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Prediction of Financial Distress and Insolvency for Industrial Firm (Case Study)

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ABSTRACT

This paper aims to redress some of the incorrect decisions practiced by management in "Al-Hayat Firm for Manufacturing Durable Products", for the period (2013-2015) bringing the firm to the edge of collapse. In this paper, the focus lies on the benefits of the financial analysis in the economy to help the decision makers become more aware and how to gain a competitive advantage for their firms. The aim of this paper also is to shed light on the negligence practices in some firms and the associated problems of a financial analysis system implementation.

The evidences suggest that the firm suffered a heavy burden of debts and going bankrupt in the near future. Financial ratio's analysis has been used to assess profitability and risk of the concerning firm. In liquidity ratios the percentage of the working capital is less than (1), indicate the increase in the liabilities over the assists. In the leverage ratios the total liabilities to total assets was increased from (38.69%) to (53.73%). In the activity ratios the inventory turnover decreased by (1.10 times) through the given period. In the profitability ratios the net profit to total sales became negative amount to (-80.01%) from (-33.61%) for the same period. Also, the net profit to total assets percentage declining to (-9.29%, -2.10%) in the given period, and the stock book value declined from (85$) to (57$), through the given period.

The researcher used one of the different measure used to predict the firm's insolvency and probably its bankrupt (i.e. Altman, Z-score analysis). The study result indicated the weakness of "Al-Hayat Firm for Manufacturing Durable Products" for the period (2013-2015). In calculating the "Altman, Z-score" the result suggest that (Z) value for the given period was less than 1.81, (Z-score <1.8). The main features give a gloomy picture and inefficiency of firm's financial position.

Keywords: Insolvency, Financial analysis, Industrial firm, Financial reporting and Working capital.

1. INTRODUCTION

To assess the results of a business operations, the financial analysis are regarded the basis for understanding and evaluating the results of such business. Such understanding is enhanced through a frame work of feasibility studies and project evaluation for reducing risks and avoiding bankruptcy. Altman equation (Altman zero scores analysis) is one measure from many to assess firms' insolvency and probably going bankrupt [1].

Within the process of communication between any organization and its stakeholders, financial reports are crucial. Such way of informing requires a careful process of extracting the essential core of information. In fact, such financial reports reflect the financial position and the firm's performance in a given period of time [5].

The annual reports remain as a key indicator reflecting the financial position of the firm in terms of its strength or weaknesses [9]. The Altman, Zero-score equation is a predictive approach for the insolvency of firm from financial point of view, also indicating to the trends of the firm's future, based on the available data through the comparison of the firm's performance. This predictive approach is encouraging to assess the challenges faced the management of financial fluctuations and to seek persuasive explanations.

In this paper, the focus lies on the benefits of the financial analysis in the economy to help the decision makers become more aware and how to gain a competitive advantage for their firms. The aim of this paper also is to shed light on the negligence practices in some firms and their associated problems of a financial analysis system implementation.

2. IMPORTANCE OF FINANCIAL ANALYSIS

The financial statements are many and, therefore the type of information required from any analysis of these financial statements may well vary depending upon the purpose of the user for whom the information is required.

The firm's owners and their representatives are interested in information about the stability and profitability of their firms; therefore, it is the firm's management responsibility to develop the resources of their business in an effective and efficient way in order to meet the objectives of the business [4]. Lenders are interested in information that enables them to determine their loans and the interest attached will be paid when due.

Investors need information to help them in their decisions to decide whether they should buy, hold or sell and on the other hand they are interested in formation which enables them to assess the ability of the firm's ability to pay dividends for their stocks [3].

Suppliers or trade creditors providing goods and services are interested in the information that are enables them to decide whether to sell to the enterprise and to determine whether amounts owing to them will be paid when due. However and usually creditors are likely to be interested in an enterprise over a shorter period than lenders unless they are dependent upon the continuation of the enterprise as a major customer [6]. Thus, insolvency will change such attitudes.

Customers have their interest in information about the continuance of an enterprise, especially when they have a

long-term involvement with, or are dependent upon the enterprise.

Governments and their agencies are also interested in the allocation of resources, and therefore, in the activities of a firm. They require information in order to regulate the activities of firms, assess taxation and provide a basis for national income and economic statistics. Due to the importance of the local firms to the economy, these firms affect members of the public in a variety of ways. Financial statements may assist the public by providing information about the trends and recent developments in the prosperity of the firm and the dance of its activities [8].

2. Long-term debt - debt with maturity greater than one year.
3. Stockholders equity - ownership of the firm.

B) Income statement: reports the income and expenses of operations during a period of time.

C) Statement of retained earnings: shows the amount of net income reinvested in the business.

1. Retained earnings represent funds reinvented in the business over a period of years.
2. Retained earnings are not usually held in cash, they are usually invested in other assets of the firm.

In general, the information contained in firm financial statement is historic. Accounts are prepared for firm's financial year and only become an available some months after the end of that year [7].

3. RESEARCH METHODOLOGY

The data was collected by the following methods, the content of which reflects the research objectives.

A) Personal interview was made with the executives of the marketing and financial departments.

B) The analysis of recent financial statement (Balance sheet) for the last three years available was used (2013-2015).This was an attempt to investigate the perceived importance of the firm's failure and insolvency.

C) Due to the importance of the percentage of the market price to the face value of the firm's stock, the researcher depends upon the average stock price mentioned officially in the daily local newspapers, and the Financial Market Bulletin Issued by the Chamber of Commerce, for the concerning period. (2013-2015), ranging (46.1 $ - 47.5 $ - 28.5 $) respectively.

D) Altman equation for insolvency prediction (Altman, 1968). Altman calculated his equation which called Z-scores as follows:

$$\text{Z- score} = 1.2\left[\frac{\text{Net working capital}}{\text{Total assets}}\right] + 1.4\left[\frac{\text{Retained earnings}}{\text{Total assets}}\right] + 3.3\left[\frac{\text{Earnings before interest and tax}}{\text{Total assets}}\right] + 0.6\left[\frac{\text{Market value of equity}}{\text{Book value of liabilities}}\right] + 1.0\left[\frac{\text{Sales}}{\text{Total assets}}\right]$$

When using this model Altman concluded:

Z-score < 1.81 = high probability of bankruptcy.
Z-score > 3.0= low probability of bankruptcy.
Z-score < 3 > 1.81= indeterminate.

For our research purposes:

$$\text{Net working capital} = \frac{X1}{\text{Total assets}}$$

$$\text{Retained earnings} = \frac{X2}{\text{Total assets}}$$

$$\text{Earnings before interest and tax} = \frac{X3}{\text{Total assets}}$$

$$\text{Market values of equity} = \frac{X4}{\text{Book value of liabilities}}$$

$$\text{Sales} = \frac{X5}{\text{Total assets}}$$

The management of e-waste as per Indian scenario can be divided into three main sections viz: Collection, Recycling and Recovery and Disposal. The sections are further divided to the sub sections as per their further activities involved.[4] To optimize the use of available resources and infrastructure of both informal and formal stake holders a few suggestions applicable for Indian scenario are listed so that their potential may be fully utilized for the Environmentally Sound Management of e-waste .

The e-waste collection must be emphasized by creating local, urban, District level, and state level collection points so that the maximum amount of e-waste can be collected. Initially, the investment will be high as approach is new, but after some time it will be established and well known for e-waste collection point.

To attract people for voluntarily disposal, the awareness about the monetary benefits have to be given to the people concerned and diseases caused due to e-waste at grass root level. By this way we can motivate people to come forward for the disposal of e-waste.

The registered recycler's representative will train the local collectors about the e-waste and its harmful effects on human beings, atmosphere, water, air, soil and ambience in absolute by conducting seminars, workshops with the help of Doctors.

Set the door-to-door e-waste collection. Its storage and further packaging mechanism can be done in the locality by one to one contact or by phones with the help of formal or/and informal collectors keeping the incentives to the informal as per minimum monetary expectations.

The separated equipment's, components etc., are packed by pasting slip with all details needed to be done on local stations and dispatch it to the registered recyclers.

Transport the e-wastes to the registered recycler‘s destination. After recovery, recycling and refurbishment the remaining material after decontamination are disposed of either through incineration or through secured land filling.

Fix the rates item-wise which are to be given to the user after receipt of items concerned and its collection charges up to the point of collection.

4. INDICATORS OF FAILURE

The rule of the financial manager and his responsibility is crucial concerning the firm's prosperity or difficulties. If the firm has financial problems, then his decisions and experience may make the difference between the losses of his firm and the rehabilitation of the firm as an ongoing enterprise. Creditors may assess the risks and challenges faces the firms through their knowledge and expectations, and enabling them to judge the financial position of the concerning firms.

On the other hand firms which assessing the credit risks are able to manage its financial resources better. Poor performance is one prominent in managing loans, thus, the larger firm's allocation to loans the more failure-prone the firm, also a low capital ratio increase the chances of failure. Similarly, firms with large purchased funds positions are more likely to fail. For example, the ratio of commercial and industrial loans to total assets is an apparent precursor concerning failure. In general failure either:

Economic - A firm's revenues do not cover costs, or
Financial - Financial failure signifies insolvency. Also we have to differentiate between:
1. Technical insolvency: when a firm cannot meet its current obligations as they come due even though its total assets may exceed its total liabilities, and
2. Bankruptcy sense, if firm's total liabilities exceed its total assets, the net worth of the firm is negative.
In the early (1990s) many rated firms, experienced financial problems, and these problems ranged from temporary liquidity, need to restructure, to ultimate insolvency.

A number of researchers have attempted to differentiate between the financial characteristics of successful firm and those facing failure, in order to develop a model based on financial ratios in order to predict firms are likelihood of becoming insolvent in the near future. Altman developed a model, is perhaps the best known of those researchers using a statistical technique known as multiple discriminate analysis. In the U.K. (Taffler) has been the most prominent researcher [11]. His discrimination point of view was:

$$1)\ \frac{\text{Earnings before interest and tax}}{\text{Total assets}} = \frac{\text{EBIT}}{\text{Total assets}}$$

$$2)\ \frac{\text{Total liabilities}}{\text{Net capital employed}}$$

$$3)\ \frac{\text{Quick assets}}{\text{Total assets}}$$

$$4)\ \frac{\text{Working capital}}{\text{Net worth}}$$

$$5)\ \frac{\text{Cost of sales}}{\text{Stock}}$$

In both models the current profitability ratio (EBIT to total assets) was the most important in discriminating between insolvent and solvent firms. The conclusion is that if a firm is successful in generating profits it can overcome short-term liquidity problems. Also if a firm makes profits but is being poorly managed, it is likely to become an attractive takeover target.

5. RESEARCH ANALYSIS AND RESULTS

Ratio analysis is regarded the basis for understanding and evaluating a firm's operations and performance. The main basic financial ratios are:

1) The liquidity ratios: measure the firm's ability to meet its maturing short-term obligations.
2) The leverage ratio: measure the extent to which the firm has been financed by debts. Creditors look to the equity to assess that margin of safety, but by raising funds through debt, owners may gain the benefits of maintaining for some extent a control of the firm through the investment of that debt.
3) The valuation ratios: measure the ability of the firm in encouraging investors and buying its stocks.
4) The activity ratios: measure how effectively a firm is using its resources.
5) The profitability ratios: measure management's overall effectiveness as shown by the returns generated on sales and investment.
Ratios, individually may mean little, but it have a significance when they are related to composite ratios in a specific industry, or ratios of the same firm compared over many periods of the time.

Appendices 1- 3, and 4 illustrate the balance sheet, and the cash flow statement of the period (2013, 2014, 2015) respectively. Trend analysis involves computing the ratios mentioned above for the given period to assess whether the firm is improving or deteriorating to achieve comparative analysis.

The researchers asked the financial manager to review the following results, which represent the fair analysis to the firm.

Table (1) represents the comparative analysis of the key ratios for the firm.

Table (1): Basis ratios for the period (2013-2015)

2013	2014	2015	Ratio formula	The Radio
Liquidity ratios				
-30744 578	-91889 108	-14449 115	Current Assets - Current Liabilities	Working Capital
69.4%	46.6%	30.3%	Current Assets / Current Liabilities	Current ratio
25.25 %	17.25 %	8.46%	Prepaid / Current Liabilities Prepaid / Current Liabilities	Acid Test
2.55%	1.58%	1.01%	Cash / Current Liabilities	Quick Ratio
Leverage ratios				
38.69 %	46.01 %	53.73 %	Total liabilities/Total Assets	Liabilities/ Assets
55.26 %	47.92 %	40.22 %	Total Equity/Total Assets	Equity/ Assets
68.55 %	93.22 %	128.22 %	Total liability/Total Equity	Liabilities/ Equity
-1.89 Times	-1.53 Times	-1.99 Times	Net Profit-losses/Interests	Average-Interest Coverage
Valuation Ratios				
0.850 $	0.737 $	0.576 $	Net worth/No Of stocks	Book Value ratio
874.56 %	-330.05 %	-76.41 %	Average stock price/Dividend	Stock market value ratio
38.40 %	46.79 %	30.02 %	Stock market value/Book value	Market value/ Book value ratio
Activity Ratios				
1.10 Times	0.98 Times	0.83 Times	Production cost/ Inventory Average	Inventory Turnover
280 days	270 days	321 days	days Inventory Average / 360	Inventory Average Period
3.01 Times	4.29 Times	3.60 Times	Deferred sales/ Average Receivable Period	Average Receivable Turnover
81 days	59 days	63 days	Average Receivable/ 360	Average Collection Period
0.11 Times	0.10 Times	0.9 Times	Sale/Average Assets	Assets Turnover
0.11 Times	0.10 Times	0.9 Times	Sales/Average Fixed Assets	Assets Turnover
0.61 Times	0.59 Times	0.51 Times	Sales/Average Current Assets	Current Assets Turnover
Profitability Ratios				
7.60%	9.9%	-6.59%	Total Profit/ sales	Profit Ratio
-80.01 %	-51.24 %	-33.61 %	Net profit/ sales	Net profit Ratio
-9.29%	-5.61%	-2.10%	Net profit/ Total Assets	Asset Revenue Ratio
-16.27 %	-8.53%	-3.69%	Net profit/ Net Equity	Net equity Revenue Ratio
-13.27 %	-8.52%	-3.68%	Net Profit/ No. of stocks	Stock Dividend Ratio

Liquidity Ratios Results

From table No.(1), the working capital ratio is less than one, which means that the current liabilities is exceeding the current assets, and presenting a burden of debt. The current liabilities increased from (3M $) to (14M $), the current ratio decreased from (69%) to (30%) and the quick ratio from (25%) to (8%) within the given period. Thus, the firm is unable to meet its maturing debts in the near future.

Leverage Ratios Results

During the given period the burden of the firm's debts was increased and the management should prepare itself for repayment, as the liabilities/ Assets increased from (38.69 %) to (53.73%), which affects in turn its bargaining power to get new loans from creditors. Owner's contribution was decreased from (55%) to (40%) for the given period indicated to high level of debt within the capital structure. The number of times interest that covered by the current earnings has been increased from (1.9 times) to (2.1 times), imply that it is necessary for the firm to capitalize its interest due to its inability of payment.

Valuation Ratios Results

The dividend yield ratio represents the most recent annual gross dividend as a percentage of the current market value. The actual book value for the stock of the firm is declining from (0.850 $) to (0.570) within the given period, which affected also the percentage of the market value to the book value for each share. This ratio dropped from (38%) to (30%) for the given period. The indication is that the firm's sales prices are relatively low and that its cost is relatively high.

Activity Ratios Results

Inventory turnover, which measures the efficiency of inventory utilization, has been decreased from (1.01 times) to (0.83 times) indicating that the firm is start entering the corner of risk. The trend analysis demonstrates the increasing period of inventory from (280 days) to (321 days), and therefore increasing the average receivable from (3 times) to

(3.6 times) and such turnover will not benefit the firm. Such increment reflects the low assets turnover which affecting the efficiency of the firm's investments in a fixed assets.

Profitability Ratios Results

Analyzing this group of ratios was not very encouraging. The net profit to the total sales is negative (-80.1, -51.24, -33.61) respectively. The firm has maintained the dropping substantially as assets is declining from (- 2.01%) to (- 9.29%). Both percentages reflects the poor performance of the firm's managements on sales and investment, as the annual profit per share is increased negatively from (- 16.27%) to (- 3.69%).To support the ratios analysis, the researchers used "Altman, Z-scores" equation, indicating the increasing risks of bankruptcy of the given firm. Table (2) represents the results analysis by using "Altman equation".

Table (2): Results Analysis by Altman Equation for the Period (2013-2015).

2013	2014	2015	
-30744578	9188910	-14449115	Net Working
47988777	9188910	45987559	Total Assets
-5.99%	-17.20%	-32.99%	X1
-9901112	-3996301	- 8995909	Accumulated Losses
47988777	47977600	45987559	Total Assets
-1.99 %	- 8.90 %	-19.98 %	X2
-9901112	-2993080	- 3999000	Net Profit/ Losses
47988777	47977600	45987559	Total Assets
-1.89%	-5.99 %	-9.95 %	X3
12990790	13990270	79915000	Share's Marketing Value
19990333	23990340	25990870	Total Liabilities
66.99 %	58.01%	31.01%	X4
2999706	5999540	4999000	Sales
47988777	47977600	45987559	Total Assets
6.98 %	11.90 %	11.61%	X5
- 0.07%	- 0.22.9 %	- 0.39.9 %	0.011 * X1
- 0.40 %	-1.22 %	-2.40 %	0.012 * X2
- 0.9 %	- 0.20%	- 0.30%	0.030 * X3
0.39 %	0.33 %	0.18 %	0.005 * X4
0.07%	0.11%	0.12%	0.009 * X5
- 0.9 %	-1.20 %	-2.99 %	Z

According to Altman equation Z values for the three successive given years was less than 1.81=Z -score < 1.81= High probability of bankruptcy.

6. CONCLUSION

In this research the financial ratio analysis was used to assess the performance of the concerning firm, profitability and managing risks from investors and creditors point of view. The researcher considered that financial ratios are vary in its purposes depending on the economic and trading conditions, and the environmental characteristics during the periods taken into considerations, and the accounts being analyzed. Altman Z-scores approach is used to judge the firm's performance to determine or assessing if the firm is going bankrupt.

The analysis shows that the firm has no effecting controlling system over spending in buying assets or reducing costs for generating profits. Also the firm is unable to sell its goods and services in a profitable manner at least to cover its daily operational costs. With such conditions liquidity is decreasing putting the firm in economic difficulties. Reduction in the liquidity and deterioration in the performance, both are affecting negatively the firm's shares value in the stock market, and investors are unwilling to buy the shares of this firm, then the fallen of the dividends' yields, and respectively the shares prices over years.

We are able to say that the concerning firm's operation is not encouraging and the ongoing concern for the future, so that such a predictive is important.

Therefore, according to the above conclusion our recommendations are as follows:

1. The researcher opinion partly to improve the situation is by using the decentralization approach for giving more initiatives and responsibilities for the employees in the decision making process to gives more suggestions and ideas to improve the working environment.
2. Improving the controlling and information system to improve the operational process of selling the firm's goods and services if a significant change has to take place, for reducing costs and generating profits.
3. Improving the firm's liquidity within the acceptable operational environment, as the total debts is (4.5M), which represent (15%) of the firm's capital. The firm should depending on the short term loans and reducing the account receivable period concerning the customers' credit selling as urgent steps to improve the liquidity.
4. Taking intense control on the raw materials buying, used as a step for reducing inventory costs and producing according to improved contract and along the firm's experience for changes in the production procedures already in practiced.
5. Rescheduling its obligation precisely according to the cash inflow/outflow to avoid a cash problem.

Such steps may strengthen the firm's credibility in the market and towards the creditors, which may improve the market value of its stocks in the market.

7. LIMITATIONS OF THE STUDY

1. Matching for similarities of environment of many firms working in different industries is not an easy job. Therefore, it is difficult and not clear if and how past experience will be transferable to future situation particularly in a dynamic environment in which businesses are operating.
2. No specific theory is existed, explaining how firms are going bankrupt, therefore, this issue needs more explanation and more analysis is needed.
3. More economic indicators may be needed to assess the strength or the weaknesses of the firm's financial position.

Appendix (1): Balance sheet (Assets) (2013-2015) 000 $

	2013	2014	2015
Current Assets: cash	299652	299111	264625
Checks under collection	999800	799120	311639
Trade Debtors	799770	989600	1394120
Account receivables (others)	399040	244950	199980
Stock After Provision	4998600	4999879	3999642
Letters of Credit	514200	599988	150170
Prepaid Expenses	0	137520	189320
Current Assets(Others)	148280	198988	200120
Total Current Assets	8159342	6181325	6309321
Expenses Deferred: Establishment Cost	130500	130500	130500
Expenses before Operations	1997900	19970000	1997000
Total Expenses deferred	2128400	2134410	2134410
Fixed Assets: Land and Buildings	399972	399972	399972
Fixed Assets(Net)	29996820	29997100	29987700
Total Fixed Assets	30396792	30397072	32522082
Total Assets	40684534	38712807	42962813

Appendix (2): Balance Sheet (liabilities) (2013-2015) 000 $

	2013	2014	2015
Current Liabilities: Bank and other borrowings	5999420	8998470	9900670
Trade Creditors	998870	1990420	2998870
Liabilities (others)	10077	19280	89870
Short-Term Notes Payables	1010000	3990000	4200000
Short-Term Loans	400000	2400000	4900000
Checks due	140490	59990	12300
Accruals	0	59750	40700
Total Current Liabilities	8558857	17517910	22142410
Long-Term Liabilities : Long- Term Notes Payable	1700200	699000	499200
Long-Term Loans	6850000	4900000	2400000
Total Long-term liabilities	8550200	5599000	2899200
Equity and Network : Capital	29000000	29000000	29000000
Accumulated Losses	-1423109	- 3900100	- 8900520
Net Equity	28576891	25099900	20099480
Total Equity and Liabilities	45118627	48216810	45141090

Appendix (3): Balance Sheet (liabilities) (2013-2015) 000 $

	2013	2014	2015
Sales	2999706	5998540	4997000
- Cost of Sales:			
Finished Products at 1/1 Production Cost	0	913768	430286
	4904337	4713657	4996700
- Finished Products at 31/12	-1000760	- 499057	- 498047
Cost of Sales	3983577	4214600	4498653
Operating Profit (Gross Profit)	-200010	600200	406076
Other Earnings	130140	22090	23300
Interest Receivables	- 699086	-2000068	-2000407
Selling and distribution expenses	-156910	-299830	- 399734
Administration expenses	-197900	-198800	-199900
Energy Expenses	0	-1061041	-1005912
Other Expenses	0	- 40200	-10910
Materials Price Decline Reserve	0	0	- 398800
Previous Adjustment	0	0	- 399900
Losses of the Year	-1002108	-3110120	- 4100006
Losses of the previous year	0	-1002108	- 4112228
Losses (Circulated)	-1002108	- 4112228	-8950234
The Stock share from Net Losses	- 3.98 %	-10.99 %	-15.98 %
Average of Total stock	2900000	2900000	29000000

Appendix (4): Cash flow Statement (2013-2015) 000 $

	2013	2014	2015
Cash flow from Operations: Loss of the Year			
	-1323089	-3110120	- 4100006
Fixed Assets Depreciation	359179	1000001	1000240
Materials Price decline Reserve	0	0	399450
Year's Adjusted Losses	-890630	-1980420	-2989000
Increase / Decrease In Current Assets Accounts receivable	-998917	- 390160	- 65520

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Checks under Collection	-997890	139820	498200
Stock at 31/12	- 4999897	-174002	- 59800
Letters of Credit	-510200	-89900	398040
Accounts Receivables (other)	-148280	-199900	-33820
Increase / Decrease in Current Liabilities Accounts Payable	998980	698300	997990
Checks (Deferred)	140450	-80900	-52800
Expenses due	0	59800	-17800
Cash Used in Operation Activities	- 6999700	-1991000	-997918
Cash flow from investment operation :			
Fixed Assets (bought)	-37900666	-827400	-139900
Deferred Payment	-2028400	0	0
Net Cash used in investment	- 40029066	-827300	-139900
Cash flow financial operations			
Bank Loans	5981420	2915900	590980
Notes Payable	3965000	125340	690970
Loan	6950888	0	0
Capital at start	29000000	0	0
Net Cash Used in investment operations	48887166	3041240	1281950
Net increase / decrease in cash	299625	12900	- 47970
Cash at 1/1	0	299625	312525
Cash at 31/12	299652	312525	264555

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