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Prediction Of Failure For Shareholding Agricultural Companies In Iraq

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Abstract: Early prediction of financial failure gives the administration a good enough chance to prepare and to treat the factor causing this to happen. This research aims at predicting financial failure of agricultural companies using the financial data of these companies for the period 2005- 2017. Altman model was applies using 5 financial ratios, 2 of which were indexes of activity, one of profitability, one of leverage, and the last one was related to distribution of profit. The model indicated that the companies achieved values less than 1.8, and this means that the shareholding agricultural companies are at risk of financial failure, their economic position is weak, and they are operating in the red zone. This is a negative indicator of the companies' performance. Probit model was estimated to recognize the impact of the factors on the probability of failure. It turned out that the index of the net retained profits to the existing assets which is related to the administration's policy of profit distribution is one of the most affecting factors on the possibility of financial failure of the companies; if it increased by one unit, the failure probability would increase by 9.96, hence, the research recommended not to rely on financial indicators only, but also to adopt a quantitative financial method in making decisions so as to have a clear vision of the financial situation of the companies.

Keywords: Altman Model, Probit Model, Decline, Financial Analysis.

INTRODUCTION

Companies' attention is usually focused on creating a realistic state of balance between their strategic plans and the potential and resources at hand. It is well known that most companies tend to and seek having the greatest returns with the least risks from using their available resources, through increasing their efficiency, which means reaching the best relation between inputs and outputs. Yet, and as a result to the present environment which is characterized by limitedness, most companies suffer from acquiring the needed resources to perform their activities and operations, hence, they have to pay attention to the factor of time which is very important in decision making; if information arrived late, they would turn into data and would not affect decisions (AL-Jubory & Ali, 2019).and this puts them in front of a ghost that chases companies unaware of their real financial situation. This ghost is failure expressed by the company starting a long road that ends with an event called financial insolvency (Argentti, 1986). Failure can be predicted in advance so as to avoid it or at least to mitigate the levels of its impact and that was found by (Beavet & Meat, 1966). because failure passes through stages

starting with economic loss, then cash deficiency, then financial insolvency and finally reaching bankruptcy (Mahdi, 2014).

Failure is a risk which companies may go through and it inflicts many economic companies whether in the developed or in the developing countries; it means that the company ceases to practice the economic life. It is defined as the inability of the company to achieve a return on the invested capital proportional to the expected risks of these investments. Others define it as the company's financial resources inability to fulfill their activities i.e. it is the phase prior to bankruptcy (Martin, 2011). (Mbat & Eyo, 2013) see that failure is all about formulating the strategies of the company, that failure or even success is a result of the performance resultant in the economic company; if success was associated with achieving a return which suites the investments, then failure is the opposite to that i.e. the return does not suit the investments (Cup, 1991). Failure has several kinds economic, business and competitors (Brighham & Gapenski, 1985). Hence, one may say that one of the most important reasons of failure is the inability of the company to pay its due earnings which is in the first place due to the shortage of liquidity being an operational element, with the consideration that the shortage of cash is not a real problem in itself, but the real problem is the symptoms that caused this shortage. Thus, failure is not the result of one decision, rather it reflects a series of wrong decisions, and this means that failure does not take the company by surprise, but some time in advance and through stages and steps, the thing that makes it predictable and treatable . (Shamrma, 2003) divided failing companies into two types; failing companies subjected to voluntary liquidation (these are troubled companies and their owners have the right to keep them be), and failing companies subjected to obligatory liquidation (failing companies that must be liquefied and the administration have no right to withdraw this decision). Reasons for failure are numerous, and (Pint & Slevin, 1988) divided them into domestic economic conditions, general economic conditions and the incompetency of the administration. According to a study conducted by Dun & Bradstreet, (93%) of the financial failure are attributed to the incompetency of the administration, (2%) for negligence, (1.5%) for forgery and (3%) for other reasons. Manifestations of failure which indicate that the company is heading towards failure are also many such as the disruption of the financial structure of the company, the inability of the company of keeping pace with the technological advancement, the financial and administrative inefficiency of the company, the declining sales and the poor control of the capital (Rammo & Wattar, 2010).

The importance of financial failure emanates from the keenness of several internal or external sides related to the facility, before its occurrence, for the contribution of those in charge of them in making the right decisions. Failure also hit large companies, its levels are rising in the society of companies especially in the advanced countries, take the USA for example, failure level rose to (5.2%) during the years (1986- 1987) despite the fact that big companies enjoy the support of their governments that may interfere in the right time, just like what happened with Chrysler for automobiles and also some Egyptian companies. The investor is interested in predicting the failure of the economic foundation in order to take investment decisions and to choose from the available alternatives and avoid risky investments. Debtors and loaners also are interested in many reasons like taking a decision to grant a credit or to refuse it, and to determine the price of interest and the terms of the loan according to the extent of the risk. Administrations, on the other hand, are interested in failure

prediction to take the necessary reform measures to save the foundation in the right time. The interest of governmental authorities in this subject aims to enable them performing their monitory role on the general institutions in economy. Accounting auditors' interest in predicting failure is originally due to their big responsibility of auditing financial bills to enable the economic institutions. This subject is clearly important to all these sides, and it is a common responsibility in spite of the different perspectives. Thus, prediction is very important as it helps us discover early the financial difficulties and failure of agricultural companies. Therefore, many various studies and models appeared on this subject such as and not limited to: The study of (Beaver, 1967) which was conducted on 79 failing companies and 79 non-failing ones and all the companies were industrial, the famous study of (Altman, 1978) which he applied on (33) failing companies and the same number of non-failing ones, and the study of (Deakin, 1972) in which he used financial ratios and the discrimination approach to predict the failure of (22) failing companies and (22) successful ones. In the USA, (Zavgren, 1985) conducted a study in which he predicted the failure of (90) companies using the logistic analysis. In Greece also, (Gloubos, 1988) conducted, and in Italy, Altman et al (1994) used neural networks to predict the failure of (1000) companies, and Bin& Mazlack used (24) financial ratios and logistic analysis to predict the failure of Jordanian companies. In (2002), Shirata predicted the failure of Japanese companies including (10457) bankrupt compaies and (30421) non- bankrupt companies using (72) financial indicators. (Al- Ammar & Kasiri, 2015) compared between the financial predictions models, and despite the importance of the other methods they preferred the size of the sample criterion as it gives more credibility and is suitable with the model of (Shirata, 2002), and was recommended being the most recent, and the model of Altman being the launcher of previous models. Financial failure prediction should be considered and avoided, and the importance of this subject rises from the importance of agricultural companies and the role the can assume especially with the increased gap of food and some basic food commodities due to the lack of agricultural production; it can be a motivation for investment which witnesses deterioration in the agricultural sector, with the necessity of promoting the agricultural companies through drawing a holistic policy with which companies can play an important role by way of organizing and fulfilling the basics and the needs of market economy.

Most of the agricultural companies working in Iraq, and the shareholding ones are no exception, suffer many problems such as poor management, inefficiency of operational policies and sales management, and their inability to keep pace with technological advancement and to cope with it, let alone the economic circumstances surrounding these companies such as the lack of the necessary finance to implement their plans and to make important expansions, which made them practice commercial activities that make their targets blurred and, thus, apt to financial failure, especially that these companies adopt simple means of financial analysis which do not give a true perspective of their financial situation in light of inflation as well as the lack, or, ignorance of the element of risk when laying their future plans.

The research aims to find a reliable means to predict the failure of companies before it takes place, through adopting a standard model that contains a number of financial ratios to distinguish between troubled and non- troubled companies. And to identify the most important factors affecting the probability of failure through estimating a standard economic model. It is assumed that the research hypothesizes that shareholding agricultural companies

in Iraq are unaware of their financial situation and they are financially troubled, and that the ratio of net retained profits to the sum of assets is one of the most influential factors on the coefficient of failure.

MATERIAL AND METHODS

To achieve the objectives of the study, data were collected from shareholding agricultural companies registered in Iraq's stock market for the period 2005-2017; these are six companies (Al- Ahlia Company for Agricultural Production (AAP), The Iraqi Company for Meat and Field Crops Production and Marketing (AIPM), Al- Iraqia Company for Agricultural Products and Marketing (ICAPM), Al- Iraqia Company for Seeds Production (ICSP), Al- Haditha Company for Animal and Agricultural Production (AMAP), and Middle East Company for Production and Marketing - Fish (AMEF)). The model adopted in predicting the agricultural companies' failure is Altman's (1968) which is a famous model that was the foundation and the baseline for other models; it was updated for seven time the latest of which was in 2014, five financial indexes were used:

X_1= Net capital/ sum of assets (activity index)

X_2= Net retained profits/ sum of assets (related to administration's policy of distribution of profits)

X_3= Net profit before the interests/ sum of assets (profitability index)

X_4= Market value of shareholders' rights/ sum of debts. (leverage index)

X_5= sales/ assets (activity index)

And after involving weight of variables the model is as follows:

And based on the values of Z (index of failure by which prediction is made to the failure of a company or otherwise), companies are divided into three categories:

- Successful companies capable of carrying on if Z was more than 2.9.
- Failing companies operating in the red zone if Z was less than 1.8.
- Companies operating in the gray or foggy zone if Z was more than 1.8 and less than 2.76.

Results and Discussion

First: Altman model

After finding the five financial indexes of the companies under study for the period 2005- 2017 and based on the final accounts of the companies published on Iraq's stock market, failure index was calculated (Z value) for each company as shown in table (1).

Table 1. values of Z according to Altman index

YEAR	AAP	AIPM	ICAPM	ICSP	AMAP	AMEF
2005	0.109	0.026	0.052	0.074	0.028	0.027
2006	0.163	0.022	0.053	0.002	0.031	0.045
2007	0.151	0.017	0.035	0.003	0.043	0.021

2008	0.085	0.015	0.042	0.001	0.035	0.019
2009	-0.006	0.017	0.046	0.049	0.037	0.015
2010	0.028	0.022	0.080	0.015	0.051	0.027
2011	0.078	0.021	0.063	0.019	0.057	0.062
2012	0.025	0.019	0.065	0.045	0.100	0.037
2013	0.033	0.019	0.051	0.025	0.147	0.032
2014	0.086	0.018	0.079	0.022	0.167	0.026
2015	0.169	0.016	0.062	0.010	0.193	0.030
2016	0.140	0.016	0.001	0.009	0.166	0.041
2017	0.013	0.016	0.080	0.007	0.170	0.031

Source: Prepared by the researchers using Altman model.

Reviewing table (1) which demonstrates the index of failure for the studied companies, it was evident that they were variant and fluctuant from year to another and from one company to another, however; in general, all the companies had Z values less than 1.8, and this means that shareholding agricultural companies are threatened with financial failure, their economic situation is weak, and they are operating in the red zone. This is a negative indicator for the performance of companies and might be ascribed to their weak administrations that did not have wide perspectives in understanding and comprehending the productive relationships, that look for profit maximization, so their visions were foggy as well as the role which they could assume in the development of the agricultural sector, in addition to the low profits achieved and this means weak investments in assets, which reflects the inappropriate return compared to the size of investments of the companies, and there is poor amount of liquefied surplus assets after settling their short term commitments. There is also a decline in the companies' ability to fulfill their financial obligations and might be apt to low suits by debtors and shareholders. These companies, and due to expanding their commercial activities without clearly setting their objectives, obviously have inefficiency in managing their assets properly; the surrounding circumstance and chaos in the market along with the intense competition led to decreased sales. Among the other reasons that put these companies in this critical situation and made them go through the path which lead to financial bankruptcy, unless their plans are revised and points of weakness addressed, are the instable security and the political and economic situations which left no appropriate investment environment in Iraq, not to mention that the risk and the lack of economic infrastructures have led to decreased rates of profitability especially the return on the rights of shareholders and the ratio of net profit which appeared with negative sign for more than one company. The increased fixed assets in the investment structure of the company compared to the circulated assets led to low liquidity and limited profits the things that made them face financial problems and put them in a position prone to failure. In addition to that there are the rapid technological changes and their impact on production, logistic changes, market saturation and the poor dealing with these changes by the administrations.
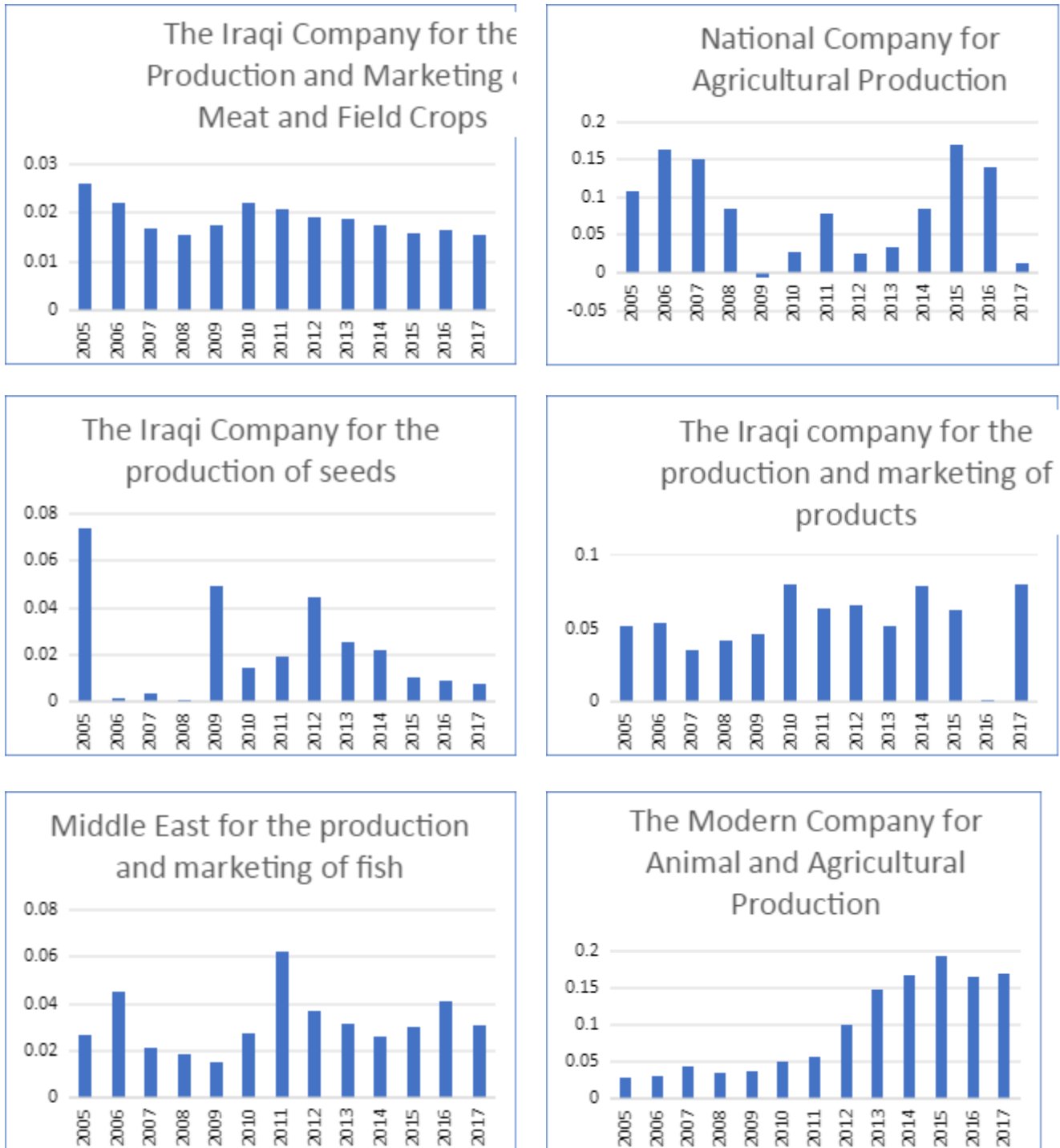
Figure (1), values of failure index of the studied companies during the period of the study

Second: Probit Model:

This model is similar to Logit model in the nature of the dependent variable; it is a qualitative variable that takes two shapes; zero and one, and based upon the probability density function f (XtB) and the cumulative distribution function F (XtB) and if it follows normal distribution with a mean=0 and variation= 0, these models were adopted as the dependent variables are qualitative not quantitative and in this case assumptions and requirements of regression models do not apply, therefore, normal regression models estimated by OLS method cannot estimate regression parameters efficiently, thus, they shall not be useful in anticipating the results, analyze or predict, and this type of regression caused by the nature of the dependent variable will lead to the emergence of instability of variation congruence and the problem of linear correlation between the explanatory variables, therefore, the anticipated value of the dependent variable will not necessarily fall between zero and one, and this problem remains ongoing regardless of the form of the estimated relation i.e. in linear and non-linear as well (Eskemderco). Thus, the dependent factor was represented by the values of the failure index Z as in the following equation:

Where Z takes two zero values in case of failure and 1 in case of success compared to the return of a share achieved in the years of the study. As for Xi it represents the five financial ratios specified in Altman's model.

The ML method and the standard program of Eviews 10 were used to estimate the Probit Model as in table (2).

Table 2. Probit Model

Variable	Parameter value	Z- St.	Statistic Indexes

Source: prepared by the researcher via Eviews program.

The regression coefficient (bi) measures the effect of the independent variable on anticipating the value of the dependent variable, and in case of the linear probability models, anticipating the dependent variable is a probability, thus, the regression coefficient (bi) measures the effect of Xi with one unit on a probability y=1. Going back to Probit model, we see that the ratio of net capital to the sum of assets was of positive sign and counter to the economic logic as logic assumes that the increment of this index will increase the ability of the company of fulfilling its financial obligations, it is significant at level 5%. As for the variable of net retained profits to the sum of assets, the parameter reached 9.96, i.e. an increment of one unit entails an increment of the probability of failure by 9.96 and this is ascribed to the poor profits achieved and their inappropriateness to the size of investments and the poor finance, it also indicates the reliance of the company on the money of others to finance its requirements of assets, and it is also significant. The variable of net profit, before adding the interests, to the sum of assets which a profitability index; if it increased by one unit, the probability of failure would decrease by 9.95 and this agrees with the economic logic and it reflects the efficiency of the administration in operating its assets. As for the variable of leverage, the market value of the shareholder's rights to the sum of assets, and the variable of sales to assets, they both had

parameters of negative signs and this confirms that their increase by one unit entails a reduction of failure probability by 3.56 and 2.85 respectively, as the increase of these indicators enhances the exploitation of fixed assets efficiently and raises the effective exploitation of production capacity and, thus, increases the incomes of the company.

To judge the quality of Probit model, we used LR test which follows the Chi square distribution; its value was 13.41 and this is more than Chi square with a degree of freedom= 5 (number of explanatory variables), thus, we reject the null hypothesis i.e. the restrains are not realized and the estimated model is accepted. The tests of Akaik info criterion, Hannan – Quinn and Schwarz criterion, all indicated the good quality of Probit model.

H & L test was performed to check whether the model represented the data well or not by using this model that follows Chi square value which reached 63.413, hence, we accept the null hypothesis, and the model represents the data well and there is matching between the observed values and the real values. Wald test was performed to check the null hypothesis which states that the studied variables in Probit regression are not different from zero, i.e. H0=b1=b2=b3=0. This hypothesis was tested via WALD statistics which follows Chi square distribution, at degree of freedom df=5; it was found that the parameters of the model have significant impact on financial failure and the suitability of Altman model, table (3).

Tests.Wald, Hosmer- LemeshorTable3

Pro. Value	Test st.
	F- st.
	Chi- sq
	H-L st.
	Andrews st.

Source: prepared by the researchers based on Wald and Hosmer- Lemeshor tests, by using Eviews program.

Conclusions and Recommendations

1- The research has proved its hypothesis, that shareholding agricultural companies suffer a critical financial situation and are now financially troubled and incapable of fulfilling their obligations, and that their accounts where not accurate and were made, probably, for other reasons, and they did not use the scientific approach in making financial decisions and this reflects the poor administration and its inability to manage their assets and human resources efficiently, which led to an inappropriate exploitation of resources and the variance of efficiency levels as the current liabilities are more than the circulating assets made the values of fixed and circulated assets relatively fluctuate from one year to the other, which gradually affected the surplus of the operations.

2- The research also concluded that some companies had decreased return on the shareholders rights and return on assets due to the inability of the company to control the management of its expenses and the increased burdens on it.

3- The index of net retained profits to the sum of assets is one of the most important factors affecting the probability of financial failure of the companies, therefore, the study recommended paying more attention to data and their precision when submitting them to Iraq's stock market.

4- There should not be reliance on financial indicators only, but also making decision based on a financial quantitative approach to give a clear vision about the financial reality of the companies, and these companies should review their financial situation more seriously and take the necessary measures to stop going on this way or they shall end up bankrupted.

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Reference

Ahmed D. Measurement of Jordanian financial brokerage companies using financial and non-financial indicators. Faculty of Management and Economics. Amman University. 2008. PhD thesis.

Ali, E.H. Measuring efficiency of the cow's farms by using the quality response models. The Iraqi Journal of Agricultural Sciences. v.47, n.2. , p.600 – 611. 2016. https://www.iasj.net/iasj/article/127156

AL-Jubory, Z. A. and E.H. Ali . Estimating constant elasticity of substitution production function for agricultural companies in Iraq. The Iraqi Journal of Agricultural Sciences. v.50, Special Issue, p.202-221. 2019. https://jcoagri.uobaghdad.edu.iq/index.php/intro/article/view/182

Al-Marshidi, A. The use of Sherrod to predict financial failure of private commercial banks in Iraq. Journal of Babylon for Pure, Applied Sciences and Engineering Sciences. v.1, n.16, p. 253-275.2018. https://www.journalofbabylon.com/index.php/JUBPAS/article/view/461

Altman, E.I. Financial Ratios Discriminant analysis and the prediction of corporate Bankruptcy. Journal of finance, v.23, n. 4, p.589-609 .1968. https://www.jstor.org/stable/2978933?seq=1

Ammar, R. and H. al-Qasiri. A comparative Study of forecasting models. Tishreen University Journal of Research and Scientific. v.37, n5, p.127-146. 2015. http://journal.tishreen.edu.sy/index.php/econlaw

Beaver, W.H. 1966. Financial Ratio as Predictors of Failure. Journal of Accounting Research, n.1,v.4,p.71-111.1986. https://www.emerald.com/insight/content/doi/10.1108/IJLMA-04-2014-0032/full/html?skipTracking=true

Bian, H. and L. Mazlack. Fuzzy-rough nearest-neighbor classification approach. Proceeding of the 22nd IEEE International Conference of the North American on Fuzzy Information Processing

Society. 2003. 500p. DOI: 10.1109/NAFIPS.2003.1226836 Deakin, B.E. Discriminant analysis of predictors of business failure. Journal of Accounting research,v.10,n.1,p.167-179.1972. https://doi.org/10.2307/2490225

Fleefl. A. and H. H. Mahmood . The use of Z-score function to predict the bankruptcy of companies. Magazine of college Administration & Economics for economic & administration and financial studies.v.7,n.3,p.22-53.2015. https://www.iasj.net/iasj/article/105842 Gloubos, G.and T. Grammatikos. Success of bankruptcy prediction modelsin Greece. Studies in Banking and Finance,v. 7,n.5,p.: 37.46.1988 . https://www.econbiz.de/Record/international-business-failure-prediction-models-altman-edward/10001080322

Martin, A.,M. Manjula and V. Venkatesan. A Business Intelligence Model to Predict Bankruptcy Using Financial Domain Ontology with Association Rule Mining Algorithm. International of Journal of Computer Science. V.8,n3.p.211-218. 2011. https://arxiv.org/ftp/arxiv/papers/1109/1109.1087.pdf

Mbat, D. and E. Eyo. Corporate Failure: Causes and Remedies . Business and Management Research, v.2,n4,p.19-24.2013. https://www.researchgate.net/deref/http%3A%2F%2Fdx.doi.org%2F10.5430%2Fbmr.v2n4p19?_sg%5B0%5D=ZBmFqvQGv8nvFDn0kSN7illwQHu7hAeSgnmEhOxmytEHg13ho5BGd6jZWIYhBGvFV42cu32HHNTBhpPTVk23tRUVEg.-FHVGjA4RFy89TJPOn37O74jQMrD9w8IMoNSNvZzhD20003atYAECw1hLwKOACXdkZM_oDJI5zClMMv7qDjCjA

Mears, P. Discussion of Financial Distress Prediction Model . Journal of Accounting Research,v.5,n.4,p.199-222.1966. http://www.iaeme.com

Mohammed, F.,A.F. Almazekh and S. Al-Hadi. The possibility of using the Kida web in predicting financial failure of Al-Anma Financial Investments. Academic Research Journal, v.16,n.3,p. 1-6.2020. https://www.whitewolfcapital.com/

Mounir, I.H. Forecasting art industrial companies of the public sector in Egypt. Scientific Journal of the Faculty of Administration and Economics. Qatar University, v.2 n.2,p. 57-125.1991. http://www.qu.edu.qa/business/

Pinot, K.J. and P. D. Slevin. Project success: Definitions and measurement techniques, project management journal,v.19, n.1,p. 67-72.1988. https://www.pmi.org/learning/library/project-success-definitions-measurement-techniques-5460

Romo, W.. and S. al-Wattar. The use of financial analysis methods in predicting the cells of industrial joint stock. A study on a sample of Iraqi industrial joint stock companies listed on the Iraq Stock Exchange. Al-Rafidain Development Journal. v. 1,n32,p. 9-29.2010. https://tanmiyat.mosuljournals.com/

Schall, L.D. and C.W. Haley. Introduction to financial management, McGraw Hill.1986.320p.

Shamrma, D. and E. Iselin . 2003. The Relative Relevance of Cash Flow and Accrual Information for Solvency Assessments: A Multi-Method Approach . Journal of Business Finance & Accounting. V.30, n.7,p. 1115-1140. 2003. https://doi.org/10.1111/1468-5957.05421

Shirata, C.Y. Financial Ratios as Predictors of Bankruptcy in Japan: An Empirical Research. Tsukuba College of Technology, Tsukuba, Japan, 2008,8p. https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.195.2721&rep=rep1&type=pdf

Zavgren, C. 1985. Assessing the vulnerability to failure of American industrial, firms: A logistic analysis. Journal of Business Finance and Accounting, v.12,n.1,p. 19-45.1985. https://www.deepdyve.com/browse/journals/journal-of-business-finance-and-accounting