A STUDY ON IMPACT OF NON-PERFORMING ASSETS ON THE PROFITABILITY OF PUNJAB NATIONAL BANK

Author's Name: Shrusti Mulgund

Affiliation*: 3rd-year Law Student, Symbiosis Law School Hyderabad, India*

Email: smulgund0@gmail.com

DOI No. – 08.2020-25662434

Abstract

Rising NPA has become an increasing concern for the banking sector. As the Net NPA increases Net Profit decreases which seriously effects the financial performance of the bank. The present study focuses on analysing on how the increase in NPA affect the profitability of a bank. Correlation method has been selected to understand impact of NPA on certain parameters, such as Net Profit, ROA% and Net Advances. Secondary sources of data have been used to carry out the research. With the help of conclusive research design, conclusion have been drawn and suggestions have been made.

Keywords: *Net NPA, Profitability, Correlation, Return of Assets, Net Profit*

INTRODUCTION

Banking Industry plays a unique role in the economy of our country. For economic growth in this modern economy, a developed and progressing banking system is a must. A bank's important role is to interconnect people who have capital to people need capital, might be a company or an individual. Banks regulate a substantial proportion of the money supply that is in circulation. With their influence over the amount of bank money, they can influence the structure and quality of production in a country. India's banking sector has had many excellent successes to its credit over the last three decades. Advancements in electronic connectivity and technology has the power to weaken the relative dominance of the banking industry over bank deposits as the primary means of exchange in the nation. India's banking system needs to develop to face the challenges risen from the modern technology, along with internal & external factors.

Punjab National Bank launched its operations from Lahore in the year 1895, with Rs.2,00,000 of authorised capital and only Rs.20,000 of working capital. It is one of the re-known Indian multinational financial & banking services organization. In the span of 125 years, PNB has spread all over the world with almost 7000 branches, 10,000 ATMs, with a revenue of 56 crores as a PSB, it has secured its position as a top Public Sector Banks after State Bank of India. It has a good banking network overseas as well, with their branches and offices in Bhutan, Dubai, Hong Kong, United Kingdom, etc. It also has some affiliate subsidiaries in Kazakhstan and several joint ventures in Nepal. PNB is the first Indian bank to be set up entirely with Indian capital that has survived to this day. It has a strong base with over 8 crore satisfied customers. The bank has solid fundamentals, a high level of franchise value and a great brand image. The brand image and faith placed by the Bank's customers has reflected in the Bank's increasing customer base and rise in the business graph. With smooth and easy integration of distribution networks, such as ATM and online banking services, PNB provides customers with 24 X 7 service at lower transaction costs. In the year 2018, PNB reported fraudulent transactions of Rs. 12,700 crores, which was nearly

1/3rd of PNB's total net worth, making this our country's biggest fraud in the banking sector. This fraud involved the infamous Nirav Modi and Mehul Choksi. The bank recovered about Rs. 5,500 in the form of gold, diamond, precious stones, etc. Punjab National Bank is still recovering from the fraud, but it has gotten back on its feet and is thriving.

The 2019-20 financial year was noteworthy in light of the amalgamation announcement of 10 public sector banks into 4, with the goal of making them powerful and greater in order to effectively meet the financial needs of a growing economy. United Bank of India and Oriental Bank of Commerce were amalgamated into PNB on 1st of April, 2020. Along with the bank's growth, the amalgamation also offers major advantages to the bank & its clients.

In this paper correlation analysis is used to carry out the research. Correlation analysis is a statistical tool employed to measure the magnitude of the relation between 2 quantitative variables. If both the variables move in the same direction, then it is said to be a positive correlation. In this correlation if one variable increases, then the other increases along with it and vice versa. While in negative correlation, if one variable increase then the other variable decreases and vice versa. And if there is no relation between the 2 variables then it is said to be zero correlation. Correlation helps to determine the strength and course of the linear relationship between the variables. Correlation helps to determine the strength and course of the linear relation between the variables. Results obtained by this method will be easy to categorise and analyse.

LITERATURE REVIEW

➢ Surender Singh and Natasha Tageja in their article "Linking NPA to Profitability: The Case of Banking Sector in India" (2020), state that the performance of banking strongly depends on how effectively NPA is kept in check and especially of the Public Sector Banks. The continuous rise in the NPA has affected the liquidity & profitability of the banks which in turn has affected their capability of lending loans and advances. Hence, the writers suggest that strict regulations and efficient governance if the bank is required.

➢ Renu Choudhary and Vandana Jain in 2016 co-authored the article "A Study on Relationship between Non-Performing Assets (NPAs) and Advances of Selected Public Sector Banks". The writers state that NPAs are very worrisome especially to the Public Sector Banks. By employing the Karl Pearson correlation, they have found that there is a positive relation between Gross advances and Gross NPA. They have also mentioned that inefficient credit lending, poor recovery processes, corruption and defaulted loans play a major role in the rising NPA.

➢ Parishwang Piyush and Shalki Goel in 2017, have tried to analyse the situation of NPA in eights banks of India with the help of annual reports in the article "Measurement of Correlations (NPA and ROA) of Different Banks and Trend Analysis of NPAs in Indian Banks". The writers have found a negative correlation between Net NPA and Net Profit in 7 out of 8 banks, and the Net profit in those 7 banks has decreased in the study period.

➢ Payel Roy and Pradip Kumar Samanta in their article "Analysis of Non-Performing Assets in Public Sector Banks of India" (2017) have noticed that the overall position of NPA has

worsened over the years. After analysis it is observed that GNPA and NP have a strong negative correlation, as the GNPA grows subsequently profit decreases. And it is also pointed out that profit of many banks has reduced drastically. Losses incurred because of rise in the NPA cannot be avoided by just making provisions against Non- Performing Assets. The writers suggest that while giving loans bank should be more careful and should asses loan receiver's background & the recovery process need to be stricter.

➢ In the article "An Empirical Study on NPA and its Impact on Profitability with special reference to Punjab National Bank" written by Rajesh Bhandari in the year 2016, the author mentions that NPA reveals the overall performance of banks, if the bank's NPA increases, then gradually bank's profit decreases. Along with affecting bank's profitability, rise in the NPA also effects the economy of the country. It has to come to light that Punjab National Bank's NPA level is way higher as per the national and international standards. The writers suggest that PNB should try reducing NPA in the upcoming years by granting loans to customers who are creditworthy.

➢ The article "Impact of NPA on Proftability Performance of Select Public and Private Sector Banks in India" is written by Poonam Devi and Dr.Arati Pant in the year 2018. The writers point out that for a developing country like India NPA is a major issue. Total elimination of NPA might be impossible in banking sector, but it can be regulated. The writers concluded that in the study period there was a significant impact of NPA on Net Profit in the selected Private as well as Public Sector Banks.

➢ Narayan M. Gadhia, in his article "A Study on Net Profit and Non-Performing Assets of Bank of India and Kotak Mahindra Bank" (2019) has focused on the current situation of Banking Sector in India, as it is facing a huge difficulty on the matter of NPA. When compared to the private sector banks, the level of NPA is higher in the public sector banks. The author suggests to reduce and take preventive measures in controlling its NPA, and work towards increasing its profitability along with productivity.

➢ Chetan Dudhe in his article "Impact of Non-Performing Assets on the Profitability of Banks – A Selective Study" (2017) states that most of the problems related to NPA is faced by public sector banks. He further mentions that NPA not only negatively effects the profitability of a bank, but also effects a bank's solvency & liquidity. Hence stringent initiatives are required to tackle NPA crises.

➢ Divya Sri. G and Sathya. K in their article "A Study on Financial Analysis of Punjab National Bank" (2019) have tried to analyse the financial performance of Punjab National Bank with the help of annual reports of the bank. With the help of Ratio Analysis, the writers have found that the bank's financial condition is satisfactory. The writers suggest that PNB needs to work on reducing the Non-performing assets (NPA) and on increasing its net profit.

➢ In the article "Profitability Analysis of Punjab National Bank in India" written by Geetaben Amrutlal Goriya in 2018, the writers have tried to analyse the profitability of Punjab National Bank. The writers have selected the time period from 2013 to 2017, and the analysis of profitability of the bank in this period reveals that the profitability has fallen

down, and the main reason for this is bad loan outrage by PNB in 2016, along with fragile management system.

RESEARCH PROBLEM AND OBJECTIVES OF THE STUDY

Recently PNB has been in the news because of the scam surrounding the infamous business tycoons Nirav Modi and Mehul Choksi, it is because of this fact the researcher has selected to study the impact of bad loans (NPA) on the profitability of a bank.

The objectives of this study are:

> ➢ To analyse the impact of Non-Performing Assets on Net Profit, Return on Assets and NPAs relation with Net Advances of Punjab National Bank
> ➢ To examine the reasons behind the impact of NPA on profitability of PNB.
> ➢ To interpret the position of PNB with regards to profitability.

RESEARCH METHODOLOGY

Scope of Study

This study deals with analysing the impact of NPA on the profitability of Punjab National Bank for the period of five years, from 2014 to 2019. To carry out this analysis, the key parameters employed are Net NPA, Net Profit, Net Advances and Return on Assets (ROA).

Research Design

The research design used in this study is Conclusive Research Design. This research design is used because it helps to acquire findings with the help of quantitative method of data collection and based on these findings, conclusions can be drawn and suggestions can be made.

Sources of Data

This study is based on the secondary data collected from the annual reports of Punjab National Bank, journals, articles, newspapers, and other internet sources.

Method of Analysis

The method of analysis chosen for this study in correlation analysis. With this method we will try to analyse if there is any relation between the variables, and if yes, whether the correlation is positive (variables move in same direction) or negative (variables move in the opposite direction).

Hypothesis Development

- Correlation between Net NPA and Net Profit

  H_{01} : There is no correlation between Non-Performing Assets (NPA) and Net Profit of Punjab National Bank. (Null Hypothesis)

  H_{a1} : There is correlation between Non-Performing Assets (NPA) and Net Profit of Punjab National Bank. (Alternate Hypothesis)

- Correlation between Net NPA% and ROA%

  H_{02} : There is no correlation between NPA% and ROA% of Punjab National Bank. (Null Hypothesis)

  H_{a2} : There is correlation between NPA% and ROA% of Punjab National Bank. (Alternate Hypothesis)

- Correlation between Net NPA and Net Advances

  H_{03} : There is no correlation between Non-Performing Assets and Net Advances of Punjab National Bank. (Null Hypothesis)

H$_{a3}$: There is correlation between Non-Performing Assets and Net Advances of Punjab National Bank. (Alternate Hypothesis)

LIMITATION

This study has some limitations & they are mentioned below:

> The present study covers only 1 Public Sector Bank and that is Punjab National Bank. Therefore, the results or findings does not apply to the Banking sector as whole.
> This study takes into account the performance of bank only from year 2014 to 2019.
> The data collected is only from secondary data, from the annual reports, article, journals etc. The data given in the annual reports may not show the accurate performance or position of the bank.

DATA ANALYSIS AND INTERPRETATION

The data analysis will be done by Tabulation of data along with graph and Karl Pearson's Correlation Co-efficient. The values of correlation are always between -1 to +1. If the value is -1, then the variables are perfectly negatively correlated, if the value is +1 then the variables are perfectly positively correlated and if the value is 0 then no correlation exists between the variables. The formula to calculate the correlation coefficient is
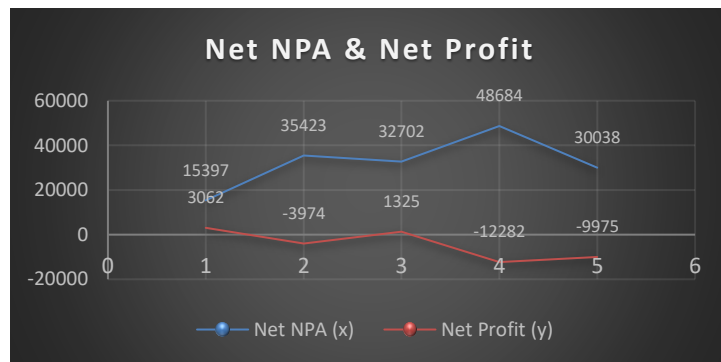
$r = \sum (x – x^-) (y – y^-) / \sqrt{[\sum (x – x^-)^2 \sum (y – y^-)^2]}$

$x^- = \sum x / n$ $y^- = \sum y / n$

i) Net NPA and Net Profit

Table 1 & Graph 1 – Net NPA and Net Profit

Year	Net NPA (x)	Net Profit (y)
2014-2015	15397	3062
2015-2016	35423	-3974
2016-2017	32702	1325
2017-2018	48684	-12282
2018-2019	30038	-9975

(Source of Table 1: Annual report 2019-20 of Punjab National Bank)

Table 2 (in crores) – Correlation between Net NPA and Net Profit

Year	Net NPA (x)	Net Profit (y)	(x – x⁻)	(y – y⁻)	(x – x⁻)²	(y – y⁻)²	(x – x⁻) (y – y⁻)
2014-2015	15397	3062	-17051	7430.8	290736601	55216788.6	-126702571
2015-2016	35423	-3974	2975	394.8	8850625	155867.04	1174530
2016-2017	32702	1325	254	5693.8	64516	32419358.4	1446225.2
2017-2018	48684	-12282	16236	-7913.2	263607696	62618734.2	-128478715
2018-2019	30038	-9975	-2410	-5606.2	5808100	31429478.4	13510942
	∑x=162244	∑y=-21844			=569067538	=181840227	=-239049589

$x^- = \sum x / n = 162244 / 5 = 32448.8$

$y^- = \sum y / n = -21844 / 5 = -4368.$

$r = \sum (x - x^-)(y - y^-) / \sqrt{[\sum (x - x^-)^2 \sum (y - y^-)^2]}$

$= -239049589 / \sqrt{(569067538 * 181840227)}$

$= -0.74312$

As it is seen above, there is a negative correlation between Net NPA and Net Profit – H_{01} is rejected and alternate hypothesis (H_{a1}) has to be accepted. It is evident in table 1 and graph 1, that as the Net NPA is increasing, the Net Profit is decreasing. From the graph it is evident that from 2014-2015 to 2017-2018 Net NPA and Net Profit are moving in the opposite direction of each other; whenever Net NPA has increased, Net Profit has decreased & when Net NPA has decreased, Net Profit has slightly improved. In 2018-2019, the Net NPA has decreased as compared to Net NPA in 2017-2018 and subsequently Net Profit has slightly increased.

Net NPA% and ROA%

Table 3 & Graph 2 – Net NPA% and ROA%

Year	Net NPA % (x)	ROA % (y)
2014-2015	4.06	0.53
2015-2016	8.61	-0.61
2016-2017	7.81	0.19
2017-2018	11.24	-1.6
2018-2019	6.56	-1.25
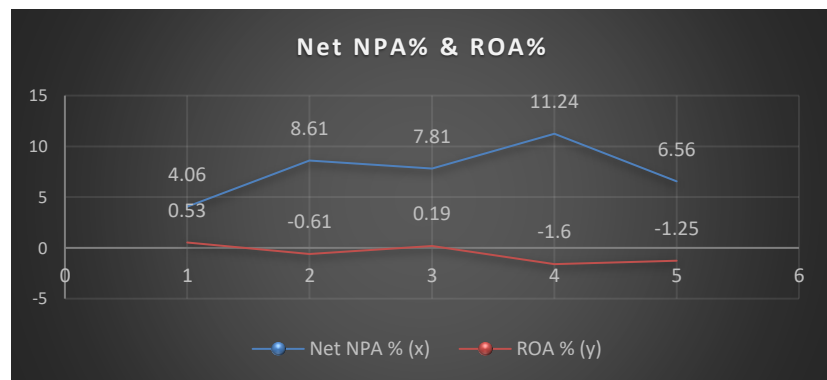
(Source of Table 3: Annual report 2019-20 of Punjab National Bank)

Table 4 (in crores) – Correlation between Net NPA% and ROA%

Year	Net NPA % (x)	ROA % (y)	(x – x⁻)	(y – y⁻)	(x – x⁻)²	(y – y⁻)²	(x – x⁻)(y – y⁻)
2014-2015	4.06	0.53	- 3.596	1.078	12.931216	1.162084	- 3.876488
2015-2016	8.61	-0.61	0.954	- 0.062	0.910116	0.003844	- 0.059148
2016-2017	7.81	0.19	0.154	0.738	0.023716	0.544644	0.113652
2017-2018	11.24	-1.6	3.584	- 1.052	12.845056	1.106704	- 3.770368
2018-2019	6.56	-1.25	- 1.096	- 0.702	1.201216	0.492804	0.769392

∑x= 38.28	∑y= -2.74		= 27.91132	= 3.31008	= -6.82296

$x^- = \sum x / n = 7.656 / 5 = 7.656$ $\qquad$ $y^- = \sum y / n = -2.74 / 5 = -0.548$

$r = \sum (x – x^-)(y – y^-) / \sqrt{[\sum (x – x^-)^2 \sum (y – y^-)^2]}$

$= -6.82296 / \sqrt{[27.91132 * 3.31008]}$

$= -0.709845$

As it is seen above, there is a negative correlation between Net NPA% and ROA%. Hence, H_{02} is rejected and H_{a2} has to be accepted. From table 3 and graph 2, it can be noted that there is a negative trend between Net NPA% and ROA%. Net NPA% and ROA% are acting opposite to each other; as the Net NPA% is increasing, ROA% is decreasing. In the period of 5 years, both Net NPA% & ROA% have been fluctuating. In 2017-2018 there was spike in Net NPA% and it negatively affected ROA%. And in 2018-2019, Net NPA% slightly decreased and it resulted in slight improvement in ROA%.

iii) Net NPA and Net Advances

Table 5 & Graph 3 – Net NPA and Net Profit

Year	Net NPA (x)	Net Advances (y)
2014-2015	15397	380534
2015-2016	35423	412326
2016-2017	32702	419493
2017-2018	48684	433735
2018-2019	30038	458249
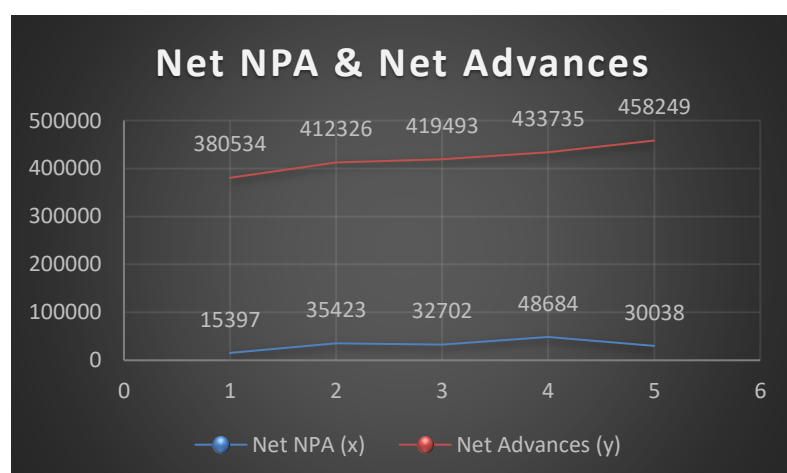
(Source of Table 5: Annual report 2019-20 of Punjab National Bank)

Table 6 (in crores) – Correlation between Net NPA and Net Advances

Year	Net NPA (x)	Net Advances (y)	$(x - \bar{x})$	$(y - \bar{y})$	$(x - \bar{x})^2$	$(y - \bar{y})^2$	$(x - \bar{x})(y - \bar{y})$
2014-2015	15397	380534	-17051.8	-40333.40	290763883	1626783155.56	687757070.12
2015-2016	35423	412326	2974.20	-8541.40	8845865.64	72955513.96	-25403831.88
2016-2017	32702	419493	253.20	-1374.40	64110.24	1888975.36	-347998.08
2017-2018	48684	433735	16235.20	12867.60	263581719	165575129.76	208908059.52
2018-2019	30038	458249	-2410.80	37381.60	5811956.64	1397384018.56	-90119561.28
	$\sum x=162244$	$\sum y=2104337$			=569067534.5	= 3264586793	= 780793737.9

$\bar{x} = \sum x / n = 162244 / 5 = 32448.8$

$\bar{y} = \sum y / n = 2104337 / 5 = 420867.4$

$r = \sum (x - \bar{x})(y - \bar{y}) / \sqrt{[\sum (x - \bar{x})^2 \sum (y - \bar{y})^2]}$

$= 780793737.9 / \sqrt{[569067534.5 * 3264586793]}$

$= 0.572849$

As it is seen above, there is a positive correlation between Net NPA and Net Advances – H_{03} is rejected and H_{a3} has to be accepted. Net Advances has a slight positive impact on Net Advances. Table 5 & graph 3, shows that as the Net Advances is increasing in the period of 5 years, Net NPA is also increasing, though not in the same proposition. From 2014-2015 to 2017-2018, Net Advances has continuously increased and so has the Net NPA. It means that there is a slight positive relation between Net Advances and Net NPA. However, in 2018-2019, Net NPA has dropped as compared to the previous years.

DISCUSSION

Net NPA and Net Profit

Non-Performing Assets (NPA) are loans or advances that are defaulted by the borrower. A loan is said to be defaulted when the debtor fails to pay back the money borrowed and fails to fulfil his obligations. There are two kinds of NPAs Gross NPA and Net NPA. Gross NPA includes all the unpaid debts whereas Net NPA is acquired by deducting provisions made by the banks for NPA. Net NPAs are a crucial factor in evaluating the financial performance of a bank. NPAs hinder the hinder the growth of the banking sector, which in turn effects the economy of a country. Increase in NPAs affects the profitability and liquidity of a bank. Net NPAs are key factor for determining a bank's credit risk, quality of their assets & its effectiveness in granting capital to different economic sectors. In Table 2 calculations of the correlation between Net NPA and Net Profit of Punjab nation Bank from 2014-2015 to 2018-2019 has been made, the correlation between these two factors is negative, i.e., -0.74312. The Net NPA has a negative impact on the Net Profit. As the Net NPA increases, the Net Profit of the bank decreases. Punjab National Bank's profitability is affecting due to the increase in Net NPA. Rapid increase in the Net NPA can be noticed from 2017-2018, this is due to the Nirav Modi Scam, where 2 corrupt employees of PNB issued a Letter of Undertaking (LOU) of Rs.11,356.84 to other banks for which the PNB was liable to pay. This was a huge blow to the profitability of PNB. This shows that the risk management of PNB is not very efficient and is flawed. A slight decrease can be noted in 2018-2019, it indicates that PNB is striving towards

decreasing its NPA to make way to increase its profitability. PNB still has to work hard towards lowering its NPA to improve its financial performance.

NET NPA% AND RETURN ON ASSETS% (ROA)

Return on Assets is a metric to analyse if a bank is utilizing its assets efficiently into converting them into income and profit; this can be determined by comparing the profitability of a bank to its total assets i.e., by dividing net income of a bank to its total assets. A bank with a ROA higher than 5% is considered to be satisfactory. A higher Return on Assets signifies a better asset efficiency as well as efficient management. Hence, it is important to assess the impact of Net NPA on ROA. In Table 4 the correlation between Net NPA and ROA has been calculated from 2014-2015 to 2018-2019, there is a negative correlation between these two parameters i.e., - 0.709845. This depicts that whenever the Net NPA increases, it results in decreasing ROA of PNB, which in turn effects the profitability & signifies that the management of PNB is not efficient.

Net NPA and Net Advances

Advances are the funds provided by the bank to a business or an individual as working capital. Advances are the core factor required for the proper functioning of a bank. The amount deposited by the customers of the bank is utilised in providing advances to those in need of money for a certain rate of interest. Advances are the credit-facility provided by the banks for a short time period. Net Advances is principal amount of outstanding Advances deducted by the amount then on deposit in accounts representing principal proceeds. It is important to analyse the relation between Net NPA and Net Advances as it helps in understanding the overall quality of loans/advances of a bank. In Table 6 the correlation between Net NPA and Net Advances has been calculated from 2014-2015 to 2018-2019, the correlation between the two variables i.e., 0.572849. This means that Net Advances slightly impacts Net NPA positively.

FINDINGS, SUGGESTION AND CONCLUSION
FINDINGS

- From Table 2, it is found that there is a negative correlation between Net NPA and Net Profit, as the Net NPA is increasing, Profitability is decreasing.
- From Table 4, it can be observed that Net NPA% has a negative influence on ROA%, ROA% decreases as the Net NPA% increases.
- In Table 6, it can be seen that Net Advances has a positive impact on Net NPA. Increase in Net Advances result is increasing Net NPA.
- In Graph 1, 2 and 3, it can be observed that Net NPA has spiked in 2017-2018 as compared to the previous years; the reason behind this is the Nirav Modi scam occurred in the early month of 2018, i.e., February 2018.
- In Graph 2, it can be observed that Net NPA% has decreased from 11.24 in 2017-2018 to 6.56 in 2018-2019.
- Punjab National Bank has managed to slightly bring down Net NPA in 2018-2019.
- However, during the study period of 5 years, there is an overall increase in the Net NPA of PNB and it is quite concerning.
- The rise in the Net NPA of PNB indicates poor risk management.
- The rising Net NPA has been affecting the profitability of PNB.

➢ The performance and profitability of PNB in the study period 2014-2019 cannot be said to be satisfactory.

SUGGESTIONS

➢ Measures should be adopted by Punjab National Bank to reduce and control NPA.
➢ Loans/ Advances should be given to those customers who are capable of paying back the loan along with interest.
➢ The quality of the assets of the borrowers which is kept as collateral security, should be thoroughly examined before lending loans/ advances.
➢ If a loan is granted to a company, bank should regularly assess its financial health.
➢ Efficient risk management and regulations should be followed.
➢ Recovery procedure of loans should be made stricter.

CONCLUSION

Increasing NPA is not just a concerning issue of a particular bank, it threatens the entire banking sector as well as the economy of a country. High level of NPA in Punjab National Bank is a result of inefficient lending practices, untrustworthy/ unreliable employees, lack of proper risk management strategy, neglecting thorough assessment of a lenders assets before lending loans, etc. Rise in the level of Net NPA is greatly affecting the liquidity and profitability of PNB. This will earn a bad reputation to the bank and it also effects the brand image of PNB. This will result in customers losing their trust in the bank. Hence, PNB should work towards decreasing its NPA and increasing its Profitability.

REFERENCES

➢ Ali, Z., Bhaskar, S. (2016). Basic Statistical Tools in Research and Data Analysis, *PMC, 60*(9), 662-669.
➢ Bhandari, R. (2016). An Empirical Study on NPA and its Impact on Profitability with special reference to Punjab National Bank. *Asian J. Management. 7*(4), 272-276.
➢ Chaudhary, R., Jain, V. (2016). A Study on Relationship between Non-Performing assets (NPAs) and Advances of Selected Public Sector Banks. *IITM Journal of Management and IT, (7)*2
➢ Devi, P., Pant, A. (2018). Impact of NPA on Profitability Performance of Select Public and Private Sector Banks in India. *International Journal of Management, 8*(7).
➢ Divya Sri, G., Sathya, K. (2019). A Study on Financial Analysis of Punjab National Bank, *IJESC, 9*(3).
➢ Dogra, A., Dogra, M. (2019). Sustainability and Ethical Banking: A Case Study of Punjab National Bank, *Amity Journal of Corporate Governance, 4*(2).
➢ Dudhe, C. (2017). Impact of Non-Performing Assets on the Profitability of Banks – *A Selective Study. Annals of Faculty of Economics, University of Oradea, Faculty of Economics, 1*(1), 307-314.
➢ Gadhia, N. M. (2019). A Study on Net Profit and Non-Performing Assets of Bank of India and Kotak Mahindra Bank. *The Research Journal of Social Sciences, 10*(8).
➢ Goriya, G. A (2018). Profitability Analysis of Punjab National Bank in India, *Online Journal Multidisciplinary Subjects, 12*(2).

➢ Gayathri, S., Mangaiyarkarasi, T. (2018) A Critical Analysis of the Punjab National Bank Scam and Its Implications, *IJPAM, 119*(12).

➢ Piyush, P., Goel, S. (2017). Measurement of Correlations (NPA and ROA) of Different Banks and Trend Analysis of NPAs in Indian Banks. *International Journal of Management 8*(4), 81-88

➢ Roy, P., Samanta, P.K., (2017). Analysis of Non Performing Assets in Public Sector Banks of India. *International Journal of Management*, *8*(1), 21-29.

➢ Singh, S., Tageja, N. (2020). Linking NPA to Profitability: The Case of Banking Sector in India. *International Journal of Advance Science and Technology. 29*(10), 6332-6336

➢ Singh, A. P (2014). A Review on Research Design and its Important Parameters, *IJARSE, 3*(7).

APPENDICES

➢ The Karl Pearson's Correlation formula used is:

$$r = \frac{\sum (x - x^-) (y - y^-)}{\sqrt{[\sum (x - x^-)^2 \sum (y - y^-)^2]}}$$

$x^- = \sum x / n$

$y^- = \sum y / n$

➢ The table used for hypothesis testing:

df	0.2	0.1	0.05	0.02	0.01	0.001	df	0.2	0.1	0.05	0.02	0.01	0.001
1	0.951057	0.987688	0.996917	0.999507	0.999877	0.999999	35	0.215598	0.274611	0.324573	0.380976	0.418211	0.518898
2	0.800000	0.900000	0.950000	0.980000	0.990000	0.999000	40	0.201796	0.257278	0.304396	0.357787	0.393174	0.489570
3	0.687049	0.805384	0.878339	0.934333	0.958735	0.991139	45	0.190345	0.242859	0.287563	0.338367	0.372142	0.464673
4	0.608400	0.729299	0.811401	0.882194	0.917200	0.974068	50	0.180644	0.230620	0.273243	0.321796	0.354153	0.443201
5	0.550863	0.669439	0.754492	0.832874	0.874526	0.950883	60	0.164997	0.210832	0.250035	0.294846	0.324818	0.407865
6	0.506727	0.621489	0.706734	0.788720	0.834342	0.924904	70	0.152818	0.195394	0.231883	0.273695	0.301734	0.379799
7	0.471589	0.582206	0.666384	0.749776	0.797681	0.898260	80	0.142990	0.182916	0.217185	0.256525	0.282958	0.356816
8	0.442796	0.549357	0.631897	0.715459	0.764592	0.872115	90	0.134844	0.172558	0.204968	0.242227	0.267298	0.337549
9	0.418662	0.521404	0.602069	0.685095	0.734786	0.847047	100	0.127947	0.163782	0.194604	0.230079	0.253979	0.321095
10	0.398062	0.497265	0.575983	0.658070	0.707888	0.823305	125	0.114477	0.146617	0.174308	0.206245	0.227807	0.288602
11	0.380216	0.476156	0.552943	0.633863	0.683528	0.800962	150	0.104525	0.133919	0.159273	0.188552	0.208349	0.264316
12	0.364562	0.457500	0.532413	0.612047	0.661376	0.779998	175	0.096787	0.124036	0.147558	0.174749	0.193153	0.245280
13	0.350688	0.440861	0.513977	0.592270	0.641145	0.760351	200	0.090546	0.116060	0.138098	0.163592	0.180860	0.229840
14	0.338282	0.425902	0.497309	0.574245	0.622591	0.741934	250	0.081000	0.103852	0.123607	0.146483	0.161994	0.206079
15	0.327101	0.412360	0.482146	0.557737	0.605506	0.724657	300	0.073951	0.094831	0.112891	0.133819	0.148019	0.188431
16	0.316958	0.400027	0.468277	0.542548	0.589714	0.708429	350	0.068470	0.087814	0.104552	0.123957	0.137131	0.174657
17	0.307702	0.388733	0.455531	0.528517	0.575067	0.693163	400	0.064052	0.082155	0.097824	0.115997	0.128339	0.163520
18	0.299210	0.378341	0.443763	0.515505	0.561435	0.678781	450	0.060391	0.077466	0.092248	0.109397	0.121046	0.154273
19	0.291384	0.368737	0.432858	0.503397	0.548711	0.665208	500	0.057294	0.073497	0.087528	0.103808	0.114870	0.146436
20	0.284140	0.359827	0.422714	0.492094	0.536800	0.652378	600	0.052305	0.067103	0.079920	0.094798	0.104911	0.133787
21	0.277411	0.351531	0.413247	0.481512	0.525620	0.640230	700	0.048427	0.062132	0.074004	0.087789	0.097161	0.123935
22	0.271137	0.343783	0.404386	0.471579	0.515101	0.628710	800	0.045301	0.058123	0.069234	0.082135	0.090909	0.115981
23	0.265270	0.336524	0.396070	0.462231	0.505182	0.617768	900	0.042711	0.054802	0.065281	0.077450	0.085727	0.109385
24	0.259768	0.329705	0.388244	0.453413	0.495808	0.607360	1000	0.040520	0.051993	0.061935	0.073484	0.081340	0.103800
25	0.254594	0.323283	0.380863	0.445078	0.486932	0.597446	1500	0.033086	0.042458	0.050582	0.060022	0.066445	0.084822
26	0.249717	0.317223	0.373886	0.437184	0.478511	0.587988	2000	0.028654	0.036772	0.043811	0.051990	0.057557	0.073488
27	0.245110	0.311490	0.367278	0.429693	0.470509	0.578956	3000	0.023397	0.030027	0.035775	0.042457	0.047006	0.060027
28	0.240749	0.306057	0.361007	0.422572	0.462892	0.570317	4000	0.020262	0.026005	0.030984	0.036773	0.040713	0.051996
29	0.236612	0.300898	0.355046	0.415792	0.455631	0.562047	5000	0.018123	0.023260	0.027714	0.032892	0.036417	0.046512
30	0.232681	0.295991	0.349370	0.409327	0.448699	0.554119							

➢ Formula to find Net NPA is:

$$\text{Net NPA} = \frac{\text{Gross NPA} - \text{Provisions}}{\text{Gross Advances} - \text{Provisions}}$$

➢ Formula to find Net NPA%:

$$\text{Net NPA \%} = \frac{\text{Net NPA}}{\text{Net Advances}}$$

➢ Formula to calculate ROA% is

ROA% = Net Income
_____

Average Total Assets

➢ The parameters selected to analyse the correlation are taken from the annual reports of Punjab National Bank:

							(₹ crore)
	प्रगति एक नजर में **PROGRESS AT A GLANCE**						
क्र. सं. S. No	पैरामीटर PARAMETERS	वित्त वर्ष15 FY'15	वित्त वर्ष16 FY'16	वित्त वर्ष17 FY'17	वित्त वर्ष18 FY'18	वित्त वर्ष19 FY'19	वित्त वर्ष20 FY'20
1	शेयर पूंजी Share Capital	371	393	426	552	921	1348
2	आरक्षित निधियाँ एवं अधिशेष Reserves & Surplus	38709	37917	41672	40522	43866	61010
3	जमाराशियां Deposits	501379	553051	621704	642226	676030	703846
4	शुद्ध अग्रिम Net Advances	380534	412326	419493	433735	458249	471828
5	कुल कारोबार Total Business	881913	965377	1041197	1075961	1134279	1175674
6	कुल आस्तियां Total Assets	603334	667390	720331	765830	774949	830666
7	निवेश Investment	149877	157846	186725	200306	202128	240466
8	शाखाएं* (संख्या) Branches*(Number)	6559	6759	6937	6982	6989	7040
9	एटीएम नेटवर्क (संख्या) ATM Network (Number)	8348	9463	10681	9668	9255	9168
10	परिचालन लाभ Operating Profit	11955	11339	14565	10294	12995	14739
11	कुल प्रावधान Total Provisions	8893	15313	13240	22576	22971	14402
12	शुद्ध लाभ Net Profit	3062	-3974	1325	-12282	-9975	336
13	कारोबार/कर्मचारी (₹ लाख में) Business/Employee (₹ lakh)	1319	1359	1417	1473	1680	1821
14	ऋण-जमा अनुपात (%) Credit-Deposit Ratio (%)	75.90	74.55	67.47	67.54	67.79	67.04
15	वैश्विक जमाराशियों की लागत (%) Global Cost of Deposit (%)	6.09	5.85	5.33	4.96	5.14	5.16
16	वैश्विक अग्रिमों पर आय (%) Global Yield on Advances (%)	9.88	9.10	8.29	7.49	7.72	7.82
17	वैश्विक निवेश पर प्राप्ति (%) Global Yield on Investment (%)	7.99	7.94	7.69	7.35	7.41	7.13
18	वैश्विक शुद्ध ब्याज मार्जिन (%) Global Net Interest Margin (%)	3.15	2.60	2.38	2.16	2.41	2.30
19	आस्तियों पर प्रतिफल (%) Return on Assets (%)	0.53	-0.61	0.19	-1.60	-1.25	0.04
20	लागत आय अनुपात (%) Cost to Income Ratio (%)	46.74	46.79	39.17	56.75	47.03	44.82
21	सकल एनपीए (%) Gross NPAs (%)	6.55	12.90	12.53	18.38	15.50	14.21
22	शुद्ध एनपीए (%) Net NPAs (%)	4.06	8.61	7.81	11.24	6.56	5.78
23	पूंजी पर्याप्तता अनुपात (बासेल III) (%) Capital Adequacy Ratio (Basel III) (%)	12.21	11.28	11.66	9.20	9.73	14.14

* एक एक्सटेंशन काउंटर सहित घरेलू शाखाएं
* Domestic Branches including one Extension Counter