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Mathematical Analysis on the NPAs of State Bank of India

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Abstract

*The banking sector is one of the biggest service sectors in India. Availability of quality services is vital for the well-being of the economy. The focus of banks has shifted from customer acquisition to customer retention. With the stepping in of information technology in the banking sector, the working strategy of the banking sector has been revolutionary changes. Various customer-oriented products like internet banking, ATM services, tele-banking and electronic payment have lessened the workload of customers. In the present paper, there is analysis about the NPAs of the SBI. On the basis of the last five financial year's data, a second degree mathematical equation of curve has been obtained by the method of Least Squares Approximation. The equation gives the estimated Net NPA % for the current financial year (2015-16) i.e., **2.022**. With the help of equation, there is also the calculation of financial year, up to which the Net NPA % will diminished i.e., financial year **2019-20**.*

Keywords: NPAs, SBI.

1. Introduction

The State Bank of India (SBI) is the largest commercial bank in India in terms of assets, deposits, profits, branches, customers and employees with a 200 year history. The Government of India is the single largest shareholder of this Fortune 500 entity with 61.58% ownership. SBI is ranked 60th in the list of Top 1000 Banks in the world by "The Banker" in July 2012. The origins of State Bank of India date back to 1806 when the Bank of Calcutta was established. In 1921, the Bank of Bengal and two other banks i.e., Bank of Madras and Bank of Bombay were amalgamated to form the Imperial Bank of India. In 1955, the Reserve Bank of India acquired the controlling interests of the Imperial Bank of India and SBI was created by an act of Parliament to succeed the Imperial Bank of India.

The origin of the State Bank of India goes back to the first decade of the nineteenth century with the establishment of the Bank of Calcutta in 1806 in Calcutta. After three years later the bank received its charter and was re–designed as the Bank of Bengal (2 January 1809). A unique institution, it was the first joint–stock bank of British India sponsored by the Government of Bengal. The Bank of Bombay (15 April 1840) and the Bank of Madras (1 July 1843) followed the Bank of Bengal. These three banks remained at the apex of modern banking in India till their amalgamation as the Imperial Bank of India on 27 January 1921.

Primarily Anglo–Indian creations, the three presidency banks came into existence either as a result of the compulsions of imperial finance or by the felt needs of local European commerce and were not imposed from outside in an arbitrary manner to modernize India's economy. Their evolution was, however, shaped by ideas culled from similar developments in Europe and England, and was influenced by changes occurring in the structure of both the local trading environment and those in the relations of the Indian economy to the economy of Europe and the global economic framework.

2. Restructuring of Assets

The Corporate Debt Restructuring of assets is being done only in cases that are technically feasible and economically viable and where the promoter's commitment to the project is ensured. Such cases are restructured only after conducting techno-economic viability (TEV) study.

Further, restructuring is done also as per the guidelines put in place by RBI. Restructuring has attained prominence in recent years due to global slowdown, sluggish growth in the domestic market and the down-turn in industry. Moreover, restructuring of viable units enables the Bank to recover funds locked with the borrower, aids continued functioning of the industry and helps in keeping manpower gainfully employed.

In order to tackle the NPAs, RBI has provided a mechanism to bankers to recover bad loans. The RBI has allowed banks to acquire 51% or more stakes in companies defaulting after restructuring their loans. Measures announced under the new scheme 'Strategic Debt Restructuring' (SDR) include allowing lenders to convert debt into equity within 30 days of review of companies' accounts.

In addition, lenders acquiring shares of listed companies under restructuring would be exempted from making open offers. Further extension of the date of commencement of commercial operations (DCCO) allowed of such projects where a change of ownership takes place, without adversely affecting the asset classification of loans to such projects in order to facilitate change in ownership and revival, subject to certain conditions.

Under the Framework for Revitalizing Distressed Assets in the economy, extension of the dispensation to NPAs sold prior to February 26, 2014 also allowed. Allowing banks to upgrade the credit facilities extended to borrowing entities whose ownership has been changed outside SDR, to 'Standard' category upon such change in ownership. Extending its flexible refinancing and repayment option (popularly known as the 5:25 scheme) for long term infrastructure projects to existing ones where the total exposure of lenders is more than 500 crore.

The option will also be available for projects that have already been classified as bad debt or stressed, but it will treated as "restructuring" and the project will continue to be termed non-performing till the project gets upgraded after satisfactory performance on servicing the loans.

3. Controlling of NPAs

The Bank has endeavored to contain the increase in NPAs, the strategies for resolution are being constantly reviewed and revisited. Suitable measures for prevention of NPAs by timely identification and diagnosis of problems of irregular accounts, tracking and reviewing Special Mention Accounts, account wise monitoring etc have been put in place. The Bank has adopted a twofold strategy for controlling fresh accretion and resolution of existing NPAs.

3.1. NPA Ratios and Numerical Analysis

Table 3.1

S. No.		Fy 2010-11	Fy 2011-12	Fy 2012-13	Fy 2013-14	Fy 2014-15
1.	Gross NPA	25,326.29	39,676.46	51,189.39	61,605.35	56,725.34
2.	Net NPA	12,346.89	15,818.85	21,956.48	31,096.07	27,590.58
3.	% of Gross NPA	3.28	4.44	4.75	4.95	4.25
4.	% of Net NPA	1.63	1.82	2.10	2.57	2.12
5.	Return on Assets %	0.71	0.88	0.91	0.65	0.76

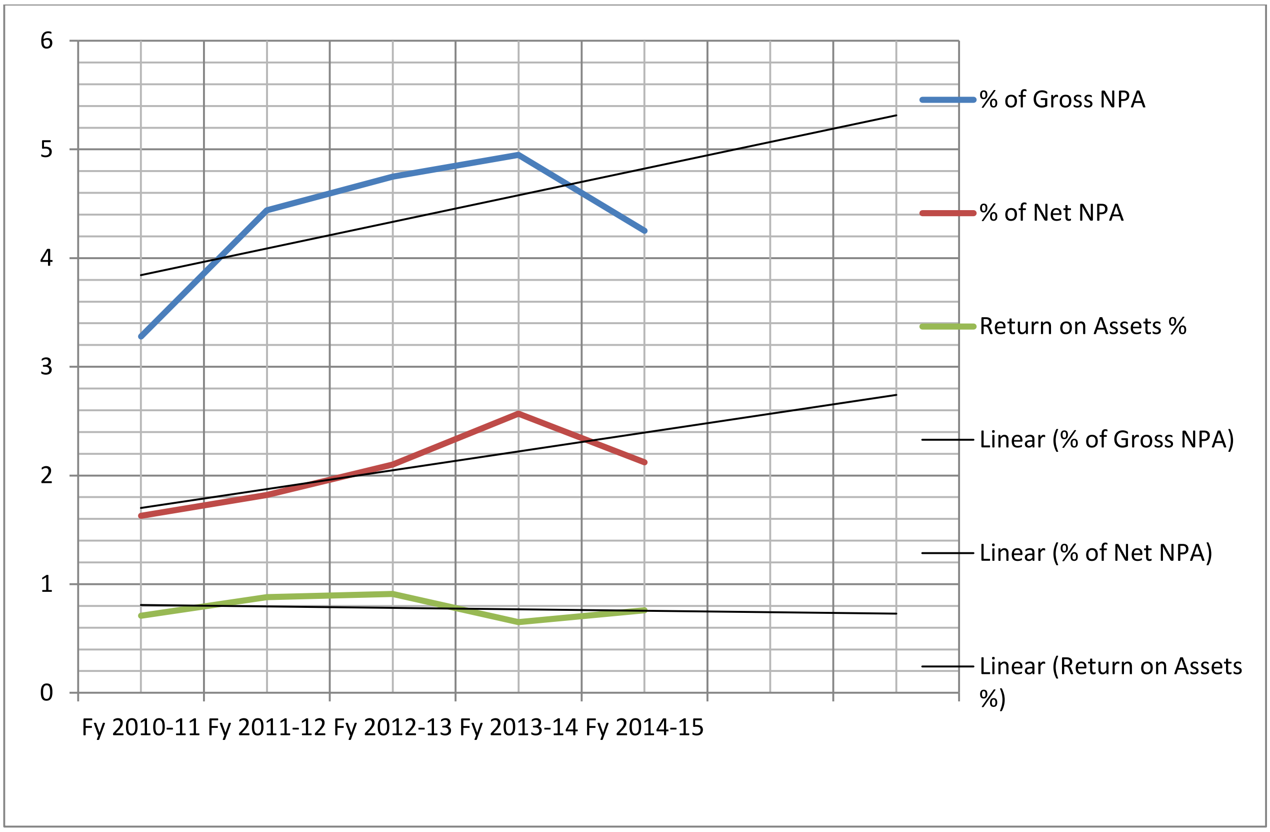

Figure-3.1 (Graphical representations of percentages of Gross NPA, Net NPA and Return on assets for the last five financial years)

By taking x as years and y as Net NPA Percent, the table is as given:

Table 3.2

x	(2010-11) 1	(2011-12) 2	(2012-13) 3	(2013-14) 4	(2014-15) 5
y	1.63	1.82	2.10	2.57	2.12

Let the second degree equation by the method of curve fitting i.e., the method of least squares of the curve be

$y=ax^2+bx+c$ (1)

The normal equations are given by

$a\sum x^2 + b\sum x + 5c = \sum y$ (2)

$a\sum x^3 + b\sum x^2 + c\sum x = \sum xy$ (3)

$a\sum x^4 + b\sum x^3 + c\sum x^2 = \sum x^2 y$ (4)

Taking the data from table 3.2, we have the normal equations as given:

$55a+15b+5c=10.24$ (5)

$225a+55b+15c=32.45$ (6)

$979a+225b+55c=121.93$ (7)

On solving, the values are as given:

$$a = -0.077857142, b = 0.6401428571, c = 0.983998429 \tag{8}$$

Hence the second degree curve for the Net NPA Percent is as given:

$$y = -0.077857142\, x^2 + 0.6401428571\, x + 0.983998429 \tag{9}$$

Put $x = 6$ for the financial year 2015-16, we get

Net NPA % (for the financial year 2015-16) = y = 2.02199846 ≈ 2.022.

Taking $y = 0$, we have

$$0.077857142\, x^2 - 0.6401428571\, x - 0.983998429 = 0 \tag{10}$$

To find the roots of the equation, we will use the Newton-Raphson method for evaluating x.

Let

$$f(x) = 0.077857142\, x^2 - 0.6401428571\, x - 0.983998429 = 0 \tag{11}$$

$$f'(x) = 0.155714284\, x - 0.6401428571 \tag{12}$$

Here, $f(9) = -0.422 < 0; f(10) = 0.4 > 0 \Rightarrow 9 < x < 10$

Let $x = \alpha_0 \approx 9.5$ be the initial value, by the Newton's method

$$\alpha = x - \frac{f(x)}{f'(x)} = \frac{0.077857142\, x^2 + 0.983998429}{0.155714284\, x - 0.6401428571} \tag{13}$$

$$\Rightarrow \alpha_1 = \frac{0.077857142\, (9.5)^2 + 0.983998429}{0.155714284\, (9.5) - 0.6401428571} = 9.546176293$$

$$\Rightarrow \alpha_1 = 9.544369095, \alpha_2 = 9.546265367$$

$$\Rightarrow \boldsymbol{\alpha = x \approx 9.54}$$

4. Initiatives Taken Regarding NPAs

Early Warning Signal (EWS): As part of its proactive management of stressed assets to contain and control NPAs, we are in the process of introducing a system which would generate Early Warning Signals in the form of actionable alerts that would help the Bank to identify assets at the incipient stage of stress and facilitate their early resolution. The objective is to tackle problem loans well before they turn SMAs. The web based Assets Tracking and Monitoring (AT@M) software enables all stake holders to have a single point of view along with granular drill down up to account level. It covers monitoring of SMAs as well as Sub Standard accounts. The Bank also tied up with GE Capital for proactively making calls to stressed accounts (SMAs) in Retail segment and Real Estate sector, to prevent slippages. SBI has Assets Tracking Centres at Circle level to track and monitor probable NPA accounts (SMAs) in SME and Agriculture segments, for making calls on the customers and follow up for recovery. Tele-calling to borrowers/guarantors has been introduced at Stressed Assets Resolution Branches to help in their recovery efforts. In order to simplify and add technology in the work flow of the call centers, a web based portal has been put in place, to efficiently monitor the callcentre process. The Bank has formed various committees to periodically review stressed assets and suggest resolution and turn around strategies.

4.1. Asset Quality Improvement Measures for P-Segment

PBBU Assets quality has improved during FY2015. To strengthen the assets quality, following strategies have been adopted:

- SMS sent to borrowers before and after EMI due date
- Soft recovery entrusted to specialised teams - A campaign for Auto Loan recovery "Aar Ya Par Paisa Ya Car" launched
- Updation of defaulters" details in Credit Information Companies" database being followed up - Auctioning of defaulters" assets hypothecated/ pledged with the Bank

- Portfolio Health Check and Skip Tracing for Auto Loan, Education Loan and -press Credit carried out

4.2. Asset Quality Improvement Measures for Agriculture Loans

Several initiatives and innovative campaigns rolled out for arresting slippages and quick resolution of NPAs resulted in reducing the Agri NPA level to below 31st March, 2014. The initiatives adopted are: -

- "R1U2 Campaign" (Recover One & Upgrade Two) - launched to target NPA accounts, which pulled standard accounts to NPA under Single CIF Multiple accounts norm. The Campaign resulted in reduction of NPAs to the tune of Rs.214 crores.
- "Project Zero Campaign" launched to drive renewal of NPA KCC/ACC accounts. The campaign is driven by SMS based daily monitoring of renewal / closure. Under the campaign, 2.81 lakhs KCC/ACC accounts renewed / closed upto 31st March, 2015.
- SBI has renewed the National level tie-up with Shriram Automal India Limited to support branches in auction of seized tractors to reduce agri NPAs.
- Gold loan auctions carried out on fixed dates each month to drive NIL NPA position in Agri Gold Loan.

4.3. Asset Quality Improvement Measures for Corporate Accounts

The asset quality of CAG remained well under control, with the gross NPAs at 0.44 % of total advances. Every effort is made to improve the asset quality through regular engagement with promoters of weak and stressed accounts. All high value stressed accounts and D rated borrowers are kept under special watch of General Manager for reduction in exposure. The sale to Asset Reconstruction Companies (ARCs) is examined in all eligible stressed accounts. These efforts have led to decline in retained NPA of Mid Corporates from 17,250 crores as on March 2014 to 14,775 crores as on March, 2015.

5. New Proposals by RBI

A number of new initiatives are also proposed by RBI but not implemented till now, which are listed below:-

- Differentiated Licensing of Banks: In addition to recently licensed differentiated banks such as payments banks and small finance banks, the Reserve Bank will explore the possibilities of licensing other differentiated banks such as custodian banks and banks concentrating on whole-sale and long term financing.
- To promote electronic payments and use of cards for transactions, RBI will put in the public domain a concept paper for proliferation of card acceptance infrastructure in the country, especially in the tier III to tier VI centers.
- Cyber Risks - Supervisory Assessment of Preparedness of Banks: RBI has commenced detailed examination of IT used by banks on a pilot basis during the current year. IT examination reports are being issued separately so as to strengthen the information security preparedness of banks as well as to assess the effectiveness of IT adoption by banks. Moving forward, it is planned to cover major banks in 2016-17 and all banks from 2017-18.
- Easing of Restrictions on Plain Vanilla Forex Options: Currently, plain vanilla currency options require adherence to stringent suitability and appropriateness norms although they are considered a generic product, while forward contracts are exempt from the same. It is proposed to bring plain vanilla forex options bought by bank clients at par with forex forwards on regulatory requirements.
- Allowing Non-Resident Indians (NRIs) to Participate in the Exchange Traded Currency Derivatives (ETCD) Market: It has been decided by RBI to permit NRIs to participate in the ETCDs, subject to limits and other conditions that are stipulated by the exchanges recognized by the SEBI. Guidelines in this regard will be issued by end-June 2016.
- Payment and Settlement Systems in India – Vision 2018: RBI will publish Vision 2018 for the payment and settlement systems in the country. Vision 2018 will continue to focus on migrating to a "less-cash" and more digital society. The endeavor would be to make

regulations more responsive to technological developments and innovations in the payments space. This would be complemented by enhanced supervision of payment system operators, improvement in customer grievance redressal mechanisms and for the strengthening of the payments infrastructure.

6. Statements of Board of Directors

The statements of the Board of Directors in a annual general meeting are as follows:-

- that in the preparation of the annual accounts, the applicable accounting standards have been followed along with proper explanation relating to material departures;
- that they have selected such accounting policies and applied them consistently and made judgements and estimates as are reasonable and prudent, so as to give a true and fair view of the state of affairs of the Bank as on the 31st March 2015, and of the profit and loss of the bank for the year ended on that date;
- that they have taken proper and sufficient care for the maintenance of adequate accounting records in accordance with the provisions of the Banking Regulation Act, 1949 and State Bank of India Act, 1955 for safeguarding the assets of the Bank and preventing and detecting frauds and other irregularities;
- that they have prepared the annual accounts on a going concern basis;
- that the internal financial controls had been laid down, to be followed by the Bank and that such internal financial controls are adequate and were operating effectively; and
- that proper system had been devised to ensure compliance with the provisions of all applicable laws and that such systems were adequate and operating effectively.

7. Recent Developments

- Faster Approval for Road Projects – Segregation of civil construction cost from total roject cost (TPC).
- Measures announced to tackle project delays.
- Exit Policy – Government has recently allowed private developers to take out their entire equity and exit all operational BOT projects two years from the Commercial Operation Date.
- Revival of Languishing Projects - Cabinet has recently allowed one time fund infusion by NHAI for revival of BOT projects which are languishing in the construction stage, that have achieved at least 50% physical completion.
- The Ministry of Road Transport & Highways (MORTH) has amended certain clauses in the Model Concession Agreements (MCA) for BOT and EPC projects.

8. Conclusion

We conclude that State Bank of India plays an important role in the achievement of high economic growth. Priorities in this context include the structural expansion of bank credit through the expansion of financial savings, and the improvement of the efficiency of financial intermediation and the allocation of financial resources. These goals will require further improvements in the efficiency of the banking sector, and the setting of loan and deposit interest rates at levels that reflect market realities. The table 3.1 and figure 3.1 show that from Fy 2010-11 to Fy 2013-14, the Net NPAs % increases, whereas in the duration Fy 2013-14 to Fy 2014-15, it decreases. The data is fitted in a second degree curve by the method of least square approximation that gives an equation of curve. The estimated value of Net NPA % for Fy 2015-16 is **2.022**, which is lower than that of Fy 2014-15. For $x = \alpha \approx 9.54 \Rightarrow y \approx 0$; shows that the Net NPA % diminishes in the Fy **2019-20**.

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