Predicting Financial Distress of Bhutan Telecom Limited

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Abstract: In the country of Gross National Happiness, the telecom industry is showing a momentous and a stable growth. The cellular network is gaining momentum across the country to connect people in the remotest part of Bhutan so that the people receive the benefits of digitalization. The present research examines the three renowned accounting based prediction models for analysing the healthiness of Bhutan Telecom limited (BTL). The applications of models under study are Altman's Z-score, Springate and Zmijewski. The findings of the study reveal that BTL under the three well-known models found to be healthy.

Index Terms: Financial Healthiness, Altman Z-score, Springate S-score, Zmijewski X-score

I. INTRODUCTION

Financial ratios are used to determine the creditworthiness and financial accuracy of firms across the world. Bhutan is a rising economy aims at sustainable and equitable development. The country aims to progress in every sector so that it ensures balanced regional development is taking place in each sector's. Bhutan also looks forward to achieve economic development aligned with its Gross National Happiness. The present study intends to compute the health of Bhutan Telecom Limited (BTL) using "Z-Score", "X-Score" and "S-Score" Model as a performance metric for the period between 2009 and 2018 using the annual reports of the company.

II. RESEARCH OBJECTIVE

The first intention is to look at the healthiness of BTL using the three renowned predictive models namely Altman's Z-score, Springate and Zmijewski model with the help of key financial ratios.

III. LITERATURE SURVEY

Due to the recent developments in telecommunication industry there is a drastic change in mobile phones technology. Nowadays smartphones can do all the tasks which modern computers can perform. Recently Augmented Reality has come into picture which will give the essence of virtual environment over real one. In order to design AR apps specific information is needed [1].

IV. PROPOSED METHODOLOGY

The distress prediction models to predict the state of being financially distressed of companies under various sectors available in the literature are: Z-score, Springate, Zmijewski, Ohlson, and Grover models(Sinarti and Sembiring (2015); Januri, Sari, and Diyanti (2017); Syamni, Majid, Siregar (2018); Verma, and Pandit (2019); Apoorva, Curpod, and Namratha (2019)).The present study is being analyzed by the first three models.

3.1 Altman' Z-score Model

The first Z-score model developed by Altman in the year 1968 uses multi-factor variables to predict financial distress situation of manufacturing firms with the help of financial ratios. The application of credit scoring model in different countries is to verify the healthiness of such tools and techniques. As there are numerous literatures that portray about financial distress prediction model (FDP). Altman (1968) using the key financial ratios developed a (FDP) model that measures the profitability, liquidity, solvency and leverage of a company. According to (Goswami, Chandra and Chouhan 2014) the study concluded that Z scores changes for all the companies is insignificant under study. The study also concludes that credit scoring model of Altman still exists and used by various researchers.

3.2 Springate Model

The model got evolved in 1968 by Gorgon L.V Springate. This model uses Multiple Discriminant Analysis (MDA) to choose four ratios from nineteen popular ratios found in literature, so that it is able to differentiate between non-distress and distress companies.

3.3 Zmijewski Model

Zmijewski(1984) model uses financial ratios

for measuring company's liquidity, leverage and performance for which Probit technique adopted. Through the available literature, the prior studies point out the advantage of "Z-Score", "S-Score", and "Zmijewski's X-Score" model in evaluating the financial healthiness of companies in developed countries.

3.4 Empirical Evidence of the Financial Distress Models

The study by Lagkas and Papadopoulos (2014) with telecom companies of Athens Stock Exchange (ASE) indicates the reliability of the various financial predictive modelling. A comparative performance of private and public telecom companies in India was studied by Narendar and Rajendar (2016) using the Z-Score model and the study revealed that private companies outperforming the public telecom company. The study signals the BSNL telecom company to adopt innovative steps to protect from its state of financial distress. The select companies under the study conducted by Zainuddin, Tapa, and Rahim (2016) reveal that Malaysian telecom companies were found to be financially good and observed that 70% of the companies rely on debt financing rather than equity in the capital structure. Primasari, N.S. (2017) has used various torment prediction models to evaluate the financial performance of 29 listed companies under Indonesian Stock Exchange. AlAli (2018) employed Altman Z-Score model to examine the financial health of the companies in the mobile communication sector in Kuwait Stock Exchange. The study observed that the bankruptcy of the companies was due to the slack in the working capital. AlAli, Bash, AlForaih, AlSabah, and AlSalem (2018) examined the chance of being bankruptcy of telecom companies in Kuwait using Zmijewski model. The study identified the top performer albeit the same company was found to be under distress zone at the start. Ramachandran and Kelkar (2019) applied Altman Z-Score model to evaluate the financial soundness of private and public telecommunication companies in Oman. The study recommended to adopt appropriate strategies to lure its customers for attaining higher profits. The research conducted by Agarwal and Patni (2019) proposed that multiple prediction models would help stakeholders and decision makers to assess the performance of five selected firms from Bombay Stock Exchange (BSE). As no literature studies have been found from the perspective of Bhutan. Hence, the absence of empirical studies in the telecom sector has motivated to observe the financial health condition of BTL. The objectives and the literature reviewed, the following hypotheses are to be tested.

H_{01}: The "Altman Z-Score" does not vary over the period of study

H_{02}: The "Springate S-Score" does not remain same over the period of study

H_{03}: The "Zmijewski's X-Score" does not changeover the period of study

V. RESEARCH METHODOLOGY

4.1 Altman' Z-score Model

The multivariate model came into existence in the year 1968 that was developed by Altman. The five variables used under study are the key financial ratios that compute the credit score. The variable A_1 explains about the liquidity in comparison to its total assets, A_2 signifies the residual profits in the form of retained earnings to its asset base, A_3 denotes the operational efficiency to its assets; A_4 signifies the book value of equity to its liabilities and A_5 indicates the revenue to its asset total. The criterion for the analysis is detailed below:

$$Z\text{-Score} = 1.2 \times A_1 + 1.4 \times A_2 + 3.3 \times A_3 + 0.6 \times A_4 + 1.0 \times A_5$$

4.2 Springate S-Score Model

The "S-Score" model is also used by several researchers to assess the financial distress of firms. The four variables under study are S_1, S_2, S_3 and S_4. The S_1 denotes the working capital to total assets of the firm, S_2 indicates earnings before interest and tax on its total assets, S_3 signifies income before tax to current liabilities, and the last variable S_4 represents sales to total assets. The criteria used for the study concludes that if "S-Score" > 0.862, the firm is pointing to healthiness, and if "S-Score" is < 0.862 then the company is moving towards financial distress. The model is explained below.

$$S\text{-Score} = 1.03 \times S_1 + 3.07 \times S_2 + 0.66 \times S_3 + 0.4 \times S_4$$

4.3 Zmijewski X-Score Model

The often used model for measuring the financial instability of companies is the "X-Score" model. Several researchers used this model to evaluate the distress situation of a company (Grice & Dugan 2003). The firm's financials are assessed with the aid of financial ratios under this model. The model is explained with the variables and its estimated coefficients are detailed below:

$$X\text{-Score} = -4.3 - 4.5\,Z_1 + 5.7Z_2 + 0.004Z_3$$

The variables Z_1 looks at the assets efficiency in generating revenue, and the variable Z_2 indicate the leverage. The variable Z_3 denotes its liquidity, as it signifies the firm's ability to meet its commitments within its short duration.

VI. DATA ANALYSIS

This section presents the financial analysis of BTL by using the annual reports of the company using key accounting ratios with predictive models such as "Altman Z-Score", "Springate S-Score", and "Zmijewski X-Score". The following sections describe the analysis of the models.

Table 5.1: "Z –Score" Analysis for BTL

Year	WC/TA (A_1)	RE/TA (A_2)	EBIT/TA (A_3)	BE/TL (A_4)	S/TA (A_5)	Z-Score Values
2009	0.129	0.472	0.108	2.203	0.425	2.92
2010	0.144	0.533	0.177	2.536	0.478	3.51
2011	0.164	0.559	0.211	2.515	0.557	3.74
2012	0.164	0.612	0.230	2.865	0.615	4.15
2013	0.108	0.571	0.159	3.390	0.529	4.02
2014	0.063	0.625	0.163	4.675	0.532	4.83
2015	0.043	0.600	0.157	3.523	0.544	4.07
2016	0.018	0.641	0.254	4.283	0.566	4.89
2017	-0.007	0.613	0.230	3.322	0.553	4.16
2018	0.035	0.536	0.262	2.262	0.638	3.65

Source: Author's Analysis

From the Table 5.1, the ratio of sales to total assets indicates that the BTL is efficient enough in utilizing its asset to maintain the solvency. The book value of equity to its liabilities is used for ascertaining the long-term financial strength. The working capital of BTL is found to decrease in 2017 in proportion to the assets. The profitability of the company started showing a mixed trend during the period of study. From the Table 5.1, the financial health of the company is found to be healthy despite its fluctuations.
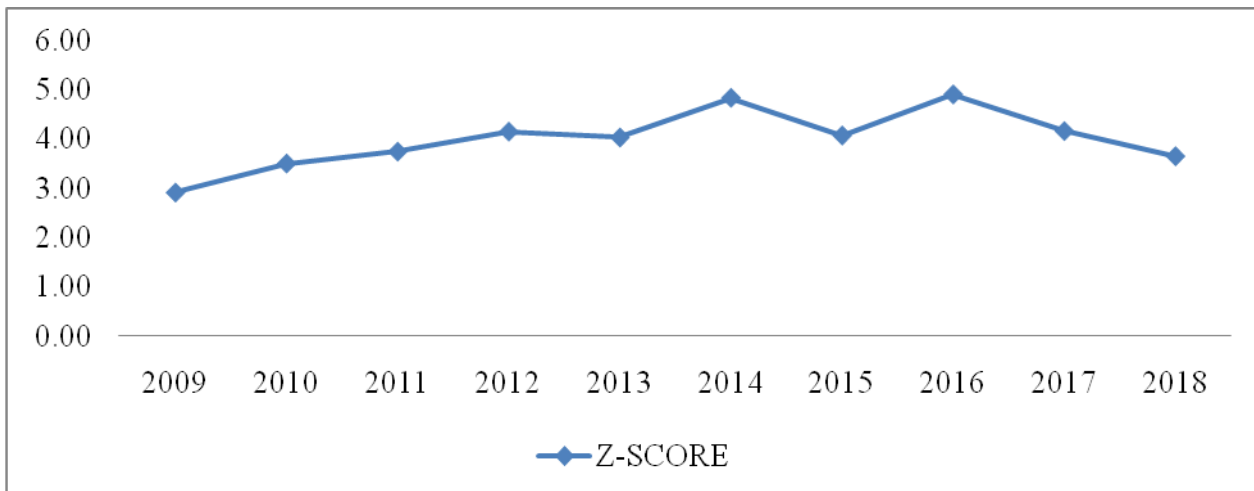

Fig 5.1. Altman's Z-Score of BTL

From the Fig.5.1, the "Z-Score" of BTL is found to be healthy as the score being above 3 all the time. According to Chouhan, Chandra, and Goswami (2014), a one sample Kolmogorov –Smirnov test (K-S test) was conducted on the "Z-Score". As $p > 0.05$, mean "Z-Score" of 3.994 with standard deviation 0.59, the null hypothesis H_{01} is retained, which indicates that the financial stability of BTL.

Table 5.2: S-Score Analysis for BTL

Year	S_1	S_2	S_3	S_4	S-Score
2009	0.129	0.108	1.082	0.425	1.35

2010	0.144	0.177	1.317	0.478	1.75
2011	0.164	0.211	1.404	0.557	1.97
2012	0.164	0.230	1.605	0.615	2.18
2013	0.108	0.159	1.483	0.529	1.79
2014	0.063	0.163	1.711	0.532	1.91
2015	0.043	0.157	1.501	0.544	1.73
2016	0.018	0.254	2.543	0.566	2.70
2017	-0.007	0.230	2.603	0.553	2.64
2018	0.035	0.262	1.801	0.638	2.28

Source: Author's Analysis

From the Table 5.2, S_1 denotes the liquidity of BTL that represents working capital out of the total assets of the firm, and this was found to be fluctuating except in 2017. The S_2 indicates operating profits before interest and tax on its assets, as this ratio shows an upward trend in 2018 despite a decrease in 2017. The S_3 signifies income before tax to current liabilities was increasing over the period except in 2018 this ratio was found to be decreasing. The last variable S_4 represents sales to total assets found to improve. From the Table 5.2, the study concludes that BTL "S-Score" > 0.862, and the firm is pointing to healthiness.
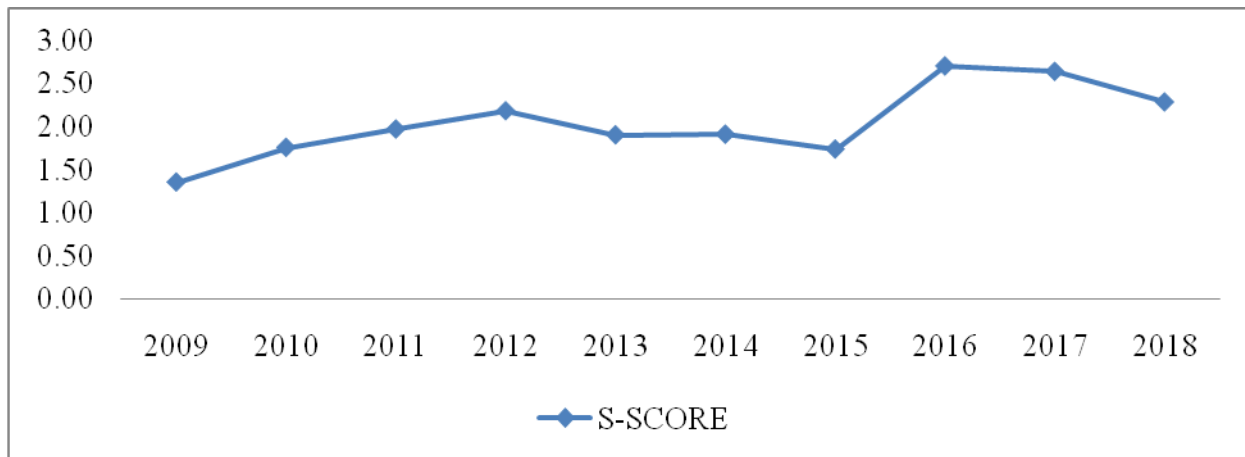

Fig 5.2 Springate S-Score of BTL

From the Fig.5.2, the "S-Score" signals the stability of BTL as confirmed by K-S test, where p > 0.05, the mean "S-Score" of 2.030 with standard deviation 0.42. Hence the null hypothesis H_{02} is retained. Thus, the BTL is healthy.

Table 5.3: Zmijewski Analysis for BTL

Year	Z_1	Z_2	Z_3	X -Score
2009	0.071	0.343	2.306	-2.653
2010	0.110	0.320	2.089	-2.961
2011	0.133	0.327	2.101	-3.027
2012	0.164	0.298	2.071	-3.329
2013	0.099	0.228	2.010	-3.440
2014	0.111	0.176	1.668	-3.787
2015	0.108	0.221	1.414	-3.521
2016	0.173	0.189	1.181	-3.993
2017	0.151	0.231	0.921	-3.656
2018	0.170	0.307	1.254	-3.314

Source: Author's Analysis

From the Table 5.3, the initial variable Z_1 mirror the performance of BTL in asset utilization and generating efficient returns. The increase in the ratio is a positive signal and a decrease indicates the distress situation. The ratio

is found to be fluctuating. The second variable Z_2 denotes leverage and it is a major factor towards measuring risk. The third variable Z_3 looks at liquidity to reflect corporation's ability to meet its petite term goals. The final variable "X-Score" is found to be negative during the period of study indicating that if "X-Score" is less than zero it means company is found to be healthy. If "X-Score" is greater than or equal to zero then the company experiences distress situation.
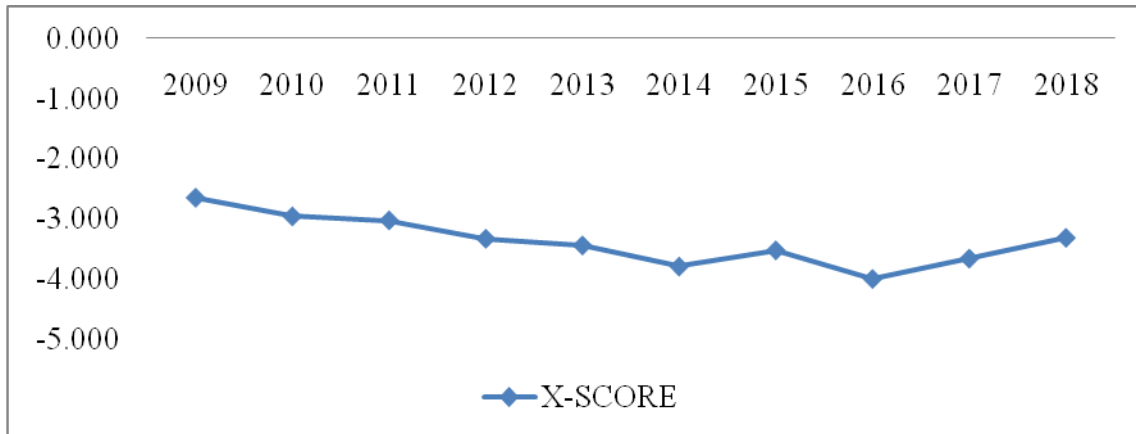

Fig 5.3 Zmijewski's X-Score of BTL

From the Fig.5.3, the "X-Score" of BTL is found to be healthy as confirmed by one sample K-S test with $p > 0.05$, mean "X-Score" of -3.368and standard deviation 0.40 indicating that BTL is financially sound during the study period. Hence the null hypothesis H_{03} is retained.
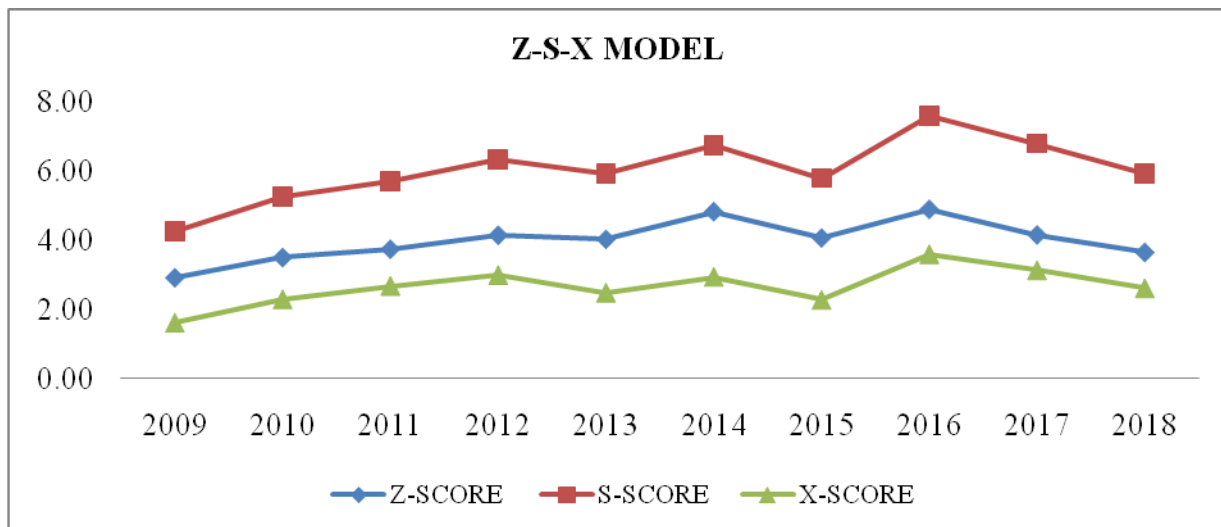

Fig 5.4. Combined Z-Score, S- Score and X-Score Model of BTL

VII. CONCLUSION

Upon the results obtained in data analysis, following points can be concluded:

a. All the three models used in the study confirm that the BTL is financially healthy during the period of time and unlikely to have bankruptcy in near future.

b. Albeit, profitability trend was up and down over the study period, the Z-Scores indicate that BTL is financially sound and unlikely to have bankruptcy.

c. The S-Score results indicate the soundness of BTL besides the fluctuations in the operating profit.

d. In case of Zmijewski model, although variation is observed in leverage factor, the company is still found to be healthy.

VIII. FUTURE RESEARCH

The present study has compared the results of the distress models discussed in the study and hence in future studies, other models like Ohlson, Grover and Fulmer can be used to reinforce the observed results.

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