FINANCIAL SOUNDNESS OF COMMERCIAL BANKS IN INDIA:
AN APPLICATION OF BANKOMETER MODEL

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ABSTRACT

The banking sector in India is undergoing tremendous changes in India since economic liberalisation and banking sector reforms. The sector witnessed the entry of new banks both domestic and foreign in to the industry which paved the way for a war between the technology based banking and traditional branch based banking. This war changed the face of Indian banking sector in many ways. The sector grows at a faster rate and stand as a strong supporter behind the economic development of our country. A strong banking system is the backbone of economic growth. Recently the industry is facing a lot of threats within and outside the system which may affect the financial health of the system mainly the mounting of bad loans, cyber threats and bank frauds.

Financial soundness plays a major role in creating an image for a business, which helps the stakeholders to assess the performance of the concern. Soundness of a business has a great impact on the earnings quality, efficiency, asset quality, share prices and liquidity. CAMELS model is used internationally to check the soundness of banks based on various ratios. Bankometer model is used in the study which is based on the financial soundness indicators revealed by the IMF. The study is an attempt to analyse the soundness of select public sector and private sector banks in India for a period of three years (2015-16 to 2017-18). In terms of financial soundness and solvency all the banks are found super sound and solvent. The S score of private sector banks especially the new generation private sector banks are better than public sector banks. There is significant difference in the financial soundness of public sector banks and the private sector banks.

Keywords: Financial soundness, Bankometer, Commercial banks

1.   Introduction

Banking sector is one of the fastest growing as well as most complex sectors in India. It serves as the backbone of the Indian economy. Indian banking sector is one of the healthiest performers in the world banking industry seeing tremendous competitiveness, growth, efficiency, profitability and soundness, especially in the recent past. The liberalization process of Indian economy has not only made the entry of new private banks but also allowed the foreign sector banks to increase their branches in the banking sector. Thus, the restructuring of public sector banks and the emergence of new banks in the private sector as well as the increased competition from foreign banks, have improved the professionalism and the adoption of Basel norms strengthened capital position of the banking sector. Financial soundness indicators (FSIs) provide insight into the financial health and soundness of a country's financial institutions as well as corporate and household sectors. Soundness of the banks state the economic development in a country which can be measured through various indicators, namely, profitability, liquidity, productivity and solvency. Ability to predict a banks' vulnerability to insolvency is an essential factor to investors and other stakeholders and efficient management system with cost control strategies contribute to the financial soundness of a business.

The banking system in India, though not hassle free, is able to meet the new challenges posed by the technology and any other external and internal factors. Policy changes in the banking sector had resulted positive impact in the banking sector especially in terms of branch expansion, technology banking, ATMs, M-banking and electronic banking, credit growth, profitability, efficiency indicators such as business per employee and profit per employee, and priority sector lending. The increased growth in the

corporate sector loans and NPAs, mergers, technology threats, demonetisation and some fraudulent practices pressurised the Indian banks especially the public sector banks. The operating result of public sector banks became very desperate.   The present study is an effort to analyse the financial strength of the Indian banking industry.

2.   Review of Literature

Veni P (2004) studied the capital adequacy requirement of banks and the measures adopted to strengthen their capital ratios. The study points out that while rating banks, agencies usually adopt CAMEL model, and capital adequacy is considered as the key parameter of bank rating.

Satish, Juture Sharath and V Surendar (2005) analysed the performance of 55 Indian commercial banks for the year 2004-05 by using CAMEL model. They conclude that the Indian banking system looks sound and information technology will help the banking system to grow in strength in the future.

Nikhil Kumar N (2007) in the paper entitled, 'Analysis of performance of banking sector since liberalistion' tried to explore the effect of liberalisation on the performance of banks using CAMEL Model to rate the performance of all public sector banks, private sector banks and foreign banks in India using the data for 15 years from 1991-92 to 2004-05. He found that the foreign banks performed better than the other two sectors in most of the parameters. On the basis of overall performance i.e., performance in all the CAMEL indicators, Corporation Bank, Karur Vysya Bank Ltd. and the Bank of America are the best banks among the public sector, private sector and foreign banks respectively.

Wirnkar Alphonsius Dzeawuni (2009), in his paper, 'CAMEL-based derived W-score function for banks performance evaluation: An urgent necessity' has made an attempt to derive an integral CAMEL-based function that can be used by bank regulators and managements to check, monitor, identify and correct emerging problems at short notice on a daily, weekly, monthly or annul basis before they become out-of-bounds or unbearable. The bank' regulators and those in academia are implored to test the efficacy of the CAMEL (CLEAM) derived function and certify its application in the banking industry.

The Analyst Magazine, Banking Special (2010) presents its seventh consecutive study of the annual performances of Indian banks. The study is based on the internationally renowned CAMEL methodology and examines the efficiency of 64 banks categorised into public sector banks, private sector banks and foreign banks,

Amir Hussain et al. (2010), in their research paper "Performance Evaluation of Banking Sector in Pakistan: An Application of Bankometer", have provided the solvent score for all the select banks that showed the banks were super sound during the study period.

Satish P Goyal (2011), in the paper titled 'Performance Analysis of Top 5 Banks in India HDFC, SBI, ICICI, AXIS and IDBI' through CAMELS Model. CAR, Net Profit Margin, EPS, Credit Deposit Ratio, GNPA, NPA and ROA are the parameters used for the study. HDFC Bank Ltd stands top in Capital adequacy, ROA and CD Ratio whereas SBI stands first in earnings per share and AXIS bank in net profit, GNPA and NNPA.

Makkar and Singh (2012), have evaluated the solvency of 37 Indian commercial banks by applying bankometer model for a period of five years from 2006-07 to 2010-11.The analysis reveals that private sector banks have performed much better than public sector banks in terms of financial soundness.

Nimalathasan et al. (2012), have made an attempt to evaluate the financial soundness of select Commercial Banks in Sri Lanka by applying Bankometer Model. They found that all the banks selected have healthy financial position and the public sector banks are in safer zone compared to private sector banks selected for the study.

Abirami K (2018), made an attempt to analyse the financial soundness of banks in India for the period of ten years (2005-06 to 2014-15). Bankometer test has been applied to analyse the solvency status of the banks and found that the All the select public sector banks in the study are found to be super sound in their financial position as per the IMF norms.

3.   Objectives of the study

The objectives of the study are as follows:
To analyse the financial soundness of select banks in India using bankometer indices.
1.   To compare the financial soundness of different sectors of banks viz; Other Nationalised Banks, SBI, New Generation Private Sector Banks and Old Generation Private Sector Banks and between Public Sector Banks and Private Sector Banks.

4.   Hypotheses of the study

H01: There is no significant difference in the **S** scores of different bank
groups viz., SBI, Other Nationalised Banks (ONB), Old Private Banks
(OPB) and New Generation Private Sector Banks (NGPB)

H02: There is no significant difference in the **S** scores of public sector
banks and Private sector banks

5.   Research Methodology

The study is based on secondary data. The data were collected from annual reports of selected banks, publications of Reserve Bank of India, Indian Banks Association, publications of IMF and various books and journals.

5.1 Period of study
 The S Scores of selected banks for the period from 2015-16 to 2017-18 were collected and analysed.

5.2 Sample Design
The universe of the study comprises of 44 foreign banks, 12 old private sector banks, 9 new generation private banks, 21 public sector banks. The sample frame under this study consists of 20 public sector banks and 16 private sector banks. The selected banks are given below. Foreign banks were excluded.

PUBLIC SECTOR BANKS (PSBs) (20)			PRIVATE SECTOR BANKS (PBs) (16)		
1	Allahabad Bank	Other Nationalised Banks (ONB) 19 banks	1	City Union Bank Ltd.	Old Private Sector Banks (OPB) 09 banks
2	Andhra Bank		2	Tamil Nadu Mercantile Bank Ltd.	
3	Bank of Baroda		3	The Catholic Syrian Bank Ltd.	
4	Bank of India		4	Dhanlaxmi Bank Ltd	
5	Bank of Maharashtra		5	The Federal Bank Ltd.	
6	Canara Bank		6	The Jammu & K Bank Ltd.	
7	Central Bank of India		7	The Karnataka Bank Ltd.	
8	Corporation Bank		8	The Karur Vysya Bank Ltd.	
9	Dena Bank		9	The South Indian Bank Ltd.	
10	Indian Bank		10	Axis Bank Ltd.	New Generation Private Sector Banks (NGPB) 07 Banks
11	Indian Overseas Bank		11	DCB Bank Ltd.	
12	Oriental Bank of Commerce		12	HDFC Bank Ltd.	
13	Punjab & Sind Bank		13	ICICI Bank Ltd.	
14	Punjab National Bank		14	IndusInd Bank Ltd.	
15	Syndicate Bank		15	Kotak Mahindra Bank Ltd.	
16	UCO Bank		16	YES Bank	
17	Union Bank of India				
18	United Bank of India				
19	Vijaya Bank				
20	State Bank of India (SBI)	SBG (01)			

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5.3 Method of analysis

The study is based on the financial soundness and solvency indicator suggested by IMF, the Bankometer method. To study the difference in the S scores, independent samples t test is used.

5.4 Description of Model used

The following model has been applied to analyse the financial soundness of select banks in the study.

Bankometer Model

International Monetary Fund (IMF) has developed a model with norms to identify the financial soundness of the firms. Analysis of financial soundness of select banks and identification of the factors that determine the financial soundness of select banks in India through Bankometer model is done in this paper. Bankometer model is applied at global level which prescribes a procedure to gauge the weakness of an individual bank. The Model helps to find the solvency scores of the banks to avoid insolvency issues and to measure the financial position by taking into account the contribution of each ratio in the model according to the IMF (2000) norms updated in 2018.

S =1.5*CA +1.2*EA +3.5*CAR +0.6*NPL +0.3*CI +0.4*LA

'S' stands for solvency score.

Capital to Assets Ratio (CA) measures the extent of the assets being financed by total capital (equity and retained earnings) of the bank. Higher ratio indicates that the bank is more secure because the assets are financed by long term funds.

Equity to Assets Ratio (EA) measures the extent to which the assets are financed by equity capital. Higher this ratio, more secure is the financial position of the bank in the long run because more assets could be financed by bank's equity capital and is less dependent on external funding.

Capital Adequacy Ratio (CAR) measures the bank's capital position and also known as capital to risk-weighted assets ratio. High CAR indicates that the banks are safe and likely to meet its financial obligations. The S-scores of the banks are mainly influenced by capital adequacy rates.

Non- Performing Loans to Loans Ratio (NPL) measures the proposition of NPL to total loans. A higher ratio indicates higher non-productive loans given by a bank.

Cost to Income Ratio (CI) compares the operating expenses excluding non-cash expenses and the operating income. Lower the ratio, higher is the level of bank profits.

Loans to Assets Ratio (LA) ratio measures the long term credit issued with respect to the amount of assets. Higher ratio indicates high earnings for the banks as return on long term credit which in turn may affect bank liquidity and vice versa.

To analyse the bankometer parameters individually, IMF has laid down the limits for a financially sound bank as follows:

Table 1 Bankometer parameters

Sl.No	Bankometer Parameters	IMF limits
1	Capital to Assets Ratio	More than or equal to 4%
2	Equity to Asset Ratio	More than or equal to 2%
3	Capital Adequacy Ratio	Between 8% to 40%
4	NPLs to Loans Ratio	Less than or equal to 15%
5	Cost to Income Ratio	Less than or equal to 40%
6	Loans to Assets Ratio	Less than or equal to 65%
7	Capital to Assets Ratio	More than or equal to 4%
8	Equity to Asset Ratio	More than or equal to 2%

Table 2 Interpretation on the basis of S score

Sl.No.	S Score	Interpretation
1	Greater than 70 percent	Super sound banks
2	Between 50 to 70	Grey area- There is susceptibility to error classification.
3	Below 50 percent	Not solvent

6.   RESULTS AND DISCUSSIONS

6.1   S-Score: Public Sector Banks

The Table 3 presents the descriptive statistics and the growth rates of S-score of select public sector banks from 2015-16 to2017-18.

6.1.1 Other Nationalised Banks

Table 3 S-score – Other Nationalised Banks

Sl. No.	Name of Bank	Years		
		2016	**2017**	**2018**
1	Allahabad Bank	101.38	104.57	90.62
2	Andhra Bank	102.20	103.59	97.98
3	Bank of Baroda	105.69	99.79	101.46
4	Bank of India	104.05	101.27	106.85
5	Bank of Maharashtra	102.48	103.95	103.52
6	Canara Bank	101.00	105.57	108.37
7	Central Bank of India	100.80	96.26	93.65
8	Corporation Bank	98.62	99.17	92.53
9	Dena Bank	103.89	104.65	107.88
10	Indian Bank	111.93	108.44	104.48
11	Indian Overseas Bank	99.68	102.67	95.82
12	Oriental Bank of Commerce	103.97	102.55	94.36
13	Punjab & Sind Bank	101.19	103.09	101.66
14	Punjab National Bank	102.52	99.85	96.04
15	Syndicate Bank	101.37	104.61	106.10
16	UCO Bank	92.94	98.64	99.87
17	Union Bank of India	100.90	102.72	101.02
18	United Bank of India	99.45	98.69	109.90
19	Vijaya Bank	107.04	105.08	110.71
	Nationalised banks other than SBI	**102.16**	**102.37**	**101.20**

Source: Compiled and computed from the annual reports of various banks

Table 3 shows the S-score of nationalised banks other than State Bank of India. In the year 2015-16, Indian bank (111.93 percent) has the highest S score followed by Vijaya bank (107.34 percent). In 2016-17 Indian bank (108.44 percent) stands top followed by Canara bank (105.57). In 2017-18, Vijaya bank showed more sound ness with S score of (110.7 percent) followed by United Bank of India (109.90percent). The least score is found in the case of Corporation bank (98.62), Central bank of India (96.26) and Allahabad bank (90.62) in the years 2015-16, 2016-17 and 2017-18 respectively. All the banks S score is found greater than 70 and not less than 90 during the entire study period and so it is inferred that the all the nationalised banks in India is financially super sound and solvent even though there is rise in NPA and decrease in the profitability position.

6.1.2 S Score State Bank of India

Table 4: S-score SBI

Sl. No.	Type of Bank	2016	2017	2018
1	State Bank of India	105.49	106.05	103.18

Source: Compiled and computed from the annual reports of various banks

Table 4 reveals the S score of SBI for the last three years and found that the largest commercial bank in India, is financially super sound and solvent as its S score during the entire study period is greater than 100 (IMF limit above 70 for super sound banks).

6.1.3 S Score Public Sector Banks

Table 5 S-score - Public Sector Banks

Sl. No	Type of Bank	2016	2017	2018
1	Public Sector Banks	102.33	102.56	101.29

Source: Compiled and computed from the annual reports of various banks

The average S scores of all the public sector banks were found to be 102.33, 102.56 and 101.29 respectively in the years 2015-16, 2016-17 and 2017-18. This clearly gives the financial health of public sector banks in India. All the banks are financially super sound as per the evaluation under IMF criteria.

6.1.4 Difference between the S scores of ONB and SBI

Table 6 Group Statistic

	Type of bank	N	Mean	Std. Deviation	Std. Error Mean
Average S score	ONB	19	101.9142	3.38286	.77608
	SBI	1	104.9067	.	.

Source: Data Analysis

Table 7 Independent samples t test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Average S score	Equal variances assumed	.	.	-.862	18	.400	-2.99246	3.47074	-10.28421	4.29930
	Equal variances not assumed			.	.		-2.99246	.	.	.

Source: Data Analysis

The independent samples t test results revealed that the P value is .400 with df 18 and t value *.862. As the p value is more than .05 at 5% level of significance, the null hypothesis is accepted and inferred that there is no difference in the S scores of SBI and ONB.

6.2   S-score of Private Sector Banks

This part presents the descriptive statistics and the growth rates of S-score of select private sector banks from 2015-16 to 2017-18.

6.2.1   S-score of Old Private Sector Banks

Table 8 S score – Old Private Sector Banks

Sl. No	Bank	Years		
		2016	2017	2018
1	City Union Bank Ltd.	118.23	117.71	119.24
2	Tamil Nadu Mercantile Bank Ltd.	106.28	108.18	111.58
3	The Catholic Syrian Bank Ltd	98.14	101.13	96.82
4	Dhanlaxmi Bank Ltd	89.02	94.93	106.83
5	The Federal Bank Ltd.	111.21	103.51	113.84

6	The Jammu & Kashmir Bank Ltd.	100.71	98.01	100.80
7	The Karnataka Bank Ltd.	104.56	106.51	103.67
8	The Karur Vysya Bank Ltd.	103.63	104.60	139.11
9	The South Indian Bank Ltd.	104.24	101.78	104.02
	Old private sector banks	**104.00**	**104.04**	**110.65**

Source: Compiled and computed from the annual reports of various banks

Table 8 shows the S-score of Old private sector banks in India. In the year 2015-16, 2016-17 and 2017-18 City union bank limited has the highest S score (118.23,117.71,and 119.24 respectively followed by Federal bank limited (111.2 percent in 2016-17), Tamil Nadu Mercantile Bank limited bank (108.18 in 2016-17) and Federal bank limited (113.84 percent in 2017-18) The weak performers are Dhanlakshmi bank limited in 2015-16 and 2016-17 with S scores 89.02 and 94.93 respectively and Catholic Syrian bank limited in 2017-18 with S score 96.62percent. All the banks S score is found greater than 70 and not less than 90 during the entire study period. Most of the banks S score is greater than 100 percent. It is inferred that the all the old generation private sector banks in India is financially super sound and solvent even though there is rise in NPA and decrease in the profitability position.

6.2.2 S Score of New Generation Private Sector Banks

Table 9 - S-score – New Generation Private Sector Banks

Sl. No.	Bank	Years		
		2016	**2017**	**2018**
1	Axis Bank Ltd.	111.87	110.27	118.35
2	DCB Bank Ltd.	117.49	112.68	121.49
3	HDFC Bank Ltd.	115.17	110.03	108.60
4	ICICI Bank Ltd.	120.37	122.84	133.15
5	IndusInd Bank Ltd.	118.99	114.71	102.00
6	Kotak Mahindra Bank Ltd.	124.09	122.43	124.41
7	YES Bank	120.18	118.70	116.11
	New Generation Private Sector Banks	**118.31**	**115.95**	**117.73**

Source: Compiled and computed from the annual reports of various banks

Table 9 shows the S-score of new generation private sector banks in India. In the year 2015-16 Kotak Mahindra bank stands top with S score 124.09 followed by ICICI bank Limited (120.37). In 2016-17 and 2017-18 ICICI bank limited has the highest S score (122.84 and 133.18 respectively followed by Kotak Mahindra bank limited (122.43 percent in 2016-17 and 122.41 in 2017-18). The weak performers are Axis bank limited in 2015-16 (118.87), in 2016-17 HDFC bank limited (110.83) and in 2007-18, Indus Ind bank limited (102). All the banks S score is found greater than 70 and not less than 100 during the entire study period. Based on the financial soundness indicators, the new generation private sector banks performance is far better than its near rivalries, the PSB and OGPB. The banking industry is currently facing lot of problems which may affect its survival. In this tough situation such as higher NPA rates, lower profitability, tough competition and new capital adequacy norms, all the selected banks have good S Scores and that they are financially super sound and solvent.

6.2.3   Comparison between OGPB and NGPB

Table 10   S Score- Private Sector Banks

Sl. No.	Type of banks	Years		
		2016	**2017**	**2018**
1	Old Private Sector Banks	104.00	104.04	110.65
2	New Generation Private Sector Banks	118.31	115.95	117.73
3	**Private Sector Banks**	**110.26**	**109.25**	**113.75**

Source: Compiled and computed from the annual reports of various banks

It can be seen from Table 10 that the average S score of NGPB is more than OPB over various years and is concluded that the NGPBS are more sound and solvent than OGPBs.

Table 11 Difference in the S scores of OPB and NGPB

	Type of bank	N	Mean	Std. Deviation	Std. Error Mean
Average S score	OPB	9	106.2330	7.50132	2.50044
	NGPB	7	117.3300	5.59467	2.11459

Table 12 Independent sample t test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Average S score	Equal variances assumed	.939	.349	-3.262	14	.006	-11.09704	3.40191	-18.39340	-3.80067
	Equal variances not assumed			-3.389	13.992	.004	-11.09704	3.27470	-18.12094	-4.07314

Source: Data Analysis

The independent samples t test results revealed that the P value is .349 with df 14 and t value -3.262. As the p value is more than .05 at 5% level of significance, the null hypothesis is accepted and inferred that there is no difference in the S scores of OPB and NGPB**.**

6.3   Overall S score

Table 13 S score of banks

Sl No	Type of bank	Years		
		2016	**2017**	**2018**
1	Other Nationalised Banks	102.16	102.37	101.20
2	State Bank of India	105.49	106.05	103.18
3	**Public Sector Banks**	**102.33**	**102.56**	**101.29**
4	Old Private Sector Banks	104	104.04	110.65

5	NGPB	118.31	115.25	117.73
6	**Private Banks**	**110.26**	**109.25**	**113.75**
	Overall S score	**105.85**	**105.53**	**106.82**

Source: Compiled and computed from the annual reports of various banks

The S score of private sector banks is higher than that of public sector banks over the period of study. The solvency score of new generation banks is better than that of all public sector banks and old generation private sector banks. It is interesting to see that the there is little difference in the scores of these banks. New generation banks were more financially sound than banks in other sectors. In nutshell, all the selected banks were financially super sound and solvent over the entire period of study based on the analysis made by using IMF criterion.

Table 14 Group Statistic

	Bank sector	N	Mean	Std. Deviation	Std. Error Mean
Average S Score	1	20	102.0638	3.35994	.75130
	2	16	111.0879	8.65194	2.16298

Source: Data analysis

Table 15 Independent samples t test

		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Average S score	Equal variances assumed	13.185	.001	-4.290	34	.000	-9.02408	2.10357	-13.29905	-4.74912
	Equal variances not assumed			-3.941	18.624	.001	-9.02408	2.28975	-13.82315	-4.22502

Source: Data analysis

The independent samples t test results revealed that the P value is .001 with df 34 and t value -4.290. As the p value is less than .05 at 5% level of significance, the null hypothesis is rejected and inferred that there is significant difference in the S scores of public sector banks and private sector banks.

Conclusion

S-score is an indicator of solvency as expressed by bankometer, which helps in understanding financial soundness of banks. All the select public sector banks in the study are found to be super sound in their financial position as per the IMF norms. The IMF prescribes that any bank whose S-score is more than 70 percent is considered super sound and solvent. The results indicate that the S-score of both the public and private sector banks have been more than 90 percent. Accordingly, all the banks, both public and private sector, are super sound and solvent. On comparison, private sector banks have been better than public sector banks during the period of study. The soundness of new generation private sector banks is far better than that of their counterparts. The difference in the S sores of PSBs and Private Banks is significantly different.

In terms of different parameters, all banks have good CRAR which is above the Basel 3 norms and so their capital adequacy position is good, the main reason for the difference in the S score of PSBs and Private Banks was the higher NPA ratio of public sector banks. Therefore the PSBs should try to reduce their NPA ratio and increase their profitability position. Bankometer helps the internal management to evaluate and predict the solvency growth of their banks and gives a caution against bankruptcy too.

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