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The Evaluation of NPAs of Indian Banking Sector: A Time Series Analysis of the Schedule Commercial Banks

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Abstract:

Economic growth is closely linked with the financial system of the country. As a financial institution, banking sector contribute a lot to the economic development. Our banking system has shown a fabulous growth since nationalisation and even after reforms of 1991 but has also faced decline in profitability on the other side due to sudden hike in the non-performing assets of the banks. In spite of due care, many loan and advances are turning into bad debts due to failure of recovery mechanism and becoming non-performing assets. The present study aims to examine the position of NPAs of the Schedule Commercial banks of the India over a period of 7 years from the year 2014-15 to 2020-21. The secondary data were used to conduct the study. The statistical tools such as mean, Standard deviation and chi-square test were applied. For estimating expected trend of NPAs, least square technique of the time series analysis was used. The study revealed that there is no significance association in position of gross NPAs, Net NPAs and NPA Provisions over a period of time. It was concluded that RBI and government should implement innovative and strict policy for reducing NPAs.

Index terms: Gross NPAs, Net NPAs, NPA Provision, Non-performing Assets, Bad loans, Time series analysis

1. Introduction:

A strong and concrete financial system is the primary condition for the continuous growth of any economy. It has been always considered as basic criteria for the life of a vibrant economy of the nation. The financial system of a nation is a key driver of the economy which provides fuels to the engine of the economy by imparting mobility and liquidity to the funds. As financial intermediaries, the banks can be appreciated as the economic arm of the nation **(Kharche and Gupta, 2023).** The performance of the bank indicates the level of economic growth and development. The economic strength of the country and the stability of its financial segment are highly dependent on the quality and capabilities of the banking sector owned by the nation. India being at the developing stage, banking sector is support system for all as all the financial transactions by government or general public are channelized through banks. In India, the banking sector majorly comprises of the Schedule Commercial banks and the Co-Operative banks in which the Schedule Commercial banks contributes for around 90% of banking assets. Further, the Schedule Commercial banks comprises of the Public Sector banks (nationalized banks), the Private sector banks, Foreign banks and Regional rural banks.

The banking reforms about nationalization which took place in 1969 and 1980 intended to bring about financial inclusion so that the banking sector can be free from the biased practices while doing banking transactions. Prior to this reforms, history of banking sector reveals that bank was primarily engaged in providing the banking facilities to that section of the society who already belongs economically stable background and failed to reach up to weaker sections of the society which resulted in regional disparity in growth of banking industry as well as economically disparity across the country **(Jana and Hundu, 2020)**. Another major reforms happened in the 1990's due to liberalisation, privatisation and foreign trade approvals. These events demanded a robust and effective financial system that can deal with any national or international turbulences. Narasimhan Committee recommended certain practical norms, competence ratios and risk management tools for developing strong banking structure in India. In spite of adopting all norms and modern tools, the banking industries is dealing with high level of non-performing assets. In recent times, many cases of bank failure such as Harshad Mehta Scam, the Kingfisher Airlines Scam, PNB scandal, ABG Shipyard Scam, Adani group Case has shocked the nation and hence the awareness and the management of NPA has got centre of attraction at all the levels.

1.1 The Concept of Non-Performing Assets:

The banking industry has its root back in the 19th century. The main objective of this business is to channelize the savings of public by accepting deposits and granting loans. It means it acts as mediator between two classes of people those who have excess of funds and those who have need of funds. The assets of the bank include fixed assets, investments, loan and advances, cash in hand, bank balances and other assets. but the concept of the Non-Performing Assets is limited to loans and advances. When an asset generates the income in form of interest or dividend and does not associated with any risk, it will be considered performing asset and when it fails to generate return in any form, it is treated as "Non-Performing Asset". In other words, it can be said that When bank had issued a loan to the third party and payment of interest and/or payment of instalments remains due up to 180 days, that principal amount of the loan along with the interest amount turn into "non-performing asset". According to the asset classification norms in effect from 31st March,204, a non-performing asset is a loan or an advance, where interest and/or instalment amount remain unpaid:

1. For the period of more than 90 days in case of a term loan/an overdraft/cash credit,
2. For the period of more than 90 days in respect of bills of exchange purchased and discounted,
3. For the two yield seasons but not more than 2.5 years in case of an agriculture loan and
4. For the 90 days any case of any other accounts.

The interest received on such terms loans/overdraft/cash credit is source of the income for the banks. It is directly linked with the profitability and liquidity of the banks. Though RBI has implemented many strategies from time to time to address the risk issue of loan and advances, the problem of default has become a regular affair resulted in worrying matter for the RBI and government. It has been observed that after the both financial reforms, there is a sudden high jump in NPAs of the Schedule Commercial Banks. It is raising a doubt on the financial system and therefore it is a matter of worry as it can adversely affect the economic growth as well in long run. The present study is focused on the position of non-performing assets of the Schedule Commercial banks in last seven fiscal years which will help to evaluate the performance of the banks in that matter and throws a light on pressing issue to decide measures to implement.

2. Review of Literature:

NPAs is a critical issue from the view point of the bankers and the policy developers. Many studies were reviewed to understand the concept and the position of the non-performing assets.

(Agarwal, 2022) emphasised on measurement and maintenance of quality of the banking assets for developing the stable and robust banking structure. According to him, Assets quality is worsening in the Public Sector Banks raising undue stress for the regulators of the banking sector and the Indian Economy. **(Ali et al., 2020)** At present, there is development of the loan culture in all over the world along with people. To take advantage of this changed scenario, the banks have also extended their credit stream to the various sectors such as production, market, agriculture, education etc. But, it is resulting into rise in the non-performing assets which has a quite string effects on the profit and net value of the banks. Banks is in need of dire steps to reduce NPAs. **(Arora,2021)** conducted a study on the trend of NPAs in all the commercial banks with focus on the substandard, doubtful and loss advances. The study revealed that there is a positive relation between gross NPAs with total advances issued by the banks, So, there is need to implement strict measures to deal with the issue of NPAs otherwise it would create problem even for the survival of the banks. **(Chhikara, 2020)** analysed the effects of the non-performing assets on the profitability of the SBI and Nationalised banks for a period of eleven years starting from 2006-07 to 2016-17 by using statistical tools and concluded that NPAs, NPA provision and bad debts of NPAs of SBI and Nationalised banks is increasing over the years and there is significant effect on the profits of those banks. According to **(Dagur, 2022)**, after the second wave of Covid-19 , there is big spike on the repayment capacity of the loan takers which resulted into quick hike in the bad loans. Here, the researcher has focused on the examination of the effects on Covid-19 on the NPAs and manipulation by RBI through certain measures such as permission for suspension (delay) on loan repayment, halt in the classification of the assets and extension of the credit facility to the borrowers. The study concluded that banks should evaluate its assets quality, credit risk and Capitan adequacy to improve performance and reduce the risks. **(Kumar and Bansal, 2022)** compared the NPAs of the Private sector and Public sector banks and also classified the NPAs into priority and non-priority sectors. It was concluded that NPAs of the public sector banks are more in comparison of the private sector bank. Bank of India has highest mean score in overall NPA as well as in NPAs of non-priority sector. While HDFC has lowest mean score in overall NPA and Yes bank has least average NPAs of priority sectors. So, Banks can follow the strategies adopting by other banks performing well in granting loans to avoid the bad loans. **(R.Sathishkumar and Umamaheswari,2022)** The economic growth of the nation largely depends on the financial structure as it provides financial services to the core sectors and later can perform efficiently without any finance problems. But Increasing issue of the non-performing assets of the banks, banks are not able operate well and failed to meet the needs of priority sectors in terms of better financial services which ultimately hampers the growth of the economy. **(Sharma and Dhiman, 2022)** The Indian government has merged total 13 Public Sector banks into total 5 Public sector banks in last few years with the intention that big banks can face challenges in better way and can compete strongly at world level in changing situation of the market. These mergers were initiated because of huge rise in bad assets of the banks otherwise many banks would have been insolvent. But the present situation is also not 100% certain that bank will able to face this both the challenges: recapitalisation resulted because of merger and NPAs effectively and will ensure good health of the banking sector.

3. Objectives of The Study:

1. To understand the concept of the non-performing assets,
2. To analyse the position of Gross NPAs, Net NPAs and NPA provision of the Schedule Commercial Banks of India,
3. To study the relationship of loan and advances with NPAs of the Schedule Commercial Banks,
4. To suggest corrective measures to reduce NPAs.

4. Research Methodology:

4.1 Research Design: The research design is analytical as well as descriptive to achieve the objectives of the study.

4.2 Data Collection Tools: The study is based on the secondary data. The data are collected from the database of RBI, Report on trend and progress of banking:2020-21, research articles and internet websites.

4.3 Sampling Frame: All Schedule Commercial Banks of India including the Public sector banks, Private Sector banks, foreign banks and Small development banks were considered.

4.4 Time Frame of the Study: 7 years from the fiscal year 2014-15 to 2020-21

4.5 Statistical Tools and Graphical Presentation: To analyse the growth of the NPAs over the period of 7 years, Statistical tools: mean, standard deviation and chi-square test were used. In Chi-square test, for determining expected trend, least square method of the time series analysis was used. Ms excel was used for the purpose of performing analysis task. For easy understanding of trends, line charts were used.

4.6 Limitations of the study: The study is limited to the period of 7 fiscal years starting from 2014-15 to 2020-21 only. The result of the similar study with the different time frame may vary. This study is conducted taking into consideration inclusive data of all Schedule Commercial banks. It is not revealing individual performance of any category of banks/ any group of banks or any individual bank.

4.7 Hypotheses: The present study is based on the following null hypothesis.

H01: There is no significant differences in the gross NPAs of the Schedule Commercial banks over a period of time.
H02: There is no significant differences in the net NPAs of the Schedule Commercial banks over a period of time.
H03: There is no significant differences in the NPA provisions of the Schedule Commercial banks over a period of time.

5. Data Interpretation and Analysis:

5.1 Gross NPAs:

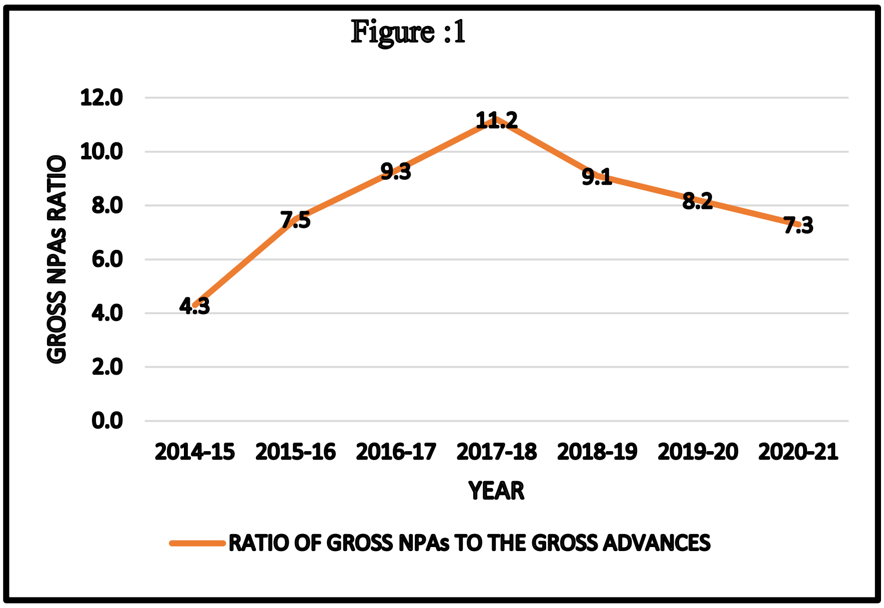
Table 1:

Ratio of Gross NPAs to Gross advances of the Schedule Commercial Banks
for the period of 7 years from 2014-15 to 2020-21 (Amount in ₹ Crore)

Year	Gross Advances	Gross NPAs	% of Gross NPAs to Gross Advances
2014-15	7559760	323335	4.3
2015-16	8173121	611947	7.5
2016-17	8492565	791791	9.3
2017-18	9266210	1039679	11.2
2018-19	10294463	936474	9.1
2019-20	10918918	899803	8.2
2020-21	11399608	837771	7.3
		Total	56.9
		Mean $\bar{X}$	8.1
	Standard Deviation σ		2.140649657

(Source: https://dbie.rbi.org.in)

Graphical Presentation:



Interpretation: The above table compares Gross NPAs of the Schedule commercial Bank with Gross Advances. The mean score of this ratio during the period of 7 years is 8.1. There was a continuous upsurge in Gross NPA ratio up to 2017-18 which indicate bad health of the bank. But after 2017-18, there is a downfall in the ratio up to 2020-21 which indicates that the asset quality of the banks is improving and it is a positive development for the banks. The standard deviation of the gross NPAs is around 2.14 which is near to zero. So, it can be interpreted that this is good for the banks and the bank authorities need to maintain this position by applying all possible measures of narrowing down NPAs.

Table 2: Determining Expected Trends of Gross NPAs Using Time Series analysis:

here N=7 years

Year(X)	% of Gross NPAs to Gross Advances (y)	x (taking 2017-18 as mean of X)	x^2	xy	Expected trends of Gross NPAs y=a+bx
2014-15	4.3	-3	9	-12.9	7.035714286
2015-16	7.5	-2	4	-15	7.4
2016-17	9.3	-1	1	-9.3	7.764285714
2017-18	11.2	0	0	0	8.128571429
2018-19	9.1	1	1	9.1	8.492857143
2019-20	8.2	2	4	16.4	8.857142857
2020-21	7.3	3	9	21.9	9.221428571
	56.9		28	10.2	

$a = \frac{\varepsilon y}{N} = \frac{56.9}{7} =$ 8.128571429

$b = \frac{\varepsilon xy}{\varepsilon x^2} = \frac{10.2}{28} =$ 0.364285714

Table 3: Chi-Square Test of Gross NPAs:

Oi (Observed data)	Ei (Expected data)	(Oi-Ei)	$(Oi-Ei)^2$	$\frac{(Oi-Ei)^2}{Ei}$
4.3	7.04	-2.7	7.5076	1.0664205
7.5	7.4	0.1	0.01	0.0013514
9.3	7.76	1.5	2.3716	0.3056186
11.2	8.13	3.1	9.4249	1.1592743
9.1	8.49	0.6	0.3721	0.043828
8.2	8.86	-0.7	0.4356	0.0491648
7.3	9.22	-1.9	3.6864	0.3998265
			$\chi 2$ =	3.0254839

At the 5% level of significance, the value of the chi-square test that was obtained from the data is around 3.03 and the table value of the chi-square test for (N-1) is 12.592. Since the computed statistics number is lower than the chi-square table value, it can be determined that the null hypothesis is true and that there is no statistically significant association in the Gross NPAs of the Schedule Commercial Banks over the time period of seven fiscal years.

5.2 Net NPAs:

Table 4:

Ratio of Net NPAs to Net Advances of the Schedule Commercial Banks
For The Period of 7 Years From 2014-15 to 2020-21 (Amount in ₹ Crore)

Year	Net Advances	Net NPAs	% of Net NPAs to Net Advances
2014-15	7388160	175841	2.4
2015-16	7896467	349814	4.4
2016-17	8116109	433121	5.3
2017-18	8745997	520838	6.0
2018-19	9676183	355068	3.7
2019-20	10301897	289370	2.8
2020-21	10820208	258228	2.4
(Source: https://dbie.rbi.org.in)		**Total**	27.0
		Mean X̄	3.9
	Standard Deviation σ		1.435104111

Graphical presentation:

Interpretation: The data about the ratio of Net NPAs to the Net advances is presented in the above table. Similar to the Gross NPA ratio, Net NPA ratio is also showing increasing trend up to 2017-18 and then continuous reduction in remaining years which is commendable growth. The average Net NPA score of the selected time frame is 3.9 and Standard deviation is 1.43 which is near to zero. Even Standard deviation of Net NPA ratio is better than Standard deviation of Gross NPA ratio. It is advantageous for the banks as it is showing declining trend in last 3 years; as a result, the bank should continue to follow established criteria to deal with it.

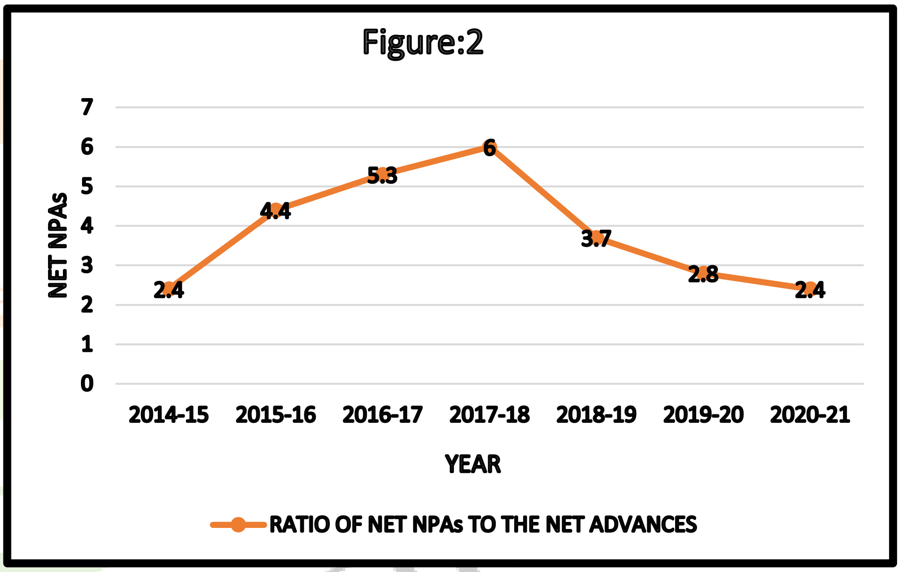


Table 5: Determining Expected Trends of Net NPAs Using Time Series Analysis:

here N=7 years

Year(X)	% of Gross NPAs to Gross Advances (y)	x (taking 2017-18 as mean of X)	x^2	xy	Expected trends of Gross NPAs y= a+bx
2014-15	2.4	-3	9	-7.2	4.371428571
2015-16	4.4	-2	4	-8.8	4.2
2016-17	5.3	-1	1	-5.3	4.028571429
2017-18	6.0	0	0	0	3.857142857
2018-19	3.7	1	1	3.7	3.685714286
2019-20	2.8	2	4	5.6	3.514285714
2020-21	2.4	3	9	7.2	3.342857143
	27.0		28	-4.8	

$a = \frac{\varepsilon y}{N} = \frac{27}{7} =$ 3.857142857

$b = \frac{\varepsilon xy}{\varepsilon x^2} = \frac{-4.8}{28} =$ -0.171428571

Table 6: Chi-Square Test of Net NPAs:

Oi (Observed data)	Ei (Expected data)	(Oi-Ei)	$(Oi - Ei)^2$	$\frac{(Oi - Ei)^2}{Ei}$
2.4	4.37	-2.0	3.8809	0.8880778
4.4	4.2	0.2	0.04	0.0095238
5.3	4.03	1.3	1.6129	0.4002233
6.0	3.86	2.1	4.5796	1.1864249
3.7	3.7	0.0	0	0
2.8	3.51	-0.7	0.5041	0.1436182
2.4	3.34	-0.9	0.8836	0.2645509
			$\chi 2$ =	2.8924189

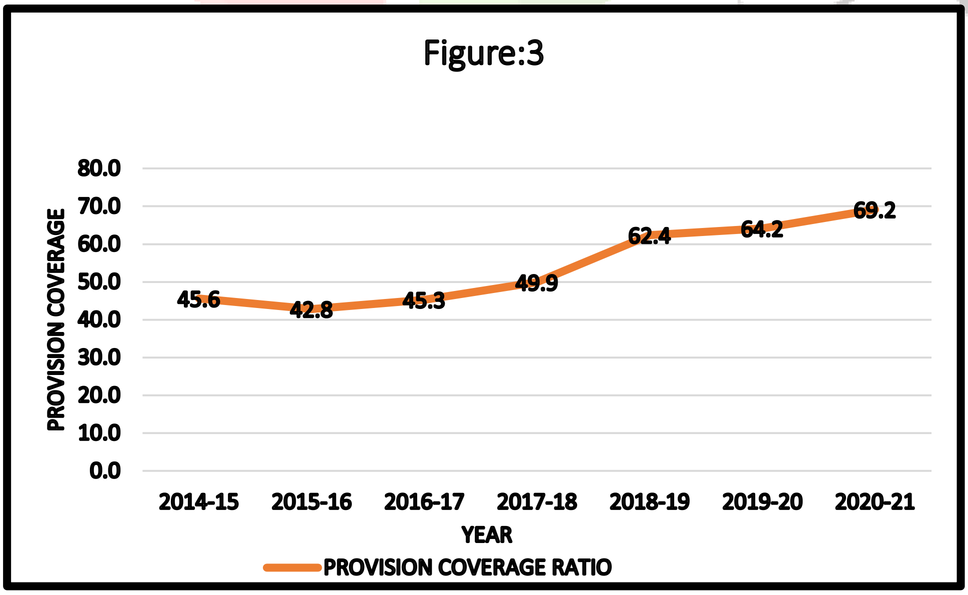
Here, the value of Chi-Square calculated is 2.89 and the tabulated value of the same test is 12.592. This was done significance level of 5%. The tabulated value is more than calculated value. So, we must accept the null hypothesis. Therefore, it is ascertained that the Net NPAs of the schedule Commercial Banks during the review period does not show any significant relations.

5.3 NPA Provision:

Table 7:
Ratio of Net Provision to Gross NPAs of the Schedule Commercial Banks
For The Period of 7 Years From 2014-15 to 2020-21 (Amount in ₹ Crore)

Year	Net Provisions	Gross NPAs	Provision Coverage Ratio
2014-15	147494	323335	45.6
2015-16	262133	611947	42.8
2016-17	358667	791791	45.3
2017-18	518841	1039679	49.9
2018-19	584406	936474	62.4
2019-20	577433	899803	64.2
2020-21	579543	837771	69.2
(Source: https://dbie.rbi.org.in)		**Total**	379.4
		Mean X̄	54.2
	Standard Deviation σ		10.73630128

Graphical presentation:



Interpretation: The information relating to the Provision Coverage Ratio is computed in the table. From 2016-17, there is increasing trend. The minimum coverage is 42.8 in 2015-16 and maximum coverage is 69.2 in 2020-21. The mean of the Provision coverage ratio is 54.2 which indicates good situation. NPA provisions are utilised to set off Gross NPAs, that means high Provision Coverage Ratio denotes that the most of the issue of bad loans are resolved and the schedule Commercial banks are not prone to the risk of insolvency. This practice of keeping certain funs aside to fight against default loan should be continued by the banks.

Table 8: Determining Expected Trends of Net Provisions Using Time Series Analysis:

Here N=7 years

Year(X)	% of Gross NPAs to Gross Advances (y)	x (taking 2017-18 as mean of X)	x^2	xy	Expected trends of Gross NPAs y=a+bx
2014-15	45.6	-3	9	-136.8494	40.22324028
2015-16	42.8	-2	4	-85.6718	44.88261265
2016-17	45.3	-1	1	-45.29819	49.54198502
2017-18	49.9	0	0	0	54.20135739
2018-19	62.4	1	1	62.404936	58.86072976
2019-20	64.2	2	4	128.34654	63.52010212
2020-21	69.2	3	9	207.53034	68.17947449
	379.4		28	130.46243	

$a = \frac{\varepsilon y}{N} = \frac{379.4}{7} = 54.20135739$

$b = \frac{\varepsilon xy}{\varepsilon x^2} = \frac{-130.4}{28} = 4.65937237$

Table 9: Chi-Square Test of Net Provisions:

Oi (Observed data)	Ei (Expected data)	(Oi-Ei)	$(Oi - Ei)^2$	$\frac{(Oi-Ei)^2}{Ei}$
45.6	40.22324028	5.4	29.08688257	0.7231362
42.8	44.88261265	-2.0	4.189035982	0.0933332
45.3	49.54198502	-4.2	18.00978711	0.3635257
49.9	54.20135739	-4.3	18.46761791	0.3407224
62.4	58.86072976	3.5	12.56139764	0.2134088
64.2	63.52010212	0.7	0.426627016	0.0067164
69.2	68.17947449	1.0	0.994617896	0.0145882
			$\chi2$ =	1.755431

Under this circumstances, at 5 % significance level, tabulated value of $\chi2$ is 12.592 and value calculated from the data is 1.76. As tabular value is more than the ascertained value, null hypothesis is correct. So, we are in a position to affirm that the provision coverage ratio of the Schedule Commercial banks of India over period of 7 years did not exhibit any significant differences.

6. Conclusion:

On the basis of the time series analysis, it was found that Gross NPAs and Net NPAs is showing continuous decrease after 2017-18 along with that NPA provisions are increasing which indicates that now Schedule Commercial Banks are better able to deal with the non-performing assets than before 2017-18. Though result of the study is showing favourable situation about the Schedule Commercial Banks, still there is need of improvement. Of course, it is not possible to completely abolish NPAs, we should try to bring it at minimum level, so, that we can operate with least amount of NPA provision and can enhance the profitability of the banks. Because high provision of NPA ultimately reduces profitability.

NPAs is cancer for the stability and profitability of the banks. It is serious issue that need to be addressed before the situation worsens. Due to continuous failure of bank in recovery of bad loans, the banks are losing the confidence of the general public. Even the frequent occurrence of non-performing assets is adversely affecting the performance of banks both economically and psychologically. Though government is focusing on issue and the condition is improving, more clarity is expected in the system. A well organised legal climate along with the strict control at bottom level will permit the banks to issue advances without much stress of NPAs. However, the process of NPA management does not begin after incidence of bad loans but starts at the time of granting loan with credit assessment of the borrower. The banks should study the intention of the borrower to whom they are sanctioning loan and keep continuous watch on end use of borrowed money with appropriate credit assessment techniques. Identification of the problem at very early stage and proper management of NPAs through recovery techniques can help a lot to combat with NPAs.

Indian government aims to achieve financial inclusion and inclusive growth and one of the major hurdles of the way is NPAs which can affect the efficiency of the financial system to the great extent. So, Skills of NPA management is must which include developing negotiation skills for settlement, counselling services, reformation and recovery skills and also knowledge about legal remedies to recover the money without much delay. In Short, banks are required to equipped with the proper credit risk appraisal mechanism to reduces loan defaults.

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