

A Statistical Analysis Of Selected Private Banks of India

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ABSTRACT

The banking sector acts as a pillar on which the entire structure of our economy stands. The development of a nation depends to a great extent upon the performance of its banking sector. The way in which the bank uses its resources to achieve its objective reflects its performance. By studying the performance of banks, we get to know how competitive these banks are. This research paper attempts to study the overall performance of selected private Indian banks (HDFC, ICICI, AXIS, KOTAK MAHINDRA, INDUSIND BANK) by analyzing their key performance ratios such as operating profit margin, return on assets, return on equity/net worth, net interest margin, interest income/total assets, operating profit/total assets, operating expense/total assets and net profit margin.

This paper has been divided into four parts. The first part gives an overall picture of the performance of the private Indian banks. In the second part, the performance data (2011-2019) of different private sector banks has been used to give an overall picture of their performances in the last nine years using statistical analysis (mean, standard deviation and coefficient of variance). The third part gives a brief description of whether there exists any significant differences in the performance of banks compared using ANOVA and the fourth part tells us whether the correlation between NET PROFIT and NET NPA of selected private banks is significant or not.

KEYWORDS

HDFC BANK, ICICI BANK, AXIS BANK, KOTAK MAHINDRA BANK, INDUSIND BANK, KEY PERFORMANCE RATIO, CORRELATION.

INTRODUCTION

Private Sector Banks :- Private sector banks are those banks where most of the capital is in the hands of private individuals. These banks are classified under two categories i.e. old private sector banks and new private sector banks. The banks which were in India at the time of nationalisation of major banks but were not nationalised due to their small size or some other reason are referred to as old private sector banks. After the banking reform these banks got license to continue and existed in India along with new private banks and government banks. India's leading private banks are:-

- **HDFC Bank:-** The HDFC (The Housing Development Finance Corporation) Bank was incorporated on August 1994 by the name of 'HDFC Bank Limited'. The registered office of the bank is in Mumbai, India. In 1995, this bank commenced its operations as a Scheduled Commercial Bank. The bank was amongst the first to receive an 'in principle' approval from the Reserve Bank of India (RBI) to set up a bank in the private sector, as part of the RBI's liberalization of the Indian Banking Industry in 1994.
- **ICICI Bank:-** ICICI (Industrial Credit and Investment Corporation of India) bank was established by the industrial credit and investment corporation of India , as a wholly owned subsidiary in 1994. It is an Indian multinational banking and financial services company headquartered in Mumbai (Maharashtra). As of 2019, it was the second largest bank in terms of assets and third largest in terms of market capitalisation in India. The bank has a network of 5275 branches and 15589 ATMs across India and has a presence in 17 countries including India.
- **AXIS Bank:-** Axis Bank is the third largest private sector bank in India. The Bank offers the entire spectrum of financial services to customer segments covering Large and Mid-Corporates, MSME, Agriculture and Retail Businesses. Axis Bank began its operations in 1994. The Bank was promoted in 1993, jointly by Specified Undertaking of Unit Trust of India (SUUTI) (then known as Unit Trust of India), Life Insurance Corporation of INDIA (LIC), General Insurance Corporation of INDIA (GIC), National Insurance Company Ltd., The New India Assurance Company Ltd., The Oriental Insurance Company Ltd. and United India Insurance Company Ltd. The share holding of Unit Trust of India was subsequently transferred to SUUTI, an entity established in 2003.
- **Kotak Mahindra Bank:-** Kotak Mahindra Bank is one of the leading banks and financial services groups in India. Headquartered in Mumbai, the bank has 1500 branches and 2,352 ATMs across India as on 31st May 2019. It offers a wide range of banking and financial services including investment banking, personal banking, general insurance, life insurance, and wealth management.
- **INDUSIND Bank:** Indusind Bank Limited is an Indian new generation bank in Pune, established in 1994. The bank offers commercial, transactional and electronic banking products and services. IndusInd Bank was inaugurated in April 1994 by then Union Finance Minister Manmohan Singh.. According to the bank, its name is derived from the Indus Valley Civilisation.

LITERATURE REVIEW:-

The study is based on the review of following research papers:-

Sri AYAN CHAKROBORTY(2017) in his paper titled “Ratio Analysis :A study on Indian commercial banks”, has said that every bank should employ profitability ratios so as to know whether they are performing efficiently or not and also suggested that all the possible efforts should be made by the banks to improve their efficiency.

Amandeep kaur hundal and moira singh (2016), “Performance evaluation of public and private sector banks in India : a comparative study”, has said that effort should be made by the banks to minimise their operating expenses by making use of expert services like professional management.

Amit kumar singh (2015) in his paper titled “An analysis of profitability position of private banks in India”,has found out that all the banks that he selected are different in terms of total assets ,interest sporead and net worth ratio.

Brindadevi .V (2013)in his paper titled “A study on profitability analysis of private sector banks in India”, has said that every bank should employ key profitability ratio so as to know whether they are performing their business operations efficiently or not.

SOURCE OF DATA :-

The data used in this study is secondary in nature. The data is collected from the annual reports of HDFC Bank , ICICI Bank , AXIS Bank , KOTAK MAHINDRA Bank,INDUSIND BANK ,journals and money control website of selected banks. Various tables and statistical tools such as ONE WAY ANOVA(Analysis Of Variance), are used in this paper to have a better understanding of the data.

SCOPE OF THE STUDY:-

As observed from various research papers, no recent study has been done to know whether any significant differences between the key performance ratios among different private banks in India exist or not. Also,no recent study has been conducted regarding the significance of correlation between net npa and net profits of private Indian banks in the recent years(2011-2019).Hence it becomes imperative to test these hypothesis.

TIME PERIOD :

Nine year’s data i.e. from 2011-2019 of all the selected private banks is used for the paper.

KEY PERFORMANCE RATIOS:-

The key performance ratios include:-

1) Operating Profit Margin:-

Operating Profit Margin is a profitability or performance ratio that reflects the percentage of profit a company produces from its operations, prior to subtracting taxes and interest charges. It is calculated by dividing the operating profit by total revenue and expressing as a percentage. The margin is also known as EBIT (Earnings Before Interest and Tax) Margin.

Table 1:-Operating Profit Margin:- Mean , Standard Deviation And Coefficient Of Variation

Year	HDFC	ICICI	AXIS	KOTAK MAHINDRA	INDUSIND
2011	-2.05	-5.76	-8.20	.89	-3.79
2012	-.28	-3.09	-5.35	1.74	-3.90
2013	-.36	-.05	-5.04	2.48	-4.32
2014	1.35	-1.39	-3.87	1.17	-5.84

2015	2.51	-2.03	-2.83	-1.67	-6.29
2016	2.56	-10.61	-2.80	-3.18	-8.72
2017	3.25	-17.91	-17.98	-.37	-9.04
2018	2.82	-19.36	-23.35	.16	-6.62
2019	3.48	-17.58	-15.37	1.09	-10.53
MEAN	1.47	-8.64	-9.42	.25	-6.56
S.D	1.82	7.40	7.13	1.66	2.28
C.V	123.8	-85.64	-75.69	664	-34.75

Interpretation

By analysing the above table , it is interpreted that:-

- The HDFC bank has the highest mean value while AXIS Bank has lowest mean value in comparison to other banks. According to the study, it can be concluded that on an average, HDFC BANK makes the highest profit from its operations, prior to subtracting taxes and interest charges while the AXIS BANK makes the lowest profit from its operations, prior to subtracting taxes and interest charges.
- The ICICI bank has highest standard deviation and KOTAK MAHINDRA Bank has lowest standard deviation i.e., ICICI BANK has the highest variability in the yearly profits from its operations, prior to subtracting taxes and interest charges while the KOTAK MAHINDRA BANK has the lowest variability in the yearly profits from its operations, prior to subtracting taxes and interest charges.
- The coefficient of variation of KOTAK bank is highest and the ICICI bank has lowest coefficient of variance.

Hypothesis Of The Study:-

H_0 :-There exists no significant difference between the means of OPERATING PROFIT MARGIN among different private sector banks in India.

H_1 :- There exists significant difference between the means of OPERATING PROFIT MARGIN among different private sector banks in India.

TEST STATISTICS:- ONE WAY ANOVA.

LEVEL OF SIGNIFICANCE:- $\alpha = .05$

DECISION RULE:- if the computed value of F is greater than $F_{\text{critical value}}$ which is 2.6059, then we reject our null hypothesis.

Computation:-

Anova Summary

SOURCE OF VARIATION	SUM OF SQUARE	DEGREE OF FREEDOM	MEAN SQUARE	F(CALCULATED VALUE)	TABLE VALUE(at 5%level of significance)
BETWEEN GROUPS	935.33	4	233.83	F=8.87529	2.60597495
WITH IN GROUPS	1053.86	40	26.34		
TOTAL	1989.19	44			

Conclusion:-

The computed value of F which is 8.87529 is greater than its critical value which is 2.6059, so the null hypothesis is rejected which says that there exist no significant difference between the OPERATING PROFIT MARGIN of private sector banks in India.

2) Return On Assets:-

Return on assets (ROA) is a financial ratio that shows the percentage of profit a company earns in relation to its overall resources. It is commonly defined as net income divided by total assets. ROA is a ratio but usually presented as a percentage.

Table 2:-Return On Assets (%):- Mean , Standard Deviation And Coefficient Of Variation

Year	HDFC	ICICI	AXIS	KOTAK MAHINDRA	INDUSIND
2011	1.41	1.26	1.39	1.60	1.26
2012	1.52	1.36	1.48	1.65	1.39
2013	1.68	1.55	1.52	1.62	1.44
2014	1.72	1.64	1.62	1.71	1.61
2015	1.73	1.72	1.59	1.76	1.64
2016	1.73	1.34	1.56	1.08	1.63
2017	1.68	1.26	.61	1.58	1.60
2018	1.64	.77	.03	1.54	1.62
2019	1.69	.34	.58	1.55	1.18
MEAN	1.64	1.24	1.153	1.56	1.48
S.D	.10	.41	.55	.18	.16
C.V	6.09	33.06	47.40	11.53	10.81

Interpretation

By analysing the above table , it is interpreted that:-

- The HDFC bank has the highest mean value while AXIS Bank has lowest mean value in comparison to other banks. According to the study, it can be concluded that on an average, HDFC BANK makes the highest profit in relation to its overall resources where as AXIS BANK makes the lowest profit in relation to its overall resources.
- The AXIS bank has highest standard deviation and hdfc Bank has lowest standard deviation which implies that AXIS BANK has the highest variability in the yearly profits which it earns in relation to its resources whereas as HDFC BANK has the lowest variability in the yearly profits which it earns in relation to its resources
- The coefficient of variation of AXIS bank is highest and the HDFC bank has lowest coefficient of variance

Hypothesis Of The Study:-

H_0 :-There exists no significant difference between RETURN ON ASSETS among different private sector banks in India.

H_1 :- There exists significant difference between RETURN ON ASSETS among different private sector banks in India

TEST STATISTICS:- ONE WAY ANOVA.

LEVEL OF SIGNIFICANCE:- $\alpha = .05$

DECISION RULE:- if the computed value of F is greater than $F_{\text{critical value}}$ which is 2.6059, then we reject our null hypothesis.

Computation:-

Anova Summary

SOURCE OF VARIATION	SUM OF SQUARE	DEGREE OF FREEDOM	MEAN SQUARE	F(CALCULATED VALUE)	TABLE VALUE(at 5%level of significance)
BETWEEN GROUPS	1.5862	4	.3966	F=3.20597	2.60597495
WITH IN GROUPS	4.9478	40	.1237		
TOTAL	6534	44			

Conclusion:-

The computed value of F which is 3.20597 is greater than its critical value which is 2.6059, so the null hypothesis is rejected which says that there exist no significant difference between the RETURN ON ASSETS of private sector banks in India.

3) Return On Equity /Net Worth:-

Return on Equity (RoE) or Return on Net Worth (RoNW) means the amount of profit or earning a company generates on the sheer strength of its shareholders' equity.

Table 3:-Return On Equity /Net Worth(%):- Mean , Standard Deviation And Coefficient Of Variation

Year	HDFC	ICICI	AXIS	KOTAK MAHINDRA	INDUSIND
2011	15.47	9.35	17.83	11.97	15.09
2012	17.26	10.70	18.59	13.59	17.74
2013	18.57	12.48	15.64	14.37	14.30
2014	19.50	13.39	16.26	12.23	16.28
2015	16.47	13.89	16.46	13.19	17.49
2016	16.91	11.19	15.46	8.72	13.20
2017	16.26	10.11	6.59	12.35	14.14
2018	16.45	6.63	.43	10.89	15.35
2019	14.12	3.19	7.01	11.47	12.52
MEAN	16.77	10.10	12.69	12.08	15.12
S.D	1.49	3.21	6.00	1.56	1.69
C.V	8.88	31.78	47.28	12.91	11.17

Interpretation

By analysing the above table , it is interpreted that:-

- The HDFC bank has the highest mean value while ICICI Bank has lowest mean value in comparison to other banks. This implies that on an average, HDFC BANK makes the highest earnings on the sheer strength of its shareholders' equity while ICICI BANK makes the lowest earnings on the sheer strength of its shareholders' equity
- The AXIS bank has highest standard deviation and HDFC Bank has lowest standard deviation which implies that AXIS BANK has the highest variability in its yearly earnings based on the sheer strength of its shareholder's equity where as HDFC BANK has the lowest variability in its yearly earnings based on the sheer strength of its shareholder's equity .
- The coefficient of variation of AXIS bank is highest and the HDFC bank has lowest coefficient of variance

Hypothesis Of The Study:-

H_0 :-There exists no significant difference between RETURN ON EQUITY /NET WORTH among different private sector banks in India.

H_1 :- There exists significant difference between RETURN ON EQUITY /NET WORTH among different private sector banks in India.

TEST STATISTICS:- ONE WAY ANOVA.

LEVEL OF SIGNIFICANCE:- $\alpha = .05$

DECISION RULE:- if the computed value of F is greater than $F_{\text{critical value}}$ which is 2.6059, then we reject our null hypothesis.

Computation:

Anova Summary

SOURCE OF VARIATION	SUM OF SQUARE	DEGREE OF FREEDOM	MEAN SQUARE	F(CALCULATED VALUE)	TABLE VALUE(at 5%level of significance)
BETWEEN GROUPS	247.1885	4	61.7971	F=5.09549	2.60597495
WITH IN GROUPS	485.1125	40	12.1278		
TOTAL	732.301	44			

Conclusion:-

The computed value of F which is 5.09549 is greater than its critical value which is 2.6059, so the null hypothesis is rejected which says that there exist no significant difference between the RETURN ON EQUITY /NET WORTH of private sector banks in India.

4) Net Interest Margin:-

Net interest margin (NIM) is a measure of the difference between the interest income generated by banks or other financial institutions and the amount of interest paid out to their lenders (for example, deposits), relative to the amount of their (interest-earning) assets. It is similar to the gross margin (or gross profit margin) of non-financial companies.

It is usually expressed as a percentage of what the financial institution earns on loans in a time period and other assets minus the interest paid on borrowed funds divided by the average amount of the assets on which it earned income in that time period (the average earning assets).

Table 4:-Net Interest Margin(%):- Mean , Standard Deviation And Coefficient Of Variation

Year	HDFC	ICICI	AXIS	KOTAK MAHINDRA	INDUSIND

2011	3.80	2.21	2.70	4.12	3.01
2012	3.63	2.26	2.80	3.82	2.95
2013	3.94	2.58	2.83	3.83	3.04
2014	3.75	2.77	3.11	4.24	3.32
2015	3.79	2.94	3.07	3.98	3.13
2016	3.89	2.94	3.20	3.58	3.22
2017	3.83	2.81	3.00	3.78	3.39
2018	3.76	2.61	2.69	3.59	3.38
2019	3.87	2.80	2.71	3.60	3.18
MEAN	3.80	2.65	2.90	3.83	3.18
S.D	.08	.25	.185	.22	.15
C.V	2.10	9.43	6.37	5.744	4.71

Interpretation

By analysing the above table, it is interpreted that:-

- The KOTAK MAHINDRA bank has the highest mean value while ICICI Bank has lowest mean value in comparison to other banks.
- The ICICI bank has highest standard deviation and HDFC Bank has lowest standard deviation.
- The coefficient of variation of ICICI bank is highest and the HDFC bank has lowest coefficient of variance

Hypothesis Of The Study:-

H_0 :-There exists no significant difference between NET INTEREST MARGIN among different private sector banks in India.

H_1 :- There exists significant difference between NET INTEREST MARGIN among different private sector banks in India.

TEST STATISTICS:- ONE WAY ANOVA.

LEVEL OF SIGNIFICANCE:- $\alpha = .05$

DECISION RULE:- if the computed value of F is greater than $F_{\text{critical value}}$ which is 2.6059, then we reject our null hypothesis.

Computation:-

Anova Summary

SOURCE OF VARIATION	SUM OF SQUARE	DEGREE OF FREEDOM	MEAN SQUARE	F(CALCULATED VALUE)	TABLE VALUE(at 5%level of significance)
BETWEEN	10.1624	4	2.5406	F=62.90171	s2.60597495

GROUPS					
WITH IN GROUPS	1.6156	40	.0404		
TOTAL	11.778	44			

Conclusion:-

The computed value of F which is 62.90171 is greater than its critical value which is 2.6059, so the null hypothesis is rejected which says that there exists no significant difference between the NET INTEREST MARGIN of private sector banks in India.

5) Interest Income/Total Assets

This ratio refers to the interest earned on the total assets used by the responsible management to decide whether to continue leaving these assets as is or use them differently.

Table 5:-Interest Income/Total Assets (%):- Mean , Standard Deviation And Coefficient Of Variation

Year	HDFC	ICICI	AXIS	KOTAK MAHINDRA	INDUSIND
2011	7.18	6.39	6.24	8.23	7.86
2012	8.07	7.08	7.70	9.41	9.30
2013	8.75	7.46	7.98	9.60	9.52
2014	8.36	7.42	7.99	10.00	9.48
2015	8.20	7.59	7.68	9.16	8.88
2016	8.49	7.31	7.80	8.52	8.26
2017	8.02	7.01	7.40	8.24	8.06
2018	7.54	6.25	6.62	7.45	7.79
2019	7.95	6.57	6.86	7.66	8.01
MEAN	8.06	7.00	7.36	8.69	8.57
S.D	.45	.46	.600	.83	.67
C.V	5.58	6.57	8.15	9.55	7.81

Interpretation

By analysing the above table , it is interpreted that:-

- The KOTAK MAHINDRA bank has the highest mean value while ICICI Bank has lowest mean value in comparison to other banks. This implies that on an average, interest earned on the total assets is highest in case of KOTAK MAHINDRA BANK while it is lowest in ICICI BANK.

- The KOTAK MAHINDRA bank has highest standard deviation and HDFC Bank has lowest standard deviation which implies that KOTAK MAHINDRA BANK has the highest variability in its yearly interest income based on its total assets where as HDFC BANK has the lowest variability.
- The coefficient of variation of KOTAK MAHINDRA bank is highest and the HDFC bank has lowest coefficient of variance

Hypothesis Of The Study:-

H₀:-There exists no significant difference between INTEREST INCOME/TOTAL ASSETS among different private sector banks in India.

H₁:- There exists significant difference between INTEREST INCOME/TOTAL ASSETS among different private sector banks in India.

TEST STATISTICS:- ONE WAY ANOVA.

LEVEL OF SIGNIFICANCE:- $\alpha = .05$

DECISION RULE:- if the computed value of F is greater than F_{critical value} which is 2.6059, then we reject our null hypothesis.

Computation:-

Anova Summary

SOURCE OF VARIATION	SUM OF SQUARE	DEGREE OF FREEDOM	MEAN SQUARE	F(CALCULATED VALUE)	TABLE VALUE(at 5%level of significance)
BETWEEN GROUPS	19.6929	4	4.9232	F=11.25345	2.60597495
WITH IN GROUPS	17.4994	40	.4375		
TOTAL	37.1924	44			

Conclusion:-

The computed value of F which is 11.25345 is greater than its critical value which is 2.6059, so the null hypothesis is rejected which says that there exists no significant difference between the INTEREST INCOME/TOTAL ASSETS of private sector banks in India.

6) Operating Profit/Total Assets:-

The operating return on assets ratio (ROA) is used to calculate the percentage rate of return a business gets on its assets. The ratio measures the ability of a business to use its assets to generate operating income.

Table 6:-Operating Profit/Total Assets (%):- Mean , Standard Deviation And Coefficient Of Variation

Year	HDFC BANK	ICICI BANK	AXIS BANK	KOTAK MAHINDRA	INDUSIND BANK
2011	-.14	-.36	-.51	.07	-.29
2012	-.02	-.21	-.41	.16	-.36
2013	-.03	.00	-.40	.23	-.41
2014	.11	-.10	-.30	.11	-.55
2015	.20	-.15	-.21	-.15	-.55
2016	.21	-.77	-.21	-.27	-.72
2017	.26	-1.25	-1.33	-.03	-.72
2018	.21	-1.21	-1.54	.01	-.51
2019	.27	-1.15	-1.05	.08	-.84
MEAN	.11	-0.57	-0.66	0.023	0.029
S.D	.13	0.48	0.47	0.14	0.17
C.V	118	-84.21	71.21	608.69	586.20

Interpretation

By analysing the above table , it is interpreted that:-

- The HDFC bank has the highest mean value while AXIS Bank has lowest mean value in comparison to other banks.
- The ICICI bank has highest standard deviation and HDFC Bank has lowest standard deviation.
- The coefficient of variation of KOTAK MAHINDRA bank is highest and the ICICI bank has lowest coefficient of variance

Hypothesis Of The Study:-

H_0 :-There exists no significant difference between OPERATING PROFIT/TOTAL ASSETS among different private sector banks in India.

H_1 :- There exists significant difference between OPERATING PROFIT/TOTAL ASSETS among different private sector banks in India.

TEST STATISTICS:- ONE WAY ANOVA.

LEVEL OF SIGNIFICANCE:- $\alpha = .05$

DECISION RULE:- if the computed value of F is greater than $F_{\text{critical value}}$ which is 2.6059, then we reject our null hypothesis.

Computation:-

Anova Summary

SOURCE OF VARIATION	SUM OF SQUARE	DEGREE OF FREEDOM	MEAN SQUARE	F(CALCULATED VALUE)	TABLE VALUE(at 5%level of significance)
BETWEEN GROUPS	4.9186	4	1.2296	F=10.16028	2.60597495
WITH IN GROUPS	4.841	40	.121		
TOTAL	9.7596	44			

Conclusion:-

The computed value of F which is 10.16028 is greater than its critical value which is 2.6059, so the null hypothesis is rejected which says that there exists no significant difference between the OPERATING PROFIT/TOTAL ASSETS of private sector banks in India.

7) Operating Expenses/Total Assets:-

Total expense ratio (TER) is the ratio between total fund costs and total fund assets. It provides information regarding total costs involved annually for investment funds. The costs include expenses like legal fees, management fees, and other operational expenses. Total Expense Ratio is also called as Expense Ratio

Table 7:-Operating Expenses/Total Assets (%):- Mean , Standard Deviation And Coefficient Of Variation

Year	HDFC	ICICI	AXIS	KOTAK MAHINDRA	INDUSIND
2011	2.57	1.62	1.96	3.05	2.20
2012	2.54	1.65	2.10	2.79	2.33
2013	2.80	1.67	2.03	2.64	2.39
2014	2.44	1.73	2.06	2.90	2.51
2015	2.36	1.77	1.99	3.07	2.49
2016	2.39	1.75	1.92	2.84	2.62

2017	2.28	1.91	2.02	2.61	2.67
2018	2.13	1.78	2.02	2.42	2.52
2019	2.09	1.87	1.97	2.40	2.30
MEAN	0.043	0.008	0.0026	0.054	0.02
S.D	0.209	0.09	0.05	0.23	0.14
C.V	486	1125	1923	425.9	700

Interpretation

By analysing the above table, it is interpreted that:-

- The KOTAK MAHINDRA bank has the highest mean value while AXIS Bank has lowest mean value in comparison to other banks.
- The KOTAK MAHINDRA bank has highest standard deviation and AXIS Bank has lowest standard deviation.
- The coefficient of variation of AXIS bank is highest and the KOTAK MAHINDRA bank has lowest coefficient of variance

HYPOTHESIS OF THE STUDY:-

H_0 :-There exists no significant difference between OPERATING EXPENSES/TOTAL ASSETS among different private sector banks in India.

H_1 :- There exists significant difference between OPERATING EXPENSES/TOTAL ASSETS among different private sector banks in India.

TEST STATISTICS:- ONE WAY ANOVA.

LEVEL OF SIGNIFICANCE:- $\alpha = .05$

DECISION RULE:- if the computed value of F is greater than $F_{\text{critical value}}$ which is 2.6059, then we reject our null hypothesis.

Computation:-

Anova Summary

Source Of Variation	Sum Of Square	Degree Of Freedom	Mean Square	F(Calculated Value)	Table Value(At 5%Level Of Significance)
Between Groups	5.5339	4	1.3835	F=47.22099	2.60597495
With In Groups	1.1719	40	.0293		
Total	6.7058	44			

Conclusion:-

The computed value of F which is 47.22099 is greater than its critical value which is 2.6059, so the null hypothesis is rejected which says that there exists no significant difference between the OPERATING EXPENSES/TOTAL ASSETS of private sector banks in India.

8) Net Profit Margin

Net profit margin is the percentage of revenue remaining after all operating expenses, interest, taxes and preferred stock dividends (but not common stock dividends) have been deducted from a company's total revenue.

Table 8:-NET PROFIT MARGIN(%):- MEAN , STANDARD DEVIATION AND COEFFICIENT OF VARIATION

Year	HDFC	ICICI	AXIS	KOTAK MAHINDRA	INDUSIND
2011	19.70	19.83	22.35	19.52	16.08
2012	18.93	19.27	19.28	17.55	14.97
2013	19.18	20.77	19.05	16.91	15.19
2014	20.61	22.20	20.29	17.13	17.05
2015	21.07	22.76	20.73	19.19	18.50
2016	20.41	18.44	20.06	12.75	19.74
2017	20.99	18.09	8.26	19.27	19.90
2018	21.79	12.33	.60	20.68	20.86
2019	21.29	5.30	8.50	20.32	14.82
MEAN	20.44	17.66	15.45	18.14	17.45
S.D	.924	5.22	7.21	2.29	2.21
C.V	4.52	29.65	46.66	12.6	12.66

Interpretation

By analysing the above table , it is interpreted that:-

- The HDFC bank has the highest mean value while AXIS Bank has lowest mean value in comparison to other banks.
- The AXIS bank has highest standard deviation and HDFC Bank has lowest standard deviation.
- The coefficient of variation of AXIS bank is highest and the HDFC bank has lowest coefficient of variance

Hypothesis Of The Study:-

H₀:-There exists no significant difference between NET PROFIT MARGIN among different private sector banks in India.

H₁:- There exists significant difference between NET PROFIT MARGIN among different private sector banks in India.

TEST STATISTICS:- ONE WAY ANOVA.

LEVEL OF SIGNIFICANCE:- $\alpha = .05$

DECISION RULE:- if the computed value of F is greater than $F_{\text{critical value}}$ which is 2.6059, then we reject our null hypothesis.

Computation:-

Anova Summary

Source Of Variation	Sum Of Square	Degree Of Freedom	Mean Square	F(Calculated Value)	Table Value(At 5%Level Of Significance)
Between Groups	114.4078	4	28.6019	F=1.40692	2.60597495
With In Groups	813.1805	40	20.3295		
Total	927.5882	44			

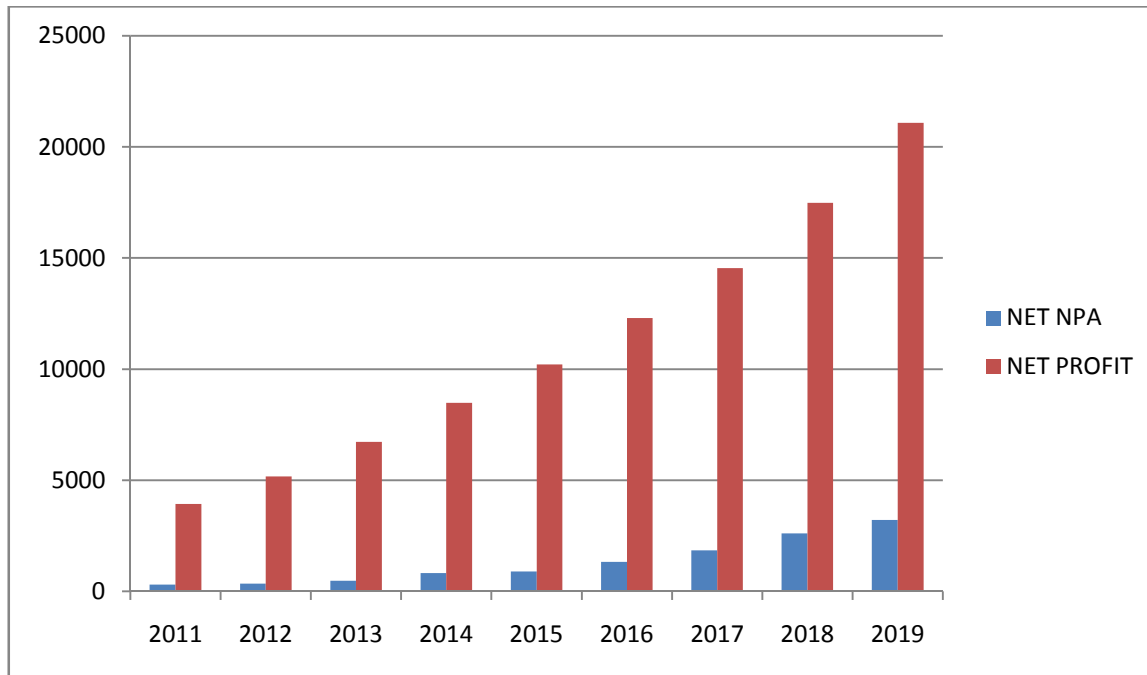
Conclusion:-

The computed value of F which is 1.40692 is Less than its critical value which is 2.6059, so the null hypothesis is accepted which says that there exist no significant difference between the NET PROFIT MARGIN of private sector banks in India.

Correlation analysis of selected private banks

1) HDFC Bank LIMITED(AMOUNT IN CRORE)

YEAR	NET NPA	NET PROFIT
2011	296.41	3926.39
2012	352.33	5167.07
2013	468.95	6726.28
2014	820.03	8478.40
2015	896.28	10215.92
2016	1320.37	12296.23
2017	1843.99	14549.66
2018	2601.02	17486.75
2019	3214.52	21078.14

Figure 1 :- NET NPA AND NET PROFIT OF HDFC BANK(AMOUNT IN CRORE)

Interpretation

The figure 1 clearly shows that:-

- Net npa of HDFC bank has shown an escalating trend from 2011-2019.
- From 2011-2019, the total amount of net npa has been proliferated by 2918.11 crore
- The net profit of HDFC bank has also shown an escalating trend from 2011-2019.
- From 2011-2019, total amount of net profit has been proliferated by 17151.75 crore

In order to know whether there exists any significant correlation between net npa and net profit of hdfc bank, we use t-test for correlation.

H_0 :-There exists no significant correlation between NET NPA and NET PROFIT.

H_1 :- There exists significant correlation between NET NPA and NET PROFIT.

TEST STATISTICS:- t-test for correlation .

LEVEL OF SIGNIFICANCE:- $\alpha = .05$

DECISION RULE:- if the computed p- value is less than .05, we reject our null hypothesis.

Computation:-

Correlation coefficient = 0.9862

P value = 0

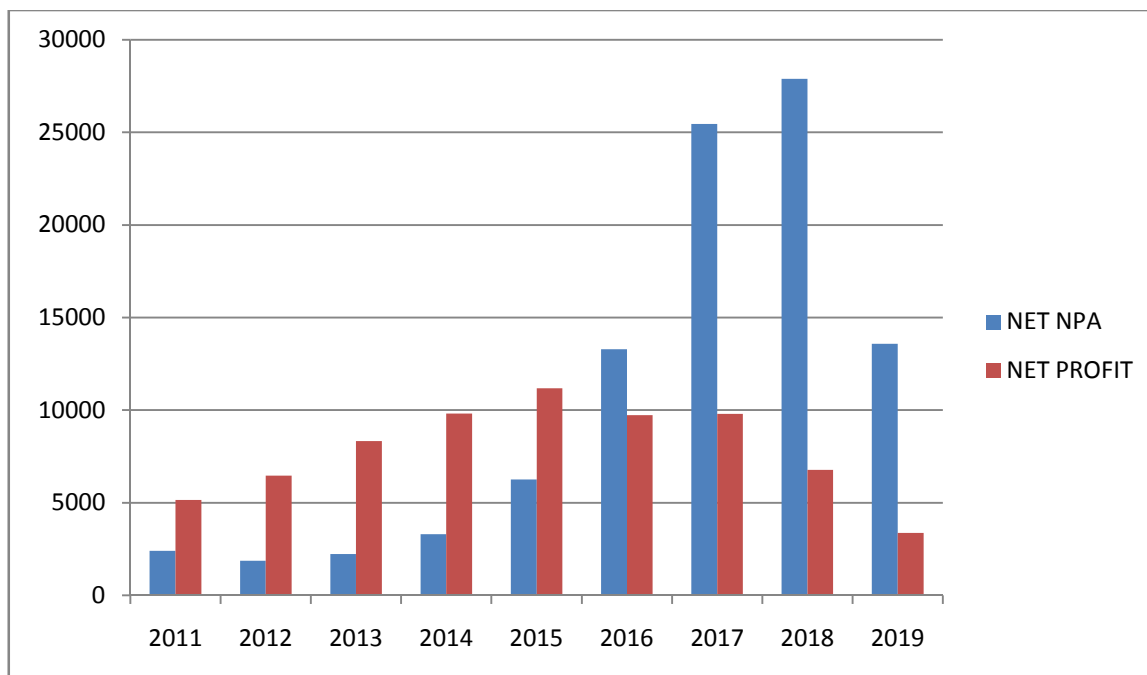
Conclusion

Since p- value is less than .05, we reject our null hypothesis and conclude that there exists significant correlation between NET NPA and NET PROFIT at a significance level of 5%.

2) ICICI BANK(AMOUNT IN CRORE)

YEAR	NET NPA	NET PROFIT
2011	2407.36	5151.38
2012	1860.84	6465.26
2013	2230.56	8325.47
2014	3297.96	9810.48
2015	6255.53	11175.35
2016	13296.75	9726.29
2017	25451.03	9801.08
2018	27886.27	6777.42
2019	13577.43	3363.30

Figure 2:- NET NPA AND NET PROFIT OF ICICI BANK(AMOUNT IN CRORE)



Interpretation

The figure clearly shows that:-

- Net npa of ICICI bank is highest(27886.27 crore) in the year 2018.
- The net profit of ICICI bank is minimum(3363.30 crore) in the year 2019.

In order to know whether there exists any significant correlation between net npa and net profit of icici bank , we use t-test for correlation.

H_0 :-There exists no significant correlation between NET NPA and NET PROFIT.

H_1 :- There exists significant correlation between NET NPA and NET PROFIT.

TEST STATISTICS:- t-test for correlation .

LEVEL OF SIGNIFICANCE:- $\alpha = .05$

DECISION RULE:- if the computed p- value is less than .05, we reject our null hypothesis.

Computation:-

Correlation coefficient = 0.0173

P value = 0.9647

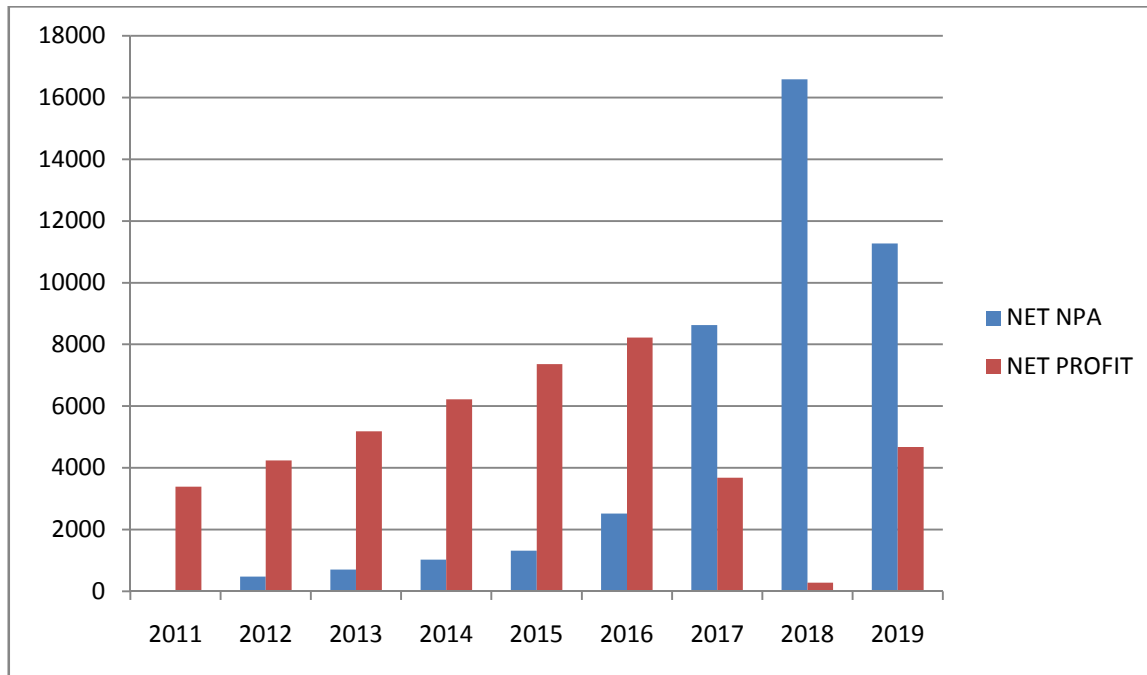
Conclusion

Since p- value is greater than .05, we accept our null hypothesis and conclude that there exists no significant correlation between NET NPA and NET PROFIT at a significance level of 5%.

3) AXIS BANK(AMOUNT IN CRORE)

YEAR	NET NPA	NET PROFIT
2011	41.04	3388.49
2012	472.64	4242.21
2013	704.13	5179.43
2014	1024.62	6217.67
2015	1316.71	7357.82
2016	2522.14	8223.66
2017	8626.55	3679.28
2018	16591.71	275.68
2019	11275.60	4676.61

Figure 3:- NET NPA AND NET PROFIT OF AXIS BANK(AMOUNT IN CRORE)



Interpretation

The figure 3 clearly shows that:-

- Net npa of AXIS bank has shown an escalating trend till 2018 after that it started declining.
- The net profit of ICICI bank has also shown an escalating trend from 2011-2016 and after that it starts declining.
- Net npa is maximum in the year 2018 and minimum in the year 2011.
- Net profit is maximum in the year 2016 and minimum in the year 2018.

In order to know whether there exists any significant correlation between net npa and net profit of axis bank , we use t-test for correlation.

H_0 :-There exists no significant correlation between NET NPA and NET PROFIT.

H_1 :- There exists significant correlation between NET NPA and NET PROFIT.

TEST STATISTICS:- t-test for correlation .

LEVEL OF SIGNIFICANCE:- $\alpha = .05$

DECISION RULE:- if the computed p- value is less than .05, we reject our null hypothesis.

Computation:-

Correlation coefficient = -0.6474

P value = 0.0594

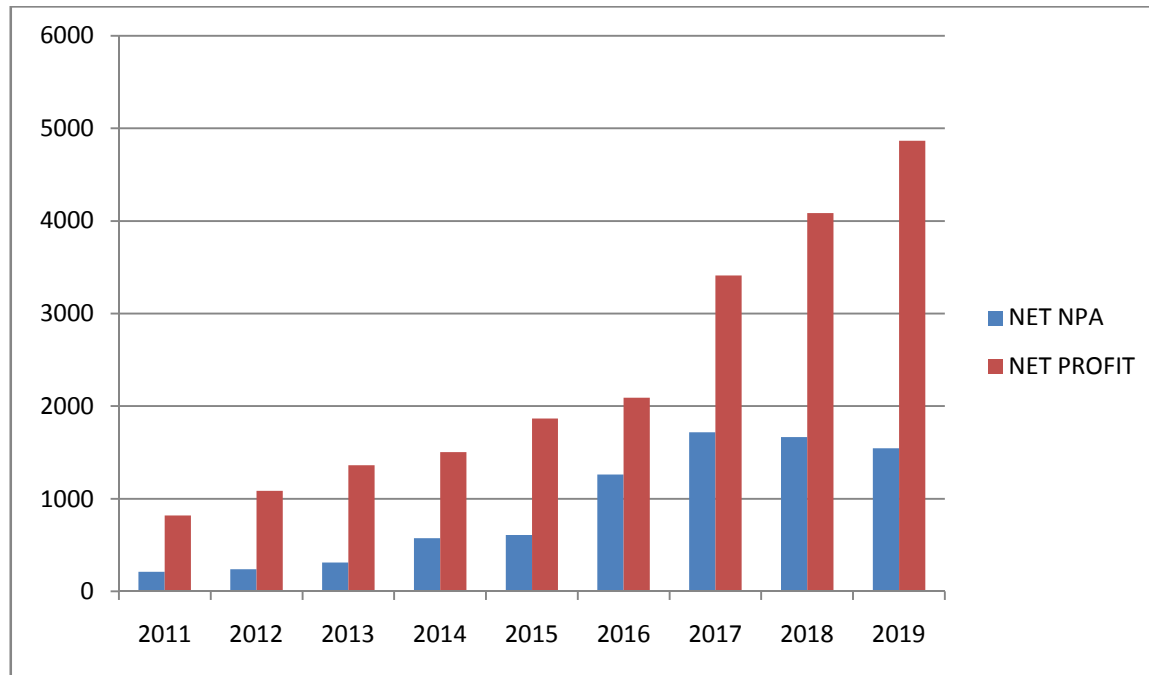
Conclusion

Since p-value is greater than .05, we accept our null hypothesis and conclude that there exists no significant correlation between NET NPA and NET PROFIT at a significance level of 5%.

4) KOTAK MAHINDRA BANK(AMOUNT IN CRORE)

YEAR	NET NPA	NET PROFIT
2011	211.16	818.18
2012	237.38	1085.05
2013	311.41	1360.72
2014	573.56	1502.52
2015	609.08	1865.98
2016	1261.96	2089.78
2017	1718.07	3411.50
2018	1665.05	4084.30
2019	1544.37	4865.33

Figure 4:- NET NPA AND NET PROFIT OF KOTAK MAHINDRA BANK(AMOUNT IN CRORE)



Interpretation

The figure 4 clearly shows that:-

- Net npa of KOTAK MAHINDRA bank has shown an escalating trend from 2011-2017 and after that it started declining.
- The net profit of KOTAK MAHINDRA bank has also shown an escalating trend from 2011-2019.
- From 2011-2019, total amount of net profit has been proliferated by 4047.15 crore

In order to know whether there exists any significant correlation between net npa and net profit of kotak mahindra bank , we use t-test for correlation.

H_0 :-There exists no significant correlation between NET NPA and NET PROFIT.

H_1 :- There exists significant correlation between NET NPA and NET PROFIT.

TEST STATISTICS:- t-test for correlation .

LEVEL OF SIGNIFICANCE:- $\alpha = .05$

DECISION RULE:- if the computed p- value is less than .05, we reject our null hypothesis.

Computation:-

Correlation coefficient = 0.9057

P value = 0.0007

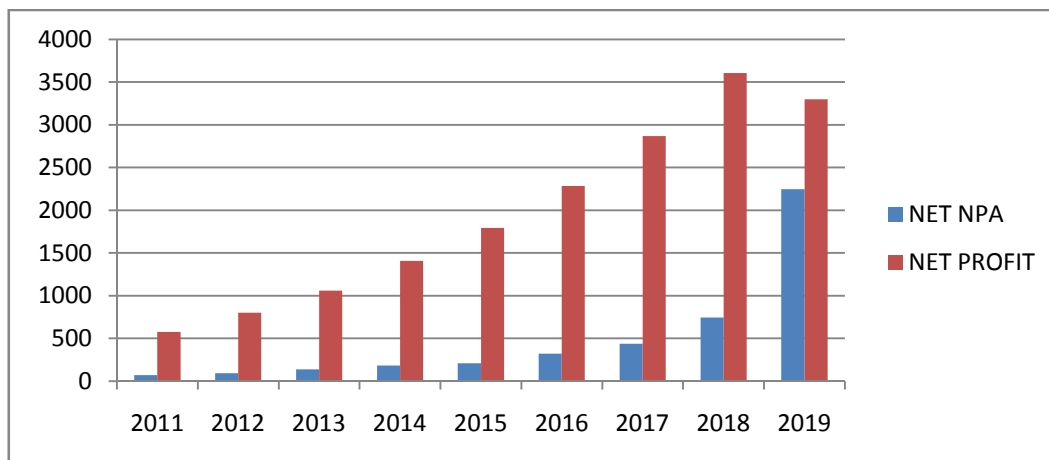
Conclusion

Since p- value is less than .05, we reject our null hypothesis and conclude that there exists significant correlation between NET NPA and NET PROFIT at a significance level of 5%.

5) INDUSIND BANK(AMOUNT IN CRORE)

YEAR	NET NPA	NET PROFIT
2011	72.82	577.32
2012	94.67	802.61
2013	136.76	1061.18
2014	184.05	1408.02
2015	210.48	1793.72
2016	321.75	2286.45
2017	438.91	2867.89
2018	745.67	3605.99
2019	2248.28	3301.10

Figure 5:- NET NPA AND NET PROFIT OF INDUSIND BANK(AMOUNT IN CRORE)



INTERPRETATION:

- The figure 5 clearly shows that:-

- Net npa of indusind bank has shown an esclating trend from 2011-2019.
- From 2011-2019, the net npa has been proliferated by 2175.46 crore.
- The net profit of induind bank has also shown an esclating trend from 2011-2018 and after that it starts declining.
- From 2011-2019, total amount of net profit has been proliferated by 2723.78 crore.

In order to know whether there exists any significant correlation between net npa and net profit of Indusind bank , we use t-test for correlation.

H_0 :-There exists no significant correlation between NET NPA and NET PROFIT.

H_1 :- There exists significant correlation between NET NPA and NET PROFIT.

TEST STATISTICS:- t-test for correlation .

LEVEL OF SIGNIFICANCE:- $\alpha = .05$

DECISION RULE:- if the computed p- value is less than .05, we reject our null hypothesis.

Computation:-

Correlation coefficient = 0.6932

P value = 0.0384

Conclusion

Since p- value is less than .05,we reject our null hypothesis and conclude that there exists significant correlation between NET NPA and NET PROFIT at a significance level of 5%.

Findings of key performance ratios:-

- [1] Operating profit margin shows that the HDFC bank has the highest mean value while AXIS Bank has lowest mean value in comparison to other banks and the hypothesis that we have used shows that there exists significant difference between the mean of operating profit margin of private sector (HDFC,ICICI,AXIS,KOTAK MAHINDRA,INDUSIND) banks in India.
- [2] Return on assets shows that the HDFC bank has the highest mean value while AXIS Bank has lowest mean value in comparison to other banks and the hypothesis that we have used shows that there exists significant difference between the mean of Return on assets of private sector banks(HDFC,ICICI,AXIS,KOTAK MAHINDRA,INDUSIND) in India.

- [3] Return on equity/net worth margin shows that the HDFC Bank has the highest mean value while ICICI Bank has lowest mean value in comparison to other banks and the hypothesis that we have used shows that there exists significant difference between the mean of Return on equity/net worth margin of private sector banks(HDFC,ICICI,AXIS,KOTAK MAHINDRA,INDUSIND) in India.
- [4] Net interest margin shows that the kotak mahindra bank has the highest mean value while ICICI Bank has lowest mean value in comparison to other banks and the hypothesis that we have used shows that there exists significant difference between the mean of Net interest margin of private sector banks(HDFC,ICICI,AXIS,KOTAK MAHINDRA,INDUSIND) in India.
- [5] Interest income/total assets shows that the KOTAK MAHINDRA bank has the highest mean value while ICICI Bank has lowest mean value in comparison to other banks and the hypothesis that we have used shows that there exists significant difference between the mean of Interest income/total assets of private sector banks(HDFC,ICICI,AXIS,KOTAK MAHINDRA,INDUSIND) in India.
- [6] Operating profit/total assets shows that the HDFC bank has the highest mean value while AXIS Bank has lowest mean value in comparison to other banks and the hypothesis that we have used shows that there exists significant difference between the mean of Operating profit/total assets of private sector banks(HDFC,ICICI,AXIS,KOTAK MAHINDRA,INDUSIND) in India.
- [7] Operating expenses/total asset shows that the KOTAK bank has the highest mean value while AXIS Bank has lowest mean value in comparison to other banks and the hypothesis that we used shows that there exists significant difference between the mean of Operating expenses/total asset of private sector banks(HDFC,ICICI,AXIS,KOTAK MAHINDRA,INDUSIND) in India.
- [8] Net profit margin shows that the HDFC bank has the highest mean value while AXIS Bank has lowest mean value in comparison to other banks and the hypothesis that we used shows that there exists no significant difference between the mean of net profit margin of private sector banks(HDFC,ICICI,AXIS,KOTAK MAHINDRA,INDUSIND) in India.

Findings of correlation:-

- [1] The correlation between the Net NPA and the Net Profits of HDFC bank, Kotak Mahindra Bank and IndusInd bank is positive and statistically significant at 5% level of significance. It implies that there is a positive linear relationship between the two variables. There is a very strong correlation between the variables for HDFC bank and Kotak Mahindra Bank while it is moderately strong for IndusInd bank.
- [2] The correlation between the Net NPA and the Net Profits of Axis bank and ICICI Bank is not statistically significant at 5% level of significance. Although the correlation is not statistically significant, it can be seen that there is no correlation between the variables for ICICI Bank and there is a negative correlation for Axis Bank.

Conclusion:

According to the study, we found out that there exists significant differences among the mean values of operating profit margin, Return on assets, Return on equity/net worth margin, Net interest margin, Interest income/total assets, Operating profit/total assets, Operating expenses/total asset and no significant differences exists between the mean value of net profit margin of selected private banks.

The correlation between NET PROFIT and NET NPA of HDFC BANK, KOTAK MAHINDRA BANK and INDUSIND BANK is found to be positive which implies that if NET NPA increases, NET PROFITS will also increase and vice versa. The correlation between NET PROFIT and NET NPA of AXISBANK is found to be negative which implies that if NET NPA increases, NET PROFITS will decrease and vice versa.

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