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DIAGNOSING BANK'S FINANCIAL HEALTH THROUGH Z SCORE MODEL: A CASE STUDY OF ANDHRA PRAGATHI GRAMEENA BANK IN ANDHRA PRADESH (APGB)

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ABSTRACT

The key stakeholders of any business be it a banking/nonbanking were much concentrated mostly on its financial health. A continuous process of its financial data is inevitable to diagnose the business in terms of healthy or ill healthy. The absolute figures in the financial statements are not serving this purpose. Despite, the ratio analysis considered as a powerful tool for analysis, but combination of different ratios into single score (i.e Z score) will become the most powerful tool than a single financial ratio. Edward I Altman, Professor of Finance at New York University was the first person who developed a new model popularly known as "Z-score Model" to predict the financial health of the business concerns. He considered four ratios and assigned a weight for each ratio and produced a single number which indicates the financial health of the banking company. In this research paper an attempt is made to predict the financial health of select bank i.e. APGB during 2009-10 to 2014-15 using modified Altman's model. The research findings of the study are that the overall financial health of both APGB was good.

KEYWORDS

diagnosis, Z score model, bankruptcy zone, healthy zone, good healthy zone, retained earnings, working capital.

INTRODUCTION

Tracking the financial health of business is a continuous process. The success of any business is largely depends on its financial health which has been reflecting from the procurement of funds and ends with effective utilization of funds. Therefore, continuous financial analysis of financial position is *sin-quo-non* to keep the business away from financial distress. Financial statements are the sources for financial information, based on which the financial planning and control is done. The profit and loss account provides data about the operating activities whereas balance sheet provides the value of acquired assets and liabilities of the business at a particular point of time. The absolute figures which reported in the financial statements, do not serve the purpose of predicting the financial health of the business. Hence, the financial analyst has to analyze the financial data on a continuous basis in order to ascertain whether the business is in safe zone or not.

Despite the financial analyst had many analytical tools, ratio analysis is most powerful toll to ascertain the financial health of the companies. Alone a single ratio does not serve the purpose. Therefore, it is necessary to combine the different ratios into a single score, which measures the probability of sickness/bankruptcy. Multiple Discriminant Analysis (MDA) is useful tool in such situations. "The use of MDA helps to consolidate the effect of all ratios". The present study is concerned with the analysis of financial health of APGB.

REVIEW OF LITERATURE

Discriminant analysis may be applied for prediction of sickness, market research, credit rating portfolio selection identification of growth and classification of officers/managers or personals. Discriminant analysis has been widely used to identify and to predict financial health of industrial units. "Multiple discriminant analysis (MDA) is a straight forward statistical technique for calculating how much weight to put on each variable in order to separate the sheeps from the goats". William H. Beaver (1967) selected five ratios out of thirty financial ratios to study the financial health of 79 successful units and 79 unsuccessful units. The ratios were (i) cash flow to total debt (ii) net income to total assets (iii) total debt to total assets (iv) networking capital to total assets and (v) current assets to current liabilities" as expected, failed firms had more debt and lower return on assets. They had less cash but more receivables as well as low current ratios. They also had fewer inventories". It was observed that cash flow to total debt had maximum prediction power among different ratios in the study. Prof. Adward I. Altman (1968) selected five ratios of twenty two initially considered. He took 33 successful firms and 33 bankrupt firms and developed a model popularly known as 'Altman's Z-Score mode'.

Ben Mc Clure (2004)¹ suggested investors to check Z score of their companies regularly. In the Indian context, L.C.Gupta (1979)² attempted a refinement of Beaver's method with the objective of building a forewarning system of corporate sickness. A simple non-parametric test for measuring the relative differentiating power of the various financial ratios were used. The test is based on taking a sample of sick and non-sick companies, arraying them by the magnitude of each ratio to be tested, selecting a cut of point which will divide the array into two classes with a minimum possible number of misclassification and then computing the percentage classification error. The cut-off point is determined by visual inspection. The percentage classification error is determined as number of classifications divided by the number in sample. The ratio which results into the lower percentage classification error is the most efficient ratio." Mansur A. Mulla (2002)³ conducted a study to evaluate financial health of textile mills by using Z score model. Selvam, M and others (2004)⁴ made a study to predict the financial health and viability of India cements Ltd. They concluded that the cement company under the study was just on the range of financial collapse. Further, they write that financial health of cement companies has been subject to empirical investigation. Krishna Chaitanya (2005)⁵ measured the financial distress of IDBI with the help of Altman's Z score model and predicted that IDBI is not in the health zone and is likely to be insolvent in the near future. Dr. K Venkat Janardhan Rao and M.Durga Prasad (2009)⁶ examined the financial performance of Eicher Motors Ltd. According to K.R. Sharma⁷, different models like R.A.Yadav and S.S.Srivastava model, Prof.C.D.Bhattacharya model and Prof. K.B.Mehta's model have been used to measure financial health. The present study is based on Prof. K.B Mehta's model because the model considers Indian conditions.

Dr.Y.V.Reddy presented Papers at World Bank International Monetary Fund and Brookings Institution Conference on Financial Sector Governance, The roles of Public and Private Sectors, Public Sector Banks and the Governance Challenge: Indian Experience, Monetary and Financial Sector Reforms in India: A Practitioner's Perspective (Indian Economy Conference, Cornell University, USA (2003), 'Towards Globalization in the Financial Sector in India' -Inaugural address at the Twenty Fifth Bank Economists Conference, Mumbai. In these addresses Dr. Reddy discussed the various initiatives being taken by the Reserve Bank of India to ensure financial health of the Banks. The regulatory changes initiated by the Reserve Bank of India, the shift from micro-prudential regulation to macro regulation have been discussed. The changes initiated have brought about a sea change in the ownership of the Banks, a marked improvement in the soundness parameters like the return on assets, staff productivity, technology, asset quality etc.

OBJECTIVES OF THE PAPER

1. To evaluate the financial health of Andhra Pragathi Grameena Bank (APGB)
2. To give suggestion for the improvement of the state of its affairs

METHODOLOGY

Secondary data, in the form of annual reports and schedules of financial statements like Cash flow and funds flow, was collected for 6 years from 2009-10 to 2014-15. Financial ratios are computed in tune with the objectives of the paper. The financial variables considered in the study are; net-working capital, total assets, retained earnings, book value of equity, book value of debt and net sales. The research tools applied in the study are; averages, percentages and Z score model. Criteria applied to judge the financial health are; bankruptcy zone, healthy zone and good healthy zone. The detailed model of Z score is Prof.K.B. Mehata's: A Modification of Altman's Model.

Prof.K.B. Mehata's model represented a modification of Altman's model as per Indian conditions." For example, as all shares were not listed on stock exchange, instead of market value of equity, book value of equity was taken as fourth financial variable (X4) considered were:

X1= Net working capital to total assets.

X2 = Retained earnings to total assets

X3 = Book value of equity of book value to total debts.

X4 = Net sales to total assets

Discriminant Function: $Z = 0.717X1+0.845X2+0.42X4+0.995X5$

Where;

X1 Shows liquidity position to the total capitalization

X2 Indicates cumulative profitability overtime and leverage

X3 Presents the long-term solvency position. It shows how much assets of an enterprise can decline in value before the liabilities exceeds the assets and the concern becomes insolvent.

X4 Reveals the sales generating capacity of the assets.

Measurement of financial health: There may be three situations;

1. If Z score is below 1.2 then the unit is considered to be in bankruptcy Zone. Its failure is certain
2. If Z score lies between 1.2 and 2.9 then the unit is considered to be in grey area or healthy zone. In this situation the failure is uncertain to predict.
3. If Z score is above 2.9, then the unit is considered to be in good health Zone.

ANALYSIS AND RESULTS

Working capital to total assets: Working capital is the excess of total current assets. The ratio of working capital to total assets shows liquidity position of relative to total capitalization. "Consistent operating losses will cause current assets to shrink relative to total assets. A negative ratio, resulting from negative working capital, is a serious problem". The ratios of working capital to total assets of both the companies are furnished in the Table 2 about here.

It may be observed from the table 2 that the working capital to total assets ratio of APGB has been around 0.158 to 0.473. It indicates that the APGB has a moderate level of investment in current assets and which shows that the bank has maintained optimum funds in the form of current assets. This analysis will help the bank as a guiding principle not to cross the threshold of working capital limits.

Retained earnings to total assets: The ratio of retained earnings to total assets indicates that how much portion of total assets has been financed by retained earnings. Higher the ratio greater the financial stability of the company at times of low profitability periods. And also it depicts that the company utilizing its own earnings as cheaper source of finance rather than debt finance. The percentages of retained earnings of APGB are furnished in the table 2 about here.

From the table 2 it is observed that on an average 0.37 % of APGB are financed by its retained earnings during the study period. This study shows that the bank has been utilizing more debt rather than its retained earnings. The increasing trend of retained earnings during the study period indicates that the bank has unsustainable growth.

Book value of equity to book value of total debts: This ratio is used to ascertain the soundness of the long-term financial policies. The company having 1:1 equity-debt mix is considered as quite good. Excessive debt tends to cause insolvency. Fixed interest paid on debt whereas variable dividend is paid on equity. If debt is more than the equity it will reduce the profit of the company, despite increases the profitability of the shareholders. It will be a curse in times of bad performing. The relevant information of the APGB is furnished in the table 2 about here.

From the table 2 it is observed that the on an average equity portion of APGB was 14.5% in comparison to debt portion in the capital structure during the study period. The highest equity portion of total capital of APGB is 15.1% in 2009-10 and the lowest portion of equity is 13.6% in 2012-13. On the basis of the analysis pertaining to this ratio, it may be concluded that the financial health of the APGB is not good. It provides a less margin of safety to its creditors in times of bankruptcy. Therefore, it is advised the APGB has to take an appropriate step to improve the equity portion as per its benchmark.

Sales to total assets: Sales revenue plays a pivotal role in overall performance of the companies because all the operations are more or less depend on the sales revenue. Sales to total assets ratio measure the power of the asset in generating the sales. Higher ratio indicates the better performance and while poor ratio indicates the poor financial management of the companies in the optimum utilization of its assets in generating the sales revenue. The ratio varies from one company to another. The relevant information of the two selected sample pharmacy companies is furnished in the table 2 about here.

From the table 2 it is observed that the average ratios of sales to total assets of APGB are 1.2433 during the study period. The ratio of APGB ranges from 1.20 to 1.27 times during the study period. Based on the information from table 2, it was crystal clear that the APGB still had an opportunity to improve its business capacity but still bank has to optimize its assets in generating more business for the better improvement in the banks revenue. It is suggested that APGB has to take appropriate steps in the optimum utilization of its assets in generating more and more deposits coupled with advances.

From the table 3, it has been found that the Z score was fluctuated above the bankruptcy zone during the study period. The score indicating the positive signals about the bank's financial health.

TABLE 1: Z SCORE COMPONENTS OF APGB

Year	Net working capital	Total assets	Retained earnings	Net sales	Book value of equity	Book value of debt
2009-10	195941.14	558031.39	167409.41	702261.6	70962.35	469817.63
2010-11	108255.22	683028.18	218569.01	830680.71	83975.24	582282.78
2011-12	136608.45	792731.97	301238.15	993974.26	99018.88	679156.84
2012-13	173254.98	971771.39	340119.98	1170346.61	114579.82	839671.58
2013-14	332621.06	1048130.28	408770.80	1319028.61	130616.82	896590.38
2014-15	558625.11	1179681.25	530856.56	1500916.64	147161.64	1012351.20

Source: Computations from APGB Financial statements

TABLE 2: STATEMENT SHOWING THE RATIOS USED IN Z SCORE ANALYSIS OF APGB

	Financial ratios	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	Mean
X1	NWC to total assets	0.350	0.158	0.172	0.178	0.317	0.473	0.2746
X2	Retained earnings to total assets	0.30	0.32	0.38	0.35	0.39	0.45	0.365
X3	BVE to BVD	0.151	0.144	0.145	0.136	0.146	0.145	0.145
X4	Net sales to total assets	1.26	1.22	1.25	1.20	1.26	1.27	1.2433

Source: Computations from APGB Financial statements

TABLE 3: STATEMENT SHOWING THE Z SCORES OF APGB

Year	0.717X1	0.842X2	0.42X3	0.995X4	Z Score
2009-10	0.25095	0.2526	0.06342	1.2537	1.8206
2010-11	0.11329	0.2694	0.06048	1.2139	1.6571
2011-12	0.12332	0.3199	0.0609	1.24375	1.7479
2012-13	0.12763	0.2947	0.05712	1.194	1.6735
2013-14	0.22729	0.3284	0.06132	1.2537	1.8707
2014-15	0.33914	0.3789	0.0609	1.26365	2.0426

Source: Computations from APGB Financial statements

CONCLUSION

The Z score of APGB based on the modified Altman's model is between 1.65 and 2.04 during the study period (i.e 2009-10 to 2014-15). It is observed from the table 3 that APGB is in grey area or healthy zone. In this situation the failure of APGB is uncertain to predict. Finally, it can be concluded that the overall financial health of APGB is good.

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