

**STUDY OF RISK EVALUATION IN ASSET MANAGEMENT COMPANIES
THROUGH EM Z-SCORE MODEL**

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ABSTRACT

This paper is a study of risk and liability management related issues in asset management companies in India. The purpose of this paper is to implement the emerging market (EM) Z-score model to predict bankruptcy and to measure the financial performance of major five asset management companies namely HDFC, Reliance, SBI, Kotak and UTI in India for 2010-11 to 2014-15. Based on the emerging market (EM) Z-score analysis, this study aims to apply the Z-score model to mutual fund industry and measure their financial performance indicators and the strengths and weaknesses of asset management companies. The output of this study could be considered as a caution of any future financial distress in asset management companies.

Key words: Risk management, Bankruptcy, Asset Management Company (AMC), HDFC, Reliance, SBI, Kotak, UTI, EM(Z)-Score

1. INTRODUCTION

In recent times, establishing a business base in the BRICs economies in general and India in particular has become a key business theme for the world's financial institutions. This has brought spotlight on the future growth potential of India's mutual fund industry. Stocks and mutual funds only account for 4.9% of personal financial assets in India, suggesting that India's individual investors tend to avoid risk

assets. Hence, it offers a huge opportunity to the mutual fund industry to create awareness among the individual investors regarding the risk factors and mitigation thereof and thereby attract them to invest in their funds into mutual funds. Another important factor which the mutual fund industry should take into consideration is that India has recently seen a rapid decline in the number of its extremely poor people, along with an increase in its wealthy and middle-income segments, with the latter referred to as the "new middle class" and inclusion of this emerging class would certainly broaden the market potential of mutual funds.

Financial intermediaries like mutual funds are expected to play an important role in accelerating saving-investment process in an emerging economy like India. There is no dearth of funds to deploy for investment with this so called middle income class or the household class. Bank deposits, life insurance, provident funds and currency still are the preferred channels of deposits of this class. This leaves a great scope for mutual fund industry to grab a greater share of the pie by providing to the investors the benefits of the expert management, diversification, continuous as well as convenient purchase and sale of securities and so on. Such services cannot be arranged by investors, on their own. Over the years, the industry has witnessed numerous changes in terms of abolishing the monopoly of UTI set up in 1964 to setting up of asset management company led by State Bank of India in 1987 to various kinds of reforms that came up along with the establishment of Security and Exchange Board (SEBI) of India in 1992 to emergence of private sector funds including foreign funds post 1993. The industry registered a significant growth during 2003-2008 when the value of the asset under management grew from Rs. 121805 crores in Jan. 2003 to Rs.505152 crores in March 2008 and except during 2008-2009 when it faced a negative growth, it has gone strength to strength to Rs.1082757 crores in March 2015. Though this growth during the last seven years is phenomenal, it loses its sheen the moment we compare it in terms of its share in the total deposits. A recent report on Mutual Fund Investments in India published by research and analytics firm, Boston Analytics, suggests investors are holding back from putting their money into mutual funds due to their perceived high risk and a lack of information on how mutual funds work. Needless to say, economic reforms and financial sector reforms have been instrumental to the growth of this industry, but keeping into consideration the size of the Indian economy and share of savings in the national income, it has miles to go to get its legitimate place. Admittedly, perceived risk factor and lack of information about the mutual funds is high, but can these factors be dealt with by better regulatory framework, progressive policies and better performance of the mutual funds which can inspire the investors to invest

their money into mutual funds without much risk and get better returns? This paper is an attempt to study these issues.

1.1 OBJECTIVES

The following are the objectives of this paper.

- ☐ To measure the default risk of asset management companies using emerging market (EM) Z-score.
- ☐ To arrive at conclusions and suggest recommendations.

2. LITERATURE REVIEW

Deepthi Fernando et al. (2011), in a World Bank Policy Research Working Paper perceived that, mainly in Asia with few exceptions, mutual funds progressed impetuous in utmost countries around the world during the 1990s. Some of the significant conclusions of her study were - Legal origin are significantly correlated with mutual fund growth. Equity funds are more progressive in common law countries, while bond funds are more developed in countries with civil law systems. Higher market returns and liquidity and lower instability have also contributed to mutual fund growth.

Markowitz (1991) noted that typical investor wants "higher returns" and "returns to be as certain as possible", i.e., investor seeking both to "maximize expected returns" and "minimize uncertainty" (i.e., risk) has two conflicting objectives that must be balanced against each other when investing at time $t=0$. In other words, fund managers are expected to trade-off between the risk and return.

Arugaslan et.,al (2008) gauged the risk-adjusted performance of the largest US-based equity mutual funds by using meticulous analysis grounded in modern portfolio theory and presented the outcomes in a manner which is coherent to an amateur investor. The outcomes showed that the funds with the highest returns may lose their lure once the degree of risk had been factored into the analysis. Contrary wise, some funds may look very appealing once their low risk is factored into their performance.

Obaid Saif H. Al Zaabi (2011) used and analyzed the methodology in his study was based on Z-score model for EMs developed by Altman. Various studies have proved that Z-score has more than 80 percent accuracy and is useful in assessing the business performance and prediction of potential distress of firms. He found that the Z-score model is a valid model to measure the performance of Islamic banks, which belong to service sector and the ratios used in calculating Z-score can be considered to provide valuable helpful indicators. He investigated that the Z-score model to banking industry as a beneficial indicative tool for possible causes standing behind the decline of financial performance. He examined the trend of financial performance thorough understanding of the relationship between the denominator and the numerator of all ratios in the Z-score model.

Z-score - Z-score is a discriminate and forecast model developed by Edward Altman in 1968 to measure the distance to default of manufacturing companies. The model consists of five ratios selected to be the Z score model variables. Their purpose is to discourse the prediction

capability of corporate bankruptcy. Certain weights are assigned to each variable. The 5th ratio (sale/total assets) had been omitted in the modified version of the model for service sector, and the adjusted formula appeared for providing equally valid predictive results, analyzed by Obaid Saif H. Al Zaabi in his study. The reason for this change was that the fifth ratio gives a high value for non-manufacturing companies. The new modified Z-score model, the emerging market (EM) Z-score model is believed to be more appropriate for non-manufacturing companies, minimizing the potential of industry effect and better suiting the EM. In this modified model for service sector, the book value of equity is used in the 4th variable and a new weight is re-assigned for all four variables. It is assumed that a Z-score below 1.10 indicates a distress condition (Altman,2002).

Abidali and Harris (1995) took 11 failed and 20 non-failed companies in their study and used a modified Z-score to predict the failure and summarized that all the failing companies displayed negative Z-scores for several years prior to failure. Hence, the lower the Z-score for the company, and the more years the company is classed as at risk, the more likely it is that the company will fail. Thus, the Z-score can be used to rank the company in terms of their solvency. Like Abidali and Harris's (1995) conclusions, Sauer's (2002) study indicated that using Z-score for company's consecutive years' accounts can highlight where a company's financial condition is worsening. Sauer quantified that Z-score is an early alert procedure designed to provide time for firm management to adjust its strategy and current debt collection prior to the actual crisis event. Saudin and Proporato's (2007) study intended to predict the bankruptcy of several companies listed in the Buenos Aires stock exchange in 1990. They studied 11 healthy companies and 11 bankrupt companies. Saudin and Proporato followed Altman (2002) in using four steps in the developing of bankruptcy prediction models. The study concluded that the Z-score ratio is the most highly recommended as the key prediction of bankruptcy in an emerging economy. It also saw the prediction ability of the Z-score as being useful for investors and banks in decision making.

In a study, Agarwal and Taffler (2007) used Z-score to explore the track record over the 25 years from 1979 to 2003 for 232 failed companies listed in the London Stock Exchange aiming to explore the question of whether a well-established and widely used UK-based Z-score model has true predictive ability. Their results indicated that Z-score is a valid descriptive tool by nature, and a readily interpretable communication device. The study considers the different aspects of economic information in a firm's set of accounts, compared with conventional ratios analysis. Agarwal and Taffler found that Z-score has true failure prediction activities and concluded that the Z-score if carefully developed and tested will continue to have significant value for financial statement users concerned about corporate credit risk and firm financial health.

Calandro (2007) found that Z-score is extremely influential in many areas including credit risk analysis, distress investing and merger and acquisition analysis. He concluded that Z-score is broadly applicable in performance management. In a study conducted by Jayadev (2006) covering 56 defaulted companies selected from the five largest public-sector banks for finding accounting data for defaulted companies financing by those banks. The study asserted the feasibility of using Z-score for internal rating of commercial banks associated to coefficient

based on their data base to various segments of borrowers. Other researchers Hesse and Cihak (2006) used Z-score to measure bank risk, and concluded that Z-score has the capability to quantify the risk of insolvency in case of facing channeling of capital. A study by Liu et al. (2004) to measure the insolvency risk of cooperative banks, selecting several Canadian banks where Z-score based on option-pricing model had been used to quantify the market value of the banks' assets in relation to the book value of their liabilities. The study found of reliability of Z-score and concluded that Z-score is feasible to measure distance to defaulting of financial institutes. Zhang et al. (2006) developed a modified Z China-score for 1,001 firms. They concluded Z-score to be a useful tool in terms of the distress- predication model in credit evaluation for business loans in the banking industry.

There have also been several criticisms of the model, beside the numerous benefits of Z-score, who indicates that Z-score works better for some industries than for others, such as Z-score is seen to lack forecast accuracy for non-manufacturing firms and that it is incredible for one tool to capture all the factors causing corporate solvency. However, this criticism is contradicted by other studies which clearly indicate that Z-score should be employed not as a descriptive theory of failure but rather as a pattern recognition tool for measuring financial risk (Altman, 2002).

Amin Jan and Maran Marimuthu (2015) stated that in 2000 Altman penned a paper in which he made the initial Z-score model functional for service like the banks as well. The coefficients of the variables were change along with the exclusion of variable x5 i.e. Revenue/ Total assets, because the service firms don't have Revenue. The new Altman z-score model for service firms shapes as.

$$Z = 6.56x1 + 3.26x2 + 6.72x3 + 1.05x4$$

Kyriazopoulos et-al. (2014) predicated the bankruptcy of 6 Greek cooperative banks afterward the subprime crisis of 2007-2008 by using Altman's model and financial data for the period 2001-2009. The study stated that, Altman model to be found very efficient model in bankruptcy prediction of Greece banks. In a study, Sharma et-al. (2013) used Altman model on 36 commercial banks of India, included of 20 public sectors and 16 private sector banks. The study analyzed all the banks in safe zone except two banks, Canara bank, among the public sector and Kotak Mahindra bank, among the private sector banks of India that were found to be in the distress zone. The study stated Altman model 70 percent accurate in predicting financial distress of Indian banking industry. Moreover, the study described that, instead of utmost accuracy in predicting financial soundness of banking industry still the Altman model is least explored in the field.

Chieng (2013) carried out Altman model to 4 distressed and non-distressed Euro-zone banks by picking the data for the period 2005-2010. The study stated that, Altman model has 100 percent accuracy in finding financial distress 5 year prior to failure of banking industry. Nayak et al., (2011) used Altman's model to assess the performance of public sectors Indian banks. The study analyzed that Altman model is very accurate for finding financial health of public sectors banks in India.

Pradhan (2014) used Z-Score Bankruptcy Model (EM Z-score model) by taking data for 11 years from 2000 to 2009, with regards to comparison of Oriental Bank of Commerce, Punjab National Bank and State Bank of India. The analysis suggested that the Z score value of Oriental Bank of Commerce is the highest amongst the mentioned three banks. She applied different combinations of short-term debts and long-term debts as a substitution for a firm's liabilities to study whether the liquidity constraint from short-term liabilities alone actually forces firms to declare bankruptcy, or if we should consider that the amount of long-term debts is also relevant to determining a firm's bankruptcy probability, for the analysis. The study indicated that Altman's model is very accurate in predicting bankruptcy of banking industry. Altman model is best suited for an early warning of bankruptcy can prudence the management to take vigilant and quick actions to halt the upcoming distress. Mamo (2011) in his Ph.D thesis applied Altman's model for finding the financial distress of 43 commercial banks in Kenya. The study described that, the Altman model is found 80% accurate in case of failed banks, however, the precision of the model is found 90 percent in case of non-failed banks while predicting financial distress of Kenyans banks. Chaitanya (2005) applied Altman model to quantity financial features and bankruptcy of Indian financial Service Industry (IDBI). The result of the study projected a possible bankruptcy for IDBI, as the Altman model placed IDBI in the distress zone.

Swayam Prava Mishra (2010) applied the most unanimously used emerging market (EM) Z-score model of 5 countries such as U.S., Australia, Brazil, Canada and Japan, and compared their ratios for both the failed and nonfailed groups after the global financial crisis of 2007-08 which had engrossed almost all the economies of the world. She stated that even though tools like Z score were available, losses were still incurred by even the most sophisticated investors and financial institutions. Further she emphasized that credit-culture is required within these financial institutions, whereby credit risk tools are made clear and evaluated in good times as well as in difficult circumstances.

In a study Mayanka et-al. (2013) applied Altman Z score model to Indian banking industry. The study estimated Z score for 36 Indian commercial banks for a period of five years from 2007-12. These banks include 20 Indian public sector banks and 16 Indian private sector banks. The two banks found somehow in distress position were Canara bank among public sector banks and Kotak Mahindra bank among private sector banks. The study concluded that with only two exceptions the financial position of Indian banks found satisfactory as per the Altman model.

Literature summary

It is almost evident from the literature that, Altman model is the best model based on very precise and relevant ratios that can predict bankruptcy five year prior to actual bankruptcy and with higher degree of accuracy. However, studies relating to future prediction of asset management companies are found scanty in the literature. Therefore, this study attempts to measure the default risk of asset management companies using emerging market (EM) Z-score with a view that it gives a forewarning to the existing investors and the potential investors not to put their money in an asset management company which is likely to be bankrupt.

3. RESEARCH METHODOLOGY

Entire paper has been based on secondary research by collecting data from the annual reports. Subsequently, the data collected from these sources was analyzed subject to the requirements of the objectives of the research paper. Primarily, the following analysis has been carried out.

- Calculating EM Z-score for the sample and interpreting the results

DEFINITION OF EM Z-SCORE

EM Z-score which is a modified version of Altman Z-score developed in 2002 by Altman himself has been widely used to assess the risk of service industries including retail, banking and financial institutions. In order to arrive at the distress potential of the companies under study, various ratios have been used, of which the four ratios that are commonly used are the ones which have been used in this study. The time series data of EM Z-score for four years for select AMCs suggests the risk probability.

The output of a credit-strength test gauges a publicly traded company's likelihood of bankruptcy. The EM Z-score is based on four financial ratios that can be calculated from data found on a company's annual reports during 2010-11 to 2014-15.

Methodology Model EM Z-score is used in this study (Altman model for service firms) is calculated as follows:

$$\text{EM Z-Score} = 3.25 + 6.56(X1) + 3.26(X2) + 6.72(X3) + 1.05(X4)$$

SIGNIFICANCE AND IMPAORTANCE OF EM Z-SCORE

X1: Working capital to total assets. Examines the net liquid assets of a firm relative to the total assets, and measures the company's ability to well manage the liquidity, the net liquidity assets, or working capital resulted from subtracting the current total liabilities from current total assets; as a rule, a distressed company suffers from decay in working capital.

X2: Retained earnings to the total assets. Examines the retained earnings relative to total assets, and measures the cumulative profitability.

X3: Return on total assets, computed by dividing earnings before interest and taxes (EBIT) by total assets. It examines the company's ability to generate profits from its assets base; it is extremely relevant when evaluating corporate survivability and measuring the profitability of the company in general and highlighting the level of productivity resulted from borrowed funds specifically.

X4: Market value of equity or firm's net worth examines stockholders' equity to total liabilities. The higher the score, the less likely the company to go bankrupt.

☐ EM Z-score > 2.60, it is unlikely to default and safe

☐ 1.1 - 2.60, chance of default

☐ <1.10 high chances of bankruptcy

4. DATA COLLECTION, ANALYSIS AND INTERPRETATION

4.1 SAMPLE

To study the EM Z-score following are the five Asset Management companies considered as sample.

1. HDFC
2. Kotak Mahindra
3. SBI
4. UTI
5. Reliance

(SOURCE: ANNUAL REPORT OF HDFC, RELIANCE, SBI, KOTAK, UTI)

To test the above objectives, 2010-2011 to 2014-2015 period was taken and the Working capital to total assets, retained earnings to total assets, EBIT to total assets and Net worth to total liabilities were calculated for each year.

4.2 ANALYSIS OF DATA

4.2.2 EM Z-SCORE ANALYSIS OF COMPANIES

HDFC ASSET MANAGEMENT COMPANY

EM Z -SCORE ANALYSIS	2014-15	2013-14	2012-13	2011-12	2010-11
CURRENT ASSETS	9,27,62,79,970.00	16,43,61,41,610.00	13,35,58,15,840.00	11,27,14,38,441.00	5,80,44,82,570.00
CURRENT LIABILITIES	1,76,86,01,922.00	10,07,19,61,974.00	7,49,87,14,329.00	6,17,41,73,089.00	96,58,95,012.00
WORKING CAPITAL CHANGES	7,50,76,78,048.00	6,36,41,79,636.00	5,85,71,01,511.00	5,09,72,65,352.00	4,83,85,87,558.00
TOTAL ASSETS	13,11,75,07,080.00	19,23,45,52,916.00	14,66,87,05,045.00	12,37,67,42,740.00	10,58,68,47,004.00
BOOK VALUE OF LIABILITIES	1,91,86,01,922.00	10,22,19,61,974.00	7,64,87,14,329.00	6,35,37,25,186.00	5,43,79,84,585.00
DIVIDEND PAID	1,64,06,52,000.00	21,44,83,700.00	18,01,66,310.00	13,47,46,510.00	72,99,01,000.00
PAT	4,15,50,00,107.00	3,57,77,01,805.00	3,18,74,63,597.00	2,69,13,48,030.00	2,42,17,91,804.00
RETAINED EARNINGS	2,51,43,48,107.00	3,36,32,18,105.00	3,00,72,97,287.00	2,55,66,01,520.00	1,69,18,90,804.00
EBIT	6,22,59,55,322.00	5,22,45,09,443.00	4,46,81,85,745.00	3,81,49,05,525.00	3,55,78,34,939.00
REVENUE	10,22,43,84,347.00	8,58,54,67,657.00	7,15,72,29,240.00	6,33,32,75,223.00	6,80,76,64,961.00
MARKET VALUE OF EQUITY	11,19,89,05,158.00	9,01,25,90,942.00	7,01,99,90,716.00	6,02,30,17,554.00	5,14,88,62,419.00
X1	WORKING CAPITAL CHANGES/TOTAL ASSETS				
X1	0.572	0.331	0.399	0.412	0.457
X2	RETAINED EARNINGS/ TOTAL ASSETS				
X2	0.192	0.175	0.205	0.207	0.160
X3	EBIT/TOTAL ASSETS				
X3	0.475	0.272	0.305	0.308	0.336
X4	MARKET VALUE OF EQUITY/BOOK VALUE OF LIABILITIES				
X4	5.837	0.882	0.918	0.948	0.947
EM Z -SCORE	$3.25+6.56*X1+3.26*X2+6.72*X3+1.05*X4$				
Calculation of EM Z -SCORE	16.949	8.742	9.548	9.692	10.022

Table 1: Calculation of EM Z-score for HDFC Asset Management Company

RELIANCE CAPITAL ASSET MANAGEMENT COMPANY

EM Z -SCORE ANALYSIS	2014-2015	2013-14	2012-13	2011-12	2010-11
CURRENT ASSETS	9,11,89,60,882.00	11,86,92,21,467.00	3,72,75,33,172.00	4,22,07,00,311.00	3,60,10,40,921.00
CURRENT WORKING CAPITAL CHANGES	3,14,72,68,631.00	3,11,67,10,855.00	2,76,84,88,563.00	2,99,25,52,726.00	3,09,52,13,523.00
TOTAL ASSETS	5,97,16,92,251.00	8,75,25,10,612.00	95,90,44,609.00	1,22,81,47,585.00	50,58,27,398.00
BOOK VALUE OF LIABILITIES	16,63,79,43,246.00	16,43,13,69,105.00	15,00,21,30,939.00	15,03,43,25,073.00	14,21,82,21,386.00
DIVIDEND PAID PAT	3,17,93,89,631.00	3,14,02,16,983.00	2,79,67,29,204.00	3,02,46,86,503.00	3,09,52,13,523.00
RETAINED EARNINGS	2,01,82,05,064.00	1,88,69,18,758.00	1,87,44,59,723.00	1,87,58,33,634.00	1,61,40,02,137.00
EBIT	3,57,33,41,092.00	3,03,94,23,887.00	1,97,53,81,922.00	2,76,10,90,431.00	2,61,27,33,568.00
REVENUE	1,55,51,36,028.00	1,15,25,05,129.00	10,09,22,199.00	88,52,56,797.00	99,87,31,431.00
MARKET VALUE OF EQUITY	4,43,31,78,131.00	3,83,61,52,596.00	2,58,04,27,741.00	3,37,56,18,674.00	3,19,28,44,073.00
X1	10,22,43,84,347.00	6,61,80,42,633.00	5,89,98,16,525.00	5,41,34,22,090.00	6,99,25,10,372.00
	WORKING CAPITAL CHANGES/TOTAL ASSETS				
X1	0.359	0.533	0.064	0.082	0.036
X2	RETAINED EARNINGS/TOTAL ASSETS				
X2	0.093	0.070	0.007	0.059	0.070
X3	EBIT/TOTAL ASSETS				
X3	0.266	0.233	0.172	0.225	0.225
X4	MARKET VALUE OF EQUITY/BOOK VALUE OF LIABILITIES				
X4	4.233	4.233	4.364	3.971	3.594
EM Z -SCORE ANALYSIS	$3.25+6.56*X1+3.26*X2+6.72*X3+1.05*X4$				
Calculation of EM Z -SCORE	12.140	12.986	9.430	9.656	8.995

Table 2: Calculation of EM Z-score for Reliance Asset Management Company

SBI ASSET MANAGEMENT COMPANY

EM Z -SCORE ANALYSIS	2014-2015	2013-14	2012-13	2011-12	2010-11
CURRENT ASSETS	31,447.00	32,625.63	24,607.30	35,226.15	30,469.87
CURRENT LIABILITIES	12,520.00	10,350.83	9,012.26	7,069.98	5,945.22
WORKING CAPITAL CHANGES					
	18,926.97	22,274.80	15,595.04	28,156.17	24,524.65
TOTAL ASSETS	67,512.00	55,684.39	44,432.95	38,141.08	34,187.39
BOOK VALUE OF LIABILITIES	13,735.06	11,366.03	9,841.75	7,701.71	6,429.48
DIVIDEND PAID	5,000.00	3,800.00	2,900.00	2,900.00	2,400.00
PAT	16,344.00	15,576.90	8,568.29	6,051.91	7,884.75
RETAINED EARNINGS					
RETAINED EARNINGS	11,343.50	11,776.90	5,668.29	3,151.91	5,484.75
EBIT	24,309.00	23,138.85	12,052.99	8,378.94	11,690.47
REVENUE	45,245.54	40,144.54	29,860.45	24,758.25	25,524.22
MARKET VALUE OF EQUITY	53,776.94	44,318.36	34,591.20	30,439.37	27,757.91
X1	WORKING CAPITAL CHANGES/TOTAL ASSETS				
X1	0.280	0.400	0.351	0.738	0.717
X2	RETAINED EARNINGS/TOTAL ASSETS				
X2	0.168	0.211	0.128	0.083	0.160
X3	EBIT/TOTAL ASSETS				
X3	0.360	0.416	0.271	0.220	0.342
X4	MARKET VALUE OF EQUITY/BOOK VALUE OF LIABILITIES				
X4	3.915	3.899	3.515	3.952	4.317
EM Z -SCORE ANALYSIS	3.25+6.56*X1+3.26*X2+6.72*X3+1.05*X4				
Calculation of EM Z -SCORE	12.165	13.450	11.482	13.988	15.310

Table 3: Calculation of EM Z-score for SBI Asset Management Company

KOTAK ASSET MANAGEMENT COMPANY

EM Z -SCORE ANALYSIS	2014-2015	2013-14	2012-13	2011-12	2010-11
CURRENT ASSETS	1,467.91	4,438.32	3,338.73	3,823.21	4,656.96
CURRENT LIABILITIES	3,610.32	2,585.98	1,721.59	1,232.37	2,964.28
WORKING CAPITAL CHANGES					
	-2,142.41	1,852.34	1,617.14	2,590.84	1,692.68
TOTAL ASSETS	10,328.36	11,756.95	9,373.45	9,610.09	9,951.10
BOOK VALUE OF LIABILITIES	4,365.84	3,089.71	2,223.21	1,571.42	3,263.64
DIVIDEND PAID	567.25	1,062.25	1,062.25	765.25	2,844.25
PAT	-3,617.75	3,338.91	346.71	1,435.17	1,061.99
RETAINED EARNINGS					
RETAINED EARNINGS	-4,185.00	2,276.66	-715.54	669.92	-1,782.26
EBIT	-3,590.81	4,955.62	294.59	2,011.41	1,466.07
REVENUE	12,564.27	16,313.56	11,268.18	11,429.80	10,827.40
MARKET VALUE OF EQUITY	5,962.52	8,667.24	7,150.24	8,038.67	6,687.46
X1	WORKING CAPITAL CHANGES/TOTAL ASSETS				
X1	-0.207	0.158	0.173	0.270	0.170
X2	RETAINED EARNINGS/TOTAL ASSETS				
X2	-0.405	0.194	-0.076	0.070	-0.179
X3	EBIT/TOTAL ASSETS				
X3	-0.348	0.422	0.031	0.209	0.147
X4	MARKET VALUE OF EQUITY/BOOK VALUE OF LIABILITIES				
X4	1.366	2.805	3.216	5.116	2.049
EM Z -SCORE	$3.25+6.56*X1+3.26*X2+6.72*X3+1.05*X4$				
Calculation of EM Z -SCORE	-0.331	10.693	7.721	12.024	6.924

Table 4: Calculation of EM Z-score for KOTAK Asset Management Company

UTI ASSET MANAGEMENT COMPANY

EM Z -SCORE ANALYSIS	2014-2015	2013-14	2012-13	2011-12	2010-11
CURRENT ASSETS	6,652.30	6,577.90	4,594.50	5,089.20	5,364.10
CURRENT LIABILITIES	1,560.20	1,073.40	1,017.00	908.70	1,098.50
WORKING CAPITAL CHANGES					
	5,092.10	5,504.50	3,577.50	4,180.50	4,265.60
TOTAL ASSETS	16,032.20	13,909.20	12,696.40	11,387.90	10,653.90
BOOK VALUE OF LIABILITIES	2,674.10	2,259.70	2,235.00	1,948.70	2,164.20
DIVIDEND PAID	437.50	406.30	343.80	343.80	431.30
PAT	2,012.60	1,699.90	1,489.00	1,340.90	1,375.00
RETAINED EARNINGS					
RETAINED EARNINGS	1,575.10	1,293.60	1,145.20	997.10	943.70
EBIT	2,946.70	2,388.40	2,066.40	1,814.20	1,942.10
REVENUE	6,526.10	5,059.30	4,930.40	4,475.10	4,605.70
MARKET VALUE OF EQUITY	13,358.10	11,649.50	10,461.40	9,439.20	8,489.70
X1	WORKING CAPITAL CHANGES/TOTAL ASSETS				
X1	0.32	0.40	0.28	0.37	0.40
X2	RETAINED EARNINGS/TOTAL ASSETS				
X2	0.10	0.09	0.09	0.09	0.09
X3	EBIT/TOTAL ASSETS				
X3	0.18	0.17	0.16	0.16	0.18
X4	MARKET VALUE OF EQUITY/BOOK VALUE OF LIABILITIES				
X4	5.00	5.16	4.68	4.84	3.92
EM Z -SCORE					
	$3.25+6.56*X1+3.26*X2+6.72*X3+1.05*X4$				
Calculation of EM Z -SCORE	12.13	12.72	11.40	12.10	11.51

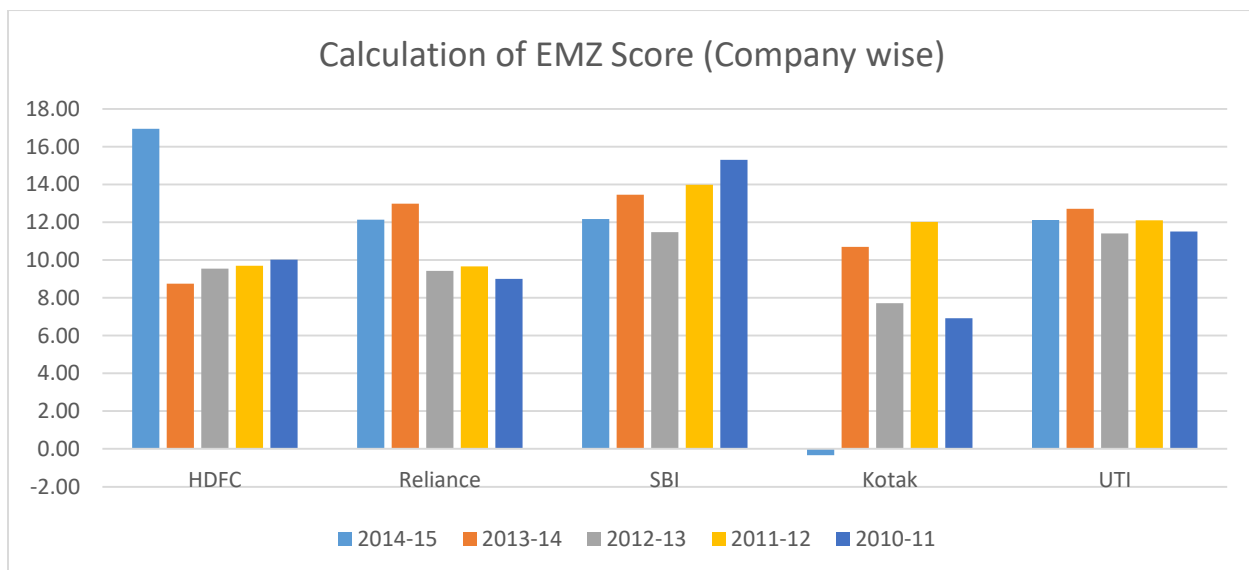
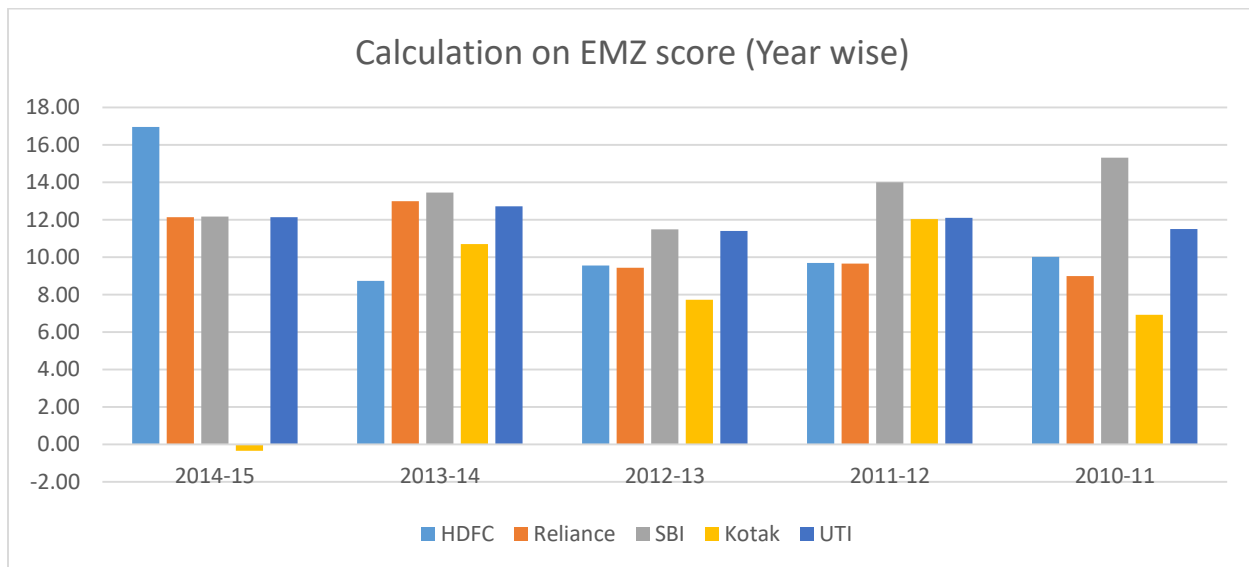
Table 5: Calculation of EM Z-score for UTI Asset Management Company

INTERPRETATION

EM Z-score

EM Z-Score	2014-15	2013-14	2012-13	2011-12	2010-11
HDFC	16.95	8.74	9.55	9.69	10.02
Reliance	12.14	12.99	9.43	9.66	8.99
SBI	12.16	13.45	11.48	13.99	15.31
Kotak	-0.33	10.69	7.72	12.02	6.92
UTI	12.13	12.72	11.40	12.10	11.51

Table 6: EM Z-Score calculation for the Asset Management Companies

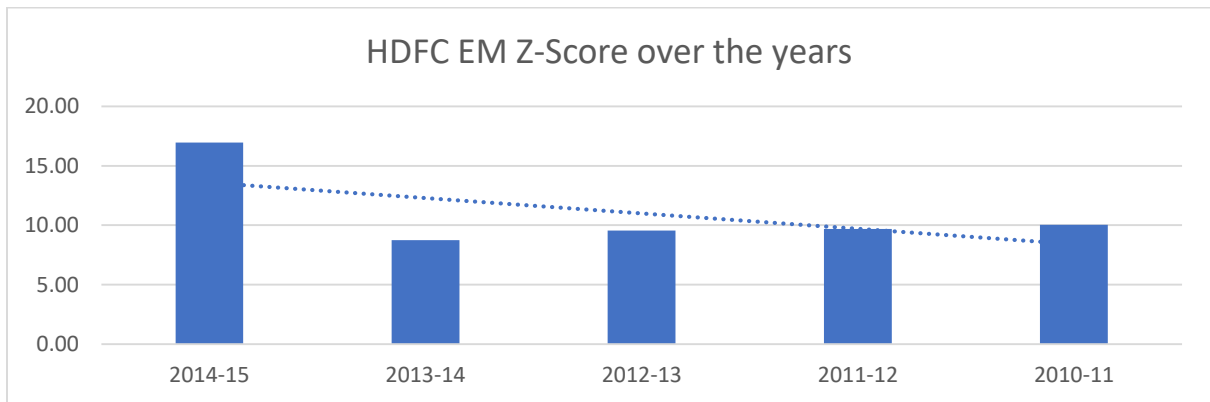


EM Z-score is about the solvency condition of Asset Management company, if company has:

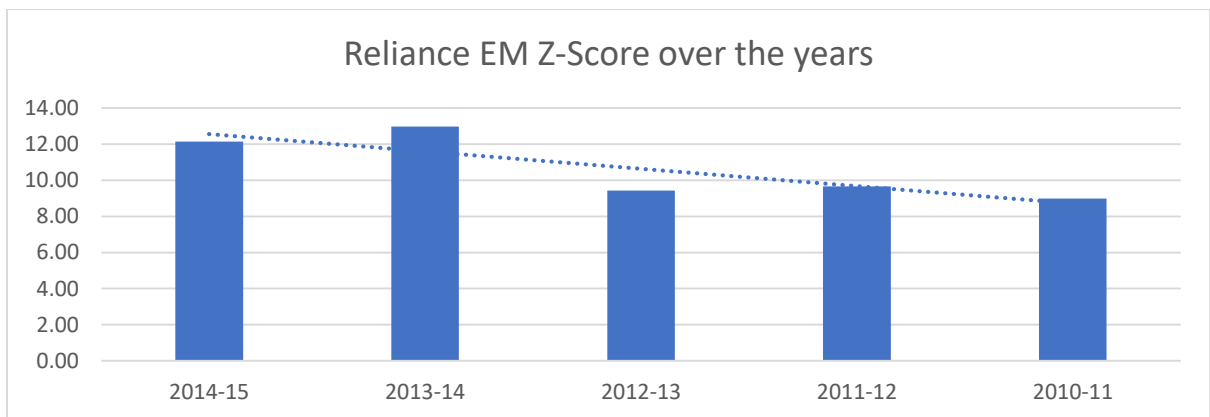
- ☐ EM Z-score > 2.60, it is unlikely to default and safe
- ☐ 1.1 - 2.60, chance of default
- ☐ <1.10 high chances of bankruptcy

From the calculation, it shows that

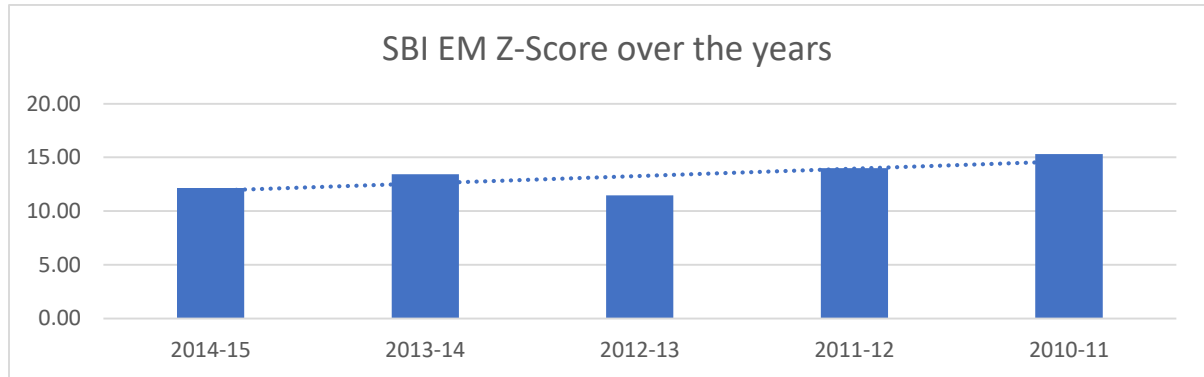
- ☐ HDFC – During 2010-11 to 2013-14, it is observed that the company maintained a steady EM Z-score, with a score of 10.02, 9.69, 9.55 and 8.74 respectively. Contrary to that, during 2014-15, the HDFC Asset Management Company has registered a remarkable EM Z-score of 16.95 which is highest EM Z-score among all the AMCs under reference. It indicates that HDFC is the strongest AMC very much unlikely to default.



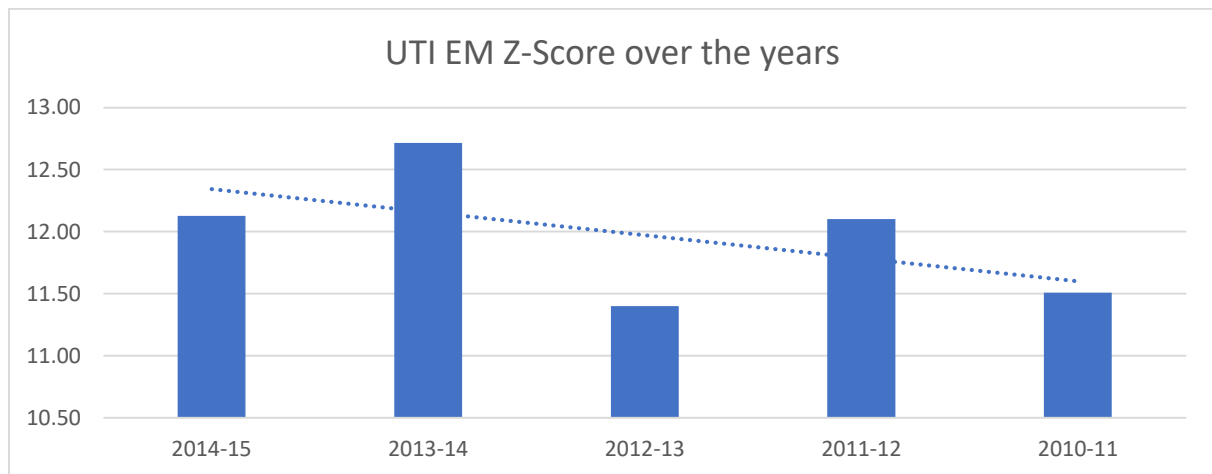
- ☐ Reliance – Looking at the EM Z-score of Reliance over the years since 2010-11 to 2014-15, it is observed that it's performance has improved from 8.99 in 2010-11 to 12.14 in 2014-15. This indicates that the risk and the bankruptcy probability does not exist with regard to Reliance.



- ☐ SBI – Though SBI EM Z-score over the years has been in double digits, its EM Z-score has been does not show any definite trend year on year. In fact, the EM Z-score has gone down from 15.31 in 2010-11 to 12.16 in 2014-15. Moreover, since EM Z-score has been double digits in all the years there is no probability of bankruptcy of SBI.



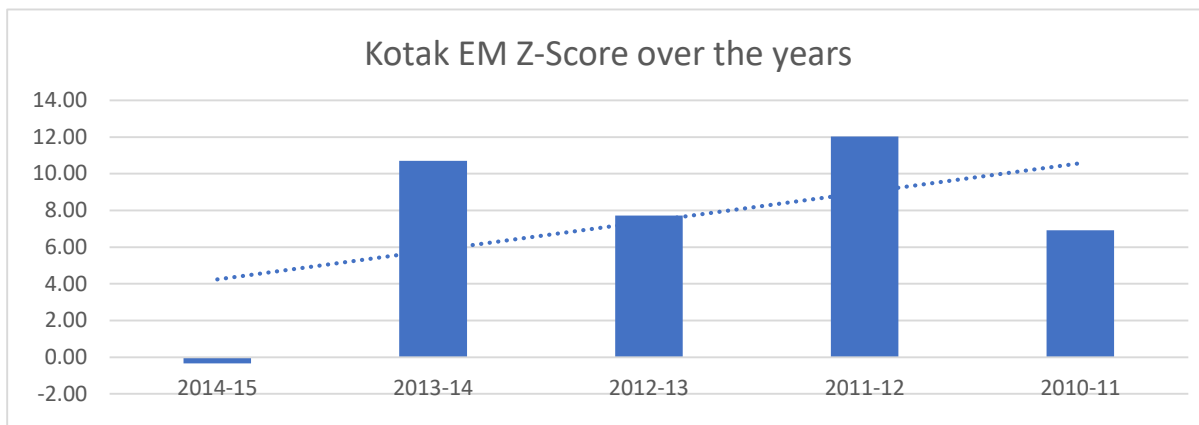
- ☐ UTI – UTI EM Z-score over the years shows marginal improvement from 11.51 in 2010-11 to 12.13 in 2014-15. In terms of bankruptcy risk UTI maintains healthy EM Z-score and hence has there by isolated from bankruptcy risk element.



- ☐ Kotak – This AMC has the most fluctuating EM Z-score during 2010-11 to 2014-15, where the EM Z-score oscillated from 12.02 to -0.33. This states that this AMC is the most vulnerable among the AMCs taken. From 2014-15 EM Z-score, it can be concluded that the AMC has 100% chance of default.

Year wise analysis of AMCs during 2010-11 to 2014-15

Looking at the year-wise performance of five AMCs' EM Z-score, SBI stands out at the top performer during 2010-11 to 2013-14. Next to SBI is UTI. Other AMCs do not show a clear-cut trend.



5. CONCLUSION

The studies conducted on asset management companies' bankruptcy are found scanty in the literature. However, this paper identified the significance of achieving strong probability of bankruptcy of asset management companies. This study highlighted the earlier bankruptcy evaluation model which were mainly confined to manufacturing based industries. However, since 2000 onward, the bankruptcy literature suggested that, Altman model with little changes in terms of relevant ratios which will form the model, was equally relevant for service firms such as asset management companies too. This study analysed the importance and consequences of comparative bankruptcy study and the importance of identifying the key performance indicators that affect the bankruptcy of asset management companies. Hence, the findings of the paper have practical implications on the current working framework of asset management companies in India. In framework of using bankruptcy as a directive for measuring EM Z-score model are studied and discussed, and hence, it is acknowledged from literature that, Altman model for service firm is the best and recommended model to predict bankruptcy and to measure the financial performance of asset management companies. The reason of selecting Altman model is also validated by its popularity and accuracy in the bankruptcy literature, secondly the ratios' nature of the Altman model made it best fit for asset management companies. The paper finds that asset management companies should work on improving the ratios that are dragging their scores down to better understand their past performance and realize their current position in the industry. The study also finds that the ratios used in calculating EM Z-score can be considered to provide valuable instrumental indicators.

As regards the recommendation, it is proposed that SEBI should form a working group to study the application of EM Z-Score on Indian Asset Management Companies. It can be done in the historical context, by applying this model on the bankrupt AMC of the past and if the model and the ratios that comprise the model predict more than 80-90% cases, it can be made compulsory for all the AMCs to calculate the EM Z-score of their mutual funds and make it a part of their mandatory disclosure.

6. LIMITATIONS

- From the point of view of risk, companies are being taken which incur losses year after year, in order to examine their bankruptcy. However, in this paper, this is not the case. Because of the very nature of the asset management companies is such that they do not seem to incur losses for many years at a stretch.

☐ Risk evaluation using all the ratios is comparative with only 5 asset management companies whereas there are many asset management companies.

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