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THE IMPACT OF FINANCIAL ENGINEERING INNOVATIONS AND THEIR ROLE IN REDUCING THE FINANCIAL DISTRESS OF INDUSTRIAL COMPANIES

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Abstract:

The purpose this study to measure and analyze the impact of the relationship between indicators of financial engineering innovations in reducing financial distress and improving performance for a sample of companies listed on the Iraqi Stock Exchange, The research community represented in the industrial sector for companies listed in the Iraq Stock Exchange for a period of three years and for the period extending from (2019-2021), The researchers reached a number of conclusions, the most important of which are(Reliance on financial engineering indicators leads to a decrease in the occurrence of financial stumbling, as the increase in dependence on financial engineering indicators by one unit leads to a decrease in financial stumbling by (1.430) referred to by a coefficient (B). The researchers reached a number of recommendations, the most important of which are(We recommend the Iraqi Company for Engineering Works and the Iraqi Company for Carpets and Furniture to overcome the critical situation it is exposed to as a result of financial stumbling through developing performance and improving the quality of goods and services to gain customer satisfaction).

Keywords: Financial engineering, the financial distress , industrial companies

RESEARCH METHODOLOGY

Research problem:-

Most of the sectors, and the industrial sector of the companies registered in the Iraqi Stock Exchange in particular, suffer from a clear decline in the achievement of profits and returns, and this in turn contributed to the distress or failure of these companies, including their exposure to financial bankruptcy, through reviewing the financial statements of the companies represented by (a list of Income and budget), and to use innovative financial engineering indicators will reduce or limit companies' exposure to financial failure, and accordingly, the study problem can be formulated with the following questions:

- What is the impact of financial engineering indicators in reducing financial distress ?
- What is the impact of financial engineering on improving and developing the company's performance?
- Is there a relationship between indicators of financial engineering in reducing financial distress?

Research aims:-

This study aims to measure and analyze the impact of the relationship between indicators of financial engineering innovations in reducing financial distress and improving performance for a sample of companies listed on the Iraqi Stock Exchange, through:

1. Studying the concept of financial distress, its causes, stages and importance.
2. Studying the conceptual framework of financial engineering in terms of concept, objectives and derivatives of financial engineering.
3. Shed light on the relationship between financial innovation and financial engineering.
4. Conducting an applied study in a sample of Iraqi industrial companies listed in the Iraqi Stock Exchange, in order to test the study's hypotheses derived from research questions.

The importance of research:

The importance of the study in practice is that predicting the financial failure of industrial companies before it occurs serves as an early warning of the risk

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of distress ,through which it is possible to maintain the continuity of the activity of these industrial companies and their position in the market through the use of innovative indicators of financial engineering, whether by taking corrective measures Or preventive measures, and thus increases the confidence of current and prospective investors and creditors and improve the financial performance of those institutions.

The importance of this study also highlights the importance of indicators of financial engineering innovations, which are considered one of the measures of the quality of financial statements because of their significant impact in evaluating the financial position of the company by different parties of the users of the financial statements, and thus help to improve the investment decisions of the various parties that rely on the financial statements As an indicator for making various decisions.

Research hypotheses

The main research hypotheses are as follows; (The indicators of financial engineering contribute to reducing the occurrence of financial distress for Iraqi industrial companies by investing the resources available to them).

Research sample and duration

The research community represented in the industrial sector for companies listed in the Iraqi Stock Exchange for a period of three years and for the period extending from (2019-2021). As for the research sample, it consisted of three companies that met the conditions:

1. That the companies have disclosed and published their financial statements during the research period.
2. The company must be listed on the market before 2019.

The above conditions apply to the following companies:

1. The Iraqi Company for Carpets and Furniture.
2. Baghdad Company for Soft Drinks.
3. Iraqi

Research Methods

The researchers used two scientific research methodologies in this field. The first approach is represented in the inductive approach, which is based on watching the situation in the three research sample companies, studying and analyzing them through a list of the questionnaire 80 forms were distributed among the research sample companies, and by enriching the subject from an intellectual and theoretical point of view by relying on scientific sources from books, research and studies. As for the second approach, it is represented by the practical (experimental) approach that The analysis of the financial statements of the sample companies is based on the research and for the period from 2019 to 2021. Using the Altman Model, this model was developed in 1968, which measures the prediction of financial distress in order to develop a prediction about the continuity of the company. This model can be expressed by the following equation:

$$Z = 1.2\,x1 + 1.4\,x2 + 3.3x3 + .6\,x4 + 1.0\,x5$$

X1 = working capital ÷ total tangible assets.
X2 = Retained earnings ÷ Total tangible assets.
X3= Profit before interest and tax ÷ Total tangible assets.
X4= Market value of shareholders' equity ÷ Total liabilities.
X5=, net sales ÷ total tangible assets.

INTRODUCTION

The subject of financial engineering has aroused the interest of financial researchers on the diversification of their financial thought in order to gain this process, especially in light of the economic, financial and technological developments in light of the globalization that spread rapidly to transform from a large world into a small village, and as a result of the financial problems that companies suffer from financial problems represented by default and bankruptcy when Practicing its economic activity, so the indicators of financial engineering can draw the policy of future companies and their growth more, financial engineering returns to the art of formulating financial inputs in order to meet the needs of users of financial statements with regard to risk, maturity and return, and financial engineering was addressed from the point of view of financial management as being An expression to describe the analytical process designed to improve a company's financial operations.

More recently, previous studies and many parties, including accountants and financial analysts, as well as the government and investors, were interested in predicting financial failure, as Americans were interested before others in such studies, and this was encouraged by the American Institute of Certified

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Public Accountants (AICPA) and the SEC, in the wake of the major bankruptcy crisis that swept America after World War II and holding auditors responsible for the misinformation in the financial statements, and it is recognized that many parties do financial analysis in order to know the extent of the success of enterprises and predict their ability to achieve their economic goals and their ability to continue in the future, as the importance of this type of analysis has increased in the era The present, especially in the field of credit, within the framework of a feasibility study for projects that request access to loans and banking facilities, with the intention of staving off or reducing the risks of company. Or financial insolvency, as described for the stage that precedes the bankruptcy of the company , as used There are others to describe the company that suffers from accumulating losses for several years, to distinguish it from the state of inability to pay obligations, which is related to the concept of Campiness .

Concept and definition of financial distress:

Financial distress is expressed as that financial situation that is synonymous with real financial hardship, which is the inability of the institution to pay its due obligations in full, where the value of real assets is less than the value of liabilities. Thus, the institution has reached a state of serious financial turmoil, which makes it very close to the stages or levels of financial failure that can be graded to the level of declaring its bankruptcy, whether these disturbances mean its inability to pay its obligations to others, or the achievement of consecutive losses year after year. Which makes the institution obliged to stop its activity from time to time, and often financial stumbling occurs as a result of the two problems together, and thus we are facing a situation of real financial hardship. The financial failure of economic companies is one of the important topics that occupied the thought of researchers in the sciences of financial management, and some of them used the term default to denote the state of the company's bankruptcy, and others used it to describe a stage of temporary economic failure associated with difficult circumstances that make the company's management unable to fulfill its obligations. That stage in which the company has reached a state of financial turmoil, which makes it unable to pay its obligations towards creditors or makes it achieve successive losses year after year (Malikiyah, 122:2018), which is the company's suffering from a liquidity crisis that makes it unable to pay its obligations, enabling it to Paying its debts, and financial distress is not an immediate result, but rather a condition that precedes financial failure (Mohammed, 13:2016), as well as the company's inability to pay or delay in repaying debts, and thus it is expected that part of the loans will turn into doubtful loans. Or non-existent, or for any reason of financial insolvency (Abdali, 2015:23).

Causes and manifestations of financial distress:

Financial **distress** is the result of many reasons and factors, and these reasons can be divided into two parts, internal and external reasons, which are as follows:

1- Internal reasons: represented by the weakness of management and the absence of specialized administrative and technical elements. The inefficiency of operational and research and development policies and the conduct of unwanted expansions, and the failure to conduct an accurate and appropriate economic feasibility study for lending operations (Hamid, 2020: 216).

2- External causes: As for the external factors, they are represented by the economic and political conditions that surround the environment of the institution, as well as the dependency that will greatly affect the economic institution (Walid, 2016: 8).

And (Karim) considers one of the most important reasons that the company is exposed to in general, which leads to financial failure (Karim, 243: 2019), (Chieng, 2013: 67):-

1- Administrative reasons:- They are represented by (negligence on the part of workers when there is no supervision over them, lack of initiative and fear of taking responsibility).

2- Financial reasons:- They are represented by (low profits compared to similar economic units, unjustified rise in expenditures and expenses, and financial policy confusion in the field of finance and credit).

3- Technical reasons: represented by (the complexity of the procedures, the delay in completing the transactions, the deficit and the inefficiency in the use of modern technology.

4- Marketing reasons :- (Customers complained about poor service and dealing, and clearly behind market requirements).

(Al-Farra) believes that the manifestations of financial stumbling are (Al-Farra, 749:2017):-

-The increasing dependence on external sources of funding.

- Weak self-financing sources (internal).

-Maintaining a large stock of goods.

-The lack of soundness of fiscal policy.

-Inadequate working capital and transferring it to short-term financial sources.

- Increasing idle production capacity with the weak competitive position of the company in the market.

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-Increasing the burden of banking interest.

Types of financial distress:

The types of failure are as follows:

1- Economic **distress**: This kind of default does not result in announcing the institution's bankruptcy, even if the matter requires its liquidation and consequently its inability to continue. This matter is regardless of the institution's ability to pay its obligations (Gabriel, 79: 2020).) .

2- Legal **distress**: This type of default results in two manifestations, the first is technical hardship "which is represented by the institution's inability to pay its obligations of debts and interests on the due date despite the increase in the value of its assets over its liabilities, while the second is the real hardship" which is represented by not The ability of the institution to pay its due obligations with a decrease in the value of its assets than its liabilities (Jabal et al., 2009:306).

3- Administrative stumbling: Administrative stumbling occurs when the institution's management is ineffective and ineffective and fails to assess what may happen in the future, which leads the institution to negative business results that cause a decrease in its activity and profitability (Ammari, 2015: 46).

In the opinion of (Malaykiah) that there are three dimensions to the types of financial stumbling, represented by the following (Malaykiyah, 122: 2018):-

1- The economic dimension, which is represented in the mixing of the economic activity of the project, which is a major reason for the inability to meet the requirements of the market (customers).

2- The financial dimension: It is represented in the different cash flows resulting from the mismanagement of economic activity with the simultaneous inability to fulfill the financial obligations that it owes.

3- The time dimension: The financial default is that it is temporary or temporal and results in either bankruptcy or passing the stage of financial failure and resuming the activity again.

The importance of predicting financial distress:

Finding an analytical method or mechanism through which it is possible to predict the possibility that the institution will reach a state of financial insolvency before a sufficient number of years is necessary, in order to take corrective measures in a timely manner, given the serious effects of the institution's stumbling on the economy and on all working groups in it. And those associated with these institutions, such as creditors, investors, financial analysts, government agencies, and others. As the investor is interested in predicting financial failure in order to make his various investment decisions and compare between the available alternatives and avoid high-risk investments. While creditors and lenders are interested in predicting financial default for many reasons, including making a decision to grant credit or not, determining the interest rate and loan terms based on the size of the risk related to it, while the administration is interested in predicting financial default in order to take corrective measures in a timely manner to save the institution from danger Bankruptcy or liquidation, as for government agencies, they are interested in predicting financial failure in order to enable them to perform their supervisory function over the institutions operating in the economy, in order to ensure its safety (Al-Amr Kassiri, 2015: 134).

Perspectives on financial stumbling and ways to reduce it

There are many points of view regarding financial stumbling, and among these points are (Amin, 202:2022):-

1- A financial defect that affects the company resulting from the interaction of many factors over long periods of time.

2- The case in which it is confirmed that there is a high probability that the company will be unable to pay the debts' installments and interests.

3- The company's inability to fulfill its obligations despite the excess of its assets in its totality over its obligations in its entirety.

4- Failure to pay its obligations on the due date or for subsequent accounting periods.

There are many means that can be used to reduce the financial default of companies, but the optimal and correct use of these means requires a new study to find out the causes of default in order to choose the best to reduce the financial default, and the following presented the various means used in limiting the financial default (Soleimani, 28: 2016):-

1- Restructuring: It is represented by

A- Re-evaluation of the financial structure, which includes re-evaluating assets, restructuring the customer, exchanging debtors for ownership, increasing capital, increasing internal cash flows and reducing external cash flows.

b- Administrative restructuring, including (re-production strategies, marketing strategies, personnel policy studies, increasing sales, reducing various administrative costs, and studying the disposal of non-economic activities and areas).

2- Financial cleansing. 3- Merger and change of legal form. 4- Liquidation and sale. 5- Economic policy tools. 6- Strategic audit.

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Concept and definition of financial engineering

The term financial engineering is one of the modern concepts that entered the world of finance and investment. The owners of the financial industry differed in defining financial engineering, some of them generalized it to all financial branches and some of them allocated it to a branch of financial management or financial markets (Mohammed and Muhammad, 383: 2015), and the concept is limited to Financial engineering in that it generates new financial tools to meet the needs of investors or those seeking increased and renewable financing that traditional methods are unable to meet, so the concept of the term financial engineering appeared as a new concept in the world of finance, both scientific and academic, and it was circulated at the beginning of the seventies of the last century, and it is known as a group of Intellectual activities that contribute to designing work in a rational and practical way while ensuring the integration of the various organizations that help achieve it (Al-Araji and Taj Al-Din, 133: 2020), which is a set of mechanisms that carry out diagnostic, analysis, financial and technical design and conduct financial research with the aim of creating and developing new financial tools And the application of innovative processes and mathematical models in order to exploit opportunities and provide the necessary funding for liquidity and improve it (Abdullah and Karim, 189:2021), and it is known as the process of doing or Designing or developing financial instruments or creating new ones for the purpose of overcoming or overcoming financing problems through the following (Suminah, 144:2021):(Inventing new financial instruments, Innovating modern financing mechanisms, Creating new solutions, Developing existing tools and solutions into new tools and solutions).It can be defined as the process of designing, developing and implementing innovative financial tools, techniques and indicators in order to find ideal solutions to address the problems of financial insolvency or bankruptcy for companies. The most important characteristic of these tools are:

- It reduces unit costs within the company, whether administrative or production.
- Helps to face risks in new ways and new dimensions.
-Overcoming many influencing external factors such as changing the tax law and corporate laws.

Objectives of financial engineering

Financial engineering is the lifeblood of financial innovation and has many goals, the most important of which are (Abdul-Jabbar, 254: 2017):-

1- Renewing opportunities to increase profits and searching for new investment opportunities and tools that raise the level of profitability.
2- Reducing the amount of financial risk by developing a variety of extracted financial instruments that contribute to reducing exposure to risk.
3- Restructuring the cash flows for a better financial management that enables it to predict the future financial cash flow.
4- Reducing transaction costs through the possibility of entering into certain transactions and creating large-sized centers at a relatively low cost.
5- Improving the liquidity of the financial market in general and the dealers of financial engineering tools in particular by making way for dealing with a wide range of new tools.

The most important factors that contributed to the emergence of financial engineering

There are many factors that helped in the emergence of financial engineering, and among these factors are (Akkar, 212: 2012): -

1- The widening and multiplicity of investment tools available in the financial markets.
2- Finding risk management tools that enabled the redistribution of financial risks according to the preferences of investors.
3- Developing arbitration tools between markets, which helps improve costs and increase financial returns.
4- The multiplicity and diversity of investment strategies as a result of the multiplicity, diversity and renewal of investment tools.

Financial engineering products and their importance

Knowledge development and innovation are among the driving force tools for any company in order to raise its economic efficiency. Therefore, we must identify the most important successful steps that contribute to the development of financial engineering products through a correct understanding of the needs and requests of customers as a major factor with the presence of cooperation with other financial companies in order to establish a common ground To know the new financial derivatives that serve all parties, financial engineering products play an important role in activating the performance of the work of companies listed on the stock market, namely (Boumediene, 134: 2013): -

1- Securitization: Securitization was the main reason for the development of financial engineering technology, which is concerned with distributing real estate loans, which was dominating all useless

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transactions that led to crises and problems. one and presented to the public.

2- Financial Derivatives:- They are new and diverse investment tools and were named by this name because they are derived from traditional investment tools such as stocks and bonds, and they depend according to their nature and risks.

- Giving appropriate attention in allocating adequate resources towards managing risk control.
- Dealers in financial derivatives must have sufficient experience.
-View derivatives as high value financial instruments.
-Avoiding some of the factors affecting the misuse of financial derivatives, such as personal greed and political interference.

The importance of financial derivatives can be determined through the following points:

1- Managing the risks of investing in companies registered in the stock market, through financial derivatives, and new ways to manage risks can be invented.

2 - Increasing the volume of investment: - Derivatives enable the opportunities to generate revenue and increase revenues by increasing investment opportunities and diversifying the investment portfolios of companies.

3- Increasing the liquidity of companies registered in the stock market through the use of financial derivatives that enjoy high liquidity.

4- Providing investment opportunities for speculators for companies registered in the stock market.

5- The speed of implementation of investment strategies.

6- Supporting the efficiency of companies registered in the stock market.

The relationship of financial engineering to financial innovation

Financial engineering is a basic strategic measure for the implementation of financial innovation.

To know financial engineering, financial innovation must be understood, which has been credited with transforming the current global system, and innovation is unpredictable, meaning that innovation is not known otherwise to be called innovation, so attention should be directed towards the tools and techniques that It facilitates the process of innovation, and financial engineering can be described as follows (they are principles and strategies for developing innovative financial solutions because it is able with tools, methods and techniques to develop innovative tools and products (Abdullah and Karim, 191:2021), and (Al-Araji and Taj Al-Din) sees that financial innovation means the synergy of all The efforts made by the company to make use of new innovations to produce new products compatible with the changing environment, and financial innovations can be classified as follows (Chou & Chain, 2004: 10):-(1- Innovative tools to assist real activities. 2- Tools to help companies grow and expand. 3- Updating the services provided to customers by the company. 4- Updating profit-oriented tools and spreading investment and risk. 5- Activating the tools to refinance obligations or mobilize assets. 6- Creating doubtful debts). Therefore, financial innovation must contribute to improving the performance of companies' work through four approaches: achieving market perfection, reducing transaction costs, improving liquidity cost and reducing agency cost. Therefore, the relationship between financial engineering and financial innovation is only a means to implement innovation, as it represents An approach formulated in the form of a system or a set of ideas and principles, and this approach is used by companies that provide services to find better solutions to the financial problems facing their customers. Financial engineering to employ financial models and indicators, and then put them on the market in the form of financial tools, so the term financial engineering is principles and strategies for developing innovative financial solutions to solve financial problems and therefore it is related to the term financial innovation (Radwan, 83: 2013).

Practical side

This topic deals with the practical aspect of the research, through which the role of financial engineering will be clarified in addressing financial insolvency and analyzing the level of answers obtained from the members of the research sample to whom the questionnaire was distributed. :

Description of the research sample

Table (1) Sample Description

No.	Companies	Founding date	nominal capital	Capital at the date of listing	private sector ratio
1	Iraqi Engineering Works	1985	8million	240 million	%66.4
2	Baghdad for soft drinks	1989	70million	10 Millar	%85.37
3	Iraqi carpets and furnishings	1989	5million	500million	%90.7

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Table (2) Distribution of the research sample according to sex

Iraqi carpets and furnishings		Baghdad for soft drinks		Iraqi Engineering Works		Sex
No.	Ratio	No.	Ratio	No.	Ratio	
16	80%	27	77%	20	80%	Male
4	20%	8	23%	5	20 %	Female
20	100%	35	100%	25	100%	Total

Table (3) Distribution of the research sample according to age

Iraqi carpets and furnishings		Baghdad for soft drinks		Iraqi Engineering Works		
No.	Ratio	No.	Ratio	No.	Ratio	Age
3	%15	5	%14	6	%24	30-25
5	%25	14	%40	8	%32	40-35
8	%40	11	%32	6	%24	55-40
4	%20	5	%14	5	%20	60-55
20	%100	35	%100	25	%100	Total

Table (4) Distribution of the research sample according to the educational level

Iraqi carpets and furnishings		Baghdad for soft drinks		Iraqi Engineering Works		
No.	Ratio	No.	Ratio	No.	Ratio	Educational
2	%10	4	%11	-	%0	Secondary
6	%30	9	%26	5	%20	Diploma
12	%60	22	%63	20	%80	Bachelor
20	%100	35	%100	25	%100	Total

Table (5) Distribution of the research sample according to the administrative position

Iraqi carpets and furnishings		Baghdad for soft drinks		Iraqi Engineering Works		
No.	Ratio	No.	Ratio	No.	Ratio	Administrative work
2	%10	4	%11	5	%20	Administrative
5	%25	6	%17	3	%12	Auditor
2	%10	3	%9	2	%8	observer
8	%40	15	%20	10	%40	accountant
3	%15	7	%30	5	%20	Technical
20	%100	35	%100	25	%100	Total

Analysis of the response of the research sample individuals to the components of the questionnaire form

In order to reach the objectives of the research and test the hypothesis, the answers to the questionnaire submitted to the members of the research sample represented by the Iraqi industrial companies will be analyzed by dividing it into two axes represented by the following:

The first axis: analysis of the response of the individuals of the research sample to the components of financial engineering (the first side)

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Table (6) analysis of the response of the sample members to the first axis

components of financial engineering	Strongly agree	I agree	neutral	I do not agree	Strongly disagree	Arithmetic mean	standard deviation	response rate
Objectives	4.67	31.82	33.67	22.20	7.3	3.03	0.97	60.6
Organizational Structure	3.91	32.6	37.4	21.78	4.09	3.08	0.90	61.6
Leadership	5.50	25.34	40.16	22.88	5.88	3.01	0.93	60.2
organizational culture	7.17	31.53	35.79	21.07	4.09	3.16	0.93	63.2
The company's financial obstacles	5.63	33.73	40.53	16.95	2.95	3.21	0.88	64.2
General Average	5.37	31	37.51	20.97	4.86	3.09	0.92	61.8

It is noted from Table (6) above the analysis of the components of financial engineering, in which the answers of the sample members were reached through the distribution of the questionnaire, which showed that the percentage of agreement by (36%) agreed with strongly agreed (31 + 5.37) and the percentage (26%) was inconsistent. 20.97 + 4.86) and a ratio of (37.51%) is neutral and with an arithmetic mean (3.09), a standard deviation of (0.92) and a response rate of (61.8%), which means that the level of individuals' perception has reached the second level of the scale space, which is an indication of the importance of the components of financial engineering .

The second axis: analysis of the response of the research sample individuals to financial engineering (the second aspect)

Table (7) analysis of the response of the sample members to the second axis

financial engineering	Strongly agree	I agree	neutral	I do not agree	Strongly disagree	Arithmetic mean	standard deviation	response rate
information tide	4.61	29.39	41.73	20.5	3.4	11.3	0.76	62.2
financial growth	5.24	23.02	38.09	27.40	6.12	2.93	0.94	58.6
investment	5.12	28.61	36.26	24.33	4.43	3.04	0.94	60.8
Community Service	30.15	43.08	18.04	7.64	0.88	3.95	0.87	79
General Average	11.28	31.02	33.53	19.96	3.7	3.25	0.87	65

It is noted from table (7) above the analysis of the response of the sample members to the re-engineering axis, which was reached through the distribution of the questionnaire form, which showed that the percentage of agreement by (42.3%) agreed with strongly agreed with (11.28 + 31.02) and the percentage (23.66%) inconsistency (19.96 + 3.7) and a ratio of (33.53%) is neutral with a mean of (3.25), a standard deviation of (0.87), and a response rate of (65%), which means that the level of perception of individuals has reached the second level of the scale space, which is an indication of the importance of re-engineering In providing modern designs for the development of the company's management.

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Predicting the financial Distress of companies research sample

Table (9) Calculation of Financial Insolvency Research Sample

Iraqi carpets and furnishings			Baghdad for soft drinks			Iraqi Engineering Works			
2019	**2020**	**2021**	**2019**	**2020**	**2021**	**2019**	**2020**	**2021**	Indicators of financial distress
0.5	**0.5**	**0.49**	**0.97**	**0.26**	**0.31**	**0.25**	**0.32**	**0.17**	Net working capital ÷ total assets (X1)
0.04	**0.05**	**0.03**	**0.02**	**0.023**	**0.026**	**0.027**	**0.035**	**0.016**	Retained earnings ÷ total assets (X2)
0.03	**0.02**	**0.08**	**0.013**	**0.015**	**0.023**	**0.024**	**0.022**	**0.036**	Earnings before interest and taxes ÷ Total Assets (X3)
0.86	**0.86**	**0.92**	**1.47**	**1.02**	**0.41**	**0.2**	**0.27**	**0.31**	Market value of equity ÷ total liabilities (X4
0.037	**0.049**	**0.074**	**0.019**	**0.021**	**0.034**	**0.039**	**0.047**	**0.062**	Sales ÷ Total Assets (X5)

It is noted from Table (8) the calculation of the financial ratios of the transactions (Z) to measure the financial default based on the financial reports published for the Iraq Stock Exchange, as these ratios were calculated for the purpose of relying on them in extracting the financial default after multiplying them by the values of (X) and then collecting and comparing them with The specific criterion for the model (Altman 1993)

Iraqi carpets and furnishings			Baghdad for soft drinks			Iraqi Engineering Works			
2019	**2020**	**2021**	**2019**	**2020**	**2021**	**2019**	**2020**	**2021**	Indicators of financial distress
0.35	**0.35**	**0.35**	**0.69**	**0.18**	**0.22**	**0.179**	**0.22**	**0.121**	**0.717(X1)**
0.033	**0.042**	**0.025**	**0.016**	**0.019**	**0.022**	**0.022**	**0.029**	**0.013**	**0.847(X2)**
0.093	**0.062**	**0.24**	**0.040**	**0.046**	**0.071**	**0.074**	**0.068**	**0.111**	**3.107(X3)**
0.36	**0.36**	**0.38**	**0.61**	**0.42**	**0.172**	**0.084**	**0.11**	**0.130**	**0.420(X4)**
0.036	**0.048**	**0.073**	**0.018**	**0.020**	**0.033**	**0.038**	**0.046**	**0.061**	**0.998(X5)**
0.872	**0.862**	**1.068**	**1.374**	**0.685**	**0.518**	**0.397**	**0.473**	**0.436**	**Z**

It is noted from Table (9) that the Iraqi Company for Engineering Works and the Iraqi for Carpets and Furniture is in a critical position to face the financial stumbling as a result of the (Z) ratio in them was less than (1.23), i.e. within the area that is considered dangerous for the occurrence of financial default, as the value of (Z) Iraqi carpets and furnishings (0.872, 0.862, 1.068) for the years (2019-2020-2021) respectively, and the Iraqi Engineering Works Company had a value of (Z) (0.397, 0.473, 0.436) for the years (2019-2020-2021) respectively, either Al-Iraqiya for Engineering Works, it is located in the foggy area of the occurrence of financial default in the year (2019), as the value of (Z) in it reached (1.374), which is between (1.23 and 2.90), and in the year (2019 and 2020), the company is in danger of facing financial distress, as it reaches The value of (Z) in it is (0.685, 0.518), which is less than (1.23), which indicates that the three companies are in a dangerous position to face financial distress in the future despite the precaution that they exercised to confront it, and for the purpose of knowing the role played by the credit risk measurement process in predicting the risks of financial distress In the future, the results of the statistical analysis will be relied upon for the purpose of testing the research hypothesis

Table (10) data of the statistical program (spss)

Iraqi carpets and	Baghdad for soft drinks	Iraqi Engineering Works	

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furnishings									
2019	**2020**	**2021**	**2019**	**2020**	**2021**	**2019**	**2020**	**2021**	Indicators of financial distress financial Engineering
37.51	**31**	**5.37**	**4.86**	**3.09**	**20.97**	**61.8**	**5.37**	**0.92**	**First side**
33.53	**31.02**	**11.28**	**3.7**	**3.25**	**19.96**	**65**	**11.28**	**0.87**	**Second side**
1.068	**0.862**	**0.872**	**0.685**	**0.518**	**1.374**	**0.473**	**0.436**	**0.397**	**Z**

It is noted from Table (10) a summary of the results of the financial engineering measurement process according to the indicators of the questionnaire, and the measurement of the financial distress of the Iraqi industrial companies, the research sample, which will be relied upon for the purpose of conducting statistical analysis in the following table.

Table (11) Statistical analysis between research variables (first aspect of financial engineering and financial distress)

details	Statistical analysis indicators
Views	**9**
modulus (T)	**2.190**
modulus (F)	**0.235**
B	**0.352**
link size	**1.000**
Significance level sig	**0.043**

It is noticed from Table (11) that there is a direct, completely significant, and statistically significant correlation between the indicators of calculating the first aspect of financial engineering and the possibility of financial distress in Iraqi companies, as the value of the correlation reached (1,000) and at a level of significance (0.043), which is less than the significance level (5%) than Indicates the significance of the relationship, as the table indicates that there is an effect of financial engineering at a rate of one unit, which leads to a high incidence of financial distress of the company with a value of (0.352), referred to as a value of (B).

Table (12) Statistical analysis between research variables (the second aspect of financial engineering and financial distress)

details	Statistical analysis indicators
Views	**9**
modulus (T)	**6.277**
modulus (F)	**11.263**
B	**1.430**
link size	**0.785**
Significance level sig	**0.006**

It is noticed from Table (12) that there is a direct and significant correlation with a statistical significance between the indicators of financial engineering and the financial distress of the Iraqi industrial companies. Reliance on financial engineering indicators leads to a decrease in the occurrence of financial distress, as increasing reliance on financial engineering indicators by one unit leads to a decrease in financial stumbling by (1.430), referred to by a coefficient (B), and through table (11-12) the proof of the hypothesis is achieved The main research point that (financial engineering indicators contribute to reducing the occurrence of financial distress for Iraqi industrial companies by investing the resources available to them).

1- CONCLUSIONS

-Financial engineering is the process of designing, developing and implementing innovative financial tools, techniques and indicators in order to find ideal solutions to address the problems of financial insolvency or bankruptcy of companies.

- The Iraqi Company for Engineering Works and the Iraqi Company for Carpets and Furniture is in a critical position to face the financial stumble as a result of the (Z) ratio in them was less than (1.23), i.e. within the

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area that is considered dangerous for the occurrence of financial default. year (2019).
- There is an impact of financial engineering at a rate of one unit, which leads to a high incidence of financial default for companies with a value of (0.352), referred to as a value of (B).
- Reliance on financial engineering indicators leads to a decrease in the occurrence of financial stumbling, as the increase in dependence on financial engineering indicators by one unit leads to a decrease in financial stumbling by (1.430) referred to by a coefficient (B).
- The level of perception of individuals has reached the second level of the scale space, which is an indication of the importance of re-engineering in presenting modern designs for the development of the company's management in Table (7), as well as the level of perception of individuals has reached the second level of the scale space, which is an indicator of the importance of the components of financial engineering in Table (6).

2- RECOMMENDATIONS

- We recommend that all industrial sectors registered in the Iraqi Stock Exchange need to constantly search for innovative financial tools and indicators in order to increase sales and then increase profits and returns.
- We recommend the Iraqi Company for Engineering Works and the Iraqi Company for Carpets and Furniture to overcome the critical situation it is exposed to as a result of financial stumbling through developing performance and improving the quality of goods and services to gain customer satisfaction.
- The need for companies to hold continuous training courses for accountants and auditors in innovative financial analysis tools (financial engineering), especially in the field of predicting financial default, and to encourage workers to participate in those courses with the work of encouraging incentives for workers who prove their competence in how to use and apply financial distress models and engineering indicators Finance.
- Conducting more studies on the subject of predicting financial distress and innovative financial engineering tools, and applying those studies to other economic sectors such as the financial institutions sector and the services sector, in an effort to enhance and develop the results of this study.
-Establishment of analysis centers specialized in the financial aspects in order to assist dealers and investors in protecting their money from entering into investments that may eliminate this money and its loss.

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The first axis: components of financial engineering

a- (goals)

N0.	Questions	Totally agree	I agree	neutral	Don't totally agree	I don't agree
1	**Renewing opportunities to increase profits and searching for new investment opportunities and tools that raise the level of profitability**					
2	**Reducing the amount of financial**					

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	risk through the development of a variety of financial instruments extracted					
3	**Reducing transaction costs by entering into certain transactions and creating large-sized centers at a relatively low cost**					
4	**Improving the liquidity of the financial market in general and dealers from the tools of financial engineering in particular**					

b- Organizational Structure

N0.	**Questions**	**Totally agree**	**I agree**	**neutral**	**Don't totally agree**	**I don't agree**
1	**The employees of the company have the knowledge in the process of financial analysis.**					
2	**The company's financial analyst has experience using financial analysis tools to predict financial failure.**					
3	**The company gives its employees specialized courses in the field of financial analysis.**					
4	**There are employees who have scientific and practical qualifications in the field of financial analysis.**					

C – Leadership

N0.	**Questions**	**Totally agree**	**I agree**	**neutral**	**Don't totally agree**	**I don't agree**
1	**The internal policy of the company pushes to adopt financial analysis as a basis for predicting failure.**					
2	**The company's management depends on financial analysis in making future decisions and future expansions.**					
3	**The company's management uses ratio financial analysis in measuring and evaluating profitability and liquidity.**					
4	**The company's management uses comparative analysis of the financial statements of previous years.**					
5	**The company's management uses in the analysis the list of sources of funds and their uses.**					

D:- organizational culture

N0.	**Questions**	**Totally agree**	**I agree**	**neutral**	**Don't totally agree**	**I don't agree**
1	**The company's management uses**					

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	statistical methods to predict financial failure.					
2	**The company's management uses financial ratios to measure the degree of liquidity.**					
3	**The company's management uses financial ratios to assess profitability.**					
4	**The company's management uses financial ratios in the study of the financial structure.**					
5	**The company's management uses sufficiency ratios to predict the current situation.**					

E: - The company's financial obstacles

N0.	**Questions**	**Totally agree**	**I agree**	**neutral**	**Don't totally agree**	**I don't agree**
1	**Poor ability to understand financial ratios and know their meaning when making decisions.**					
2	**Not defining exact duties and responsibilities for each job.**					
3	**Failure to keep pace with the latest methods, administrative and technological systems and their applications in companies**					
4	**Senior management neglecting the process of monitoring, following up and evaluating the performance of companies.**					
5	**Lack of knowledge of using statistical models to predict financial failure.**					

2- 2- Financial Engineering

A- Information tide

N0.	**Questions**	**Totally agree**	**I agree**	**neutral**	**Don't totally agree**	**I don't agree**
1	**The company needs sufficient financial information to access the latest financial instruments**					
2	**The financial information is up-to-date, accurate and free from fraud and errors**					
3	**Focusing on the quality of the information used and the use of quantitative methods such as statistics**					
4	**Companies apply high-quality financial technologies such as expert systems in the company**					

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B-- Growth

N0.	Questions	Totally agree	I agree	neutral	Don't totally agree	I don't agree
1	The company contributes to the development of the technical and technical methods necessary for the advancement and growth of the company					
2	The company's management focuses on financial and economic growth and recovery					
3	The company provides the necessary needs of customers and develops them in the direction of the company's growth					
4	The company's management provides innovative financial tools at the lowest cost and most effective					

C-Investment

N0.	Questions	Totally agree	I agree	neutral	Don't totally agree	I don't agree
1	The company works in a variety of investment tools available in companies					
2	The company offers new investment opportunities to shareholders and investors					
3	Diversification of the company's financial portfolio according to the diversity of the preferences of shareholders or investors					
4	The company works on the multiplicity and diversification of investment strategies					

D-Community Service

N0.	Questions	Totally agree	I agree	neutral	Don't totally agree	I don't agree
1	The company contributes to increasing returns and opening up to other companies					
2	The company's management is working on new projects that would reduce unemployment and inflation.					
3	The company's management is working to reduce the focus on economic returns The company's					

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	management is working to reduce the focus on economic returns					
4	**Companies are aware of their requirements for innovative financial instruments and derivatives**					