such factors affect the organization and its ability to increase its value (COSO, 2013).

According to Hillson (2017), risks can be defined as threats that the entity is facing them currently or may face them in the future. Such threats result from undesirable actions and events that hinder the entity from meeting its long-term or short-term goals. Such actions and events may prevent the entity from manufacturing goods or delivering services. They may affect the profitability level of the entity or the entity's survival and continuity.

There are several financial risks that the business entity may face. Hence, each business entity must identify and analyze the risks it might face. That's necessary to take measures for handling such risks. The types of risks include the following: (Hull, 2018).

- Credit risk: It is the probability of incurring a financial loss due to the borrower's failure to repay a loan or the possibility that the debtors will not fulfill their financial obligations on time.

- Liquidity risk: It is represented in the inability of the entity to meet its obligations through providing cash or another financial asset. It can be defined as the risk that results from the inability of the entity to fulfill its short-term obligations to creditors on time.

- Market risk: It is the risk that emerges because the fair value or future cash flows of a financial instrument will fluctuate due to changes in market prices. It is defined as the risk associated with potential financial loss due to having uncertainty about the future prices of financial instruments of the entity. There are several types for market risks. Such risks include: interest rate risks, currency risks and etc....

- Capital adequacy risks: They refer to the risks that result from the possibility of having insufficient total capital to carry out the operations of the facility.

#### Financial Analysis Models:

Today, there are thousands of models for the prediction of financial failure (Kliestik et al, 2020). Such models are mentioned in the studies conducted in the field of accounting. They include: Altman Model. They include: Sherrodow Model. Analysts use those models to predict the future financial status of enterprise. They use those models to predict the ability of enterprises to survive. They have shown remarkable effectiveness in predicting the future of companies in terms of continuity. Such effectiveness was proved through studies that target companies in many places and countries. Those models are based on several ratios. The values of such ratios are identified through reviewing the financial statements of companies (Abu Alia et al., 2021).

The models used for predicting financial failure are similar with each other in terms of their use of ratios. However, they differ from each other in terms of the weights given to each ratio. The reason behind that is represented in the nature of the different sectors and different environmental conditions as well. For example, the banking sector focus on the lending volume and the movements of the funds to the clients. As for the industrial sector, it focuses on the fixed assets that are need to manufacture products. Therefore, the financial analyst must take into consideration the suitability of the ratio weights to the sector he /she wants to analyze. That should be done in order for the analyst to reach the intended result (i.e. the bankruptcy coefficient (Z)). After that, the analyst shall conduct

an analytical test for the main ratios to reach a decisive result about continuation, bankruptcy or failure (Al-Morshedy, 2018).

Prediction of financial failure is based on expectations about the future of the entity. It is based on the results of an analysis. It's also based on examining the financial ratios listed in the financial statements. There are models for making such a prediction. Through using such models, the facility's ability to continue shall be measured and the potential risks shall be predicted. The studies in the field of accounting offer many models which can be used for predicting corporate default (Al-Rifai, 2017).

#### Kid Model

Kid model is a model used to predict financial failure. Employing this model requires identifying the values of the most important financial ratios. It involves carrying discriminant analysis for classifying observations into compatible categories. The latter analysis aims to differentiate the failed economic units from the non-failed economic ones. The value of Z is identified through adding and subtracting the five multiplied variables. It manifests in the following equation (Abu Shehab, 2018):

$$Z = 1.042X_1 + 0.42X_2 - 0.461X_3 - 0.463X_4 + 0.271X_5$$

Whereas,

X<sub>1</sub> = The net profits before taxes to total assets

X<sub>2</sub> = The total equity to liabilities

X<sub>3</sub> = The liquid assets to current liabilities

X<sub>4</sub> = The revenues to total assets

X<sub>5</sub> = The cash to total assets

In this model, the prediction of financial failure of companies is based on the Z value. The more the negative the result is, the higher the probability of the failure shall be. The more positive the result is, the higher the financial stability level shall be.

#### Altman Model

This model was developed in 1986. It is used to predict the financial distress experienced by an entity. It offers an expectation about the continuity of the entity. It manifests in the following equation (Abu Alia et al., 2021):

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + .6X_4 + 1.0X_5$$

Whereas:

X<sub>1</sub> = The working capital ÷ the total tangible assets.

X<sub>2</sub> = The retained earnings ÷ the total tangible assets.

X<sub>3</sub> = The earnings with excluding interest and tax ÷ the total tangible assets.

X<sub>4</sub> = The market value of the shareholders' equity ÷ the total liabilities.

X<sub>5</sub> = The net sales ÷ the total tangible assets.

Z serves as an indicator of financial failure. The more positive the Z value is, the better the financial position of the entity shall be (Al-Ghoussein, 2004). The Altman model is used as an instrument for evaluating investments. That's because this model allows investors to identify the financial position of the targeted facility. The latter model includes a set of relevant ratios. It involves carrying the multiple discriminant analysis for differentiate the distressed companies from the non-distressed ones (Altman, 1968).

### Sherrod Model

This model emerged in 1987. It aims to measure the credit risks when granting loans to economic projects. It's used for evaluating the continuity of the activities of an entity on the long term (Al-Morshedi, 2018). It manifests in the following equation

$$Z = 17x_1 + 9x_2 + 3.5x_3 + 20x_4 + 1.5x_5 + 0.1x_6$$

Whereas,

Z = The failure index

X1= The net working capital / the total assets.

X2= The liquid assets / the total assets.

X3 = The total shareholders' equity / the total assets.

X4 = The net earnings with excluding interest and taxes / the total assets

X5 = The total assets / the total liabilities.

X6 = The total shareholders' equity / the fixed assets.

Based on the value of Sherrod's Z coefficient, the level of risk is determined (Abu Alia et al., 2021)

### Statement of the Problem

It's very important to examine the financial status of companies and analyse their risks. That shall enable the management to predict financial failure in the targeted companies. Such a prediction can be made through using many financial analysis models. The latter models are used to examine financial ratios and risks.

Predicting financial failure has been receiving much attention by many researchers and scholars specialized in financial and accounting sciences. That's because such a prediction is an important tool for avoiding financial distress. Since 1930s, much attention has been given to the prediction of financial failure especially in the United States of America. It increased after having several bankruptcy cases in US organizations (Abu Shehab, 2018).

The present study aimed to shed a light on the prediction of financial failure. It also aimed to identify the impact of the prediction of financial failure on financial risks. It also aimed to identify the mediating role of the financial analysis models.

### Questions of the Study

The current study aimed to offer answers for the following questions:

Q.1. Does predicting financial failure contribute to reducing financial risks when mediated by the financial analysis models?

Q.2. Can the financial failure of the companies being liquidized be predicted through financial analysis models?

### Objectives of the Study

The researcher of the present study aimed to:

- Review the relevant theoretical literature on corporate financial risks, financial failure and financial analysis models.
- Testing the impact of predicting financial failure on financial risks when mediated by the financial analysis models.
- Identify whether it's possible to predict the financial failure of companies being liquidized through financial analysis models

### The Significance of the Study

-The present study provides decision makers and stakeholders with information about the way of predicting financial failure. It promotes awareness among them about the significance of making such a prediction

- The present study promotes knowledge about financial models and their role in predicting financial failure

### Definitions

**Financial failure:** It refers to the situation in which an enterprise becomes incapable of paying short-term obligations due to having insufficient resources. That's usually attributed to the inability of the management to achieve an alignment between the entity's resources and due obligations (Abu Alia et al., 2021).

**Financial risks:** They refer to the potential losses that may be incurred by an entity currently or in the future. Incurring such losses has a negative effect on the ability of the entity to achieve its goals. It has negative impact on the profitability and continuity of the entity (Othman and Ismail, 2021).

**Financial analysis models:** They refer to a set of models that are employed to predict the companies' future financial status and ability to survive. Such models are based on several ratios. The values of such ratios are identified through reviewing the financial statements of the targeted companies (Abu Alia et al., 2021).

## Review of Literature

Shawqi, and Na'eemah (2023) aimed to predict the financial failure of small and medium sized enterprises that are listed on the Malaysia Stock Exchange through using Altman model. The sample consists from six (6) SMEs that were listed on the Malaysia Stock Exchange during the period 2016-2021. Based on the results of the study, two SMEs were unlikely to experience a financial failure. It was also found that two other SMEs were far from facing financial failure.

Zhao et al (2023) aimed to make a systematic review of literature. They targeted the literature on enterprise risk analysis. They reviewed 250 articles that were published in the past almost 50 years (from 1968 to 2023). They found that the existing deep learning models have achieved success in enterprise risk analysis.

Mansor et al. (2022) examined the factors affecting financial stress among the Bottom 40 Percent (B40) group of Malaysian households. Examining such factors reflect the overall financial well-being. Data were collected through using a questionnaire. This questionnaire was used to collect data from 1008 respondents chosen from five regions in Malaysia. The latter researchers provided evidence suggesting that financial behaviour, locus of control (luck and self-confidence) and financial vulnerability (debt and income) have a significant impact on financial stress among B40 households. It was found that there is a significant positive relationship between financial vulnerability (debt and income) and locus of control (self-confidence) from one hand and financial stress from another hand. It was found that financial stress affects financial well-being. Based on the results, policy-makers should take more effective measures for reducing the financial burden on B40 households.

Abu Alia et al. (2021) examined the effectiveness of the Altman and Sherrod models in predicting the financial distress of the Palestinian companies the listed on the Palestine Stock Exchange. They aimed at examining the level of congruence of the results of the targeted models. They analyzed several financial statements to acquire the data needed for calculating the ratios used in the targeted models. They targeted (13) industrial companies that were listed on the Palestine Stock Exchange. The analysis was conducted

for a five-year time series (i.e. 2015 – 2019). It was found that the targeted models can effectively predict the financial failure of the Palestinian companies targeted years before the occurrence of such a failure. There is an agreement between the results of the targeted models. Despite that, Altman model show higher accuracy in prediction. .

Shadry et al (2021) investigated the role that financial risk management in the detection of the risks and managing them. Such detection and management contribute to avoiding financial failure. It also shows the importance of early warning of financial failure in avoiding financial failure. Such failure often leads to bankruptcy. Facing financial failure is the result of several reasons. The most important reason is having a poor financial management. Such a poor management shall hinder the entity from creating a balance between costs and revenues. Thus, it shall make the entity in capable of paying costs. As a solution, entities must have effective financial risk management to predict financial failure and manage risks effectively.

Othman and Ismail (2021) conducted an analytical study. They analyzed the financial risk prediction models. They reviewed the findings of several studies. They reached several results. They found that there is a need to promote more awareness about of the importance of predicting financial risks. Such a prediction contributes to achieving a balance between the pursuing investment opportunities and increasing return from one hand and managing risks from another hand. The latter researchers found that adding non-financial indicators to the models predicting financial risks shall increase their accuracy. The latter researchers found that using neural network models in forecasting will increase the predictive ability of financial risks.

Kalash and Bahloul (2021) shed a light on the role of financial analysis in managing financial risks and predicting financial failure. They shed a light on some financial indicators. They shed a light on three models of prediction (i.e. Sherrod, Kida, and Altman). They used those models to gain information about the financial position of the Great Balghaith Mills Corporation. They used the information listed in the financial statements of the period (2016-2018). They found that the models predicted financial failure. Therefore, the company must take effective measures for managing the financial risks it faces.

Kliestik et al (2020) analyzed the financial ratios used in the models of countries of transition economy and compared them with each other. The analysis focuses on the prediction of the financial development of a particular enterprise and the determination of potential dependencies among the nation in consideration of financial ratios and country of origin. More than four hundred prediction models of the Czech Republic, Hungary, Poland, Romania, Latvia, Lithuania Estonia, Russia, Croatia, Ukraine, Slovak Republic and Belarus were analyzed. Based on the results of the analysis, the individual groups of countries prefer different financial ratios in developing models of prediction of financial distress, differences which arose as a consequence of common changing political, market and economic conditions within each group of nations.

Abu Shihab (2018) examined the effectiveness of the Kida Model for predicting financial failure in the companies listed on the Amman Stock Exchange. The latter model was applied to fifty two companies that were referred for liquidation or discontinued companies. It was also applied to fifty two continuing companies (not referred for liquidation). The latter researcher found that the Kida Model predicted predicting financial failure and referral to liquidation in (8) companies out of (52) companies that were included. The results of the Kida Model weren't achieved for two companies. It was found that the Kida model is capable of predicting financial failure. Thus, the latter model can detect financial difficulties or changes. It can be used to assess the financial position of companies, but with a low degree of confidence.

Almansour (2015) aimed to develop a prediction model for predicting financial failure in Jordanian companies. . The sample consists from 22 bankrupt and non-bankrupt

Jordanian public joint stock companies. The data was collected on the period (2000 – 2003). They were collected from the relevant financial statements. It was found that the current asset to current liabilities, market value of equity to book value of debt, working capital to total assets, sales to total asset and retained earnings to total asset can predict financial failure in Jordanian public joint stock companies

## **Methodology**

### **Approach**

The descriptive analytical approach was adopted. Through this approach, the researcher of the present study examined the financial ratios of the selected companies being liquidated in Jordan. Such an examination was conducted through using the Kida model

### **Population**

The population of the presented study is represented in all the Jordanian public joint stock companies.

### **Sample**

The financial statements of five Jordanian public joint stock companies that were liquidated or under liquidation were reviewed for the three years preceding their liquidation. These companies are listed below:

Table (1): The sampled companies

NO	Company
1	United Group
2	Jordanian ceramic factories
3	Al Janoub Filters Manufacturing
4	International Chemical Industries
5	Jordanian tanning company

### **Instrument**

The researcher of the present study acquired the required data from the Securities Depository Center in Amman Financial Market. The Kida Model was used by the researcher for predicting financial failure. That was done through examining the financial ratios of the selected companies and finding the value of Z. It was done to identify the probabilities of having those companies facing financial failure before going through the liquidation process. The targeted model manifest in the following equation:

$$Z = 1.042X_1 + 0.42X_2 - 0.461X_3 - 0.463X_4 + 0.271X_5$$

### **Data collection methods**

- Secondary data sources: They are represented in books, and studies
- Primary data sources: They are represented in the financial statements of the sampled companies (i.e. five Jordanian public joint stock companies that were liquidated or under liquidation)

## Results

### Results Related to the First Question

Q.1. Does predicting financial failure contribute to reducing financial risks when mediated by the financial analysis models?

Financial ratios and Z values were identified through using Kida model. They were identified for predicting the financial failure during the last three years preceding the liquidation process of the selected public joint stock companies. The Z values are shown in table No. (2).

Table (2): The Z Factor Value Applying the Kida Model to Predict Failure

Company	$1.042X_1$	$+0.42X_2$	$-0.461X_3$	$-0.463X_4$	$+0.271X_5$	= Z Value
1	-0.107	2.302	-1.150	-1.613	0.015	-0.42
	-0.378	1.048	-0.401	-1.438	0.015	-0.80
	-0.532	0.648	-0.247	-0.313	0.007	-0.54
2	-0.178	3.752	-1.195	-0.112	0.000	0.79
	-0.930	2.840	-1.334	-0.486	0.004	-0.62
	-0.206	1.881	-0.638	-0.045	0.004	0.26
3	-0.131	4.345	-37.226	-0.689	0.185	-15.74
	-0.278	1.760	-2.341	-0.553	0.185	-0.84
	-0.228	0.967	-2.666	-0.410	0.299	-1.17
4	-0.197	10.776	-9.592	-2.261	0.030	-1.14
	-0.091	8.395	-7.731	-1.594	0.221	-0.81
	-0.153	9.543	-6.004	-0.963	0.026	0.64
5	0.009	8.274	-3.881	-0.045	0.133	1.71
	-0.020	8.236	-3.653	-0.035	0.055	1.75
	-0.070	6.767	-3.800	-0.251	0.011	0.90

Based on table (2), the Z values of the sampled companies are negative except for the fifth company. The Z value of the fifth company is positive. These companies were liquidated due to their accumulated losses. Through using the Kida model, the financial failure of companies can be predicted due to the exposure of these companies to various financial risks. In other words, the financial models allows companies to predict financial failure before it occurs.

### Results Related to the Second Question

Q.2. Can the financial failure of the companies being liquidized be predicted through financial analysis models?

The regression was conducted in order to find if the financial failure of the companies being liquidized can be predicted through financial analysis models as shown in table (3):

Table (3): The Results of Regression

	Sum of Squares	df	Mean Square	F	Sig
Regression	244.037	5	48.807	8615967.041	0.000(a)
Residual	.000	9	.000		
Total	244.037	14			

The mean value of F test is (8615967.0). The significance value is (0.000) at the statistical significance level of ( $\alpha \leq 0.05$ ). The results indicate that the financial failure of the companies being liquidated can be predicted through financial analysis models. Those results indicate that the financial failure of companies being liquidated can be predicted through using financial analysis models.

### Conclusion:

Based on the results, there are clear indicators that can be measured to predict the financial failure of companies through using the financial analysis models. Such models are based on analyzing the financial indicators and ratios of the targeted companies. That shall contribute to reducing the financial risks that the targeted companies are exposed to.

### Recommendations:

The researcher of the present study recommends

- Obliging public joint-stock companies to measure the indicators of financial failure in a regular manner to avoid financial losses
- Conducting studies about the effectiveness of other models in detecting financial failure

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