

## PROFITABILITY ANALYSIS OF CO-OPERATIVE BANKS IN BHAVNAGAR CITY WITH REFERENCE TO THE ALTMAN Z SCORE MODEL

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### ABSTRACT

*As the world is turning in to the global village, with the help of communication gap one can reach almost too intelligible distance. It is also necessary to know the financial health of the banking sector. India being a Developing country there are many nationalized, privatized and co-operative banks which play an important role in the overall management. The project report consist of financial health and the sickness of Co-Operative bank, it also contains the various type of ratio to be used to know the financial health of the bank with the help of the z-score model.*

*The importance of banking as the nerve sector of economic development cannot be over Emphasized. The banking industry has acquired a key position in mobilizing resources for defense & for socio-economic development of the country. It is said that "Bank which is that need of & great wealth of our country has got to be kept very scared. Just as water is for irrigation, good banks are for the countries industry & trade." Since the beginning of planning in India, banking industry has grown not only in size but also in depth this industry has become one big complex. The main objective of the project is to study the financial health of the cooperative sector bank. It contains both theoretical aspects as well as practical aspects.*

**KEYWORDS:** *Co-Operatives, Bhavnagar, Z Score*

### INTRODUCTION

Banking in India is as old as Narsinh Mehta of Junagarh who was a devotee of Lord Krishna, is. We get clear evidence from old mythological books that the traction of money was existing in society. In fact, in Arth Shasta of Kautilya, the banking and its terms of lending loans are clearly given. In Chankya's chants revenue collection and its distribution is clearly evident. In the modern sense, originated in the last decades of the 18th century. Among the first banks were known as the Bank of Hindustan, which was established in the year 1770 and willingly liquidated between the years of 1829–32 as the part of reform; and the General Bank of India, established in 1786 but failed in 1791 as Indian continent has a different prospect than what Britishers actually understood.

SBI, the largest public sector bank in India was initially established in June 1806. After that, this bank has seen only growth. 1921, was a year of change as a bank of Bombay, the bank of madras all get dissolved into SBI. The size of SBI has become so large that the Britishers need to pass a special act for the same in 1935. Just before undertaking by the government of India, SBI has become a giant, in 1980 six private banks again acquired by SBI. Day by day network of SBI kept on increasing.

## LITERATURE REVIEW

Usha, 2013, A study on co-operative banks in India, mentioned that cooperative movement in India resulted in heavy growth of banks in India especially in urban and semi -urban area. both have different work patterns as well as growth patterns.

Bhulal and Dhanna, 2017, a study of cooperative banks with special reference to Himachal Pradesh Co-Operative Bank, mentioned that the camel model is having equal importance. Results differ in rural and urban areas in case of services.

Gaba and Goneka, 2017, in their paper to study the pattern of lending practices in urban co-operative banks in Delhi, mentioned that facilities given by cooperative banks are not enough for the customers. People get attracted due to schemes and so that only they are withdrawing their accounts from cooperative banks

### How Z Score Works

There are 5 variables on which the Z score works thereon:

**X1** = (Working Capital/Total Assets).

**X2** = (Retained Earnings/Total Assets).

**X3** = (EBIT/Total Assets).

**X4** = (Market Value of Equity/Total Liabilities).

**X5** = (Net Sales/Total Assets).

For **Public Companies**, the Model is calculated as follows:

$$Z = 1.2*X1 + 1.4*X2 + 3.3*X3 + 0.6*X4 + 1.0*X5.$$

**Table 1: The Interpretation of Altman Z-Score**

Points of Z Score	Meaning
Above 3.0	safe
Between 2.7 to 2.99	Alert or caution
Between 1.8 to 2.6	Likely to be bankrupt in two years
Below 1.8	Immediate failure of the bank

If the Altman Z-Score is close to or below 3, then it would be as well to do some serious due diligence on the company in question before even considering investing.

## Z SCORE FOR PRIVATE COMPANIES OR NON-MANUFACTURER INDUSTRIALS

There are 4 variables

**T1** = (Working Capital/Total Assets).

**T2** = (Retained Earnings/Total Assets).

**T3** = (EBIT/Total number of Assets hold by the bank).

**T4** = (Market Value of Equity shares/ Total Liabilities on hold).

$$Z = 6.56T1 + 3.26T2 + 6.72T3 + 1.05T4$$

#### **Zones of Discrimination:**

$Z > 2.6$  -“Safe” Zone

1.1  $< Z < 2.6$  -“Grey” Zone

$Z < 1.1$  -“Distress” Zone

#### **Accuracy and Effectiveness**

In its initial test, the Altman Z-Score has found that it is nearly 72% accurate in predicting bankruptcy just two years prior to the event, with a Type II error (false positives) of 6%. (references are taken from Altman’s book in 1968). After Altman many people worked on the same model as a series of subsequent tests covering different time periods (preferably three) over the next 31 years (up to 1999), the model was found to be approximately 80–90% accuracy in predicting banks’ bankruptcy one year prior to the event, with a Type II error (classifying the firm as bankrupt when it does not go bankrupt) of approximately 15–20% (Altman, 2000)

#### **OBJECTIVES OF THE RESEARCH**

The first and foremost step of a researcher is to identify the research objectives, by this scientific way it has become easy for the researcher to achieve the goal and might solve the research problem based on the objectives. Research objectives are as follows.

- To know the stability and profitability of the banks.
- To study the financial position of cooperative banks in Bhavnagar
- To forecast the financial health and viability of selected 3 Co-Operative banks of the Bhavnagar City of Gujarat State.
- Facilitating Comparative analysis of the performance

#### **RESEARCH PROBLEM**

**“Analysis of Financial Health of Co-Operative Banks of Bhavnagar City through Altman Z score Model”**

#### **SAMPLE OF THE RESEARCH STUDY**

I have taken 3 Co-Operative banks of Bhavnagar City which are the following:

- The Bhavnagar District Co-Operative Bank Ltd
- Bhavnagar Nagrik Sahakari Bank Ltd
- Bhavnagar Mahila Nagrik Sahakari Bank

#### **DATA ANALYSIS & INTERPRETATION**

**Z Score is One of the Major Ways to Get a Glimpse of the Financial Performance of Any Bank. The Calculation Measure is as Follows:**

$$Z = 6.56T1 + 3.26T2 + 6.72T3 + 1.05T4$$

**T1= Working Capital / Total Assets**

**Working Capital** = Current Assets – Current Liabilities

**Table 2: Current Assets (Rs. in Cr.)**

Bank/Year	31 <sup>st</sup> Mar '13	31 <sup>st</sup> Mar '14	31 <sup>st</sup> Mar '15	31 <sup>st</sup> Mar '16	31 <sup>st</sup> Mar '17
The Bhavnagar District Co-Operative Bank	942.83	1030.74	1217.73	1090.94	1455.85
Bhavnagar Nagrik Sahkari Bank	174.82	234.94	228.67	247.56	267.78
Bhavnagar Mahila Nagrik Sahkari Bank	5.01	5.09	5.24	5.46	5.96

Sources: Annual Reports of the Bank

**Table 3: Current Liability (Rs. in Cr.)**

Bank/Year	31 <sup>st</sup> Mar '13	31 <sup>st</sup> Mar '14	31 <sup>st</sup> Mar '15	31 <sup>st</sup> Mar '16	31 <sup>st</sup> Mar '17
The Bhavnagar District Co-Operative Bank	613.68	659.35	770.75	828.06	940.62
Bhavnagar Nagrik Sahkari Bank	128.34	138.42	157.21	179.18	196.38
Bhavnagar Mahila Nagrik Sahkari Bank	3.91	3.92	4.09	4.30	4.78

Sources: Annual Reports of the Bank

**Table 4: Working Capital= Current Assets – Current Liabilities (Rs. In Cr.)**

Bank/Year	31 <sup>st</sup> Mar '13	31 <sup>st</sup> Mar '14	31 <sup>st</sup> Mar '15	31 <sup>st</sup> Mar '16	31 <sup>st</sup> Mar '17
The Bhavnagar District Co-Operative Bank	329.15	371.39	446.98	262.87	515.23
Bhavnagar Nagrik Sahkari Bank	46.48	96.52	71.47	68.38	71.40
Bhavnagar Mahila Nagrik Sahkari Bank	1.10	1.16	1.15	1.16	1.19

Sources: Annual Reports of the Bank

**Table 5: Total Assets (Rs. in Cr.)**

Bank/Year	31 <sup>st</sup> Mar '13	31 <sup>st</sup> Mar '14	31 <sup>st</sup> Mar '15	31 <sup>st</sup> Mar '16	31 <sup>st</sup> Mar '17
The Bhavnagar District Co-Operative Bank	969.62	1080.53	1268.72	1139.22	1500.87
Bhavnagar Nagrik Sahkari Bank	260.98	258.10	251.00	251.44	271.98
Bhavnagar Mahila Nagrik Sahkari Bank	5.37	5.46	5.61	5.83	6.19

Sources: Annual Reports of the Bank

**Table 6: T1= Working Capital / Total Assets**

Bank/Year	31 <sup>st</sup> Mar '13	31 <sup>st</sup> Mar '14	31 <sup>st</sup> Mar '15	31 <sup>st</sup> Mar '16	31 <sup>st</sup> Mar '17
The Bhavnagar District Co-Operative Bank	0.34	0.34	0.35	0.23	0.34
Bhavnagar Nagrik Sahkari Bank	0.21	0.21	0.20	0.20	0.19
Bhavnagar Mahila Nagrik Sahkari Bank	0.18	0.37	0.28	0.27	0.26

Sources: Annual Reports of the Bank

**T2 =Retained Earning / Total Assets**

**Table 7: Retained Earning (Rs. in Cr.)**

Bank/Year	31 <sup>st</sup> Mar '13	31 <sup>st</sup> Mar '14	31 <sup>st</sup> Mar '15	31 <sup>st</sup> Mar '16	31 <sup>st</sup> Mar '17
The Bhavnagar District Co-Operative Bank	-12.01	-18.91	-18.16	-16.70	-7.76
Bhavnagar Nagrik Sahkari Bank	1.99	1.66	0.87	1.26	1.39
Bhavnagar Mahila Nagrik Sahkari Bank	-0.0065	0.0459	0.0008	0.0012	0.0013

Sources: Annual Reports of the Bank

**Table 8: Total Assets (Rs. in Cr.)**

Bank/Year	31 <sup>st</sup> Mar '13	31 <sup>st</sup> Mar '14	31 <sup>st</sup> Mar '15	31 <sup>st</sup> Mar '16	31 <sup>st</sup> Mar '17
The Bhavnagar District Co-Operative Bank	969.62	1080.53	1268.72	1139.22	1500.87
Bhavnagar Nagrik Sahkari Bank	260.98	258.10	251.00	251.44	271.98
Bhavnagar Mahila Nagrik Sahkari Bank	5.37	5.46	5.61	5.83	6.19

Sources: Annual Reports of the Bank

**Table 9: T2 =Retained Earning / Total Assets (Rs. in Cr.)**

Bank/Year	31 <sup>st</sup> Mar '13	31 <sup>st</sup> Mar '14	31 <sup>st</sup> Mar '15	31 <sup>st</sup> Mar '16	31 <sup>st</sup> Mar '17
The Bhavnagar District Co-Operative Bank	-0.0124	-0.0175	-0.0143	-0.0147	-0.0052
Bhavnagar Nagrik Sahkari Bank	0.0076	0.0064	0.0035	0.0050	0.0051
Bhavnagar Mahila Nagrik Sahkari Bank	-0.0012	0.0084	0.0001	0.0002	0.0002

Sources: Annual Reports of the Bank

T3 = EBIT / Total Assets

**Table 10: EBIT (Rs. in Cr.)**

Bank/Year	31 <sup>st</sup> Mar '13	31 <sup>st</sup> Mar '14	31 <sup>st</sup> Mar '15	31 <sup>st</sup> Mar '16	31 <sup>st</sup> Mar '17
The Bhavnagar District Co-Operative Bank	-1.26	-6.90	0.75	1.46	8.94
Bhavnagar Nagrik Sahkari Bank	2.97	2.23	0.79	1.26	1.39
Bhavnagar Mahila Nagrik Sahkari Bank	-0.00653	0.04310	0.00080	0.00118	0.00127

Sources: Annual Reports of the Bank

**Table 11: Total Assets (Rs. in Cr.)**

Bank/Year	31 <sup>st</sup> Mar '13	31 <sup>st</sup> Mar '14	31 <sup>st</sup> Mar '15	31 <sup>st</sup> Mar '16	31 <sup>st</sup> Mar '17
The Bhavnagar District Co-Operative Bank	969.62	1080.53	1268.72	1139.22	1500.87
Bhavnagar Nagrik Sahkari Bank	260.98	258.10	251.00	251.44	271.98
Bhavnagar Mahila Nagrik Sahkari Bank	5.37	5.46	5.61	5.83	6.19

Sources: Annual Reports of the Bank

**Table 12: T3 = EBIT / Total Assets (Rs. in Cr.)**

Bank/Year	31 <sup>st</sup> Mar '13	31 <sup>st</sup> Mar '14	31 <sup>st</sup> Mar '15	31 <sup>st</sup> Mar '16	31 <sup>st</sup> Mar '17
The Bhavnagar District Co-Operative Bank	-0.00130	-0.00638	0.00059	0.00128	0.00596
Bhavnagar Nagrik Sahkari Bank	0.011	0.009	0.003	0.005	0.005
Bhavnagar Mahila Nagrik Sahkari Bank	-0.00122	0.00789	0.00014	0.00020	0.00021

(sources: Annual Reports of The Bank)

**T4 = Book Value of Equity / Total Liabilities****Table 13: Book Value of Equity (Rs. in Cr.)**

Bank/Year	31 <sup>st</sup> Mar '13	31 <sup>st</sup> Mar '14	31 <sup>st</sup> Mar '15	31 <sup>st</sup> Mar '16	31 <sup>st</sup> Mar '17
The Bhavnagar District Co-Operative Bank	32.87	35.12	38.84	47.10	54.47
Bhavnagar Nagrik Sahkari Bank	5.17	5.19	5.35	5.51	5.64
Bhavnagar Mahila Nagrik Sahkari Bank	0.56	0.57	0.58	0.59	0.59

(sources: Annual Reports of The Bank)

**Table 14: Total Liabilities (Rs. in Cr.)**

Bank/Year	31 <sup>st</sup> Mar '13	31 <sup>st</sup> Mar '14	31 <sup>st</sup> Mar '15	31 <sup>st</sup> Mar '16	31 <sup>st</sup> Mar '17
The Bhavnagar District Co-Operative Bank	936.75	1045.41	1229.87	1092.12	1446.40
Bhavnagar Nagrik Sahkari Bank	255.81	252.91	245.64	245.93	266.34
Bhavnagar Mahila Nagrik Sahkari Bank	4.81	4.89	5.03	5.24	5.60

**Sources: Annual Reports of the Bank****Table 15: Book Value of Equity / Total Liabilities (Rs. in Cr.)**

Bank/Year	31 <sup>st</sup> Mar '13	31 <sup>st</sup> Mar '14	31 <sup>st</sup> Mar '15	31 <sup>st</sup> Mar '16	31 <sup>st</sup> Mar '17
The Bhavnagar District Co-Operative Bank	0.035	0.034	0.032	0.043	0.038
Bhavnagar Nagrik Sahkari Bank	0.020	0.021	0.022	0.022	0.021
Bhavnagar Mahila Nagrik Sahkari Bank	0.116	0.117	0.115	0.112	0.105

**Sources: Annual Reports of the Bank****Average of the Year****Table 16**

Bank	T1	T2	T3	T4
The Bhavnagar District Co-Operative Bank	0.3200	-0.0128	0.000029	0.0364
Bhavnagar Nagrik Sahkari Bank	0.2020	0.0055	0.0066	0.0212
Bhavnagar Mahila Nagrik Sahkari Bank	0.2720	0.0015	0.0014	0.1130

**Sources: Annual Reports of the Bank**

$$Z = 6.56T1 + 3.26T2 + 6.72T3 + 1.05T4$$

**The Bhavnagar District Co-Operative Bank –Z Score****Table 17**

<b>T1</b>	6.56*0.3200	2.0992
<b>T2</b>	3.26*-0.0128	-0.0417932
<b>T3</b>	6.72*0.000029	0.000194418
<b>T4</b>	1.05*0.0364	0.03822

**Z Score of the Bhavnagar District Co-Operative Bank = 2.0958****Interpretation**

As the answer of calculated z-score is 2.0958. The score of The Bhavnagar District Co-Operative Bank is quite good than the Bhavnagar Nagrik Sahkari Bank and Bhavnagar Mahila Nagrik Sahkari Bank but they are still in the grey zone. But the z-score for The Bhavnagar District Co-Operative Bank is greater than among all 3 selected banks. So, among

all selected bank The Bhavnagar District Co-Operative Bank is safe than the other two banks only on the financial figure.

#### Bhavnagar Nagrik Sahkari Bank –Z Score

**Table 18**

<b>T1</b>	6.56*0.2020	1.32512
<b>T2</b>	3.26*0.0055	0.0179952
<b>T3</b>	6.72*0.0066	0.044352
<b>T4</b>	1.05*0.0212	0.02226

**Z Score of Bhavnagar Nagrik Sahkari Bank = 1.4097**

#### Interpretation

As the answer of calculated z-score is 1.4097so the Probability of Financial Catastrophe is low. Means Bhavnagar Nagrik Sahkari Bank is in the grey zone and they take some serious step so they do not go into the distress zone. If the score goes below the 1.1 than a bank may be in trouble.

#### Bhavnagr Mahila Nagrik Sahkari Bank Z Score

**Table 19**

<b>T1</b>	6.56*0.2720	1.78432
<b>T2</b>	3.26*0.0015	0.0050204
<b>T3</b>	6.72*0.0014	0.009704
<b>T4</b>	1.05*0.1130	0.11865

Z Score of Bhavnagar Mahila Nagrik Sahkari Bank = 1.9177

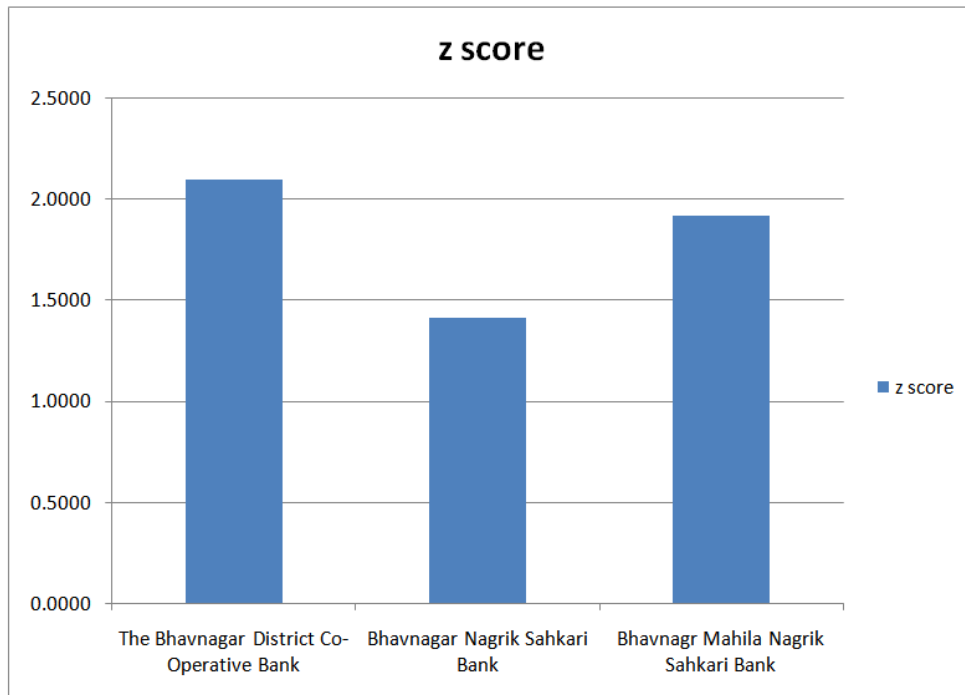
#### Interpretation

The score of Bhavnagar Mahila Nagrik Sahkari Bank is high comparing to Bhavnagar Nagrik Sahkari Bank that is 1.9177 and low comparing to The Bhavnagar District Co-Operative Bank. But they are still in the grey zone so they have to improve their performance because ofthey far from reaching the safe zone.

#### Z SCORE OF ALL SAMPLED BANK

**Table 20**

Sr. No.	Bank	Z Score
1	The Bhavnagar District Co-Operative Bank	2.0958
2	Bhavnagar Nagrik Sahkari Bank	1.4097
3	Bhavnagar Mahila Nagrik Sahkari Bank	1.9177



**Figure 1**

## INTERPRETATION

From the above **table 20**, it can be said that the financial health of all these private sector banks is in “Grey” Zone means not good or bad and no high Risk because the value of Altman Z score of all these banks is moderate as compared to the standards given by Altman. While Bhavnagar Nagrik Sahkari Bank is having very low Z score compare to other banks which means its financial position is not good compare to other 2 sampled banks.

A score of Z less than 1.1 indicates that these all co-operative sector becoming bankrupt in the future. However, Altman result shows that in practice, scores between 1.1 to 2.6 should be thought of like a grey area. Firms, with Z scores within this range, are considered uncertain about credit risk and considered marginal cases to be watched with attention. Altman (1968) formerly described the grey area as the “zone of ignorance”. This area is where firms share distress and non-distress financial characteristics and should be carefully observed before it is too late for any remedial or recovery action. Firms with Z scores below 1.1 indicate a failed firm, Z score above 2.6 indicates non-bankruptcy. Altman shows that bankrupt firms have very peculiar financial profiles one year before bankruptcy. These different financial profits are the key intuition behind Z score model.

## FINDINGS

### Networking Capital to Total Assets

The ratio of working capital to total assets shows the liquidity position of relative to total capitalization. It may be observed from the Average of the Ratio of working capital to total assets of The Bhavnagar District Co-Operative Bank had been 0.3200 which is highest among all the sampled banks, and the ratio of Bhavnagar Nagrik Sahkari Bank had been 0.2020 which is lowest among all the sampled banks.\



The above results indicate that all three banks had a very high level of investment (aggressive) in current assets and which shows that too much of its current funds are blocked in the form of current assets instead of investing them in the potential investments.

### **Retained Earnings to Total Assets**

The ratio of retained earnings to total assets indicates how much portions of total assets has been financed by retained earnings. Higher the ratio, greater the financial stability of the banks at times of low profitability periods. And also it depicts that the banks utilizing their own earnings as a cheaper source of finance rather than debt finance. It is observed that on an average of 4 to 5 % of total assets of all these banks were financed by its retained earnings during the study period.

This study shows that these banks have been utilizing more debt rather than retained earnings. During the study period, it was found that the ratio of all three Banks had reduced which was continuously decreasing trend of retained earnings during the study period indicating the unsustainable growth of the bank. This situation may compel the banks in bankruptcy at low profitable times.

### **Earnings before Interest and Tax to Total Assets**

The ratio is considered an indicator of how effectively a bank is using its assets to generate earnings before contractual obligations must be paid. The greater banks earnings in proportion to its assets, the more effectively the banks are said to be using its assets.

From the Table, it is observed that the average ratios of Bhavnagar Nagrik Sahkari Bank and Bhavnagar Mahila Nagrik Sahkari Bank 0.0066 and 0.0014 respectively. This indicates that these two banks had generated high earnings in proportion to its assets. The Bhavnagar District Co-Operative Bank had only 0.000029 which indicates that these banks had low earnings in proportion to its assets.

### **Book Value of Equity to Total Liabilities**

This ratio is used to ascertain the soundness of the long-term financial policies. The banks having 1:1 equity-debt mix is considered as quite good. Excessive debt tends to cause insolvency. Fixed interest paid on debt whereas the variable dividend is paid on equity. If the debt is more than the equity it will reduce the profit of the banks, despite increases the profitability of the shareholders. It will be a curse in times of bad performing.

On the basis of the analysis pertaining to this ratio, it may be concluded that the financial health of the banks is quite bad when compared to standards and it provides a much more risk to its creditors in times of bankruptcy. The financial health of all three Banks is a low book value of equity compared to book value. Therefore it is advised to all the Bank should take an appropriate step to improve the equity portion as per its benchmark.

## **CONCLUSIONS**

Researchers present a new, comprehensive information database from past information of banks, and analyze this information to estimate selected banks early warning system for bank distress. From this research, conclusions can be drawn that out of 3 selected bank The Bhavnagar District Co-Operative Bank and Bhavnagar Mahila Nagrik Sahkari Bank

have a good position than Bhavnagar Nagrik Sahkari Bank which has lowest z score among selected bank. So they have to face more problem in the future than the other 2 banks as they are near to the distress zone. As this model gives an answer about the bankruptcy above all are in the grey zone and the probability of financial bankruptcy is there only on the financial figure. Using Altman approach for the year 2012-13 to 2016-17, all banks categorized in having financial difficulties since no one scores more than 2.60. And only The Bhavnagar District Co-Operative Bank is near to score 2.6

Although the numbers that go into the Z-score can be influenced by external events, it is a useful tool to provide a quick analysis of where a bank stands compared to competitors, and for tracking the risk of insolvency over time

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