A comparative study between Altman, Kida and Sherrod's model in predicting the financial failure of listed companies in Amman Stock Exchange

دراسة مقارنة بين نموذج ألتمان، كيدا وشيروود في التنبؤ بالفشل المالي لشركات المساهمة المدرجة في بورصة عمان

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Abstract: This paper aimed to conduct a comparative analytical study between Altman, Kida and Sherrod model in predicting the financial failure three years before it occurs a sample of 30 joint stock companies listed on the ASE. The study found that there is a difference in the results of applying the three financial failure prediction models. However, the KEDA model is considered the best in predicting the failure of joint stock companies listed on the ASE during the three years preceding the Failure with a rating accuracy of 66.67%.
keyword: predict financial failure; Altman model; Kida model; Sherrod model; listed companies in ASE.
JEL classification code : G33 ،C25

ملخص: هدفت هذه الورقة البحثية إلى عمل دراسة تحليلية مقارنة بين نموذج ألتمان، كيدا، شيروود في التنبؤ بالفشل المالي قبل ثلاث سنوات من وقوعه على عينة من شركات المساهمة المدرجة في بورصة عمان بلغ عددها 30 شركة، نصفها فاشلة والنصف الآخر سليمة، وقد توصلت الدراسة إلى أن هناك اختلاف في نتائج تطبيق النماذج الثلاث، إلا أن نموذج كيدا يعتبر هو الأفضل في التنبؤ بفشل شركات المساهمة المدرجة في بورصة عمان خلال الثلاث سنوات السابقة قبل الفشل بنسبة دقة تصنيف بلغت 66.67%.
الكلمات المفتاحية : التنبؤ بالفشل المالي؛ نموذج ألتمان؛ نموذج كيدا؛ نموذج شيروود؛ شركات المساهمة المدرجة في بورصة عمان.
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1. Introduction :

Financial failure is one of the most important financial risks that threaten the institution, and has occupied a large area of researchers' concerns because of its negative effects on the level of institutions and investors and the level of the economy as a whole, it is one of the most important financial problems facing the institution, and prevent continuity, if not detected The importance of predicting the failure of institutions is due to the interest of many parties involved with the institution, whether internal or external, including banks, investors, management, auditors, and government agencies. By trying to find ways to detect early, it gives them the opportunity to take the necessary measures to avoid what can be avoided.

Many researches and studies have come up with models and tools for predicting financial failure before it occurs, with the aim of taking the necessary corrective actions, based on the financial statements through which the financial ratios that form them can be extracted to help in the early detection and prediction of the probability of failure. These models and financial ratios help us to identify the current state of the organization and predict its future status and then assist in the decision-making process within the institution, the most prominent of these models: Sherrod, Kida, Altman.

The phenomenon of financial failure occurs as a result of a number of reasons and factors, some of which are internal, such as weak management and inefficient operational policies, and some external ones, mainly in the economic conditions surrounding the institution, while a series of research is underway to adopt qualitative models in predicting enterprise failure, quantitative models in this field have proved to be effective in many countries and economic sectors, hence the problem of this research, which is to test the effectiveness of the most used prediction models (Sherrod, Kida, Altman) with the failure

of a sample of shareholding companies listed on the ASE in a sufficient period of time to allow the Procedures to correct its current situation to avoid the risk of bankruptcy and liquidation.

Study questions can be formulated as follows :

1- How effective is the Altman model in predicting corporate failure?

2- How effective is the Kida model in predicting institutional failure?

3- How effective is the Sherrod model in predicting institutional failure?

4- What is the best model to predict the failure of joint stock companies listed on the ASE?

The study started from the following hypotheses :

1- Altman's model can predict the failure of failed institutions during the three years preceding liquidation;

2- The Kida model can predict the failure of failed institutions during the three years preceding the liquidation;

3- The Sherrod model can predict the failure of failed institutions during the three years preceding the liquidation;

4- The Altman model is the best and most predictable failure of the Amman Stock Exchange listed companies among the other two models.

The study derives its importance from the importance of financial failure and its prediction by identifying the most effective model in predicting the failure of joint stock companies listed on the ASE, which helps the management of these companies and their stakeholders to predict their future performance and the ability to continue, and avoid the losses that can occur in the event of bankruptcy and liquidation And allowing them to take the necessary measures to avoid what can be avoided.

This study aimed to :

- Familiarity with the concept of financial failure;

- Identify the predictive power of the Altman model, the Kida model and the Sherrod model in the early diagnosis of the failure of liquidated joint stock companies listed for the three years preceding bankruptcy and liquidation;
- Comparison of the three previous models to determine which is better able to predict the failure of joint stock companies listed on the Amman Stock Exchange.

The researcher relied on the use of the experimental and descriptive analytical method in conducting the study because it is one of the most used methods in social and human studies, in order to study the ability to predict the failure of companies using quantitative models to predict (Altman, Kida, Sherrod) on the companies listed on the ASE market, and to collect the study data The researcher relied on the annual financial reports of the companies published on the ASE website for the period from 2011 to 2018.

We will present some of the previous foreign studies related to financial failure, namely :

Meyer and Pifer (1970) : "prediction of Bank failures"

The researchers conducted a study on the banking sector where the study aimed to use the financial ratios to predict the failure of banks, and the study was conducted on a sample of 30 successful banks and 30 banks failed during the period 1948-1965 using the method of gradual discriminatory analysis.

To test this model, data were collected for 6 years before failure and 32 financial ratios were analyzed. A model was formed that could predict the failure of banks with an accuracy of 80% two years before the failure occurred, but the model could not predict failure before that period. (Meyer & Pifer, 1970, pp. 853-868)

Deakin (1972) : "A Discriminant Analysisof Predictors of Business Failure"

The researcher re-studied the research of Beaver and Althman, it was based on only 14 ratios used in the Beaver study, and on the method of discriminatory analysis to reach the best set of financial ratios that can predict the failure of companies five years before the failure occurred, the study was conducted on a sample of 22 successful companies and 22 failed companies, in which Deakin reached Similar to Beaver's findings.

He developed different models in each of the five years before failure, with a prediction error ranging between 3% and 4.5% in the first three years before failure, while in the fourth and fifth years the error rate was 21% and 17%, respectively. Also the model tested on another sample of companies included 44 failed companies and 23 successful companies, the prediction error in the first year was 22%, in the second year 6%, in the third year 12%, in the fourth year 23% and in the fifth year 15%, the researcher could not justify a large percentage of error in the first year before the failure.

Finally, the researcher concluded that the application of statistical techniques, especially discriminatory analysis, can be used to predict the failure of companies through accounting data for up to three years in advance with fairly high accuracy, which is sufficient time to manage potentially failing companies to take steps to avoid this happening. (Deakin, 1972, pp. 167-179)

Sinkey (1975) : "A Multivariate Statistical analysis of the Caracteristics of Problem Banks"

This paper presents a multiple discriminatory analysis of the characteristics of distressed banks, the main purpose of which is to identify and describe the characteristics that distinguish distressed banks from non-defaulted banks. For this, 110 troubled banks were analyzed and 110 non-troubled banks, the data used are the financial ratios derived from the balance sheet and income data during the period

1969-1972, and the researcher analyzed 10 financial ratios for the use of multivariate discriminatory analysis, including these ratios: efficiency ratios, liquidity and capital adequacy.

The study reached a model capable of predicting the default of banks with an accuracy of 73.18% in 1969 and 82.4% in 1972. (Sinkey, 1975, pp. 21-36)

Zmjewsk (1984) : "Methodological Issues Related to the Estimation of Financial Distress Prediction Models"

The study aimed to predict the financial failure of companies two years before it occurred through the construction of a standard model, where it was conducted on several different industries in which the researcher selected a sample consisting of 40 bankrupt companies, and 800 non-bankrupt companies in the period between 1972-1978, and applied a number of The financial ratios that he analyzed from previous studies and based on his study on the analysis of Probit Analysis in the financial statements.

The study concluded that the formulation of the model consists of three financial ratios that can be used to predict the failure of companies.

The study also came up with a new idea: relying on three ratios proved in previous studies that have the ability to predict financial failure, and also distinguished the researcher using a new method is the method of Probet, but the researcher relied on a heterogeneous sample in terms of the number of companies, the researcher neglected a group of ratios That can have good predictability. (Zmijewski, 1984, pp. 59-82)

Zavgren (1985) : "Assessing the Vulnerability to Failure of American Industrial Firms: A Logistic Analysis"

The study aimed to build a model to predict failure, where the researcher conducted this study in the United States during the period

from 1972-1978 on a sample consisting of 45 failed companies and 45 successful companies, and these companies are equal in size and in total assets, the researcher used logistic regression method Regression In analyzing the financial statements extracted from the financial statements of these companies, seven financial ratios were used for this purpose.

The accuracy of the model in predicting the failure of the companies reached by this study was 99%, however, it is not possible to generalize the accuracy of this model to the rest of the American companies or others because the researcher in choosing the sample of the study on a group of companies of equal size and total assets. (Zavgren, 1985, pp. 19-45)

2. The theoretical aspect of the study :

1.2. The concept of financial failure :

Many financial and accounting researchers disagreed about the definition of financial failure, and became there are many concepts and terminology associated with this concept, which made the views of those interested in determining the stages and types of failure, some of them believe that financial failure means the failure of the institution to pay its obligations at maturity, and others believe that it means the institution to stop paying its debts due to insufficient Liquid assets to cover their financial obligations.

The concept of failure has been associated with the economic researcher Beaver, who is the first to use this term to indicate the beginning of the institution to reach bankruptcy, where it is defined as "the inability of a firm to pay its financial obligations as they mature. Operationally a firm is said to have failed when any of the folllM'ing events have occurred: bankruptcy, bond default, an overdrawn bank account or non-payment of a preferred stock dividend ". (Castagna & Matolcsy, 1981, p. 31)

However The researcher Deakin sees the failed companies "only included those firms which experienced bankruptcy, insolvency, or which were otherwise liquidated for the benefit of creditors in his default analysis". (Weiying, 2008, p. 6)

Altman also briefly defined corporate failure as "a company that is legally bankrupt and placed in liquidation". (Coelho, 2014, p. 23)

Blum defines it as "events signifying an inability to pay debts as they come due, entrance into a bankruptcy proceeding, or an explicit agreement with creditors to reduce debts". (Blum, 1974, p. 3)

Also it can be defined as "the condition of a firm when it is unable to meet its financial obligations to its creditors in full. it is deemed to be legally bankrupt and is usually forced into insolvency liquidate". (Berryman, 1983, p. 49)

Based on previous definitions of financial failure, a comprehensive definition consistent with the requirements of the study can be formulated as follows: Financial failure is a financial situation that does not occur suddenly but is the result of a set of accumulations and complications that start from a certain situation, and a certain degree of liquidity shortage, which develops in the absence of attention from a bad situation to a worse situation, to the point where available financial resources are unable to meet obligations owed to creditors, and usually the institution is forced to liquidate.

2.2. Quantitative models used to predict financial failure :

The issue of financial failure is of great importance to all parties involved in the company, and since financial failure takes a long way, as the company must pass before it reaches that state, in turbulent positions that set it apart from other successful companies in the market, and since the 1960s, researchers have conducted studies aimed at developing quantitative models to predict the probability of financial

failure. The most prominent and most capable of predicting financial failures based on financial statements to assess the company's future financial position are: Altman 1968, Kida 1980, and Sherrod 1987.

a- Altman Model (1968)

Altman study is one of the important studies he conducted in the field of predicting the failure of companies in 1968, where it relied on many studies, and aimed at determining the predictability of financial failure of companies, and this through studying and analyzing of financial ratios and indicators for a group of companies under study, he Conducted a study on 33 non-bankrupt companies and 33 bankrupt companies during the period 1946-1965, and he used 22 financial ratios extracted from the financial statements of these companies and relied on a statistical model known as Multiple Discriminant Analysis (MDA) to analyze these ratios and construct a Z-score model, which distinguishes this study from its predecessor which used a single-variable model. .

The researcher concluded that the following ratios are among the most important rates that can be predicted for bankruptcy of companies:

- retained earnings to total assets;
- working capital to total assets;
- Sales to total assets;
- EBITDA to total assets;
- Market value of shares to book value of total debt.

Finally, a multivariate model (Z-score) was developed:

Z = 0.012X1 + 0.014X2 + 0.033X3 + 0.006X4 + 0.999X5

Where:

X1: Working capital to total assets.

X2: Retained earnings to total assets.

X3: EBITDA to total assets.

X4: the market value of shares to total debt.

X5: Sales to total assets.

Z: represents the financial default index where:

Z>2.99: No bankruptcy is expected.

Z<1.88: Bankruptcy is expected.

1.88<Z <2.99: The position of the company cannot be judged.

The model was able to predict the failure of companies before it happened and for five years accurately reached 95% in the first year before the failure, 72% in the second year, 48% in the third year, 29% in the fourth year, 36% in the fifth year before bankruptcy. (Altman, 1968, pp. 589-609)

b- Kida Model (1980)

The study aimed to determine the predictability of financial failure of companies through the construction of a prediction model, based on the method of discriminatory analysis step-by-step based on 20 financial ratios and a sample of 40 institutions, half of which are distressed and the other half non-defaulted. A short period of time spanned from 1974 to 1975, while the results of this study coincided with the results of the Altman study in ratios that have the ability to predict financial failure.

The study reached the formulation of the model consists of five financial ratios with great predictability, reaching 90%:

Z = -1.042X1-0.427X2-0.461X3-0.463X4 + 0.271X5

Where:

X1: net profit to total assets.

X2: Equity to total debt.

X3: liquid assets to current liabilities.

X4: Sales to total assets.

X5: Cash to total assets.

Z: financial default index as the higher the index indicates the integrity of the financial position of the company and the lower it indicates the possibility of falling into the company.

The error rate in forecasting non-performing companies was 15%, which is greater than the non-performing non-performing companies' error rate of 9%. This means that the model has more effectiveness in predicting non-performing companies. (Kida, 1980, pp. 506-523)

c- Sherrod Model (1987)

which is one of the most modern models in predicting financial failure, this model depends on the six independent financial indicators, in addition to the relative weights of the discrimination function coefficients given for these variables, according to the following formula : (Arkan, 2015, pp. 240-241)

Z = 17X1 + 9X2 + 3.5X3 + 20X4 + 1.2X5 + 0.1X6

where:

X1: net operation capital/total assets,

X2: current liquid assets/total assets,

X3: total equity/total assets,

X4: net income before income tax/total assets,

X5: total assets/total liabilities,

X6: total equity/total fixed assets.

Z: bankruptcy index (financial failure) where :

Category	Risk degree	Z
First	Company is not exposed to the risk of bankruptcy	$Z > 25$
Second	Little likelihood of exposure to the risk of bankruptcy	$25 \geq Z > 20$
Thrid	Difficult to predict the risk of bankruptcy	$20 \geq Z > 5$
Fourth	The Company is exposed significantly to the risk of bankruptcy	$5 \geq Z > -5$
Fifth	The Company is exposed to the risk of bankruptcy	$Z \leq 5 -$

3. Study Methodology :

1.3. Sample study :

The study population consists of all the public shareholding companies listed on the ASE.The number of companies in the study community reached 195 companies according to the ASE website in 2018 (www.exchange.jo/en)

The study sample was selected from the study population, where we divided the study sample into two groups, the first group was the failed companies and the second group was the non- failed companies, whose financial data are available during the study period (2011, 2018).Failure companies were selected from a total of ninety-five (195) companies present in the study population, this selection was in accordance with the criteria of failure in our study, which was represented in the companies that stopped practicing the activity, which were liquidated, and were taken according to the location of the Securities Depository Center.

While fifteen non- failed companies were selected to meet the number of failed companies, this choice was according to companies that have not stopped their activities and have not been liquidated, which have achieved profits during the last three years, and was taken at random while trying to diversify sectors excluding the financial sector.

2.3. Apply the Altman form to the joint stock companies listed on the Amman Stock Exchange :

The main variables of the study are the financial ratios of the Altman model (independent variables), while financial failure is the dependent variable.

The results of applying the Z-score to the failed and non- failed companies. What can be seen from the failed companies is that all of them have deteriorated in the three years that preceded the liquidation

based on the average Z values obtained, UNIF(Z=-1.01) was the most degraded company, with results showing the failure of the organization over the three years preceding the liquidation, followed by JOCF(Z=-0.01) and AMAN(Z=0.02).

The results also show that the model was able to predict the failure of all companies over the three years prior to the liquidation, except for the palaces of the real estate projects, which predicted the model safety during the years of study

As for the non- failed companies, it is clear that Altman model predicted failure in all years of study except APOT(Z=56.04), which considered the model sound throughout the years of study, as well as NAST(Z=2.17) and MANE(Z=2.11), which show the difficulty of determining their position during the three years before liquidation, and through these results we conclude Two things:

- There are signs of financial failure in sound companies that are not referred to liquidation and do not disclose them;
- the model does not achieve the desired results when the company is sound and not threatened by financial failure.

3.3. Application of Kida model to the joint stock companies listed on the Amman Stock Exchange :

The main variables of the study are the financial ratios of the Kida model (independent variables), while financial failure is the dependent variable.

We note that the number of companies that have achieved the Kida Model in terms of predicting financial failure and referral to liquidation has reached (09) companies out of (15) companies, which were included in the sample of the study and were referred to liquidation **[**JOWL(Z=-0.11), AJFM(Z=-0.22), AREN(Z=-0.33), GLCI(Z=-0.09), FNVO(Z=-0.54), JOCF(Z=-0.06), UNIF(Z=-1.76), DKHS(Z=-0.51), AMDI(Z=-0.28)**]**, while the results of the Kida Model were not

achieved at (06) companies referred to liquidation, namely **[**JOTN(Z=1.21), ICER(Z=0.82)**]**, The number of companies that have achieved the Kida Model in terms of showing that there are no threats of financial failure and no referral for liquidation has reached (11) companies out of (15) companies included in the study sample, It was inevitably liquidated, and Represented in the companies **[**GENI(Z=2.75), JODA(Z=0.04), APOT(Z=0.13), ICAG(Z=0.24), UMIC(Z=0.54), AIFF(Z=56.54), NATA(Z=0.55), JOWM(Z=9.45), JTEL(Z=0.90), TAJM(Z=0.37), JOHT(Z=3.00)**]**, while the results of the Kida Model were not achieved at (04) companies out of (15) companies.

The number of companies that have achieved the model (20) out of (30) companies referred and not referred to liquidation, and the total number of companies Which did not achieve the form (10) companies out of (30) companies referred and ineligible for liquidation.

3.4. Apply the Sherrod model to the joint stock companies listed on the Amman Stock Exchange

The main variables of the study are the financial ratios that make up the Sherwood model (independent variables), while financial failure is the dependent variable.

The results of applying the Sherrod model to the failed and non-failed companies.What can be seen from the failed companies is that the majority of them are either exposed to bankruptcy risk or highly exposed to bankruptcy risk during the three years preceding the fact of liquidation according to the average values of Z obtained, where UNIF(Z=-495.43) was the most deteriorated, where the results show that it is highly exposed to bankruptcy and failure risk over the three years preceding the liquidation, followed by AMDI(Z=-9.67) and then JOCF(Z=-8.02), also appeared difficult to determine the status of the

company during the years of study of the failed companies through companies **[**JOTN(Z=10.95), ICER(Z=14.87), UNIC(Z=18.42)**]**.

As for the non-failed companies, it is clear that the Sherrod model in all years of study predicted the difficulty of predicting the risks of bankruptcy and failure through companies **[**JODA(Z=14.83), RMCC(Z=7.26), ICAG(Z=11.76), NATA(Z=17.95), JTEL(Z=12.47), TAJM(Z=12.10), JOEP(Z=5.66)**]**, or that the company is exposed to the risks of bankruptcy and failure from During the companies **[**GENI(Z=20.42), APOT(Z=24.08), JOHT(Z=22.14)**]**, except NAST(Z=3.39) and MANE(Z=1.38) which considered the model exposed to bankruptcy risk throughout the years of study, and the rest of the companies represented in the companies **[**UMIC(Z=36.26), AIFF(Z=165.88), JOWM(Z=39.59)**]** were considered by the model companies are really sound and non Exposed to bankruptcy risk throughout the years of study.

4. Study Results :

According to the above analysis, if we go back to the Altman, Kida, Sherrod model, we find a difference between the coefficients of the components of these models, this difference had an impact on the results of their application if we tried to classify the companies studied according to the strength of their financial position, as the company that was considered the best according to the Altman model was not so according to the model of Kida or Sherrod, despite the agreement of these latter two in determining the best company, as it shows us that the company The worst is the same according to the three models throughout the study period.

In order to evaluate the effectiveness of the three models, a good rating of the models must be calculated, which reflects the percentage of healthy companies, which are correctly classified within the healthy group of companies, and also the percentage of failed companies,

which are correctly classified within the failed group of companies,this can be illustrated in the following table:

Table 1 : *Accuracy Ratio*

Co	***Sort by Altman model***				***Sort by Kida model***				***Sort by sherrod model***			
	F	%	N-f	%	F	%	N-f	%	F	%	N-f	%
F	14	93.33	1	6.67	09	60	06	40	12	80	1	6.67
N-f	12	80	1	6.67	04	26.67	11	73.33	2	13.33	6	40
Number of companies that achieved the model and its percentage: 15 by 50%					Number of companies that achieved the model and its percentage: 20 by 66.67%				Number of companies that achieved the model and its percentage: 18 by 60%			
Number of companies that did not achieve the model and its percentage: 15 by 50%					Number of companies that did not achieve the model and its percentage: 10 by 33.33%				Number of companies that did not achieve the model and its percentage: 3 by 10%			

Source: *Prepared by the researchers based on the results of the application of Altman model, Kida, Sherrod.*

We can see from Table (5) that the percentage of sound companies that were classified according to the model Altman, Kida, Sherrod is: 6.67%, 73.33%, 40%, respectively. And the percentage of non-failed companies that have been classified as failing by the Altman, Kida and Sherrod models is 80%, 26.67%, and 13.33% respectively, indicating that the Altman model does not achieve the desired results when the company is healthy and is not threatened by financial failure compared to other models, also it Show that the Kida model is best placed to classify these companies within three years before liquidation.

We see also the percentage of failed companies classified as failed according to the model of Altman, Kida and Sherrod is 93.33%, 60% and 80% respectively. And the percentage of failed companies that are classified as non-failed according to the model of the Altman model, Kida and Sherrod is: 6.67%, 40%, 6.67%, respectively.

It can be said from these ratios that Altman and Sherrod model have a low ability to classify failed companies during the three years before liquidation compared to the Kida model which achieved an acceptable accuracy rate, they are considered acceptable ratios for the classification of public shareholding companies listed on the Amman Stock Exchange.

In general, we conclude that the KEDA model was the best and most predictable failure of the joint stock companies listed on the ASE, among the other two models, where he managed to predict financial failure somewhat more accurately, this is an indication that the model reflects the financial difficulties or changes experienced by the company as threatening financial failure with acceptable confidence.

5. Conclusion :

1.5. Results

After applying the models on a sample study, we reached the following results:

- The results obtained by applying the three financial failure prediction models to the studied joint stock companies vary, although these models were applied to the same data and the same period.
- The study showed the weakness of the ability of Altman model to predict the failure of joint stock companies listed on the Amman Stock Exchange during the years preceding the reality of liquidation, where the accuracy of the rating reached only 50%.
- The study showed the ability of the Kida model to predict the failure of joint stock companies listed on the Amman Stock Exchange during

the years preceding the reality of liquidation with an acceptable degree of confidence, with an accuracy rating of 66.67%.

- The study showed the ability of the Sherrod model to predict the failure of the joint stock companies listed on the ASE during the years preceding the liquidation with an acceptable degree of confidence but also less than the Kida model, where the accuracy rating of 60%.
- The study found that the Kida model is the best able to predict the failure of companies and during the three years preceding the reality of liquidation and failure, this is an indication that the model reflects any financial difficulties or changes experienced by the company as a threat to financial failure, and that it can be relied upon to judge the financial position of companies with a degree of acceptable confidence.

2.5. R ecommendations

Based on our findings, we recommend:

- Encouraging the listed companies in the ASE to use and apply the KEDA model because it has an acceptable ability to predict failure and for a sufficient period before liquidation and failure.
- Paying attention to the subject of predicting financial failure and giving it its share of studies and research in order to protect companies that are exposed to financial failure.
- Conducting further studies and researches in this field and trying to build a model for predicting the failure of companies listed on the ASE.
- Preparation of new studies including other independent variables that have proved effective in predicting financial failure.

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7. Appendices :

Appendice 1 : *The companies Sample study*

number	***Company code***	***Company Status***	***number***	***Company code***	***Company Status***
01	JOWL	Failed	16	GENI	Non-Failed
02	AJFM	Failed	17	JODA	Non-Failed
03	JOTN	Failed	18	RMCC	Non-Failed
04	ICER	Failed	19	APOT	Non-Failed
05	AREN	Failed	20	ICAG	Non-Failed
06	UNIC	Failed	21	UMIC	Non-Failed
07	GLCI	Failed	22	AIFF	Non-Failed
08	FNVO	Failed	23	NATA	Non-Failed
09	AMAN	Failed	24	NAST	Non-Failed
10	IENG	Failed	25	JOWM	Non-Failed
11	JOCF	Failed	26	MANE	Non-Failed
12	PRED	Failed	27	JTEL	Non-Failed
13	UNIF	Failed	28	TAJM	Non-Failed
14	DKHS	Failed	29	JOHT	Non-Failed
15	AMDI	Failed	30	JOEP	Non-Failed

Source: *Prepared by researchers depending on the location of the Securities Depository Center http://www.sdc.com.jo/arabic/index.php?option=com_members_info (consulted on 24/8/2019).*