Predict Financial Failure

Predicting the strength or weakness of an enterprise, and predicting its potential failure may require the use of certain financial ratios, these are representative of performance factors. The results of these ratios are then measured in the knowledge of the performance of the entity. The scientific literature presents the existence of many predictive models of the financial failure of the enterprises.

التنبؤ بالفشل المالي : أن التنبؤ بقوة أو ضعف المنشأة ، والتنبؤ باحتمال فشلها يستلزم بالضرورة استخدام بعض النسب المالية . تمثل عوامل مميزة للأداء ، ليتم بعد ذلك قياس نتائج هذه النسب في معرفة أداء المنشأة ، وتعرض المراجع العلمية وجود العديد من النماذج التنبؤية للفشل المالي لمنشآت الأعمال.

The most common analytical models used to support the financial failure of a business is:

1. (Altman and Mccovgh) Z-Score Model (1974)
2. (Kida) Z-Score Model 1984
3. (Sherrod) Z-Score Model 1987

Altman and Mccovgh Model (1974)

Altman is the first to use multivariate analysis to predict business failure problems. He has collected more than one variable to achieve this goal. In a comparison of 33 failed companies and 33 successful companies in the same activity, an equation known as z- score.

يعد Altman أول من استخدام التحليل متعدد المتغيرات، لأجل التنبؤ بمشكلات الفشل لمنشآت الأعمال، إذ قام بجمع أكثر من متغير لتحقيق هذه الغاية ومن خلال الدراسة المقارنة بين 33 شركة ناجحة من النشاط و 33 شركة فاشلة ، توصل الى معادلة تعرف باسم(Z- Score)ويعد من اكثر النماذج شيوعا في التنبؤ بالفشل المالي لمنشئات الأعمال

Variables	Financial Ratio	Nature Ratio	Relative Weight
X1	Ratio of net working capital to total assets	Activity ratio	0.012
X2	Ratio of reserves and retained earnings to total assets.	Profitability Ratio	0.014
X3	Ratio of net profit before interest and tax to total assets	Profitability Ratio	0.033
X4	Ratio of market value of capital to book value of debt (liabilities)	Financial Leverage	0.006
X5	ratio of net sales to total assets	Activity ratio	0.0999

expressed mathematically by the following formula:

Z = 0.012X1 + 0.014X2 + 0.033X3 + 0.006X4 + 0.010X5

The ratios used in the model are: X1 = Net working capital / total assets. X2 = Retained Earnings / Total Assets, X3 = EBITDA / total assets, X4 = Market value of equity / total liabilities, X5 = Sales / Total Assets

Z = Continuity Guide

According to this model, companies are classified into three categories in terms of failure or success in continuity of work and these categories are:

1. Successful companies should have a value of (Z) in them (2,99) and more.
2. Companies whose existence and probability of bankruptcy are doubtful are limited to (Z) between (1,81) and (2,99).
3. Failed Companies The value of (Z) is less than (1,81).

This model is a good example of a financial failure study, which proved its ability to predict the detection of financial failure two years earlier.

وبموجب هذا النموذج فان الشركات تصنف إلى ثلاث فئات من حيث فشلها او نجاحها في الاستمرارية بالعمل وهي :-

1) الشركات الناجحة يتعين ان تكون قيمة Z فيها فاكثر.2,99

2) الشركات المشكوك في إمكانية استمراريتها واحتمال إفلاسها تنحصر قيمة (Z) بين (1,81) و(2,99)

3) الشركات الفاشلة تكون قيمة (Z)اقل من (1,81)

ويعد هذا النموذج من النماذج الجيدة لإجراء دراسة الفشل المالي، حيث اثبت قدرته على التنبؤ باكتشاف الفشل المالي بدرجة عالية قبل سنتين من وقوعه.

Example : The following is the financial data extracted from the books of a business entity: Total assets 1,600 , Total Liabilities 600 , Retained earnings , 300 , Net operating profit 350 , Stock Market Value 700 , Current assets 800 , Current Liabilities 500 , Sales 1,200

Required: prepare an analytical study of these data by using the (Altman and Mccovgh) Z-Score Model to determine the extent of the entity's ability to continue.

Z = 0.012 (300/1600) + 0.014 (300/1600) +0.033 (350/1600) +0.006 (700/600) +0.010 (1200/1600)

0.027 = 0.002 + 0.003 + 0.007 + 0.007 + 0.008

Comparing the results of the example with the indicators of the three categories mentioned above, we find that the probability of failure of this company is certain since the value of Z is (0.027) much lower than (1.81).

وبمقارنة نتائج المثال بمؤشرات الفئات الثلاث المشار إليها اعلاه نجد أن احتمال الفشل لهذه المنشاة مؤكد حيث أن قيمة (Z) هي (1.81) أقل بكثير من (0.027)

Kida Model (1984):

This model is also based on five main financial ratios

Variables	Financial Ratio	Nature Ratio	Relative Weight
X1	Net Profit after Tax / Total Assets	Profitability Ratio	1.042
X2	Equity / total assets Leverage rate	Leverage rate	0.420
X3	Current Assets / Current Liabilities	Liquidity Ratio	0.461
X4	Sales / Total assets	Activity ratio	0.463
X5	Assets Cash / Total Assets	Activity ratio	0.271

The equation of this mathematical model is as follows:

Z = 1.042X1 + 0.42X2 - 0.461X3 - 0.463X4 + 0.271X5

The probability of failure is high according to this model when the value of (Z) is negative, but if the value of Z is positive, the firm is safe. That is, according to this model, the probability of failure of the companies increases as the value of (Z) negative, but if the result is positive, the company's potential to continue to work without financial failure.

تعد احتمالات الفشل مرتفعة حسب هذا النموذج عندما تكون قيم Z سالبة اما اذا كانت قيمة Z إيجابية فتكون المنشأة في أمان . أي أن وفق هذا النموذج فان احتمالات الفشل التي تتعرض لها الشركات تزداد كلما ظهرت قيمة(Z) أما اذا ظهرت النتيجة موجبة فان إمكانيات الشركة جيدة في الاستمرار بالعمل دون تعرضها للفشل المالي .

Example : The following balances appeared in the records of an industrial company:

Total Assets 3000 , Total liabilities 1800 , Sales 4000 , Cash Assets 800 , Current Liabilities 1200 , Shareholders' Equity 2000 , Net profit after tax 150 .

Required: prepare an analytical study of these data by using the KIDA model to determine the extent of the entity's ability to continue.

Solution:

Z = 1.042 (150/3000) +0.42 (2000/1800) -0.461 (800/1200) -0.463 (4000/3000) +0.271 (800/3000)

Z = 0.052 + 0.466-0.307-0.617 + 0.072 Z = (0.334)

According to this model, we find that the firm of subject of the study is under the probability of a high failure, this is because the value of (Z) was negative (0.334).

وبموجب هذا النموذج نجد أن المنشأة موضوع الدراسة تقع تحت احتمالات فشل مرتفعة وذلك لان قيمة (Z) ظهرت سالبة بمقدار (0.334)