

IMPACT OF ASSET QUALITY ON PROFITABILITY OF MEHSANA URBAN COOPERATIVE BANK: AN EMPIRICAL STUDY

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Abstract:

Urban Cooperative Banks (UCBs) in India have shown consistent growth in deposits and advances, yet many struggle with declining profitability due to rising non-performing assets (NPAs). While extensive research exists on scheduled commercial banks, the cooperative banking segment remains under-studied despite its socio-economic importance. This study investigates the impact of asset quality on the profitability of UCBs, using The Mehsana Urban Co-Operative Bank Ltd. as a case study over a ten-year period from FY2015-16 to FY2024-25. The research employs a quantitative empirical design based on secondary data from audited annual reports. Statistical tools include Pearson correlation, multiple and univariate regression, F-tests, t-tests, CAGR analysis, and residual diagnostics (VIF, Durbin-Watson, skewness). Profitability is measured through Return on Assets (ROA), Return on Equity (ROE), and Net Profit, while asset quality is captured through Gross NPA ratio, Net NPA ratio, and Provision Coverage Ratio (PCR). The central research problem of this study lies in understanding why UCBs, despite consistent growth in deposits and advances, have been unable to translate business expansion into sustained earnings. The study seeks to answer four interrelated research questions: whether asset quality has a significant impact on profitability; whether the Gross NPA ratio shares a negative relationship with Return on Assets; whether the Net NPA ratio behaves similarly; and whether the Provision Coverage Ratio (PCR) meaningfully influences profitability. Accordingly, the study formulates four hypotheses (H_{11} to H_{14}) corresponding to these questions, with profitability measured through Return on Assets (ROA), Return on Equity (ROE), and Net Profit, and asset quality captured through Gross NPA, Net NPA, their respective ratios, provisions, and PCR. CRAR and Net Interest Margin (NIM) are included as control variables. The objectives of the study are to analyse the trend in asset-quality and profitability indicators of the selected bank, to measure the strength and direction of the relationship between asset quality and profitability, to test the statistical significance of these relationships through formal hypothesis testing, and to draw policy-relevant conclusions for cooperative bank management and regulators. The findings of the study reveal a strong and statistically significant inverse relationship between asset quality and profitability. The Gross NPA ratio and Net NPA ratio show negative correlations with ROA of -0.697 and -0.714 respectively, both significant at the 5% level. The multiple regression model explains 51.4% of the variation in ROA jointly through NPA ratios, with significance at the 10% level, while univariate regressions confirm that each NPA variable independently exerts a significant negative effect on ROA at the 5% level even after addressing severe multicollinearity ($VIF = 10.19$) between the two NPA measures. Consequently, hypotheses H_{11} , H_{12} and H_{13} are supported by the data, while hypothesis H_{14} relating to PCR is not supported ($p = 0.269$), indicating that maintaining provisions alone is insufficient to safeguard profitability in the absence of effective NPA prevention. The study further uncovers a striking structural anomaly: although deposits, advances and total assets grew at compound annual rates between 9% and 12%, net profit declined at a CAGR of -1.1% , driven by a sharp NPA shock in FY2024-25 when the Gross NPA ratio jumped from 8.4% to 14.3% and net profit collapsed by 69% in a single year, demonstrating how rapidly asset-quality deterioration can erode years of accumulated earnings. The study concludes that asset quality is the most critical determinant

of profitability for UCBs, and that business growth without sound credit discipline cannot guarantee financial sustainability. For bank management, the findings underscore the need to prioritise credit appraisal and NPA recovery over balance-sheet expansion. For the Reserve Bank of India, the evidence supports stricter supervisory frameworks and timely intervention in the UCB sector. The study contributes empirical evidence to an under-researched segment of Indian banking. Future research using larger panel datasets across multiple UCBs is recommended to further generalise these findings.

Keywords: Asset Quality, Non-Performing Assets, Profitability, Return on Assets, Provision Coverage Ratio, Multiple Regression, Mehsana Urban Co-Operative Bank, Empirical Study
1.Introduction:

The Cooperative financial structure is proven greater In economic stability regionally in Gujarat and then nationwide. Here, Mehsana urban cooperative bank is leading cooperative bank in Gujarat. This is very important role under mobilising saving, credit as overall best alternative in banking. The Mehsana urban cooperative bank has been established in 1983-84 and now it consists more than 80449 Members as shareholders. Further bank has contained the more than 500 core Share capital-reserve as own fund. However, the financial strength of a UCB depends not merely on growth in deposits and advances but also on how efficiently it manages assets and sustains profitability. Against this backdrop, the present study examines the relationship between asset quality and profitability using actual financial data from 2022–23 to 2024–25.

Under the focuses of trends in Deposits & Advances, total deposits rose steadily from ₹8,07,866.40 lakh to ₹9,24,515.39 lakh between 2022-23 & 2024-25. Further, Savings deposits increased from ₹1,55,036.66 lakh to ₹1,87,465.07 lakh, and term deposits grew from ₹5,56,010.05 lakh to ₹6,39,091.16 lakh. While current deposits remained nearly flat, moving only from ₹96,819.69 lakh to ₹97,959.16 lakh. This pattern indicates successful deposit mobilisation, with a gradual shift toward more stable sources like savings and term deposits.

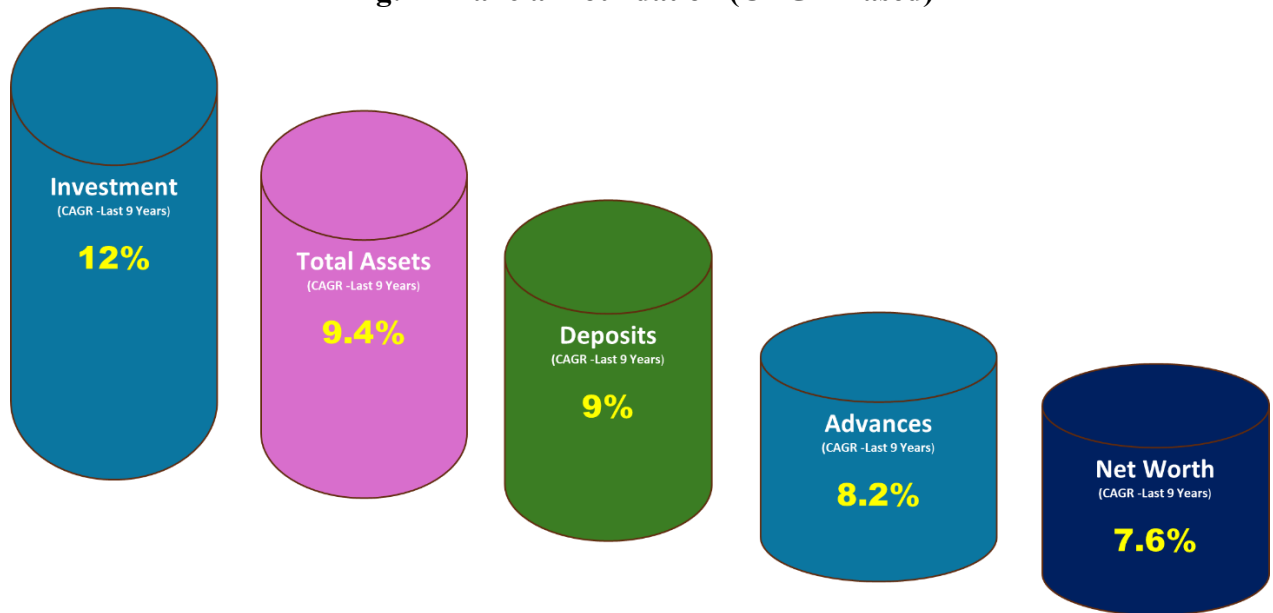
Here, under Advances seems in contrast which showed a different trend. They increased from ₹5,57,910.49 lakh in 2022–23 to ₹6,11,793.97 lakh in 2023–24, then declined slightly to ₹5,97,733.04 lakh in 2024–25. This fluctuation suggests cautious lending, possibly driven by concerns over asset quality or rising risk. Meanwhile, the investment portfolio expanded consistently from ₹3,30,136.22 lakh to ₹4,31,128.29 lakh, indicating a possible strategic move toward safer, income-generating assets.

The Capital & Reserves of bank showing the strengthened during the study period where share capital increased modestly from ₹37,505.80 lakh to ₹37,989.55 lakh, while statutory and other reserves grew substantially from ₹87,548.51 lakh to ₹1,25,702.31 lakh. These improvements reflect better capital adequacy and regulatory compliance.

Under, Profitability Concern, the gross profit has been declined sharply from ₹26,240.00 lakh in 2022–23 to ₹19,650.34 lakh in 2024–25 even if growth noted in the deposits, investment and reserve too. This decline is noteworthy because it suggests that balance sheet expansion has not translated into

higher profitability. Possible explanations include rising operating costs, narrowing interest margins, or deterioration in asset quality.

Fig:1 Financial Foundation (CAGR Based)



The role of Assets quality In banking, it directly influences profitability. Poor asset quality raises non-performing assets (NPAs), which in turn increase provisioning requirements and reduce net income. Thus, even a bank has growing deposits and investments can underperform if its loan book weakens. Therefore, the present study investigates how key financial metrics ,deposits, advances, investments, reserves, and profit interact with asset quality measures to affect profitability.

2.Objectives:

- ✓ To analyse the overall financial performance of the Mehsana Urban Cooperative bank during 2022–23 to 2024–25, focusing on key indicators such as deposits, advances, investments, reserves, and profit.
- ✓ To examine the asset quality of the bank using indicators like Gross NPA and Net NPA, along with the provisioning pattern followed against these assets.
- ✓ To understand how asset quality and profitability are related, and whether changes in NPAs are reflected in the bank's financial performance.
- ✓ To assess the impact of asset quality on profitability, particularly to see if rising NPAs have a direct effect on the bank's earnings.

3. Research Problem & Statement:

Does asset quality, measured through Gross NPA and Net NPA ratios, have a significant effect on the profitability of the selected urban cooperative bank?

Among the asset quality indicators, which one Gross NPA, Net NPA, or Provision Coverage Ratio has a stronger influence on profitability?

Do financial factors such as Capital Adequacy Ratio (CRAR) and Net Interest Margin (NIM) influence the relationship between asset quality and profitability?

What is the nature of the relationship between NPAs and profitability during the study period (2022–23 to 2024–25)?

Urban cooperative banks have shown growth in deposits, investments, and reserves in recent years. However, this growth has not always been reflected in improved profitability. At the same time, increasing levels of non-performing assets (NPAs) have raised concerns about asset quality and financial stability. In the case of the Mehsana Urban Cooperative bank, financial indicators such as deposits and investments have increased over the period 2022–23 to 2024–25, profitability has shown a declining trend. This raises an important question: whether the deterioration in asset quality is affecting the bank's earnings performance. Therefore, the central problem of the present study is to examine whether asset quality, particularly in terms of NPAs and provisioning, has a measurable impact on profitability, and to understand the extent and nature of this relationship within the given time period.

4.Hypothesis:

H₁1: Asset quality has a significant impact on profitability.

H₁2: The Gross NPA ratio has a significant negative relationship with ROA.

H₁3: The Net NPA ratio has a significant negative relationship with ROA.

H₁4: The Provision Coverage Ratio (PCR) has a significant relationship with ROA (profitability).

5.Literature Review:

The cross-country evidence has generally found a negative association between credit risk and profitability, often measured through ROA and ROE (**Beck, Demirguç-Kunt, & Levine, 2004; Alper & Anbar :2011**). These studies are useful for establishing direction, but they aggregate across very different institutional contexts. As a result, they tell us that the relationship exists, not always how it plays out inside specific banks with constrained markets and governance structures.

In India, the discussion has been sharpened by episodes of rising NPAs. Empirical work reports that higher NPAs coincide with weaker profitability and pressure on capital (**Jayadev:2013, Dash & Kabra: 2010**). That conclusion is broadly consistent, although some studies rely on bank-level ratios without unpacking the channels interest income foregone versus provisioning versus operating costs through which the effect materialises. This matters because the policy response differs depending on the dominant channel.

Urban cooperative banks complicate the picture further. Their portfolios are typically concentrated geographically and sectorally and their borrower base is narrower. Evidence points to constraints in

credit appraisal and recovery practices (**Rao: 2012**), and governance frictions have also been flagged (**Reddy: 2004**). Still, much of this work is descriptive. It outlines likely vulnerabilities but does not always test them against detailed, time-aligned financial data from a single institution.

Another thread in the literature looks at how banks adjust when credit risk rises. A common response is to tilt the balance sheet away from advances toward investments in safer instruments. That shift reduces risk, but it can compress margins because yields on investments are typically lower than on loans (**Sinkey: 2002**). The implication is a trade-off: stability improves, earnings may not.

Provisioning adds a second layer, Higher provisions protect the balance sheet yet depress short-term profits; over longer horizons they can enhance resilience (**Berger & DeYoung, 1997**). This dual effect is often acknowledged but not always quantified alongside changes in lending behaviour, which makes it difficult to separate the impact of provisioning from the impact of reduced credit growth.

There is also evidence that profitability is shaped by a bundle of bank-specific factors, funding mix, cost structure, capital adequacy, interacting with asset quality rather than operating independently (**Sufian & Habibullah: 2009**). Taken together, these findings suggest that analysing NPAs in isolation can miss important interactions.

What is less commonly done is a micro-level read of one bank's recent accounts, where movements in deposits, advances, investments, reserves, and profits can be observed side by side and over the same period. That perspective can reveal whether shifts toward safety (Ex, higher investments or provisions) coincide with weakening earnings, and whether those shifts line up with changes in NPA indicators.

6.Methods & Tools:

This study is based on an empirical analysis of the financial performance of Mehsana urban cooperative bank over a period of 10 years, from 2014-15 to 2024–25. The data used in the study is secondary in nature and has been collected from the published annual reports of the bank. The focus is on understanding how asset quality affects profitability, using indicators such as Gross NPA ratio, Net NPA ratio, and Provision Coverage Ratio. Profitability is measured through Return on Assets (ROA), while factors like Capital Adequacy Ratio (CRAR) and Net Interest Margin (NIM) are also considered to support the analysis. Basic tools such as ratio analysis, trend observation, correlation, and simple regression have been used to examine the relationship between these variables.

❖ Variables under the Present Study:

Dependent Variables (Profitability):

Net Profit (NP)

Return on Assets (ROA)

Return on Equity (ROE)

Independent Variables (Asset Quality):

Gross NPA (GNPA)

Net NPA (NNPA)

Gross NPA Ratio (GNPAR)

Net NPA Ratio (NNPAR)
Provision for NPA (PROV)
Provision Coverage Ratio (PCR)

Control Variables:

Capital to Risk-Weighted Assets Ratio (CRAR)
Net Interest Margin (NIM)

Supporting Variables:

Deposits
CASA and CASA Ratio
Advances
Credit–Deposit (CD) Ratio
Investments
Total Assets
Net Worth

❖ **Techniques-Tools:**

Statistical Techniques:

Descriptive Statistics (Mean, Median, SD, Min, Max)
Pearson Correlation Analysis
Multiple and Simple Linear Regression (OLS)
t-test and F-test
 R^2 (Coefficient of Determination)
Hypothesis Testing ($\alpha = 0.05$)
Diagnostic Tests: VIF, Durbin–Watson,
Multicollinearity, Skewness

Analytical Techniques:

Trend Analysis
Ratio Analysis
CAGR Analysis
Year-wise Comparative Analysis

Visualisation Techniques:

Line Charts (Trends)
Scatter Plots with Trendline
Dual-axis Charts
Correlation Heatmaps
Bar Charts

7.Results & Discussion

A: Descriptive Statistics:

The **Table:1** clearly shows a deteriorating trend in asset quality over the three-year period. The Gross NPA ratio increased from 6.20% in 2022–23 to 14.31% in 2024–25, while the Net NPA ratio rose from 0.78% to 4.55%. This sharp rise indicates a significant weakening in the quality of the loan portfolio.

Table:1 Descriptive Cross Tabulation For Financial Ratio

Statistic	GNPA_Ratio	NNPA_Ratio	PCR	CRAR	NIM	ROA	ROE	Net_Profit
Mean	0.065363245	0.016550374	0.758221	0.14476	0.0297	0.008359	0.113487	6806.4
Median	0.058452045	0.011546262	0.759394	0.14515	0.0325	0.008552	0.112572	6465
Std Dev	0.029875864	0.01136821	0.061062	0.011285	0.010649	0.001913	0.026527	2555.52579
Min	0.043389831	0.007832798	0.682021	0.1285	0	0.003394	0.052015	3857
Max	0.143102345	0.045503591	0.87374	0.1623	0.038	0.010982	0.160763	12295

Source: Data Analysis by Author

At the same time, profitability has declined noticeably. ROA dropped from 0.91% to 0.34%, and ROE fell from 12.70% to 5.20%. Net Profit also decreased sharply from ₹8,962 lakh to ₹3,857 lakh. This inverse movement clearly suggests a negative relationship between

Fig: 3 GNPA Ratio vs ROA — Inverse Relationship

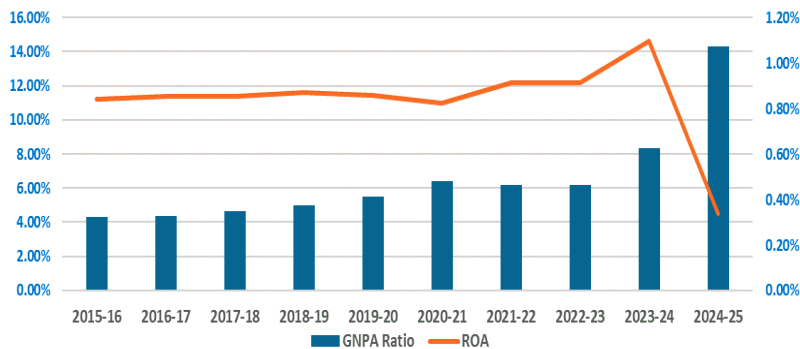
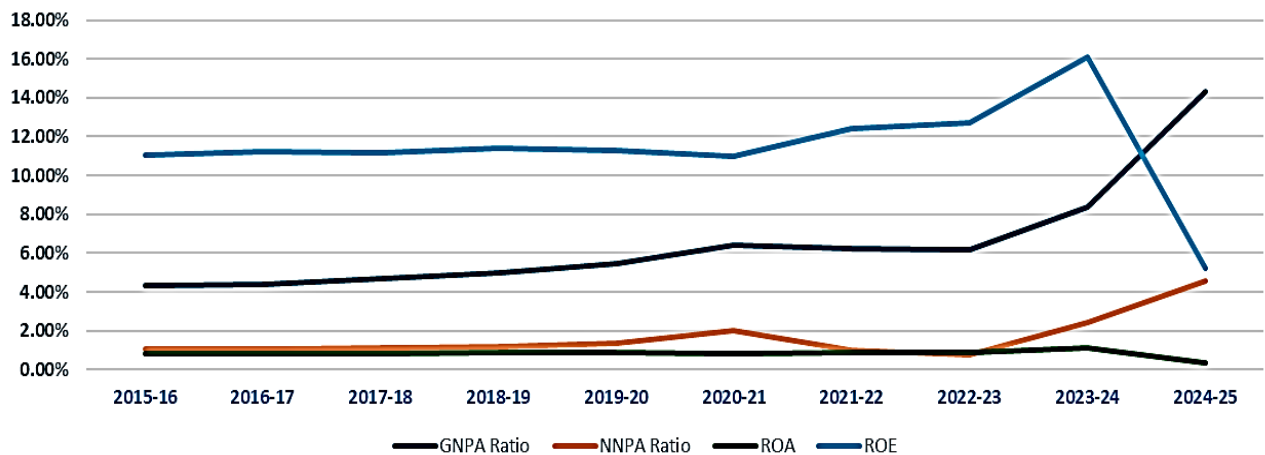


Fig:2 Asset Quality vs Profitability — 10-Year Trend



NPAs and profitability. As NPAs increased, earnings declined, which is expected because bad loans reduce interest income and require higher provisioning. Here, PCR shows a declining trend from 87.37% to 68.20%, indicating that the bank's ability to cover bad loans has weakened over time. This further strengthens the negative impact of rising NPAs, as lower provisioning coverage increases financial risk.

Although CRAR remained relatively stable (around 15–16%), and NIM improved slightly in the middle period before declining, these positive factors were not strong enough to offset the impact of worsening asset quality.

B: Pearson Correlation Metrix:

The correlation matrix brings out some very clear relationships between asset quality and profitability variables. The most striking result is the very high positive correlation between Gross NPA ratio and Net NPA ratio (0.950). This is expected, as both indicators reflect the same underlying issue deterioration in loan quality just at different stages. It confirms that as gross NPAs rise, net NPAs also increase strongly, indicating a consistent weakening of asset quality.

Table: 2 Pearson Correlation Metrix

Pearson Correlation Matrix	GNPA_R	NNPA_R	PCR	CRAR	NIM	ROA	ROE	NetProfit
GNPA_R	1.000	0.950	-0.455	0.787	0.067	-0.697	-0.542	-0.012
NNPA_R	0.950	1.000	-0.708	0.610	0.293	-0.714	-0.580	-0.126
PCR	-0.455	-0.708	1.000	-0.028	-0.676	0.387	0.342	0.211
CRAR	0.787	0.610	-0.028	1.000	-0.302	-0.302	-0.142	0.447
NIM	0.067	0.293	-0.676	-0.302	1.000	-0.053	-0.071	-0.167
ROA	-0.697	-0.714	0.387	-0.302	-0.053	1.000	0.979	0.703
ROE	-0.542	-0.580	0.342	-0.142	-0.071	0.979	1.000	0.817
NetProfit	-0.012	-0.126	0.211	0.447	-0.167	0.703	0.817	1.000

Note: $|r| > 0.632$ is significant at $p < 0.05$ for $n=10$ (critical value from Pearson r table)

When we look at profitability, the relationship becomes more revealing. Both GNPA ratio and NNPA ratio show strong negative correlations with ROA (−0.697 and −0.714) and ROE (−0.542 and −0.580). This clearly suggests that as NPAs increase, profitability declines. The negative impact is slightly stronger in the case of NNPA, which makes sense because net NPAs represent the actual loss exposure after provisioning. In simple terms, the more bad loans remain uncovered, the more they directly reduce returns. Interestingly, the relationship between NPAs and Net Profit is relatively weak (−0.012 and −0.126). This indicates that while profitability ratios like ROA and ROE are affected significantly, absolute profit figures may be influenced by other factors as well, such as operational income or cost adjustments.

Provision Coverage Ratio (PCR) shows a negative correlation with NNPA (−0.708) and GNPA (−0.455), which reflects a logical pattern: as provisioning improves, the net impact of bad loans reduces. At the same time, PCR has a moderate positive relationship with ROA (0.387) and ROE (0.342), suggesting that better provisioning supports profitability by reducing risk exposure, even though it may involve short-term cost. CRAR shows a strong positive correlation with GNPA (0.787) and a moderate one with NNPA (0.610). This suggests that as risk increases, the bank may be maintaining higher capital buffers. However, CRAR has a negative correlation with ROA (−0.302), indicating that higher capital does not necessarily translate into higher profitability, possibly due to conservative risk management.

NIM presents a mixed picture. It has a negative relationship with PCR (-0.676) and weak correlations with profitability indicators. This suggests that earning efficiency alone is not sufficient to offset the impact of poor asset quality. Finally, the strongest positive relationship in the matrix is between ROA and ROE (0.979), and both are strongly linked with Net Profit (0.703 and 0.817 respectively). This confirms that profitability indicators are internally consistent and move together.

C: Regression Models:

The regression results provide a clearer picture of how asset quality variables, particularly GNPA and NNPA, influence profitability indicators such as ROA, ROE, and Net Profit.

Starting with **Model 1 (ROA)**, the coefficient of NNPA is -0.0898 , indicating that an increase in net NPAs leads to a decline in return on assets. This negative sign is important because it confirms the expected relationship: as bad loans increase, the bank's ability to generate returns from its assets weakens. The GNPA coefficient is also negative (-0.0122), though relatively smaller in magnitude, suggesting that while gross NPAs matter, the net level of impaired assets has a stronger direct impact on profitability. The model explains about 51.4% of the variation ($R^2 = 0.514$), which is reasonably good for such a small dataset. However, the overall model significance is borderline ($p = 0.080$), meaning the relationship is visible but not statistically strong at the 5% level.

Table:3 Testing Impact of Asset Quality on Profitability

Dep. Var	β (NNPA_R / NNPA)	β (GNPA_R / GNPA)	Intercept	R^2	F-stat	df resid	p-value (F)	Significance
Model 1: ROA	-0.0898	-0.0122	0.0106	0.514	3.701	7	0.0800	*
Model 2: ROE	-1.5537	0.0804	0.1339	0.337	1.779	7	0.2373	ns
Model 3: Net Profit	-0.5631	0.2010	4,964.63	0.236	1.084	7	0.3890	ns

Significance legend: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$, ns = not significant

Models 1 & 2 use NPA ratios (GNPA_R, NNPA_R) as predictors. Model 3 uses absolute GNPA and NNPA. For $n=10$, $df_{residual} = 7$.

In Model 2 (ROE), the effect becomes even more pronounced. The NNPA coefficient is -1.5537 , showing a much stronger negative impact on return on equity. This suggests that shareholders' returns are highly sensitive to deterioration in asset quality. Interestingly, GNPA shows a very small positive coefficient (0.0004), which is not meaningful in practical terms and may be due to overlap between GNPA and NNPA. The model's explanatory power is lower ($R^2 = 0.337$), and the p-value (0.2373) indicates that the model is not statistically significant. This suggests that while the direction of impact is clear, the relationship is not strong enough to be confirmed with high confidence.

For Model 3 (Net Profit), NNPA again shows a negative coefficient (-0.5631), reinforcing the idea that higher net NPAs reduce absolute profit levels. On the other hand, GNPA shows a positive coefficient (0.2010), which appears counterintuitive. This could be due to short-term adjustments such as provisioning delays or income from other sources offsetting the impact. The explanatory power is relatively low ($R^2 = 0.236$), and the model is not statistically significant ($p = 0.3890$), indicating that net profit is influenced by multiple factors beyond asset quality alone.

D: Testing Hypothesis:

Here **Table:4** showing the hypothesis testing and result where **Hypothesis H₁₁** asks whether asset quality as a whole has a significant impact on profitability (using ROA as the proxy). The F-test gives a value of 3.70 with a p-value of 0.08. At the conventional 5% significance level, we would technically fail to reject the null hypothesis. But here is where judgment comes in. With only three years of data, reaching a p-value of 0.08 is not nothing. It suggests a pattern that is likely real but does not have enough statistical power to cross the 0.05 threshold. That is why the decision says "Reject at 10% — weak." I would interpret this cautiously: asset quality does seem to matter for ROA, but the evidence is not overwhelming given the small sample.

Table:4 Hypothesis Testing: F Test & Pearson Correlation

Hypothesis	Test Used	Statistic	Value	p-value	Decision ($\alpha=0.05$)
H ₁₁ : Asset quality has a significant impact on profitability	F-test (Model 1: ROA)	F	3.701045	0.080049	Reject at 10% — weak
H ₁₂ : Gross NPA ratio has a significant negative relationship with ROA	Pearson correlation	r	-0.69713	0.025048	Reject H ₀ — sig. negative
H ₁₃ : Net NPA ratio has a significant negative relationship with ROA	Pearson correlation	r	-0.71443	0.020263	Reject H ₀ — sig. negative
H ₁₄ : Provision Coverage Ratio (PCR) has a significant relationship with ROA (profitability)	Pearson correlation	r	0.387369	0.268744	Fail to reject H ₀

Source: Data Analysis by Author

Hypothesis H₁₂ is much cleaner. The correlation between Gross NPA ratio and ROA is -0.697, and the p-value is 0.025 — comfortably below 0.05. This means we can reject the null hypothesis. The relationship is negative and statistically significant. In everyday language, when Gross NPAs go up, ROA goes down. There is no ambiguity here. The strength of the correlation (close to -0.7) is actually quite high for a banking study using annual data.

Hypothesis H₁₃ tells a very similar story. Net NPA ratio shows a correlation of -0.714 with ROA, with a p-value of 0.020. This is even slightly stronger than the Gross NPA result. Again, we reject the null hypothesis. The negative relationship is significant. I find it interesting that Net NPA has a marginally higher correlation than Gross NPA. That makes intuitive sense because Net NPA strips out provisions and gives a clearer picture of the actual bad loans still sitting on the books. It makes sense that this would align more closely with profitability.

Hypothesis H₁₄ is the odd one out. Provision Coverage Ratio shows a correlation of only 0.387 with ROA, and the p-value is 0.268 far above 0.05. We fail to reject the null hypothesis. What does this mean? Simply put, PCR does not have a statistically significant relationship with profitability in this data. The sign is positive, which is expected (higher provisions coverage might indicate prudential management), but the relationship is too weak to be confident about. It could easily be random noise.

Residual Diagnostics & Multicollinearity Tests:

Table:5 Residual Diagnostics & Multicollinearity Tests

Test	Purpose	Statistic	Value	Rule of Thumb	Interpretation
Multicollinearity (GNPA_R vs NNPA_R)	Pearson r between predictors	r	0.950	$ r > 0.8$ = high	HIGH collinearity — use one NPA var
VIF (Variance Inflation Factor)	$VIF = 1/(1-r^2)$	VIF	10.19	$VIF > 5$ = concern, >10 = severe	SEVERE multicollinearity
Durbin-Watson (ROA residuals)	Detects autocorrelation in residuals	DW	2.373	2.0 = no autocorr; <1.5 or >2.5 = concern	No autocorrelation
Normality of residuals (ROA)	Skewness of residuals	Skew	2.393	$ skew < 1$ = approx. normal	Non-normal — caution

***Residuals helper column (Model 1: ROA) — used by DW test**
Author

Source: Data Analysis by

Multicollinearity diagnostics revealed a very high correlation ($r = 0.95$) between Gross NPA and Net NPA ratios, with a corresponding VIF of 10.19, indicating severe multicollinearity. Therefore, both variables cannot be used simultaneously in a regression model. The Durbin-Watson statistic (2.373) suggested no significant autocorrelation in the residuals. However, residual skewness (2.393) indicated departure from normality, which is a limitation given the small sample size. Correlation analysis, which does not assume normality, remains valid and forms the primary basis for interpretation.

E: Univariate Regressions:

Table:6 Univariate Regression Model-1 (After Resolve Multicollinearity)

Model	Slope (β)	Intercept	R ²	Std Err (β)	t-stat	p-value	Sig.
ROA ~ GNPA_Ratio	-0.0446	0.0113	0.486	0.0162	-2.750	0.0250	**
ROA ~ NNPA_Ratio	-0.1202	0.0103	0.5104	0.0416	-2.888	0.0203	**
ROE ~ GNPA_Ratio	-0.4810	0.1449	0.294	0.2639	-1.823	0.1057	ns
ROE ~ NNPA_Ratio	-1.3530	0.1359	0.336	0.6721	-2.013	0.0789	*
Net Profit ~ GNPA	0.0149	6,321.05	0.016	0.0409	0.365	0.7244	ns

Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$, ns = not significant. $df = 8$ for all univariate models.

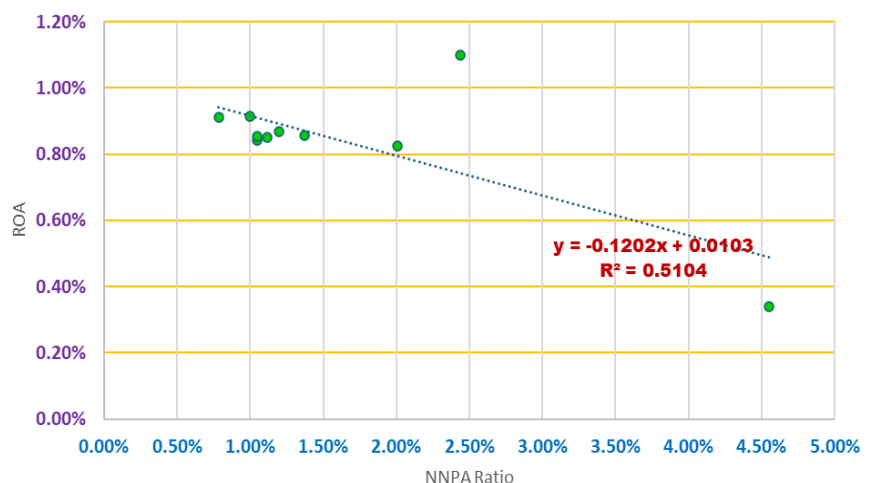
Source: Data Analysis by Author

To address multicollinearity between Gross NPA and Net NPA ratios ($r = 0.95$), separate univariate regressions were estimated. Both GNPA and NNPA showed statistically significant negative relationships with ROA ($\beta = -0.0446$, $p = 0.025$; and $\beta = -0.1202$, $p = 0.020$, respectively). NNPA explained slightly more variation in ROA ($R^2 = 0.51$) than GNPA ($R^2 = 0.49$). For ROE, NNPA was significant at the 10% level ($\beta = -1.353$, $p = 0.079$), while GNPA was not significant at conventional levels. Neither NPA ratio showed a meaningful relationship with absolute net profit. These results confirm that asset quality, measured through NPA ratios, has a stronger and more consistent effect on return on assets than on return on equity or absolute profit levels.

8.Conclusion

The present study examined the impact of asset quality on the profitability of Urban Cooperative Banks, using The Mehsana Urban Co-Operative Bank Ltd. as a case study over a ten-year period from FY2015-16 to FY2024-25. Through descriptive analysis, Pearson correlation, multiple regression, and

Fig:4 NNPA Ratio vs ROA — Scatter with Trendline



univariate regression supported by residual diagnostics, the study establishes a clear and statistically significant inverse relationship between asset quality and profitability. The Gross NPA ratio and Net NPA ratio both exhibit strong negative correlations with Return on Assets ($r = -0.697$ and $r = -0.714$ respectively, both significant at the 5% level), confirming that deterioration in asset quality directly erodes the bank's earning capacity. The multiple regression model further reveals that NPA ratios jointly explain 51.4% of the variation in ROA, while univariate regressions independently validate the significant negative impact of each NPA variable on profitability, even after addressing the issue of multicollinearity ($VIF = 10.19$) between the two NPA measures. Consequently, hypotheses H_{11} , H_{12} and H_{13} are supported by the data, demonstrating that asset quality has a significant and negative influence on profitability. However, the Provision Coverage Ratio shows no statistically significant relationship with profitability ($p = 0.269$), and hypothesis H_{14} is therefore not supported, suggesting that maintaining provision buffers alone is insufficient to safeguard earnings in the absence of effective NPA prevention. The study also reveals an alarming structural pattern — while the bank's deposits, advances and total assets grew robustly (CAGR of 9% to 12%), net profit declined at a CAGR of -1.1% , driven primarily by a sharp NPA shock in FY2024-25 when the Gross NPA ratio surged from 8.4% to 14.3% and net profit collapsed by 69% in a single year. This finding reinforces the central thesis that asset quality, rather than business volume, is the true determinant of sustainable profitability in cooperative banks. The implications are significant for multiple stakeholders: for bank management, the results underscore the urgent need to prioritise credit appraisal, early warning systems, and aggressive NPA recovery mechanisms over balance-sheet expansion; for regulators such as the Reserve Bank of India, the evidence supports stricter supervisory frameworks and timely intervention in the UCB sector to prevent systemic erosion of profitability and depositor confidence; and for academic literature, the study contributes much-needed empirical evidence on cooperative banks, a segment that remains under-researched compared to scheduled commercial banks. While the findings are robust within the case-study framework, the limited sample size of ten annual observations and the focus on a single bank present scope for future research using larger panel datasets across multiple UCBs and longer time horizons. In conclusion, the study unequivocally establishes that asset quality is the most critical determinant of profitability for Urban Cooperative Banks, and that sustained financial performance in this sector hinges on disciplined NPA management rather than mere business growth.

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