

DEVELOPING A PREDECTION MODEL ABOUT THE DELINQUANCY OF COMPANIES USING THE NON FINANCIAL INDICATORS

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Abstract

The main objective of the research is developing a mathematical model to predict the financial delinquency using non-financial indicators. The study sample consisted of (24) joint-stock industrial companies in Jordan (12 delinquent and 12 are not). The researcher considered the companies that experienced losses for two consecutive years or had been under liquidation action, as per the financial statements published in the Amman Stock Market during the period from 2000 to 2008 are delinquent, provided that they were established before the year 2000. To realize the objectives of this study in identifying the indicators of the financial delinquency of the sample companies, the research employed the multi discriminate analysis for defining the discriminate variables (discriminate equation), to develop the targeted model of the current study.

Keywords: Mathematical Model, Prediction, Delinquency, Industrial Company, Jordan

Introduction

Delinquency is a dangerous phenomenon affecting many business companies, whether in the economically developed countries, or those in the developing stages, as these companies practice their economic activities. Many business companies take many investment decisions such as business expansion, or decisions on crediting or borrowing, which may become a cause of delinquency (Al-Zubaidi, 2002, p. 233).

Therefore, it is quite possible to say that delinquency was not a result of a one single decision, but most probably as a result of a series of wrong decision that cannot direct the business results toward achieving their goals, as well as ignoring the follow-up of the implementation of the development and growth decisions.

Research Objective

Developing a mathematical model to predict financial delinquency using non-financial indicators through the data and illustrations given by the companies by the end of every fiscal period.

Research Hypothesis

The proposed model using the non-financial indicators does not work as a prediction tool of the financial delinquency of the Joint-Stock Industrial Companies.

Literature Review

Concept of Delinquency

There are many definitions of the financial delinquency appeared in the related literature. In this concern, Matar stated, in his book titled "Modern Analyses Trends" that the financial delinquency purports the disability of the company to achieve a suitable revenue cost that may decrease the cost of the capital (Matar, 2010, p.352). Further, it is the stage when the company becomes unable to face paying its liabilities to their creditors, and subsequently, liquidation of the company (Drapeau, 2000, p.2). It was also defined as the inability of the company to pay its current liabilities on their maturity dates (Al-Hiyali, 2007, p.56). Some others see that delinquency is the approach of a company to announce its bankruptcy (Mohammad et al, 2008, p.210). Gibson sees that delinquency is the company inability to pay the dividends of the premier shares, the short-term obligations and the interests of the loans (Gibson, 2009 p.451). Still, the Companies Control Directorate in the Hashemite Kingdom of Jordan deems the company as delinquent, and moving toward liquidation if it realizes losses for two consecutive years. However, we may define it as the inconsistency between the investment decisions with the financial decisions, which will lead to create a gap between the revenues and funding expenses in a manner that increases delinquency possibilities. Usually, the beginning is the inability of the company to pay its short-term obligations on their maturity dates, so that it will reach the state of being unable to pay the interests on the loans, bonds, installments of the premiere shares (Al-Shaikh, 2000, p. 76). As a final conclusion of the definition, it could be described as follows: "It is the stage at which the company approaches the state of inability to pay its short-term liabilities, inability to achieve operational profits, inability to pay its expenditures and operational, investment and funding expenses, realizing consecutive losses year after year, which will end into announcing its bankruptcy and liquidation.

Delinquency Aspects

There are many features in the companies life courses indicate that they are moving toward delinquency, which attract attention and calls for caution and awareness, they are:

1. The economical feature: is the inability of the company to achieve a return on the investment (ROI) more than the funds invested in the project (Mohammad et al. 2008, p.176). Or, the inability of the company revenues to cover all the costs, including funding costs. In other words, the weakness of the management to realize a return on the investment outnumbering the prevailing interest rates in the market, and not in line with the anticipated risks of such investments (Al-Zubaidi, 2002, p. 236).
2. The Financial feature: meaning that the company had reached the financial insolvency state, i.e. the book values of the company assets became less than the book value of its liabilities, which is named the legal insolvency. In this case, the company becomes unable to pay its debts, which will lead to the final liquidation of the company (Matar, 2010, p.363). Thus, we can say that the financial feature of delinquency is the inability of the company to pay its short-term liabilities, in spite of the fact that its assets overrun the liabilities. However, maybe it is meant by this last definition that a state the companies pass through when its liabilities overrun the values of its assets (Al-Zubaidi, 2000, p. 236).

Reasons of Delinquency

The delinquency state is a serious one that results in high risks, and many of the business companies may face, whether in the developed or developing economics, as a result of many external and internal factors. The factors include: weakness of management, lack of liquidity, aggregation of losses, inefficiency of the operational policies, such as pricing, selling policies, the increase in the financial raising (i.e. increase of the loan contributions in the financing structure), unjustified expansion actions, poor collection management, in addition to the surrounding situations, such as the governmental procedures, work and competition environment.

In this concern, a study had been carried out by DUN & Bradstreet Company, which indicated that most important delinquency reasons are: inefficiency of management and workers (93.1%), negligence (2%), forging (1%), disasters (0.9%), and other reasons (3%). This means that delinquency reasons are several and different, most of them are not financial. Accordingly, the delinquency state of the company can be defined by the level of delinquent intensity, such as poor technical efficacy, meaning it could not face its due obligations, and that company from the efficacy perspective is considered delinquent or failing. But it did not reach the state of bankruptcy and liquidation. Furthermore, it cannot rearrange its papers and conditions through a single one process so as to become able to pay. In this concern the extremist delinquency or failure degrees of the companies are the loss of the actual financial

efficacy that is the total inability to pay its liabilities, even if it had been given chances. In this case, the company becomes entering the state of total failure leading to the liquidation (Al-Zubaidi, 2002, p.233).

In addition, it could be said that the most important reasons of failure are (Argenti, 1983):

1. Management
 - a. One-man management
 - b. Imbalanced management
2. Information Management
 - a. Poor accounting system
 - b. Poor cost accounting level
 - c. Poor of the information flow into the organization
3. Non-response to the economical changes and developments in the business environment, as the response to the technological and economical changes help companies to develop and survive.
4. Expansion in work, as an unplanned expansion is an important reason of the companies delinquency.
5. Creative accounting and considering it a misleading tool, which will affect the investment decisions.

Importance of Predicting the Delinquency

Prediction is deemed the future crossing bridge for many companies, whether the statistical, mathematical, or any other method is used. The most important thing is to employ the scientifically organized methods in prediction to help in taking the required corrective actions before it is too late (Fadalah 1995 p 43). delinquency prediction is the concern of many scientists and business people, as it produces positive advantages to the users of the results of this prediction at the right time. Therefore, the efforts were directed toward creating an early alarm system to monitor the failure indications since the very beginning (Al-Taweel, 2008).

In the light of the above, research indicates that the prediction results, whether positive or negative are an important tool to move the company toward success and survival. Creating an alarm system in the company through using the financial delinquency prediction forms for early detection of the fault, which enables it to take necessary correction procedures of this fault, is important for many categories.

Non-Financial Indications

The non-financial indicators are usually non-quantitative (Argenti 1983), as also mentioned by Matar (op cit.) that the non-financial indicators are centered on the company size, age and delay in issuing its financial statements. Use of creative accounting, and the continuous change in the accounting policies and principles.

These indicators are the most influencing on the business companies delinquency, and were extracted out of 16 models that used these variables. Studies were conducted on these variables as indicators that the company is delinquent or not, for the purpose of developing prediction models of companies delinquency (Matar, 2001).

Al-Shaibani noted that the timing of issue the financial statements has a great effect on the companies stock prices in the stock exchange market. Furthermore, timing the issue of the financial statements helps the investors direct their investments toward the successful companies; and issuing the statements within the legally permissible period may be a sign of a healthy situation free from financial problems in the company (Al-Shaibani 2009). Aqil also mentioned that delaying the issuance of the financial statements beyond the prescribed time is an indicator of financial delinquency of the companies (Aqil, 2006).

Former Studies

1. Al-Momani's (2011), titled: " Developing a Prediction Model of the Financial delinquency Using Financial and Non-Financial Indicators", which aimed at developing a delinquency prediction model using financial and non-financial indicators. The study employed the applied analytical method on the financial statements of a number of companies comprising 24 companies (12 experiencing delinquency and 12 are not). The multiple regression analysis was used as well as the multi linear discriminate analysis to approach the targeted model. The researcher approached a model that may predict the company delinquency one year in advance.
2. Al-Dhayyat (2008), conducted a study titled "Measuring the Performance of the Jordanian Brokerage Companies Using Financial and Non-Financial Indicators." The study aimed at developing an pattern of a number of financial and non-financial indicators to rate the performance of the Jordanian Brokerage Companies, both the successful and less successful companies. The study used the questionnaire, the statement analysis of a sample of brokerage companies. Then data was analyzed using the multi discriminate analysis, a branch of SPSS. The study concluded into a model to judge the performance of the brokerage companies. The study also developed a discriminate equation to measure the financial performance of the brokerage

companies, which include a number of financial rates to judge the brokerage companies performance. However, this equation did not include the non financial indicators.

3. Matar (2001), made a study titled: " Nature and Importance of the Company Financial Failure Indicators" (An Analytic Comparative Study among the view of the Auditors and Financial Analyzers in Jordan). The study aimed at underlining the indicators that are important for the financial analyzers, and effective in predicting the financial failure; in addition to the indicators that are important for the auditors to enable them predict the financial future of the economical units. The researcher compared between the two groups and defined the financial percentages that enjoy relative as compared with each group. In other words, what are the important percentages for each group? To achieve the objective of the study, the researcher used the questionnaire as a data collection tool. He distributed (35) questionnaires to the financial analyzers, and (28) questionnaires to the auditors. Among the recommendations of the study was that both the financial and non-financial indicators are equally important for the two groups as a prediction instrument of the financial failure. The researcher also recommended not to confine work on the financial percentages only, rather the non-financial rates should be given wide importance as a tool of financial failure prediction.
4. Argenti (1976) cited from Matar (2010, p. 358) study which form a model known in the business world by "A-Score". The model combines the risk analysis and financial analysis, and employs the financial, specific or descriptive indicators, and gives more weight to the descriptive indicators. According to this model, the delinquent company passes through the following stages:

1- Defect occurrence stage leading to: 2- fault occurrence stage which will entail the emergence of: 3- delinquent symptoms stage which will lead to: 4- falter occurrence stage. Argenti gave the first stage 43 points, the second 45 points and the third stage 12 points. He set a number of questions, each having certain points, and determined the possibilities of failure or non-failure as follows: Company getting less than 18 points has minimum failure possibility. Company getting 18-35 points is a company with failure possibility. Company getting more than 35 points is a company with high failure possibility.

The most important focus of Argenti is that if the management performance is poor, then it will neglect the accountability system, and will not respond to the changes taking place in the labor market. Argenti created a new revolution in the world of building the model of the financial delinquency, because he employed the non-financial indicators that affect the company delinquency. He considered the non-financial indicators have the greatest influence in the company delinquency.

Research Methodology

The current study is an applied, analytic study of the financial statements of the industrial sector in Jordan (All the industrial companies listed on the Amman Stock Market), between 2000 and 2008. The applied, analytic method will be employed.

Study Population and Sample

The study population consisted of the public joint-stock industrial companies in Jordan, that are listed on the Amman stock market, whether or not delinquent companies, during the period from 2000 to 2008 (n=82) until 2008, as per the data cited from Amman stock market and the library of the Jordan Securities Commission.

Study Sample

The study sample consisted of (24) joint-stock industrial companies (12 delinquent and 12 are not). The researcher considered the companies that experienced losses for two consecutive years or had been under liquidation action, as per the financial statements published in Amman stock market during the period from 2000 to 2008 are delinquent, provided that they were established before the year 2000. On the other hand, the same number (n=12) is non- delinquent companies also established before 2000. In the light of the above, the delinquent companies which data were incomplete or those established after 2000, were excluded. Accordingly, the sample comprises (30%) of the total study population. This is quite good enough for conducting such study, as the sample is representative of the study population for the aim of reliance on the findings. The researcher included the non-financial indicators of the delinquent and non- delinquent companies over nine former years. The categorization accuracy of the model will be tested based on the latest analysis year. On the other hand, the model predictive accuracy will be tested one year prior delinquency, using the financial statements of the delinquent companies. The study sample consisted of the following companies shown in Table (1).

Table (1) Study Sample of the delinquent and Non- delinquency Companies

| Delinquent Companies | Non-Delinquent Companies | End of the Fiscal Year | Type of Industry |
|--|--|-------------------------------|-------------------------|
| Integrated Investments and Industries | International Silica Industries | 31/12 | Mining |
| National Steel Industries | Travertine | 31/12 | Mining |
| Jordan Ceramics | International Ceramic Industries | 31/12 | Ceramics |
| Al-Kindi Pharmaceutical Industries | Dar Al-Dawa'a Development and Investment | 31/12 | Pharmaceutical |
| Jordan Poultry and Productions Preparation | National Poultry | 31/12 | Food |
| Jordan Sulfa- Chemicals | Jordan Chemicals Industries | 31/12 | Chemicals |
| Jordan Industries and Sulfur (JIMCO) | International Modern Vegetable Oils | 31/12 | Chemicals |
| Avant-garde Business and Projects | South Filter Industries | 31/12 | Chemicals |
| Arab Engineering Industries | Arab Metal Pipes Industries | 31/12 | Engineering |
| Integrated Land Development | JWAICO Wood Industries | 31/12 | Engineering |
| Jordan Tanning | Jordan Broadcloth Factories | 31/12 | Clothes |
| Zai Cloth Industries | Dar Al-Ghitha'a (Food) | 31/12 | Clothes |

Table (1) shows the companies that had been chosen as a sample based on the above mentioned criteria. In this concern, the company that had suffered losses for two executive years or liquidated was considered a delinquent company. Accordingly, 12 companies were considered delinquent and other 12 companies randomly chosen were considered non-delinquent, based on the stratum of the delinquent companies.

Study Procedures and Statistical Processing

To realize the objectives of this study in identifying the indicators of the financial delinquency of the sample companies, the research employed the multi discriminate analysis for defining the discriminate variables (discriminate equation), to develop the targeted model of the current study.

The multi discriminate analysis is one of the statistical methods employed to categorize viewing within a group out of many groups. It will be defined beforehand using the individual characteristics of this viewing (Duda, 2001). This analytic method is used when the dependent variable specifically either delinquency or non- delinquency or failure or non failure (Abdi, 2007). Applying this method requires first defining the desired groups to be categorized (study sample); in this research, they are the public joint-stock industrial companies, which will be grouped into delinquent and non- delinquent.

The next step will be data collection of each group. In the current research, the data is the non-financial indicators, as they are considered the discriminate variables expected to be the produce of the multi discriminate analysis, after entering the data to the analysis process. The variables resulting from this multi discriminate analysis must measure the same

characteristics of each group (McLachlan, 2004), so that the model to be developed will be having categorizing and predictive abilities. The third step which the discriminate analysis will perform is testing a number of the linear groups through the rates entered in the analysis, through which the research will seek approaching the best group with best categorizing and predictive abilities (Friedman, 1989).

The linear group chosen by the multi discriminate analysis as the strongest group for the purpose of predicting the financial delinquency is called the discriminate equation (Gharaibeh, 1987). This group includes the strongest variables which have discriminate ability, accompanied by coefficients expressing the relative importance of these variables (Dirichx and Landeghem, 1994) cited from Hamdan's study (2008).

The discriminate analysis seeks to find mutual relations between the independent variables, and increasing the spacing degree between the groups to the farthest possible extent, or else decreasing the interweaving between the groups to the lowest extent. To measure the spacing degree between them, the Wilks Lambda indicator was used. The value of this indicator shows that the closer the independent variable to the zero, the more powerful discriminate ability will have among the targeted groups. If its value is one, meaning that this variable has no discriminate ability among the groups, so it will be excluded from the discriminate equation. Usually the discriminate equation, or the model to be developed resulting from the multi discriminate analysis, takes the following formulation (Nam and Jinn, 2000), (Hamdan, 2008):

$$Z=a_0+X_1a_1+X_2a_2+X_3a_3+\dots\dots\dots X_n a_n$$

Where:

X= the discriminate variable (non-financial indicator) chosen by the multi discriminate analysis as a discriminate indicator with a predictive ability;

a= the relative importance of the discriminate variable (non-financial indicator), which is the coefficient of the discriminate variable;

a₀= the consonant coefficient of all the variables in the discriminate equation.

Z= the value by which discrimination occurs, which is obtained by observation, and subsequently, judging whether or not the company is delinquent, and is called the discriminator value.

Accordingly, the following procedures were applied to formulate the discriminate equation:

First: Study Sample Determination Stage (Studied Categories)

The delinquent companies were defined through the financial statements of the companies (2000-2008). The research considered that companies facing losses over two or more executive years (and are still facing losses) as delinquent companies. Here an important point should be taken care of. That is, some companies even though they faced losses for two or more years during the period (2000-2008), yet they later enjoyed profits. For instance, a company in the years 2000, 2001 faced losses, but later enjoyed profits and remained gaining profits. The researcher did not consider such company (or companies) as delinquent, because they managed to correct its financial position. On the other hand, the researcher considered the companies which names no longer appear in the Amman Stock Market, and were liquidated, according to the market statements and the Securities Commission, as delinquent companies. As a result, the delinquent companies were (17), out of which the researcher selected (12) only, and the other (5) excluded, because no financial data was obtained for them. Or else, these companies issued financial statements facing losses, but did not practice its business activity actually for a long period since establishment date. There are not purchases or sales or even revenues, which necessitates considering their indicators are eccentric, and were excluded from the study, which resulted in selecting the delinquent companies during the study period. On the other hand, another 12 non- delinquent companies were randomly chosen, as compared with the strata of the delinquent companies. The researcher deliberately followed this method of selection because these companies are working in the same field of industry or business. Ultimately, 24 companies (both delinquent and non- delinquent) comprised the study sample, i.e. (30%) of the study population. The congruence among the selected sample was built on the type of industry and the end of the fiscal year.

Second: Data Collection and Taking the Nonfinancial Indicators Stage

The researcher collected and categorized the data as well as the financial statements of all the companies. The data were obtained from the Securities Commission which is the party to keep such data, and is deemed a neutral party, and the companies are obliged to send their annual statements to this commission. Then the researcher took the calculations of the required financial rates and indicators through the statements; and the non-financial indicators were taken from the company statements and disclosures issued by it about a number of employees during the analytic years. The date of issuing the statements was obtained through the dates of the meetings of the company general assembly to approve the financial statements and publishing them in the gazette. Meanwhile, the age of the company

was obtained from the library of the securities commission, i.e. date of establishment; and the company size was defined by the volume of the total assets, the method followed by the former accounting studies to determine the company size.

Third: Data Arrangement and Categorization Stage

Following the extraction of all the non-financial rates and indicators, the data arrangement was done through the Excel Program, where every non-financial indicator was given a symbol/code. For example, X base was chosen, so X1 represents the company size, X2 the age and so on for all the indicators and all the years covering the study. The rates and indicators taken into account were four non-financial indicators. All the indicators (not their means) were entered to obtain more accuracy to develop the targeted model. The non-financial indicators which were entered in the multi discriminate analysis are illustrated in Table (2).

Table (2) Nonfinancial Indicator Employed in the Study

| The Indicator | How the Indicator Was Calculated |
|--|--|
| Number of Delay Days in issuing the Statements | Number of days the company delayed beyond the prescribed date by the Securities Commission |
| Workers Turnover Rate | Number of workers who left the company during the year/mean of the total workers |
| Company Age | Number of Years the Company spent in the labor market as of the date of establishment |
| Company Size | Total Assets |

Fourth :Data Analysis and Model Approach Stage

The researcher utilized the multi discriminate analysis, and the data obtained was entered into the discriminate analysis for the purpose of developing a model to predict the financial delinquency. This type of analysis selects the variables that are able to discriminate the delinquent from the non- delinquent companies. These variables are called discriminate variables, which are the independent variables having a categorizing ability. These variables are the components of this model; usually the variable giving highest F value and lowest Wilks Lambda value are selected. In other words, the variable holding lowest value according to Wilks Lambda is the one that has better discriminate and categorization ability. As a result, it will be entered to the discriminate equations which are tested by the multi discriminate analysis. Then the variables with highest F value are selected, and the variable with highest discriminate ability, based on the lowest Wilks Lambda value; and value should be less than (1), because this means that the variable has not discriminate ability. That is, in order to include the variable within the discriminate equation, it must be with higher F value and less Wilks Lambda value (less than 1), and the more it descends toward the zero the more discriminate ability it has.

Fifth: Test of the Discriminate Ability of the Model

The research tested the categorizing ability of the model during the last year of the companies selected to comprise the sample. This was made by defining the financial rates of the last year and entering them into the model approached; thereafter defining the categorizing mark the company obtains. Then it will be compared with z value which had been obtained in the model. And the above mentioned steps will be applied to all the companies included in the sample to determine the validity of the model and validity of the research results as well.

Seventh: Study Variables

Selecting the independent variables of the study was not an easy job. Former studies and research works in this field were followed and reviewed, such as Matar's (2001) in which he recommended to study the non-financial indicators and their effects on the company delinquency, especially the company size, age and delay in disclosing the financial statements. The researcher also reviewed research works and studies conducted in this field, such as studies of Altman (1981), Al-Dawood's (2002), Al-Juhaimani and Al-Dawood, (2004), Balcean and Ooghe (2004), Al-Rajabi (2006), Dakin (1972), Platt (1990), Litinen (1991), Al-Dhayyat (2008), and many other studies he mentioned within the former studies in the current research. In the light of the above, the following variables were chosen as independent variables for the purposes of achieving the current study objectives for predicting the financial delinquency, namely:

1- The Independent Variables:

a- Company size, b- company age, c- delay in issuing the financial statements. d- efficiency of the workers.

3- The Dependent Variable:

Prediction of the Financial delinquency

Study Results and Hypotheses Testing

Results

The main objective of the research is developing a mathematical model to predict the financial delinquency using non-financial indicators. Further the research is aimed to define the effect of every variable stated in the hypothesis already mentioned in prediction of the company delinquency. Realizing this objective comes from negating the hypothesis which says that "The use of the model based on the non-financial indicators do not fit as a tool to predict the financial delinquency of the joint stock industrial companies in Jordan.

The researcher employed the multi discriminate analyses to develop the model of the non-financial indicators. We entered all the definitions, non-financial indicators as independent variables, which was stated in the multi discriminate analysis statistical program, branching from SPSS Version (17). The researcher obtained the outcomes of the analysis, which are with the most abilities to discriminate between the delinquent and non- delinquent companies, which are usually of high predictive ability. We then obtained what is named "the discriminate equation". Normally, this equation is accompanied by what is named "the standardized discriminate coefficients", as well as the non-standard discriminate coefficients". The standardized discriminate coefficients are the value of the contribution of every indicator in predicting the industrial companies' financial delinquency. On the other hand, the non-standard regression coefficient of each rate separately, which consist the discriminate equation of the high predictive and categorizing abilities, which the research should reach. The results were as shown in table (3).

Table (3) Results of the Multi Discriminate Analyses (Stepwise Method) of the Research on the Nonfinancial Indicators Ability to Predict the Financial delinquency of the Joint Stock Industrial Companies

| No. | Indicator | Wilks Lambda | F Partial Value | F Significance | Wilks Lambda of the Model |
|-----|--|--------------|-----------------|----------------|---------------------------|
| 1 | Employees Turnover | 0.576 | 140.56 | 0.000 | 0.44 |
| 2 | Days Delayed in Issuing the Financial Statements | 0.526 | 85.53 | 0.000 | |
| 3 | Company Age | 0.488 | 66.13 | 0.000 | |
| 4 | Company Size by Logarithm | 0.440 | 59.75 | 0.000 | |

Table (3) shows the result of the multi discriminate analysis using the stepwise model to find out the ability of the non-financial indicators to predict the financial delinquency of the joint stock industrial companies. Wilks lambda value indicates the ability of the non-financial indicators shown in the table to discriminate between the delinquent and non-delinquent companies. The measure is used in an inverse method, that is the closest to the zero position, the more indicates the highest ability to differentiate or discriminate. On the contrary, the more it becomes near integer one, the less its ability to discriminate among the two categories. From the above, we can say that all the non-financial indicators are able to discriminate between the delinquent and non- delinquent companies, as the value of Wilks Lambda for all the indicators was less than (1), the indicator selection criteria to enter into the equations subject to testing. The most powerful discriminate equation will be selected, that is able to discriminate between the delinquent and non- delinquent companies. F calculated value also indicates the existence of a discriminate ability of the indicators, as all the significance level values were less than 0.05. Furthermore, F value of the variable was more than 1, as F value of the variable is the ability criteria to discriminate. So we find that the

employee turnover rate is the most capable indicator to discriminate, as the F partial value of this variable was (140.56). As for the Wilks Lambda value of the model it was 0.44 (less than 1), meaning that the model variables as a whole have the ability to predict, categorize and discriminate between the delinquent and non- delinquent companies.

Values of the Standard and Non-Standard Coefficients

Table (4) Values of the Standard and Non-Standard Coefficients of the Discriminate Model Extracted from the Nonfinancial Indicators

| No. | Indicator | Standard Coefficient | Non-Standard Coefficient | Non-Standard Stable Limit |
|-----|--|----------------------|--------------------------|---------------------------|
| 1 | Company Age | 0.456 | 0.039 | 4.627 |
| 2 | Company Size by Logarithm | -0.445 | -0.407 | |
| 3 | Employees Turnover Rate | 0.826 | 5.547 | |
| 4 | Days Delayed in Issuing the Financial Statements | 0.557 | 0.022 | |

Table (4) shows the values of the standard and non-standard coefficients of the discriminate model extracted from the non-financial indicators. The values of the standard values define the rate of contribution that puts every indicator in the model to discriminate between the delinquent and non- delinquent companies. So this value will increase proportional to the value of the coefficient (regardless of the sign). Therefore, the strongest contributing indicator is the employee turnover which value was 0.826, meanwhile the company size was the lowest contributing indicator (0.445). As for the non-standard coefficients they are a congruent value of the standard coefficients in building the discriminate model, as the model is usually built using these coefficients, with caution that these values do not give the indicator the relative importance because their derivation was from the raw data not in a standard way.

Decisive Point to Discriminate Between the delinquent and Non- delinquent Companies

Table (5) indicates the decisive point of the delinquent and non- delinquent companies, which the research employed to define the model categorization ability of the sample companies by applying both accountably and financially on the last analysis year. It was also used to define the model's predictive ability one year before the occurrence of the delinquency state by applying them on the rates and indicators of the delinquent companies in the study sample for one year at least of the appearance of the delinquency indicators.

Table (5) Decisive Point of the delinquent and Non- delinquent Companies

| Company Type | Decisive Point |
|------------------------|----------------|
| Faltering | 1.2 |
| Non-Faltering | -1.05 |
| Mean of Decisive Point | .075 |

The mean of the decisive point represents the criteria by which the company will be judged, delinquent or non- delinquent. Meaning that the company achieving a mark less than .075 (moving toward the negative) is a non- delinquent company. On the other hand, the company with a mark more than .075 is a delinquent company, meaning that the mark direction is moving toward the positive, a falter indicator.

Model Categorization Statistical Power

Table (6) Percentages of the Model Categorization Statistical Power Derived from the Non-Financial Indicators.

| Company State | Number of Companies | Companies Categorization as per the Model | | | | Model Total Categorization Ability |
|----------------|---------------------|---|------|------------------|-------|------------------------------------|
| | | Delinquent | | Non- Delinquency | | |
| | | No. | Rate | No. | Rate | |
| Delinquent | 12 | 9 | 75% | 9 | 25% | 83.35% |
| Non Delinquent | 12 | 1 | 8.3% | 11 | 91.7% | |

Table (6) shows the percentages of the model categorization statistical ability, which is derived from the non-financial indicators. Examining the model percentages we find that the model categorization statistical ability of the delinquent companies was 75%, while for the non- delinquent companies it was 91.7%.. The model could statistically be successful in categorizing the delinquent companies correctly (9 out of 12 companies), and was mistaken in categorizing 3 companies only, meaning that the model categorization statistical accuracy of the non- delinquent companies were 91.7%. Subsequently, when taking the mean of the model's categorizing ability of the delinquent and non- delinquent companies, we find that the total ability of the model in categorizing the companies into delinquent and non- delinquent was 83.35. The two researchers approached the following model:

$$Z=4.627 + (0.938X1)- (0.407X2) + (5,547X3) + (0,022X4)$$

Where:

$$Z=.075$$

X1= company age

X2= company size

X3= Employees turnover

X4= Delay in issuing the financial statements

Recommendations

Through the analyses of the above mentioned results, the research focuses on the following recommendations:

- 1- Using the model by the parties concerned in the companies delinquency, as the prediction rate was 83.3%.

- 2- Attention to adopt the financial and non-financial indicators when the joint stock companies take into consideration the future situation of the company's course and ensuring their growth and development.
- 3- Conducting other studies and research works concerning the non-financial indicators and take into account other variables due to their importance, such as: changes in the laws, especially the tax, the technological changes, disclosure, institutional governess, etc.

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