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Predicting the Business failure of companies (A case study of a Lebanese company)

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Abstract:

This study aimed to know the current situation companies in Lebanon and the extent of their ability of applying financial failure models in order to take the appropriate decisions to reduce the risks of business failure and bankruptcy in the future.

The financial data for the years 2017-2018 was studied for a Lebanese company, the study applied four models (The Kida Model, Sherrod's form, Tishow and Taffler Model, ALTAMAN Model) used to measuring business failure, and conclusion was:

- The most of the Lebanese companies operating in the Lebanese market are family business and do not use the measurement of business failure to predict any business risk .
- The four models to detect the business failure can be applied in Lebanon.
- Applying these models by the Lebanese companies contributes in advance to detect the business failure.
- Early detection of business failure helps management take appropriate action to reduce these risks.

Finally, the study listed a number of recommendations that if applied would contribute to reducing the risk of business failure in the future and help the company in Lebanon in going concern.

Keywords: Future Prospect, the companies, Business Failure, Continuity.



المخلص

هدفت هذه الدراسة إلى معرفة الوضع الحالي للشركات في لبنان ومدى قدرتها على تطبيق نماذج الفشل المالي من أجل اتخاذ القرارات المناسبة للحد من مخاطر فشل الأعمال والإفلاس في المستقبل. تمت دراسة البيانات المالية للسنوات 2017-2018 لصالح شركة لبنانية ، وطبقت الدراسة النماذج الأربعة (نموذج كيدا ، نموذج شيروود ، نموذج تيشو وتافلر ، نموذج التمان) المستخدمة لقياس فشل الأعمال ، ووصلت الدراسة إلى النتائج التالية:

- بدراسة هذه الحالة نظهر ان معظم المشاريع الاقتصادية في القطاع الخاص هي شركات عائلية ولا تستخدم مقياس الفشل المالي مقدما لتحديد مخاطر العمل.
- القدرة على قياس مخاطر فشل الشركات في لبنان حسب النماذج الأربعة.
- تطبيق هذه النماذج على الشركات في لبنان يساهم بشكل مسبق في كشف فشل الأعمال.
- يساعد الاكتشاف المبكر لفشل الأعمال الإدارة في الشركات في لبنان على اتخاذ الإجراءات المناسبة للحد من هذه المخاطر.

أخيرًا ، أدرجت الدراسة عددًا من التوصيات التي إذا طبقت ستساهم في تقليل مخاطر فشل الأعمال في المستقبل وتساعد الشركة في لبنان على الاستمرار.

الكلمات المفتاحية: أفاق المستقبل ، الشركات ، فشل الاعمال ، الاستمرارية.

Introduction

The research develop the method used by Lebanese companies to detect the business failure, and explain different types of companies operating in Lebanon.

It also defines the business failure, causes, stages, components, and the model used in detecting and predicting financial failure.

In addition, it presents the outputs of the accounting system for these companies and the financial statements (income statement, balance sheet, cash flow statement and notes to financial statements) .

The research focused on a practical case study highlighting the rules used for measuring forecasting financial failure the indicators and results that clarify reading and understanding these indicators to contribute to administrative decision-making.

Objective of the study:

The aims of this study are the following:

- The definition and characteristics of companies, the legal framework and theoretical organization.
- The presentation of the financial statements
- The rules of prediction business failure in Lebanese companies and the obstacles in applying it.

Problematic the study:

Why does business failure happen and how to mitigate it?

The problematic of the study leads to the following sub-questions:

1. Are Lebanese companies using the tools of detecting business failure?
2. Does pre-detection of the business failure will help Lebanese companies mitigating it in-order to continue as going concern?
3. Does pre-detection financial failure help in making appropriate management decisions?

Hypnotizes study

H1-Lebanese companies are not using tools to pre-detect business failure.

H2- The pre-detection of the business failure will not help Lebanese companies in mitigating it in-order to continue it's going concern.

H3- The pre-detection business failure will not help in making appropriate management decisions.

The methodology of the study

A descriptive approach is adopted by using books, journals and previous studies as a first part. Thus, the second part will be a case study of a Lebanese companies by applying the four models in order to pre-detect the business failure in the appropriate decision to be taken in order to continue as a going concern.

Contents of the study

An introduction presenting the importance, the purpose and the problematic of this research, then two descriptive parts as per the below:

- First theoretical part that presents the general overview of the Lebanese companies, the definition of the concept of business failure and model for measuring business failure.
- The Second part related to field study, an explanation of the methodology used in this study to detect the business failure of a Lebanese companies. A quantitative analysis of the financial statements, and the pre-detection of the financial failure its.
- Conclusions and recommendations of this study.

Part One: Theoretical Part

This part deals with the definition companies and the concept of financial failure analysis as follows:

1.1 Types of business.

The company is an organization that deploys factors of production to manufacture products or services. It is also an economic entity looking for profit and growth. It can also be a legal entity known to the public by name. The legal structure of a company is the adoption, by the owner or owners, of the assets that can generate future economic benefits in order to generate future income and cash flow for the company. Thus, the legal structure determines the distribution of powers in the company and the relationships with all parties.

a. Partnerships:

Partnership is companies their characteristics are:

- Partnerships are formed of two or more people.
- The partners receive by exchanging their contributions, shares that cannot be transferred.
- The partners are personally liable for the company's debts and obligations.
- No required capital is requested by law

Partnerships are distinguished by general partnerships and limited partnerships.

b. Joint stock companies (S.A.L):

- A joint stock company is formed by at least three persons.
- It should have a minimum authorized capital of 30 million
- The shares in the company entitles the shareholder to membership in the company, a right to participate in management and a right to vote.
- Shares are negotiable or transferable.
- The liability of each shareholder is strictly limited to the value of the shares held.

c. The limited liability company (S.A.R.L).

The limited liability company is a type of intermediary between capital companies and partnerships. Three or more persons can constitute it and receive non-negotiable shares which can only be transferred with the majority consent of the other partners. In this type of company, the partners bear the losses up to the level of their contributions.

d. Branch Offices

Foreign companies wishing to do business in Lebanon have the possibly of opening local branch or representative office.

To set up a branch office, the foreign company's Board of Directors must issue a proxy/power of attorney in favor of a person residing in Lebanon granting him the authority to register the company in Lebanon, to represent it and to sign documents and do all the necessary measures on its behalf.

1.2 Brief Definition of private sector companies

The private sector constitutes the sector in which private initiatives without any governmental intervention in a regulatory role.

The dictionary of economics and social sciences Claude Daniele Echaudemaison (2006) defines the private sector as being all companies whose capital is owned by natural persons, or private legal entities, as well as non-profit associations. The private sector is in opposition to the public sector over which the state exercises a decisive influence.

According to the OECD (2006), the private sector is not only made up of companies in the formal sector, but also of economic actors who consume, cultivate or produce goods and services.

The International Accounting Standard Board IASB defines private sector companies as an entity publicly accountable and publishes general purposes financial statements for external users.

An entity is considered publicly accountable if one of the following conditions is applied:

- The enterprise has debts or equity instruments traded on public market.
- The enterprise holds assets in a fiduciary capacity for a broad group of outsiders as one of its primary businesses.

A complete set of financial statements comprises:

- (a) A balance sheet;
- (b) An income statement;
- (c) A statement of changes in equity showing
- (d) A cash flow statement;
- (e) Notes, comprising a summary of significant accounting policies and other explanatory notes.

1.3 Current situation of the Private sector companies in Lebanon

The biggest threat for private sector is to define how to enter the market in a way to resist and growth. Using the right strategies, companies can prove develop their resources and competencies in order to lead the market. Large enterprises are facing difficulties in employing the right talented people in order to work with, while SME's are facing challenges in attracting financial resources and brand equities.

1.4The Private sector companies and Lebanese market

As per Mr. Jhonny Matta, head of market researcher at ministry of trade and economy, Small and Medium entities represents 95 % and big companies big 5 % of the total economy market in Lebanon. Thus, 50 % of Lebanese working population is employed in an SME's. and other 50 % in big companies the Besides, 60 % of worldwide enterprises are classified under SME section and 40 % of the Gross Domestic Product GDP is affected by SME's operation, thus the other Product GDP for the big companies.



Lebanon has fertile lands and benefits from a moderate climate and abundant water resources. However, the agricultural sector is underdeveloped, only contributes 5.3% of the GDP, and employs 13% of the workforce (World Bank, 2019). Key agricultural products include fruits (mainly apples, oranges, bananas and grapes, but also significantly olives) which account for around 30% of total agricultural production, and vegetables (such as potatoes, tomatoes and maize) which account for more than 60% of total production.

And industry accounts for 12.8% of GDP and employs 22% of the workforce. It is dominated by the manufacturing of agricultural products, metals, minerals, furniture and other manufactured goods. There are over 4,700 industrial firms in Lebanon with 26% industries manufacturing agri-food products, followed by construction materials (12%) and chemical products (8%).

and services are the dominant sector of Lebanese economy, representing 75.9% of the country's GDP and employing slightly less than two-thirds of the workforce (64%).

The banking sector was traditionally the mainstay of the economy, but it is going through a major crisis, the country facing an imminent risk of default. Banking activity, even when it was sustained and lucrative, did not constitute real support for the private sector since most of the liquidity coming from banks is used to finance public debt. Tourism accounts for almost 20% of GDP and employs around 18% of the active population.

The sector currently suffers from the serious economic and political crisis that the country is going through.

However, the country is undergoing one of its worst political and economic crisis. A study by InfoPro Research, a local economics consultancy based in Beirut, found that one fifth of companies have ceased or suspended their operations since the beginning of 2019, half of which have shut down in the first five months of 2020.

At the end of 2019 Lebanon is facing compounded crises starting by an economic and financial crisis, followed by COVID-19 pandemics, and lastly the explosion at the Port of Beirut.

Now In the immediate term, Lebanon needs to adopt and implement a credible, comprehensive, and coordinated macro-financial stability strategy, within a medium-term macro-fiscal framework.

This strategy would be based on:

- A debt restructuring program aimed at achieving debt sustainability over the medium-term;
- A comprehensive restructuring of the financial sector toward regaining the solvency of the banking sector;
- A new monetary policy framework aimed at regaining confidence in the exchange rate and its stability;
- A phased fiscal adjustment aimed at regaining confidence in fiscal policy;
- Growth enhancing reforms;
- Enhanced social protection.

2. Business failure

2.1. Definitions of business Failure

The issue of business failure is considered one of the sensitive topics that arouse the interest of various researchers and shareholders, as well as commercial banks. No matter what is the reason of company's default, its impact remains on the company reputation in particular and on the economy as a whole in general? Researchers are define many terms such as faltering, insolvency, failure and bankruptcy, in order to reach an accurate definition that may describe the state of business failure in the company.

2.1.1. Bankruptcy:

Bankruptcy occurs when the corporation stops paying its obligations towards others on their maturity date, and afterwards a court ruling is issued by the competent court under which a liquidator is appointed to liquidate it, sell its assets and pay its obligations with the available financial means.

2.1.2 Financial hardship:

It is an expression of the situation in which the cash liquidity available to the institution is not sufficient to pay the obligations towards others. The financial hardship appears in two forms: a technical financial hardship and a real financial hardship.

A- Technical financial hardship:

It arises when the institution goes through a severe liquidity crisis related to generating positive cash flow from its activities as a result of its low profitability. Since the total assets it has exceeds the total claims, it has the opportunity to overcome this crisis without reaching the state of bankruptcy by selling its assets to cover the due and urgent liabilities, and certainly in this case it calls for the management to take effective measures to protect its future from the recurrence of such crises.

B - Real financial hardship:

The institution is close to the state of bankruptcy, as it is unable to pay its short-term as well as long-term obligations, in addition to being suffering from accumulating losses, which made its total assets less than its total liabilities, that is, even if it thinks about resorting to sell its assets to cover its obligations, this will not contribute to the treatment of financial hardship.

Technical insolvency may be temporary and “transient” meaning that the company can bypass it, although it is sometimes the main reason for declaring official bankruptcy.



2.1.3. Financial Delinquency:

Financial faltering is an imbalance that may affect the company at some stage of its growth or development, and it may happen for many reasons, it may be transient that the company can bypass it or it may lead it to the trap of falling into bankruptcy.

2.2. Forms of business failure:

The company A is facing a business failure that can lead to bankruptcy, many events has been taken into consideration by the Credit Administration, the most important are:

- The inability of paying liabilities on time
- Frequent request to postpone of instalments.
- Looking for new facilities in unjustified circumstances.
- The emergence of new creditors to the company that had not previously been disclosed to the bank.
- Bank employee are refusing the visit for the company management or the company site.
- The company is operating in a volatile market, and the non-stable macro economy effect negatively on the company's performance.
- Refusing providing company's bank with the necessary financial information requested by the bank from the company's management.
- Distribute profits for shareholders by creating a due to balances instead of paying the profit distribution by cash or bank transfer.
- Lack of disclosure and transparency in the financial statements issued by the company.
- Understatement of provision for doubtful debts.
- Low rate of return on invested funds.
- Pay interest on medium-term loans by borrowing new short-term loans or banks overdrafts accounts.

We believe that there are some non-financial difficulties that may face small and medium-sized companies, which may lead to their stumbling, requiring immediate follow-up and treatment in order to avoid difficult financial problems, as:

- Difficulty of distribution of final products or a decrease in the company's marketing share, whether because the consumer has stopped ordering the company's products
- Decrease in the company's production capacity due to of low productivity of workers due to the high turnover
- Increase in tension between workers and bosses because they do not have the same income, especially, in addition to increase the rate manifestation or refuse of work in the company.
- Reduced inventory turnover of goods held for sale and an increase in their quantity and storage period.

2.3. Causes of business failure:

The causes of business failure can be classified into internal reasons and external reasons, in addition to other factors.

2.3.1. Internal causes:

1- Technical reasons:

Represented in the use of inappropriate technology, in addition to the use of low quality of raw materials that, which lead to affect the quality of product that have a direct impact on the sales process.

2- Administrative reasons:

It is one of the common factor for the business failure, as the administration is unable to provide adequate support to the employees, especially if they are highly qualified and have excellent skills, and they find it difficult to complete their work without the support of the administration.

3- Marketing reasons:

The small size of the local market or a high competitive market without having any diversification from the competitors.

The strong competition that uncontrolled by the company.

High material prices.

The lack of a strong marketing plan or miss using the marketing plan.

The failure to estimate sales and expected profits.

4- Financial reasons:

The lack of liquidity and especially long term ratios, means the defect in the financing structure of the company. This leads to the accumulation of its debts that will negatively affects the results of business and the conclude the major financial problems with a loss of cash liquidity and inability to fulfil trade debts.

2.3.2. External causes: It includes:

- The macro-economic conditions as hyperinflation or operation in a non-sable market.
- High recommendation by the legal authority that affect the compliance of the company with the legislation
- Competitive environment
- The unavailability of the necessary sources of financing to implement necessary expansion required by the company.

2.4. Business failure stages:

2.4.1. The incubation stage:

In this stage the company can easily mitigate this risk. The company didn't reach an advance stage of business failure but there may be many negative indicators on it that can be solved by the company's management, such as high indirect costs, increased competition, lack of credit facilities provided by bank and financial institution.

2.4.2. The cash deficit stage:

During this stage, the enterprise suffers from its inability to meet its current and urgent obligations. Noting that the company's assets are highest of its liabilities, as the difficulty in converting those assets into cash liquidity to cover debts in addition to the fact that a big part of the working capital is composed of inventory and debtors. This phase can last from one day to several months, and in order to solve this problem, the company will try to have short term borrowing to meet immediate cash needs.

2.4.3. The financial insolvency stage:

This stage is limited to the company's inability to obtain the funds necessary to cover its due debts. This stage can be solved with a long period of time. Most of the companies succeed in skipping this stage, by having a good negotiation with debtor and having in counterparty of a good rescheduling payment terms.

2.4.4. The Total Failure Stage:

It is a critical stage in the life of the company, when the company cannot ignore the failure anymore, and all management attempts to obtain the necessary financing have ended, the business failure and bankruptcy after it will be achieved through legal steps.

2.5. Models of Measuring Business Failure

For more accuracy in forecasting the financial position of companies in terms of their ability to continue as a going concern or to liquidate. These indicators have created mathematical uses or regression analyses to develop the financial position and analyse performance in the near future in the time of these models:

2.5.1. Kida Model:

It is one of the quantitative models in predicting financial failure. It was established in 1980. It is based on five Mali indicators. The formula is as follows:



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

X1: Net profit after interest and taxes / total assets (The higher this indicator, the more the facility is considered good)

X2: Total Equity / Total Liabilities (The increase in this indicator is considered evidence of the firm's ability to fulfill its debts)

X3: liquidity Assets / Current Liabilities (An increase in this rate indicates the facility's ability to fulfil those obligations and vice versa.)

X4: Sales / Total Assets (It measures the efficiency of the entity's management in utilizing its assets to generate revenues)

X5: Cash / Total Assets (The increase in this rate is considered an indication of the availability of liquidity to meet financial obligations)

If the result of this model is positive, then the project will be in a state of safety from financial failure. The result was negative, because the project is threatened with financial failure, and this model proved its predictive ability a year before the event of bankruptcy. And that it depends on the financial indicators derived from the income and financial position lists.

2.5.2. Sherrod Form:

This model was established in 1987 and it is one of the important models and has two main goals:

- 1- Credit risk assessment: used by banks to assess credit risk when granting loans to company's
- 2- Business failure: it is used in order to know the extent of the facility's ability to conduct its activity in the future. The formula related to this form is as below:

$$Z = 17X1 + 9X2 + 3.5X3 + 20X4 + 1.5X5 + 0.1X6$$

X1: Net working capital / total assets

X2: Liquid Assets / Total Assets

X3: Total Shareholders' Equity / Total Assets

X4: Net Profit before Tax / Total Assets

X5 Total assets / total liabilities

X6: Total Shareholders' Equity / Total Fixed Assets



The conclusion will be according to the following:

The higher the Z -value, the lower the risk of financial failure and the lower the value the risk of financial failure is high

Weights for financial indicators

Type Indicator	Weight	Indicator
X ₁	17	Liquidity
X ₂	9	Liquidity
X ₃	3.5	Upload
X ₄	20	Profitability
X ₅	1.5	Upload
X ₆	0.1	Upload

The largest weight of the financial indicator is the liquidity index, because it is used to know the facility’s ability to pay off debts and its ability to continue in the activity.

Z Categories The degree of risk of exposure to financial failure is valuable:

Sherrod the degree of risk by model:

1-	The facility is not exposed to the risk of failure	$Z \geq 25$
2-	Low risk of failure	$Z \geq 20 \geq 25$
3-	The risk of failure is difficult to predict	$20 Z \geq 5 \leq$
4-	The facility is at risk of failure	$Z \geq 5 \geq - 5$
5-	The entity is exposed to a significant risk of failure	$Z < - 5$

2.5.3. Tishow and Taffler Form:

This model was applied in 1977 in the United Kingdom, it's a mathematical model that is capable of predicting the failure of British companies. This model was based on the method of linear analysis to compare between 46 industrial companies continued as a going concern and 46 companies declared bankrupt. The following formula was the conclusion of this model:

$$Z = 0.53X1 + 0.13X2 + 0.18X3 + 0.16X4$$

X1: Earnings before Taxes / Current Liabilities

X2: current assets / total liabilities

X3: Current Liabilities / Total Assets

X4: Self-financing period (liquid assets - current liabilities / expected daily operating expenses)

The conclusion of the company's ability to continue as a going concern will be based on the following:

- If the value of (Z) is equal or greater than (0.3), it is considered a successful company.
- If the value of (Z) is between (0.3 and 0.2), the risk-in starting company is considered.

If the value of (Z) is lower than (0.2) the company at risk of bankruptcy

2.5.4. ALTAMAN Model:

This model was created and defined by a professor of finance at New York University in 1968, also known as "five independent variables" and the form of the model is as follows:

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

As for the parameters (0.012 -0.014 -0.033 -0.006 -0.010), they represent the weights of the function variables and express the relative importance of each variable

X1 = Net capital / total assets "Activity Index"

X2 = Retained earnings / total assets "an indicator related to the management policy in dividend distribution"

X3 = Net Profit before Interest and Tax / Total Assets "Profitability Index"



$X4 = \text{Market Value of Shareholders' Equity} / \text{Total Liabilities}$ “Financial Leverage Index”

$X5 = \text{Sales} / \text{Total Assets}$ “Activity Index”

The study will rely on this model in preparing the analytical part of it. Noting that this model is the most conservative.

Z = the failure index by which to predict the failure or failure of the firm.

According to this model, the establishments are classified into three categories:

- If the value of Z is greater or equal to 2.99, the company is considered successful and viable
- If the value of Z is less than 1.81, the company is considered a failure due to its low performance
- If the value of Z is between 1.81 and 2.99, then it is difficult to determine the status of the establishment, and therefore it is subjected to a detailed study.
- If the value is less than 2.76, then this is an indication that the enterprise is facing a 90% probability of bankruptcy within a year.



Second part the filed study

The chapter introduces the measurement of the financial failure of the company, which is considered one of the most important tools that judge the success or failure of development plans and decisions. Therefore, this criterion was used as it would evaluate the health of its financial position.

1. History of the company:

The company was established as a Lebanese joint stock company, and it originated in Beirut. It was established in 1999 with a capital equivalent to 150,000,000 LBP. Distributed to 150,000 shares, distributed equally among 10 shareholders, the value of each share is 1000 LBP, and its aim is to import basic agricultural materials and distribute them to farmers in the Lebanese market.

2. The company's financial statements for year ended 2017-2018

Table n- 1 - Balance sheet as at 31 Dec. 2018 in thousand of LBP:

Assets	2017	2018	Liabilities and Equities	2017	2018
Cash	25,000	40,000	Accounts payable	300,000	290,000
Accounts Receivable	375,000	450,000	Other liabilities	150,000	200,000
Inventories	250,000	310,000	Current liabilities	450,000	490,000
Current assets	650,000	800,000	Loans and bonds	782,500	725,000
Investment	325,000	300,000	Total liabilities	1,232,500	1,215,000
Tangible fixed assets	1,900,000	2,000,000	Capital	150,000	150,000
Total – Depreciation	(800,000)	(960,000)	Reserves	550,000	550,000
Goodwill	25,000	25,000	Retained earnings	167,500	250,000



Fixed assets	1,450,000	1,365,000	Total Equities	867,500	950,000
	0	0	T. liabilities and Equities	2,100,000	2,165,000
Total assets	2,100,000	2,165,000	Total Equities	867,500	950,000
	0	0	Total Equities	0	0

Table n-2 - Income Statement for the year ended 31 Dec. 2018 in thousand of LBP.

Accounts	2017	2018
Net sales	1,350,000	1,700,000
Cost of goods sold	(850,000)	(1,000,000)
Gross profit	(500,000)	(700,000)
Administrative and selling expenses	150,000	225,000
Depreciation expenses	150,000	160,000
Total operating expenses	(300,000)	(385,000)
Ordinary profits	200,000	315,000
Financial revenues – interest	20,000	25,000
Financial expenses – interest	(46,950)	(50,000)
Other income	30,000	50,000
Profit before tax	203,050	340,000
Tax	(75,000)	(100,000)
Net profit	128,050	240,000

3. Quantitative models to measure a company's financial failure:

Quantitative Models to Predict the Failure of the Company in question (X): For more accuracy in predicting the future status of the company in terms of its ability to continue or liquidate, the study will rely on the application of known rules and principles on some models that help predict the failure of the company (X). Among the models that will be used are: (The Kida Model, Sherrod's form, Tishow and Taffler Model, ALTAMAN Model)



3-1: The Kida Model

The Kida model is one of the most important failure prediction models, especially because of the current financial and economic situation in Lebanon, and it is measured through the following equation:

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

- X1: Net profit after interest and taxes / total assets (The higher this indicator, the more the facility is considered good)
- X2: Total Equity / Total Liabilities (The increase in this indicator is considered evidence of the firm's ability to fulfill its debts)
- X3: liquidity Assets / Current Liabilities (An increase in this rate indicates the facility's ability to fulfil those obligations and vice versa.)
- X4: Sales / Total Assets (It measures the efficiency of the entity's management in utilizing its assets to generate revenues)
- X5: Cash / Total Assets (The increase in this rate is considered an indication of the availability of liquidity to meet financial obligation.

If the result of this model is positive, then the project will be in a state of safety from financial failure the result was negative, because the project is threatened with financial failure, and this model proved its predictive ability a year before the event of bankruptcy. And that it depends on the financial indicators derived from the income and financial position lists.



Table n-3 - Calculation of ratios for equations (X₁, X₂, X₃, X₄, X₅)

profit after interest and taxes / total assets Net	2017	2018
Net profit	128,050	240,000
total assets	2,100,000	2,165,000
The ratio = X1	0.06	0.11
Total Equity / Total Liabilities	2017	2018
Total Equity	867,500	950,000
Total Liabilities	1,232,500	1,215,000
The ratio = X2	0.70	0.78
liquidity Assets /Current Liabilities	2017	2018
liquidity Assets	400,000	490,000
Current Liabilities	450,000	490,000
The ratio = X3	0.888	1
Sales / Total Assets	2017	2018
Sales	1,350,000	1,700,000
Total Assets	2,100,000	2,165,000
The ratio = X4	0.642	0.785
Cash / Total Assets	2017	2018
Cash	25,000	40,000
Total Assets	2,100,000	2,165,000
The ratio = X5	0.011	0.018

$$Z_{2017} = 1.042 * 0.06 + 0.420 * 0.7 - 0.461 * 0.888 - 0.463 * 0.642 + 0.271 * 0.011 = -0.3471$$

- It is clear from the table's n-3 above, calculating the equation and analyzing the result for the year 2017, where it was negative at a value of **0.3471**, and this indicator indicates that the project is threatened with financial failure.



$$Z_{2018} = 1.042 * 0.11 + 0.420 * 0.78 - 0.461 * 1 - 0.463 * 0.785 + 0.271 * 0.018 = - 0.3774$$

- It is clear from table's n-3 above, calculating the equation and analyzing the result for the year 2018, where it was negative at a value **0.3774**, and this indicator indicates that the project is threatened with financial failure.

3-2: Sherrod Form:

This model was established in 1987 and it is one of the important models and has two main goals:

- 1- Credit risk assessment: used by banks to assess credit risk when granting loans to establishments
- 2- Financial failure: it is used in order to know the extent of the facility's ability to conduct its activity in the future. The formula for the form is as follows:

$$Z = 17X_1 + 9X_2 + 3.5X_3 + 20X_4 + 1.5X_5 + 0.1X_6$$

X1: Net working capital / total assets

X2: Liquid Assets / Total Assets

X3: Total Shareholders' Equity / Total Assets

X4: Net Profit before Tax / Total Assets

X5 Total assets / total liabilities

X6: Total Shareholders' Equity / Total Fixed Assets

If the indicator Z is as follows:

The higher the Z -value, the lower the risk of financial failure and the lower the value

The risk of financial failure is high

The largest weight of the financial indicator is the liquidity index, because it is used to know the facility's ability to pay off debts and its ability to continue in the activity



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Sherrod the degree of risk by model:

1-	The facility is not exposed to the risk of failure	$Z \geq 25$
2-	Low risk of failure	$Z \geq 20 \geq 25$
3-	The risk of failure is difficult to predict	$Z 20 \geq 5 \leq$
4-	The facility is at risk of failure	$Z \geq 5 \geq - 5$
5-	The entity is exposed to a significant risk of failure	$Z < - 5$



Table n-4 - Calculation of ratios for equations (X₁, X₂, X₃, X₄, X₅, X₆)

Net working capital / total assets	2,017	2,018
	- 450000	800000 - 490000
Net Working Capital	= 650000	=
	200,000	310,000
total asset	2,100,000	2,165,000
X1 = The ratio	0.09524	0.143187
Total Assets / Liquid Assets	2,017	2,018
Liquid Assets	400,000	490,000
total asset	2,100,000	2,165,000
X2 = The ratio	0.1905	0.2263
Total Shareholders 'Equity / Total Asset	2,017	2,018
Total Shareholders 'Equity	867,500	950,000
total asset	2,100,000	2,165,000
X3 = The ratio	0.413	0.439
Net Profit before Tax / Total Assets	2,017	2,018
Net Profit before Tax	203,050	340,000
total asset	2,100,000	2,165,000
X4 = The ratio	0.0967	0.15704
Total assets / total liabilities	2,017	2,018
Total assets	2,100,000	2,165,000
total liabilities	1,232,500	1,215,000
X5 = The ratio	1.704	1.782
Total Shareholders 'Equity / Total Fixed Assets	2,017	2,018
Total Shareholders 'Equity	867,500	950,000
Total Fixed Assets	1,450,000	1,365,000
X6 = The ratio	0.598	0.696

$$Z_{2017} = 17 * 0.09524 + 9 * 0.1905 + 3.5 * 0.413 + 20 * 0.0967 + 1.5 * 1.704 + 0.1 * 0.598 = 9.33$$

It is noted that the result of the evaluation of the possibility of the company in year 2017 falling into financial failure in the medium and long term according to the Sherrod model gave a result of $Z = 9.33$ and this result falls within The third category, $Z \geq 5$, and this could indicate that The risk of failure is difficult to predict It is a gray area.

$$Z_{2018} = 17*0.143187 + 9*0.2263 + 3.5*0.439 + 20*0.15704 + 1.5*1.782 + 0.1*0.696 = 11.89$$

It is noted that the result of the evaluation of the possibility of the company year 2018 falling into financial failure in the medium and long term according to the Sherrod model gave a result of $Z = 11.89$ and this result falls within The third category, $Z \geq 5$, and this could indicate that The risk of failure is difficult to predict It is a gray area.

The contradiction in the results is noted in the failure measurement indicator between the Keda model and the Sherrod model, and we see that the Kida model is more accurate, because tracking the financial position of the company during the years 2019 and 2020, we find the company that it has already suffered from a difficult financial situation that will lead to its suspension if the administration does not intervene and works to increase the capital.

Although the result was gray.

3-3: Tishow and Taffler Form

This model relied on the method of discriminatory multivariate linear analysis to distinguish between 46 industrial companies continuing to operate and 46 companies declared bankrupt. The following variables were arrived at:

$$Z = 0.53X_1 + 0.13X_2 + 0.18X_3 + 0.16X_4$$

X1: Earnings before Taxes / Current Liabilities

X2: current assets / total liabilities

X3: Current Liabilities / Total Assets

X4: Self-financing period (liquid assets - current liabilities / expected daily operating expenses)

If the indicator Z is as follows:

- If the value of (Z) is (0.3) or more, it is considered a successful company.
- If the value of (Z) is between (0.3 and 0.2), the risk-in starting company is considered.
- If the value of (Z) is (0.2) or less then it is a company at risk of bankruptcy

Table n-5 - Calculation of ratios for equations (X₁, X₂, X₃, X₄)

Earnings before Taxes / Current Liabilities	2017	2018
Earnings before Taxes	203,050	340,000
Current Liabilities	450,000	490,000
X1 = The ratio	0.451	0.693
current assets / total liabilities	2017	2018
current assets	650,000	800,000
Total liability	1,232,500	1,215,000
X2 = The ratio	0.53	0.66
Current Liabilities / Total Assets	2017	2018
Current Liabilities	450,000	490,000
Total Assets	2,100,000	2,165,000
X3 = The ratio	0.214	0.226
Self-financing period = (liquid assets - current liabilities / expected daily operating expenses)	2017	2018
liquid assets - current liabilities	-50,000	0
expected daily operating expenses	5,000	6,500
X4 = The ratio	- 10	0

$$Z_{2017} = 0.53*0.451 + 0.13*0.53 + 0.18*0.214 + 0.16*-10 = - 1.25$$

The index in 2017 indicates - 1.25, which is less than 0.3 that the company is exposed to the risk of financial failure, and this is what was shown previously with the Keda index.

$$Z_{2018} = 0.53 \times 0.693 + 0.13 \times 0.66 + 0.18 \times 0.226 + 0.16 \times 0 = 0.49$$

The index for 2018 indicates 0.49, which is greater than 0.3 and not between .03 and .02, that the company is exposed to severe fluctuations, which is an inappropriate indicator because it is outside the scale.

We see the Tishow and Taffler Form model gave results close to the Keda model, and therefore the company is exposed to the risks of financial failure despite the high value of index year 2018 and its high value about the standard.

3-4: ALTAMAN Model:

Also known as "five independent variables and the form of the model is as follows:

$$Z = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.010 X_5$$

X1 = Net capital / total assets "activity indicator"

X2 = balance of retained earnings / total assets "an indicator related to the management policy in dividend distribution"

X3 = Net Profit before Interest and Tax / Total Assets "Profitability Index"

X4 = Market Value of Shareholders' Equity / Total Liabilities "Financial Leverage Index"

X5 = Sales / Total Assets "Activity Index"

Z = the failure index by which to predict the failure or failure of the firm. According to this model, the establishments are classified into three categories:

- If the value of Z1 is greater or equal to 2.99, the company is considered successful and viable
- If the value of (Z2) is less than 1.81, the company is considered a failure due to its low performance
- If the value of (Z3) is greater than 1.81 and less than 2.99, then it is difficult to determine the status of the establishment, and therefore it is subjected to a detailed study.
- If the value is less than 2.76, then this is an indication that the enterprise is facing a 90% probability of bankruptcy within a year.



Table n-6 - Calculation of ratios for equations (X₁, X₂, X₃, X₄, X₅)

Net working capital / total assets	2017	2018
Net working capital	200,000	310,000
total asset	2,100,000	2,165,000
X1 = The ratio	0.095	0.143
balance of retained earnings / total assets	2,017	2,018
balance of retained earnings	167,500	250,000
total asset	2,100,000	2,165,000
X2 = The ratio	0.08	0.12
Net Profit before Interest and Tax / Total Assets	2,017	2,018
Net Profit before Interest and Tax	250,000	390,000
total asset	2,100,000	2,165,000
X3 = The ratio	0.12	0.18
Market Value of Shareholders' Equity / Total Liabilities	2,017	2,018
Market Value of Shareholders' Equity	150,000	150,000
Total Liabilities	2,100,000	2,165,000
X4 = The ratio	0.071	0.069
Sales / Total Assets	2,017	2,018
Sales	1,350,000	1,700,000
Total Assets	2,100,000	2,165,000
X5 = The ratio	0.643	0.785

$$Z_{2017} = 0.012 * 0.095 + 0.014 * 0.08 + 0.033 * 0.12 + 0.006 * 0.071 + 0.010 * 0.643 = 0.013 * 100 = 1.3$$

Also, the ALTAMAN Model, all indicators indicate that the company in 2017 suffers from financial failure in the near future.

$$Z_{2018} = 0.012 * 0.143 + 0.014 * 0.12 + 0.033 * 0.18 + 0.006 * 0.069 + 0.010 * 0.785 = 0.0176 * 100 = 1.76$$

Also, the ALTAMAN Model, all its indicators indicate that the company in 2018 suffers from a financial failure in the near future.



As a result of analysing the results of the data from the four models, it was found that the results of the study hypotheses can be interpreted as follows:

1- Acceptance of the first hypothesis: There is not companies in Lebanon using tools to pre-detect financial failure, because it was found through the study of this case that the company does not use any of the four models as a measure for the prior detection of financial failure.

2 - Rejection of the second hypothesis: there is no prior detection of financial failure that will help companies in Lebanon to alleviate it in order to continue their work's it has been shown the existence of these models and any of them can be relied upon that may contribute in advance to the detection of financial failure.

3 - Rejecting the third hypothesis: there is no financial failure for prior detection that helps in taking appropriate management decisions. Because it was found there are measures of financial failure in advance that helps the administration to take appropriate management decisions in timely manner reduce these risks.

FINDINGS, Conclusions and recommendations:

A- Conclusions:

The following results:

1. By studying this case, we show that most of the economic projects in the private sector are family companies and do not use the measurement of financial failure in advance to determine business risks.
2. Through this study, how to measure the prediction of financial failure was identified, which is a necessary issue for companies because it helps to give a clear picture of the current and future financial conditions through which the management can predict the conditions of the company or institution, and dependence on models of forecasting financial failure from the data Financial available within the company, and it can measure, analyze and take all administrative decisions at appropriate times to avoid failure and to ensure the survival and continuity of units economic.
3. The results of this case were determined by the possibility of measuring the company's occurrence in the risks of financial distress in the short and medium term according to the four applied models, but the matter remains for it, the management must overcome these risks by changing its policy in collecting its debts towards others, improving the marketing policy and increasing capital to provide liquidity.
4. It was found through the study of this case that the companies in Lebanon does not use any of the four models as a measure for the prior detection of financial failure.
5. It has been shown the existence of these models the companies in Lebanon and any of them can be relied upon that may contribute in advance to the detection of financial failure.



6. It was found the study of this case there are measures of financial failure in advance that helps the administration in the companies in Lebanon to take appropriate management decisions in timely manner reduce these risks
7. It was found that failure does not mean that the company stops working, nor does it mean liquidating it.
8. It was found that Failure prediction models give early warnings before failure occurs so as to take appropriate decisions and actions.

B- Recommendations:

1. Focus and attention must be given to crises and problems, and to find indicators characterized by predictive power before their occurrence through the application of models to measure financial failure in companies in Lebanon.
2. When adopting the measurement of financial failure, the most accurate models must be used, which experiments have proven correct expectations, as is the KIDA model and the ALTAMAN model.
3. The need to develop models for forecasting financial failure and work to develop methods of financial analysis so that the institution can know the current situation and predict the future.
4. Seek to hold seminars and courses to develop the capabilities and train employees in companies in Lebanon to apply models of forecasting financial failure to educate and train them on how to use these methods and understand its indicators.



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