# A Comparative Analysis of Non-Performing Assets (NPAs) in Public and Private Sector Banks in India

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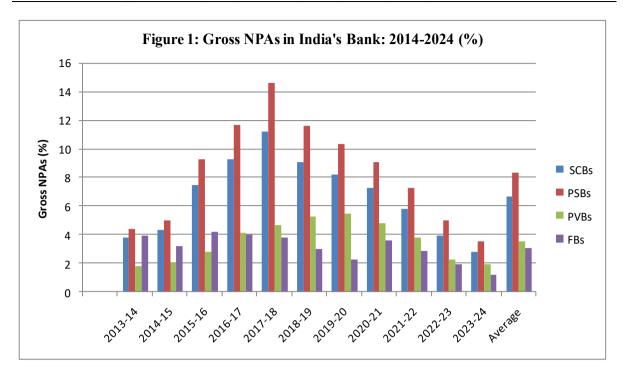
#### Abstract

Non-Performing Assets (NPAs) serve as a crucial measure of the financial stability and operational efficiency of the banks. The volume of NPAs is significant because it assesses the overall soundness of the banking system. In Indian context, ownership significantly explains the extent of NPAs. Accordingly, the present study is carried out to focus on the comparative analysis of NPAs in public and private sector banks in India based on key financial ratios. For this study, a sample of six banks, comprising three public banks (BOB, PNB, and SBI) and three private banks (AXIS, HDFC, and ICICI), is selected based on their market capitalization. The study utilizes the secondary data over an 11-year span, covering the period from 2014 to 2024. The research is quantitative in nature. To examine the data, descriptive statistics is used to summarize the data; Welch test and post-hoc (Games Howell) test are used to assess the bank differences. The analysis highlights that public banks have higher fluctuation in NPA ratios than private banks. Out of public banks, PNB shows more NPAs, whereas in private banks, ICICI Bank has higher NPAs in all years.

Key Words: Asset Quality, NPAs, Public and Private Banks, Welch-ANOVA test

#### I. Introduction

"The growth of an economy is largely influenced by the performance of its banking sector." (Liang & Reichert, 2006). The banking sector and economy are closely intertwined, with one having a significant influence on the other. In India, Banking sector serves as the backbone because it supports economic growth, facilitates financial intermediation and provides credit to various sectors. Banks play important role in the growth and development of any country. The banking system stability and viability is viewed vital to both financial stability and overall economic growth. The majority of banking system in India consists of commercial & cooperative banks. On the basis of ownership, Commercial banks may further be divided into three main categories such as "Public Sector Banks (PSBs), Private Banks (PVBs) and Foreign Banks (FBs)". The total assets of PSBs and PVBs were Rs. 16,128,080 crore and Rs 1,09,52,458 crore respectively in 2024 (Banking industry report, IBEF, Feb, 2025). Public banks hold 59.53 % of total assets in banking sector. Ownership serves as an important variable in explaining NPAs as NPA levels are high in PSBs than PVBs. NPAs are considered as main indicator of financial health and operational efficiency of banks. We have seen that NPAs have been a key challenge for Indian banking industry, particularly for PSBs. Historically, PSBs are the one that have struggled more with the high NPA due to various factors. Large corporate default, priority sector lending, frauds, weak internal control and inefficiencies of management and bank officials resulted into high NPAs. With the introduction of "Asset Quality Review" (AQR) by RBI in 2015, aims to reveal the hidden stressed assets in banking by ensuring transparent recognition of NPAs; it reclassified the restructured loans as NPAs, which leads to a sharp rise in reported NPAs. The increased provisioning requirements strained the banks' financials, results in limited lending capacity and economic support. Nidugala and Pant (2017) recommended that banks should concentrate more on refining their earning management and must ensure the prudent lending to various sections of the society. As per the RBI's provisional data, as of September 2024, GNPAs of PSBs and PVBs are at Rs 3,16,331 crore and Rs 1,34,339 crore, respectively. RBI conduct stress tests under baseline, medium and severe scenarios for a period of oneyear, which covers the credit risk, liquidity risks and interest rate risks, aims to assess the resilience of banks. On the basis of macro stress test conducted, the GNPA of SCBs is expected to rise to 2.8 percent in financial year 2026. Therefore, find it relevant to examine the NPAs of PSBs and PVBs in India and hence this study is conducted.



During 2013-14 to 2017-18, there was an increasing trend in Gross NPA ratio. It is evident from the figure 1 that 2017-2018 was the year in which NPAs of SCBs were at peak i.e. 11.2 percent. The NPAs of PSBs was at 14.6 percent during 2017-18. This hike in NPAs was a result of strict recognition norms introduced by the RBI with various systemic issues in infrastructure, steel and power sectors. While the short-term impact was severe, these measures were necessary to cleanse the banking system and lay the foundation for sustainable growth in the future. Thereafter it shows a declining trend in Gross NPA of SCBs. Banks started experiencing better asset quality in 2018-19, as evident from their GNPA ratio. The year 2023–2024 experienced increase in banks profitability for the sixth year in a row, while at the end march-2024, their GNPA ratio dropped to 2.7 per cent, at the lowest level in 13 years (Trend & Progress Report 2023-24). In 2024, global banking sector showed improvement in the asset quality, as well as in capital and provision buffers. Asset quality confirmed gains across all the bank groups. All bank groups complied with regulatory requirements related to liquidity while maintaining more provision coverage ratios (PCRs). The Gross NPAs of SCBs showed a declining trend, falling from 11.2 % to 2.8 % at end March 2024. The declining trend in NPAs in recent years is mainly due to regulatory reforms, better credit management, improved recovery mechanisms and recovery in economy

Table 1: GNPA & NNPA Ratio of Selected Banks in India (%)

Bank	BC	)B	PN	<b>VB</b>	Sl	BI	AX	KIS	HD	FC	IC	ICI
Name	GNPA	NNPA	GNPA	NNPA	GNPA	NNPA	GNPA	NNPA	GNPA	NNPA	GNPA	NNPA
Year \												
2014	2.94	1.52	5.25	2.85	4.95	2.57	1.22	0.40	0.98	0.27	3.03	0.97
2015	3.72	1.89	6.55	4.06	4.25	2.12	1.34	0.44	0.93	0.25	3.78	1.61
2016	9.99	5.06	12.90	8.61	6.50	3.81	1.67	0.70	0.94	0.28	5.21	2.67
2017	10.46	4.72	12.53	7.81	6.90	3.71	5.04	2.11	1.05	0.33	7.89	4.89
2018	12.26	5.49	18.38	11.24	10.91	5.73	6.77	3.40	1.30	0.40	8.84	4.77
2019	9.61	3.33	1550	6.56	7.53	3.01	5.26	2.06	1.36	0.39	6.70	2.06
2020	9.40	3.13	14.21	5.78	6.15	2.23	4.86	1.56	1.26	0.36	5.53	1.41
2021	8.87	3.09	14.12	5.73	4.98	1.50	3.70	1.05	1.32	0.40	4.96	1.14
2022	6.61	1.72	11.78	4.80	3.97	1.02	2.82	0.73	1.17	0.32	3.60	0.76
2023	3.79	0.89	8.74	2.72	2.78	0.67	2.02	0.39	1.12	0.27	2.81	0.48
2024	2.92	0.68	5.73	0.73	2.24	0.57	1.43	0.31	1.24	0.33	2.16	0.42
Source:	Data is co	llected fro	m the web	site of ind	ividual ba	nks		·				•

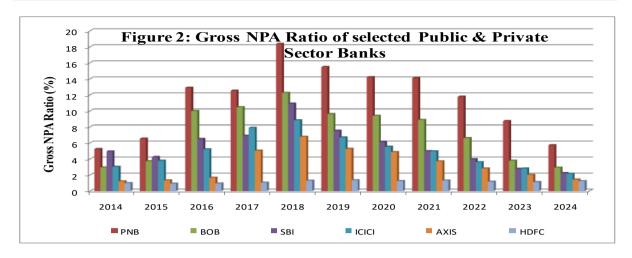


Table 1 shows the data related to GNPA and NNPA ratio of selected banks. The GNPA ratio of selected PSBs and PVBs is shown in figure 2. The analysis also showcased trends in the GNPA ratios over the study period, indicating that PSBs have higher fluctuation in NPA ratio compared to PVBs. Among PSBs, PNB shows more NPAs whereas in PVBs, ICICI Bank has higher NPAs in all years ranging from 2014-2024.

#### **II.** Literature Review

The review of literature is an essential step in research which lays the foundation for meaningful and impactful research. For present study, relevant research papers published in reputed journals were studied. This section shows the key contribution from existing available literature.

Poonam Mahajan (2014) highlighted that NPAs were more prominent in PSBs, whereas PVBs showed relatively better performance. The growing NPA levels were affecting the profitability and liquidity of banks, leaving PSU banks in a particularly weak state (Javheri and Gawali, 2022). Batra and Batra (2020) reported that the variability of NPAs is also higher for public banks which are indicated by standard deviation and annual growth rate. Gaur and Mohapatra (2020) concluded that NPA is a root cause of declining profits in banks. Gowda (2019) stated that decline in asset quality is the primary cause of the growing NPAs, requiring greater Provisions against NPAs, resulting in either reduction in profit and profitability or loss situation. According to Brahmaiah (2019), the ownership type, management style, credit management and overall banking principles and practices, all influence and determine NPAs in SCBs in general, and PSBs in particular. Mohammad Miyan, 2017 reported that PSBs are performing well because of their professional and competent core management. The bank must be proactive in the selecting clients and customers when granting loans (Mishra and Pawaskar, 2017). Kadanda and Raj (2018) pointed out that inefficient management, greater credit concentration, aggressive lending, rising interest rates, and bank moral hazard issue are all main contributing factors to this issue. Borrowers and lenders use loan restructuring to change the terms of their existing obligations. This can be accomplished by lowering the loan's EMI, extending the loan payback period, or changing the previously agreed-upon interest rate.

Salike and Biao Ao (2017) investigated the factors influencing Asian bank profitability, with a special emphasis on the effect of asset quality. The author discovers that poor asset quality has a major negative influence on banks' profitability. Capital adequacy, income diversification, and operational efficiency, are other important bank-specific factors.

It is possible to view NPAs as a continuous problem that endures in the banking industry rather than appearing and disappearing at a particular moment in time. Although lots of literature is available on the NPA issue globally and domestically, yet a continuous update on it is required. Thus, the proposed study is carry out for the comparative assessment of NPA of Public and Private sector banks because both are important part of Indian banking system and plays an important role in its growth and development.

#### **Objective**

Keeping in mind the importance of topic, following objectives is framed which are as follows:

- 1. To explore the underlying factors contributing to the divergent trends of fall and rise of NPAs.
- 2. To make comparative assessment of NPAs of PSBs and PVBs in India.

#### **Hypotheses**

Following hypotheses are developed on the basis of different aspects of NPA:

H<sub>01</sub>: There is no significant difference in the GNPA Ratio among selected banks.

H<sub>02</sub>: There is no significant difference in the NNPA Ratio among selected banks.

H<sub>03</sub>: There is no significant difference in the GNPA to Total Assets Ratio among selected banks.

H<sub>04</sub>: There is no significant difference in the NNPA to Total Assets Ratio among selected banks.

H<sub>05</sub>: There is no significant difference in the Provision Coverage Ratio (PCR) among selected banks.

#### III. Methodology

For the study, out of 12 PSBs three public banks- 'Bank of Baroda (BOB), Punjab National Bank (PNB), and State Bank of India (SBI) and out of 21 PVBs three private banks- Axis Bank, HDFC Bank, and ICICI Bank' are selected as a sample bank for the study on the basis of 'market capitalization'. The study utilizes secondary data over a period of 11-year ranging from 2014 to 2024. The relevant data is collected from multiple sources which include Trend and Progress report of Banking and statistical tables on Indian banks form the website of RBI, and the annual reports of the selected banks from their respective websites. The research is quantitative in nature, combining descriptive statistics for analysis of data and One-way ANOVA for hypothesis testing in SPSS for drawing inferences. One-way ANOVA is used as individual bank is considered as group and comparison is done among them. Different ratios and hypotheses are used for the comparative analysis. With the help of MS Excel, the data of GNPA and NNPA is collected and arranged in the form of tables and graphs. The key financial ratios selected for the analysis are as follows-"Gross NPA to Gross Advances Ratio, Net NPA to Net Advances Ratio, Gross NPA to Total Assets Ratio, Net NPA to Total Assets Ratio, Provision Coverage Ratio (PCR)." The normality of data is checked with the help of the value of skewness and kurtosis. According to Ghasemi & Zahediasl (2012), its value should be between -2 +2 for the normality of data. The skewness and kurtosis results confirmed that data is normally distributed and every value falls within specified limit. The Levene test statistics is used to measures the homogeneity of data. The Levene's test significant value is less than .05 which shows lack of "homogeneity of variances". Therefore Welch ANOVA test is used. But the results of Welch ANOVA test reveals overall significance difference but it don't show which group is different from other groups. Therefore, Posthoc test (Games Howell) is used in the analysis.

#### IV. Results & Discussion

In this section, the result of comparative analysis of NPA of selected banks is presented. Descriptive statistics is calculated to summarize the key characteristics of the NPA ratios. The mean, variance and standard deviation of the NPA ratios are calculated for each bank across the study period.

**Table 2: Descriptive Statistics** 

		Table 2. L	escriptive S	lausucs		
Bank Name	BOB	PNB	SBI	AXIS	HDFC	ICICI
Gross NPA To G	ross Advances Rati	0				
Mean	7.32	11.43	5.56	3.28	1.15	4.96
SD	3.43	4.30	2.43	1.94	0.16	2.16
Variance	11.78	18.51	5.92	3.77	0.03	4.65
Net NPA to Net A	Advances Ratio					
Mean	2.87	5.54	2.45	1.20	0.33	1.93
SD	1.68	2.98	1.56	.97	.06	1.58
CV	2.82	8.92	2.43	.98	.003	2.51
Gross NPA to To	otal Assets Ratio					
Mean	4.62	7.11	3.89	2.10	0.74	3.34
SD	2.13	2.65	1.78	1.27	.127	1.55
Variance	4.52	7.03	3.18	1.61	.016	2.40
Net NPA to Tota	l Assets Ratio					
Mean	1.69	3.22	1.45	.81	.21	1.26
SD	.95	1.72	.89	.69	.04	1.07
Variance	.90	2.97	.81	.48	.001	1.14
Provision Covera	age Ratio					
Mean	76.44	71.21	77.17	80.42	71.51	66.55
SD	12.02	14.64	12.44	10.54	2.14	14.86
Variance	144.49	214.22	154.73	111.05	4.56	220.91

Source: Author Calculations in SPSS

Table 2 shows the descriptive statistics such as mean, variance and standard deviation. By comparing Mean of Gross NPA, it was found that PNB (11.43) has more Gross NPA followed by BOB (7.32) and SBI (5.56) in public sector whereas in private sector, ICICI bank (4.96) followed by AXIS bank (3.28) and HDFC bank (1.15). On the basis of Net NPA ratio, PNB shows more variations followed by BOB and SBI. ICICI bank shows greatest variance among private banks, followed by AXIS and HDFC bank. Both in terms of GNPA and NNPA, it can be concluded that SBI shows better performance among public sector banks while HDFC bank leads in the private sector banks. The results of PCR show that SBI bank has maintained high Provision Coverage ratio

followed by BOB and PNB among public banks whereas AXIS bank followed by HDFC and ICICI bank in private banks.

To statistically test the significance difference among the NPAs of selected banks, One-Way ANOVA test is used. Table 3 shows the results of Welch ANOVA test.

**Table 3: Results of Welch ANOVA Test** 

Variables	Levene's Statistics	Sig.	Welch	Sig.	Hypotheses
GNPA to Gross Advances (%)	8.709	.000	32.182	.000	H <sub>01</sub> REJECTED
NNPA to Net Advances (%)	5.942	.000	17.620	.000	H <sub>02</sub> REJECTED
GNPA to Total Assets (%)	7.649	.000	31.363	.000	H <sub>03</sub> REJECTED
NNPA to Total Assets (%)	5.723	.000	17.906	.000	H <sub>04</sub> REJECTED
PCR (%)	7.383	.000	2.258	.080	H <sub>05</sub> ACCEPTED

Source: Author's Own Calculation

The interpretation of results of Welch ANOVA test of different financial ratios as shown in table 3. The significance value of Welch test (p-value < 0.05) which reveals significant difference in the "Gross NPA Ratio" among the selected banks; hence we reject the null hypothesis ( $H_{01}$ ). Hence, concluded that PVBs have lower GNPA ratio than PSBs.

Table 4: Multiple Comparisons of GNPA to Gross Advance Ratio Using the Games-Howell Method

Banks Name (I)	BANK_NAME (J)	Mean Difference (I-J)	Standard Error	Sig.
	AXIS	4.04000*	1.18906	.036
BOB	HDFC	6.17273*	1.03609	.001
	SBI	5.86636*	1.49025	.013
PNB	AXIS	8.14182*	1.42302	.001
	HDFC	10.27455*	1.29792	.000
	ICICI	6.47091*	1.45084	.005
CDI	PNB	-5.86636*	1.49025	.013
SBI	HDFC	4.40818*	.73536	.001
	BOB	-4.04000*	1.18906	.036
AXIS	PNB	-8.14182*	1.42302	.001
	HDFC	2.13273*	.58729	.039
	BOB	-6.17273*	1.03609	.001
	PNB	-10.27455*	1.29792	.000
HDFC	SBI	-4.40818*	.73536	.001
	AXIS	-2.13273*	.58729	.039
	ICICI	-3.80364*	.65179	.002
ICICI	PNB	-6.47091*	1.45084	.005
ICICI	HDFC	3.80364*	.65179	.002

Source: Author's own calculations.

The 'Post Hoc (Games Howell) test' result as shown in Table 4 exhibit that public banks-PNB, BOB, and SBI have higher GNPA than private banks-HDFC, ICICI, and AXIS. PNB has the highest GNPA ratio in comparison to all private banks. HDFC bank consistently shows the lowest GNPA ratio. HDFC, ICICI, and Axis have significantly lower GNPA than PNB & BOB. This indicates that more effective credit risk management and lower exposure to bad loans exist in private banks. Whereas SBI has a lower GNPA ratio than PNB but still it has higher ratio than HDFC bank.

The Welch test results (Table-3) are significant in case of NNPA ratio (p-value is less than 0.05), reject the null hypothesis (H<sub>02</sub>) and concludes that there exists a significant difference in the "Net NPA Ratio" of the selected banks. Post Hoc result (Table-5) indicates that PNB has significantly higher NNPA ratio as compared to AXIS, HDFC, and ICICI. HDFC bank has significant difference with all public banks in the study. ICICI bank has significant difference with PNB bank only.

Table 5: Multiple Comparisons of NNPA to Net Advance Ratio (Games-Howell Method)

Banks Name (I)	BANK_NAME (J)	Mean Difference (I-J)	Standard Error	Sig.
BOB	HDFC	2.53818*	.50689	.005
PNB	AXIS	4.34000*	.94849	.006
	HDFC	5.20818*	.90098	.002

<sup>\*</sup> indicates significant difference at the 0.05 level.

	ICICI	3.61000*	1.01947	.029
SBI	HDFC	2.12182*	.47060	.010
AXIS	PNB	-4.34000*	.94849	.006
	BOB	-2.53818*	.50689	.005
HDFC	PNB	-5.20818*	.90098	.002
	SBI	-2.12182*	.47060	.010
ICICI	PNB	-3.61000*	1.01947	.029

<sup>\*</sup>indicates significant difference at the 0.05 level.

The p- value is less than 0.05 (Welch Statistic = 17.620, p-value = 0.000) as shown in Table 2. So, we reject Null Hypothesis (H<sub>03</sub>). And, concludes that significant difference exists among the sample bank in terms of above variable. Further the results post hoc (Games-Howell) test (Table-6) shows that HDFC Bank has significant difference with BOB (.001), PNB (.000), SBI (.002), AXIS (.044) and ICICI (.002), indicating superior performance of the bank. PNB exhibits significant difference with SBI (.036), AXIS (.001), HDFC (.000) and ICICI (.009), means PNB has more GNPA to their total assets.

**Table 6: Multiple Comparisons of GNPA to Total Assets Ratio** 

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Banks Name (I)	BANK_NAME (J)	Mean Difference (I-J)	Standard Error	Sig.
non	AXIS	2.52082*	.74670	.037
ВОВ	HDFC	3.88182*	.64222	.001
PNB	SBI	3.22545*	.96362	.036
	AXIS	5.01536*	.88632	.001
	HDFC	6.37636*	.80029	.000
	ICICI	3.76818*	.92602	.009
CDI	PNB	-3.22545*	.96362	.036
SBI	HDFC	3.15091*	.53949	.002
	BOB	-2.52082*	.74670	.037
AXIS	PNB	-5.01536*	.88632	.001
	HDFC	1.36100*	.38477	.044
	BOB	-3.88182*	.64222	.001
	PNB	-6.37636*	.80029	.000
HDFC	SBI	-3.15091*	.53949	.002
	AXIS	-1.36100*	.38477	.044
	ICICI	-2.60818*	.46904	.002
ICICI	PNB	-3.76818*	.92602	.009
ICICI	HDFC	2.60818*	.46904	.002

<sup>\*</sup> indicates that significant difference at the 0.05 level.

The p-value (.000) < 0.05, indicating a "statistically significant difference in the NNPA to Total Assets Ratio" among the sample banks. Hence, the null hypothesis  $H_{04}$  is not accepted and posthoc comparison using Games Howell is applied. HDFC has significant lower "NNPA to Total Assets Ratio" than the BOB, PNB, and SBI (Table-7). PNB has significantly higher "NNPA to Total Assets Ratio" as compared to AXIS and HDFC bank. Other bank pairs do not show significant differences in this ratio. Thus, indicating variability in the asset quality of selected banks.

Table 7: Multiple Comparisons of NNPA to Total Assets Ratio (Games-Howell Method)

Banks Name (I)	BANK_NAME (J)	Mean Difference (I-J)	Standard Error	Sig.	
ВОВ	HDFC	1.48273*	.28635	.004	
	AXIS	2.40727*	.56002	.009	
PNB	HDFC	3.01091*	.51981	.002	
SBI	HDFC	1.23545*	.27113	.010	
AXIS	PNB	-2.40727*	.56002	.009	
	BOB	-1.48273*	.28635	.004	
HDFC	PNB	-3.01091*	.51981	.002	
	SBI	-1.23545*	.27113	.010	

<sup>\*</sup> indicates significant difference at the 0.05 level.

As per the result of Welch test (Table-3), the p-value (p = .080 > 0.05), thus accept the null hypothesis ( $H_{05}$ ). It means Provision Coverage ratio of all banks is similar and no statistical significant difference found in provision coverage ratio of the selected banks. In nutshell, we can say that PSBs have higher fluctuation in their NPA ratios as compared to PVBs. Among the public banks, PNB shows more NPAs whereas in private banks, ICICI bank has higher NPAs. PNB has significantly higher GNPA among all selected banks. Results are

consistent with previous studies such as Chawla and Rani, 2019. BOB also shows weak performance. SBI is in a better position in comparison to PNB & BOB but still lags behind the private banks. Among private banks, HDFC has the lowest GNPA, followed by ICICI and AXIS. The data suggests that private banks have better risk management and asset quality.

#### V. Conclusion

The NPAs of both public and private banks showing declining trend. In the study, we found that NPAs are more in public banks as compare to their counterparts. During the study period, PSBs, especially PNB & BOB, have significantly higher NPAs than PVBs. The asset quality of HDFC and AXIS bank is well. HDFC Bank is doing well in management of NPAs. Historically, PNB bank has more NPA burden, but now it has improved. If we talk about the asset quality of overall banking sector in India, then it has improved during 2022-23 and 2023-24 which is the result of lower slippages. The structural reforms, better credit management and improvement in economy lead to decrease in NPAs. It is important that banks must implement a multifaceted approach that emphasizes on prevention and resolution both. First and foremost, it is necessary to improve the credit evaluation procedure. This includes meticulous evaluation of borrower creditworthiness, their total income and past records and also utilizing modern credit scoring system. Once a loan is disbursed, proactive monitoring becomes important. Implementing early warning systems (EWS) can help in spotting the indicators of stress in borrower accounts and also allow for prompt action. While challenges remain, particularly with global economic uncertainties, the current trend suggests a healthier banking system.

#### Scope for future study

We can further explore the study by incorporating large sample size and more variables in it. Further qualitative methods such as interview, case studies along with quantitative methods can also be used to get more benefits.

#### **Conflict of interest**

The authors declare that there is no conflict of interest.

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