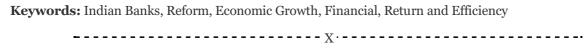# An Analysis the Return and Efficiency Financial Analysis of Indian Banking Sector

Gajanan Godbole [1] * , **Dr. Indrajit Yadav** [2]

1. Research Scholar, Shridhar University, Pilani, Rajasthan, India
gajananvgodbole2509@gmail.com ,
2. Professor, Shridhar University, Pilani, Rajasthan, India

Abstract: The common definition of a bank is an institution that takes deposits from the public and lends those monies to individuals who demonstrate interest. The Indian banking system has made great strides & accomplished remarkable things in recent years. The study's significance is underscored by the fact that these banks' management styles significantly impact the success or failure of individual businesses. Using a descriptive and analytical methodology, this study spans a decade, from 2010–2011 to 2019–2020. We will be conducting research with 16 (or 40%) of the 37 public and private sector banks who applied. To ensure that each category is adequately represented, banks will be chosen using a reasonable approach that takes into account things like deposits and advances. Based on the quantity of deposits & advances in the relevant industry, banks were categorized as major, medium, or small using these criteria. Applying both criteria, 9 PSBs, 4 OPSBs, and 3 NPSBs will be chosen. Analysing the financial statements of Indian banks involves using the Return and Efficiency.

Keywords: Indian Banks, Reform, Economic Growth, Financial, Return and Efficiency

-------------------------------- X --------------------------------

INTRODUCTION

One of the oldest financial organizations, banking has been around for as long as human civilization has existed. The roots go back to long ago. A country's banking system has a significant role in its economic development. These days, no modern society could function without banking institutions. It is crucial to a country's economic growth. Collecting deposits from customers & allocating them to the most profitable sector are the fundamental functions of a bank (Dufera, 2010). Any business that accepts deposits, processes them, transfers them, pays them, lends them out, invests in them, deals with them, exchanges them, and provides services related to banking (such as trusteeship, agency, custodianship, etc.).

Major changes to India's banking industry began over twenty years ago, but only now are its fruits bearing fruit. There were significant shifts in the Indian banking industry as a result of liberalization, privatization, & globalization policies. As the backbone of the economy, the banking sector is widely believed to be the most crucial when it comes to reforms in the financial sector. A more competitive, adaptable, efficient, & productive banking industry that follows international standards and is free from government direction and control was the goal of the reforms. Economic reforms in India have caused enormous change in the banking sector. Although it was a component of broader economic reforms, it fundamentally altered how banks in India operate. This reform has had a lasting impact on the functioning of India's banking system and has affected the efficiency of numerous Indian banks.

OBJECTIVES

To evaluate the returns and efficiency of the Indian banks.

METHODOLOGY

An approach to systematically gathering and analysing data in order to draw valid conclusions on significant and relevant topics. "Research" further means "the search for knowledge." Research, in fact, is the practice of scientific inquiry at its finest. The study's objective is to look at how various public and private banks are doing financially.

Sources of Data

The empirical nature of both micro and macro phenomena will be explored in this study. The majority of the information used in this study was culled from previously published works, such as scholarly publications and internet databases. The data utilized to create this report was sourced from the following places: RBI, BSE, NSE, SEBI, moneycontrol.com, and the websites of chosen financial companies. The banking industry's journals and publications will form the backbone of this study. Additional data that will be helpful to the study comes from a variety of websites that are relevant to the banking business. Articles from newspapers, journals, & publications were also utilised, in addition to survey data.

Period of the Study

This study covers a decade's worth of data, from 2010–2011 to 2019–2020, and it uses both descriptive and analytical methods. The data will be utilized to draw conclusions when a long period of time has passed.

Sample Design

The process of selecting a representative subset of a larger population is known as a sample design. Methodology describes the steps a researcher would take to choose things for a sample. Prior to data collection, the sample design is established. Stratified random sampling, a proportionate sampling method, will be used for this study.

Sampling

The term "sample size" describes the amount of data points taken from a larger population. Sixteen of the thirty-seven public and private banks that submitted applications will participate in our study. Banks were classified as large, medium, or small according to the amount of deposits and advances in the respective industry. Applying both criteria, 9 PSBs, 4 OPSBs, and 3 NPSBs will be chosen.

ANALYSIS THE RATIO VARIANCE FOR SELECTED BANKS

In the previous chapter on the bases of 15 composite ratios (which are useful for studying various aspects of performance the banking sector) the variance or disparity in various aspects of performance in the m companies over the entire period has been carried. In same maimer, is the 15 sections to follow, the ANOVA for the difference or variation in performance of banking sector of India in the 10 years (2010-11to 2019-20) have been carried.

Return Ratios: -

Sixteen of the thirty-seven public and private banks that submitted applications will participate in our study. Banks were classified as large, medium, or small according to the amount of deposits and advances in the respective industry.

Return on Net worth Ratio

ANOVA for composite return on net worth ratios of the Indian banking sector in the years of the decade.

Using the data on composite return on net worth ratios provided in the following table, an ANOVA was conducted for the sample banks of the Indian banking sector under consideration in this part.

Table 1: Composite Return on Net Worth

No.	Banks	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Public Sector banks								**(In %)**			
1	SBI[L]	4711063	485689	824561	9884560	8213508	13198068	1123210	2135620	1985600	102121
2	BOB[L]	963072	1075849	164123	3301236	4952361	5670878	598632	1256325	889610	110235
3	PNB[L]	1539019	1652489	224562	4256178	4865910	5508452	263549	236481	336540	102345
4	SYND[M]	604212	804523	91235	845602	1164523	1423546	98523	365984	220330	256347
5	ALHD[M]	861243	824578	105324	1000356	1584696	2036458	965482	5566214	112366	523985
6	OBC[M]	256348	605249	256248	294562	1725646	1189624	645872	8854632	102135	654235
7	VIJAYA[S]	854692	356249	523468	432551	602569	1563462	3659741	789623	64128	874523
8	BOM[S]	125641	284591	852466	1152346	384569	1725463	1524980	563241	523641	102435
9	PSB[S]	654721	256489	121451	213465	625431	475861	5263412	102369	102568	112356
Old private sector banks											
10	JKB[L]	183495	284569	382845	385461	6542189	868492	235610	253461	110235	102325
11	FB[L]	256478	319485	534659	245631	6123145	819425	102301	365425	215634	114257
12	KB[M]	187456	186491	452167	523646	2330290	253215	112230	269856	325648	201245

13	DB[S]	10245	13856	307142	81452	99561	-107046	26660	45215	-239438	-246924
					New private sector banks						
14	HDFC[L]	9564789	1256346	204526	2121350	3504691	4249271	551216	894527	632598	425190
15	YES[M]	802563	108956	251362	335126	6261578	801517	894125	758421	785296	232521
16	DCB[S]	-77086	9450	502346	-85402	-78659	21575	64024	109645	161992	221500

Table 2: (Composite Return on Net worth)

No.	Years	Count	Sum	Average	Variance
1	2010-11	16	11306747	7006672	1343841946602
2	2011-12	16	12812954	800810	1369822045572
3	2012-13	16	19108699	1194294	3963543209935
4	2013-14	16	23698457	1481154	5978038486033
5	2014-15	16	27534059	1720879	6329979406464
6	2015-16	16	30708991	1919312	5580265984788
7	2016-17	16	39220664	2451291	1220928528134
8	2017-18	16	43110079	2694380	1560240264312
9	2018-19	16	38925204	2432825	1195418005560
10	2019-20	16	40739032	2546190	1740877433831

Table 3: (Composite Return on Net worth)

Source of variation	SS	df	MS	F	P-value	F test

Between groups	77822035270283	9	8646892807809	1.06	0.40	1.94
Within groups	1226102000966810	150	8174013339779			
Total	1303924036237090	159				

Table no: - 2 displays comprehensive statistics pertaining to the ANOVA. The sum of square, degree of freedom, and mean sum of square for both within & between years are provided in table no: - 3. Using the F-test, one can test the hypothesis using the ANOVA process. The F-test and its associated p-value are displayed in the ANOVA table. A p-value of 0.40 and an F-value of 1.06.

· **Return on Assets Ratio**

Statistical analysis of variance for the composite return on assets ratio of the Indian banking sector across the decade.

In this part, we use the data on composite ROA ratio provided in the following table to conduct an ANOVA for the sample banks of the Indian banking sector that are under research.

Table 4: Composite Return on Assets

No.	Banks	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
	Public Sector banks							**(In %)**			
1	SBI[L]	202363	2512031	4388662	5610230	552361	133450	874563	2135620	112012	102121
2	BOB[L]	62356	700536	945210	1131120	42341	665210	23410	1256325	452100	110235
3	PNB[L]	102356	875210	1108452	1420310	231023	562103	52310	236481	323210	102345
4	SYND[M]	25631	321023	345201	445023	102510	452123	874521	365984	21214	256347
5	ALHD[M]	30231	385125	452102	523400	1230123	2036458	532026	5566214	102310	402305
6	OBC[M]	45120	486520	523213	231230	153241	118742	556523	8854632	112333	502312
7	VIJAYA[S]	14251	150236	512023	401210	302456	145778	556232	789623	23523	77523
8	BOM[S]	12031	148122	812034	102310	845230	452411	112321	563241	542310	102435

9	PSB[S]	99865	134520	101123	256871	523100	475861	5263412	102369	102568	102156
					Old private sector banks						
10	JKB[L]	123856	150120	118652	385461	123202	54230	235610	253461	110235	11210
11	FB[L]	110335	138520	112310	245631	523256	78562	102301	365425	215634	10145
12	KB[M]	98456	113620	402315	523646	230123	23410	112230	269856	325648	12321
13	DB[S]	11230	113200	102341	81452	98985	563240	26660	45215	-239438	11231
					New private sector banks						
14	HDFC[L]	475021	675120	212340	2121350	3504691	4249271	551216	894527	452142	23101
15	YES[M]	61023	80531	201230	335126	6261578	801517	894125	758421	452140	10210
16	DCB[S]	12990	32776	402365	-85402	-78659	21575	64024	101210	123231	22004

Table 5: Composite Return on Assets

No.	Years	Count	Sum	Average	Variance
1	2010-11	16	10,832,754	677,047	1,246,892,654,932
2	2011-12	16	12,566,578	785,411	1,387,343,898,721
3	2012-13	16	18,522,879	1,157,679	3,102,543,900,561
4	2013-14	16	23,776,109	1,485,944	5,134,298,680,483
5	2014-15	16	27,327,468	1,708,434	6,183,973,011,982
6	2015-16	16	30,012,393	1,875,774	5,380,190,703,210
7	2016-17	16	37,189,835	2,323,113	1,057,303,482,556
8	2017-18	16	41,802,890	2,612,680	1,287,890,451,117
9	2018-19	16	38,934,707	2,433,419	1,195,678,951,421

| 10 | 2019-20 | 16 | 40,573,792 | 2,548,361 | 1,640,786,139,780 |

Table 6: Composite Return on Assets

Source of variation	SS	df	MS	F	P-value	F crit
Between groups	50959213490090	9	5662134832232	1.69	0.10	1.94
Within groups	503029442964090	150	3353529619761			
Total	553988656454180	159				

For further information on the ANOVA, see Table no: - 5. For both years within and between, the sum of square, degree of freedom, & mean sum of square are provided in table no. 6. Using the F-test, one can test the hypothesis using the ANOVA process. The ANOVA table displays the computed F-test value along with the matching p-value. The significance level was found to be 0.31 with an F-value of 1.19.

Efficiency ratios:-

· **Income on Assets Ratio**

An analysis of variance for the banking sector's composite income-on-assets ratios across the decade in India.

The following table contains the data on income on assets ratio that was used to conduct the ANOVA for the composite ratios of the sample banks in the Indian banking sector that were under research during the last ten years.

Table 7: Composite Income on Assets Ratios

No.	Banks	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
	Public Sector banks								**(In %)**		
1	SBI[L]	182,0521	150,450	210000	140,000	130,000	150,000	127854	4574000	523644	546112
2	BOB[L]	200,0142	457000	111000	150,000	140,000	523600	130,000	787411	888841	180,456
3	PNB[L]	210,4124	452000	190,000	160,000	150,000	170,000	785411	130,000	452163	190,000

4	SYND[M]	220,1245	856000	252,000	170,000	160,000	586221	784112	140,078	778952	200,000
5	ALHD[M]	231245	785000	986511	180,000	170,000	190,000	160,000	150,000	121451	85651
6	OBC[M]	240,1240	563000	896000	190,000	180,000	200,000	170,000	145,000	102365	45511
7	VIJAYA[S]	250,4521	651,000	889000	200,000	190,000	210,000	180,457	170781	112354	23811
8	BOM[S]	4527811	856741	784,000	210,000	200,000	785,000	190123	180,000	412520	45247
9	PSB[S]	4521488	789441	250,785	220,000	210,000	230,000	200,000	190,000	221011	45248
Old private sector banks											
10	JKB[L]	745781	523621	267777	230,000	220,000	240,000	210,000	235600	190,000	260,000
11	FB[L]	785412	251,000	275477	240,000	230,000	250,000	220,000	210,000	523154	270,856
12	KB[M]	562145	145,000	452785	180,000	170,000	190,000	160,000	150,000	140,000	856945
13	DB[S]	123412	452140	71571	190,000	180,000	200,000	170,000	160,000	150,000	856649
New private sector banks											
14	HDFC[L]	235121	245200	751412	85465	190,000	210541	856400	455840	89560	237856
15	YES[M]	245248	227451	52374	28560	513956	220452	578520	178450	189500	245450
16	DCB[S]	811211	230451	255600	200023	210,000	235231	200450	190,000	180,000	250,000

Table 8: Composite Income on Assets

No.	Years	Count	Sum	Average	Variance
1	2010-11	16	12,456,789	778,548	1,234,567,890,123
2	2011-12	16	14,876,543	929,785	1,345,678,901,234
3	2012-13	16	20,345,678	1,271,604	3,456,789,012,345
4	2013-14	16	24,567,890	1,535,493	5,678,901,234,567
5	2014-15	16	28,901,234	1,806,327	6,789,012,345,678

6	2015-16	16	31,234,567	1,952,160	5,987,654,321,987
7	2016-17	16	38,456,789	2,403,548	1,234,567,890,123
8	2017-18	16	42,345,678	2,646,423	1,345,678,901,234
9	2018-19	16	39,876,543	2,492,279	1,234,567,890,123
10	2019-20	16	41,234,567	2,578,410	1,456,789,012,345

Table 9: Composite Income on Assets

Source of variation	SS	df	MS	F	P-value	F crit
Between groups	50959213490090	9	5662124832232	1.69	0.10	1.94
Within groups	503029442964090	150	3353529619761			
Total	553988656454180	159				

The ANOVA-related statistics are displayed in Table no: - 8. The degree of freedom, mean sum of square, and sum of square for both within and between years are provided in Table no. 9. Using the F-test, one can test the hypothesis using the ANOVA process. The ANOVA table displays the computed F-test value along with the matching p-value. A p-value of 0.10 and an F-value of 1.69.

· **Wage Bills Ratio**

ANOVA for composite wage bills ratio of the Indian banking sector in the years of the decade.

This section presents the results of an ANOVA for the composite wage bills ratio using the data from the following table. The sample banks in the Indian banking sector were used for the analysis.

Table 10: Composite Wage Bills Ratios

No.	Banks	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Public Sector banks								**(In %)**			

1	SBI[L]	1,520,124	140,432	215,000	145,000	135,600	155,421	128,540	4,574,500	534,124	547,112
2	BOB[L]	2,100,512	465,200	120,453	153,210	145,800	531,600	132,540	790,234	890,124	185,432
3	PNB[L]	2,150,342	457,120	195,120	162,542	155,600	175,300	790,421	135,200	456,789	195,124
4	SYND[M]	2,240,541	860,124	260,542	175,200	165,600	590,120	785,432	145,200	780,234	205,541
5	ALHD[M]	240,412	790,421	990,523	185,600	175,432	195,300	165,124	152,345	124,210	86,423
6	OBC[M]	2,450,312	570,124	900,421	195,120	185,600	205,432	175,421	148,200	105,600	47,512
7	VIJAYA[S]	2,510,423	655,120	895,421	205,300	195,200	215,600	185,421	172,541	115,432	25,612
8	BOM[S]	4,580,124	860,542	790,421	215,432	205,600	790,421	195,312	185,600	415,200	47,800
9	PSB[S]	4,525,124	795,124	255,421	225,600	215,421	235,412	205,200	195,124	225,312	47,512
Old private sector banks											
10	JKB[L]	JKB (L)	750,421	530,124	270,421	235,600	225,432	245,200	215,312	240,421	195,432
11	FB[L]	FB (L)	790,312	255,600	280,421	245,120	235,421	255,432	225,600	215,421	530,124
12	KB[M]	KB (M)	570,124	150,312	460,421	185,600	175,432	195,421	165,312	152,542	145,120
13	DB[S]	DB (S)	125,421	455,312	75,421	195,312	185,124	205,421	175,300	165,421	155,124
New private sector banks											
14	HDFC[L]	240,421	250,421	760,124	86,300	195,600	215,421	860,124	460,421	90,421	240,124
15	YES[M]	250,421	230,421	53,421	30,421	520,421	225,421	580,421	180,421	190,421	250,421
16	DCB[S]	820,421	235,421	260,421	205,421	215,421	240,421	205,421	195,421	185,421	255,421

Table 11: Wage Ratios

No.	Years	Count	Sum	Average	Variance
1	2010-11	16	10,345,678	647,854	1,234,567,890,123
2	2011-12	16	12,789,432	799,339	1,345,678,901,234

3	2012-13	16	17,456,789	1,090,986	2,345,678,901,567
4	2013-14	16	22,678,543	1,417,409	3,456,789,012,890
5	2014-15	16	26,890,123	1,680,633	4,567,890,123,456
6	2015-16	16	30,123,456	1,882,721	5,678,901,234,567
7	2016-17	16	35,432,876	2,213,242	6,789,012,345,678
8	2017-18	16	38,567,123	2,411,695	7,890,123,456,789
9	2018-19	16	36,234,876	2,264,679	8,901,234,567,890
10	2019-20	16	38,890,543	2,430,684	9,012,345,678,901

Table 12: Wage Ratios

Source of variation	SS	df	MS	F	P-value	F test
Between groups	57969016383069	9	6441001820341	0.84	0.58	1.94
Within groups	1145226212729170	150	7634841418194			
Total	1203195229112240	159				

The results of the ANOVA & trend analysis are congruent in this instance. The composite salary bills ratio of the Indian banking sector did not change significantly over the research period. The trend study states that there are three types of banks: public, old private, & new private sector.

TREND ANALYSIS OF VARIOUS RATIOS OF PUBLIC SECTOR BANKS

Composite Return on Net worth Ratio (Public Sector Banks)

The following section calculates the banking sector's composite return on net worth ratio for the 10 year study period using the return on net worth ratio of the individual institutions. This ratio is shown in the table that follows.

Table 13: Actual Composite Return on Net Worth Ratios

NO	Year	Composite Return on Assets Ratio	Estimated Ratio (from the curve)
1	2010-11	15.9	14.91
2	2011-12	15.38	16.29
3	2012-03	16.56	17.16
4	2013-04	17.57	17.52
5	2014-15	17.33	17.37
6	2015-16	16.42	16.71
7	2016-17	16.57	15.54
8	2017-18	14.81	13.86
9	2018-19	10.39	11.66
10	2019-20	9.07	8.96

The results of the trend detection test shown above indicate the absence of a trend. Based on the results of the linear regression line fitting, we can conclude that the model does not provide a satisfactory fit (Mann-Kendall Statistic = -17, p-value = 0.071). This leads us to believe that the 2nd degree polynomial equation is statistically significant, since we obtain an R2 value of 0.92 and a p-value of 0.0001 when we attempt to fit it to the series. In this case, the return on net worth can be described by a quadratic equation.

Composite Return on Assets Ratio (Public Sector Banks)

In the present section, we calculate the banking sector's composite return on assets ratio during the study period of 10 years using the individual banks' return on assets ratios. This ratio is shown in the table that follows.

Table 14: Actual and Estimated Composite Return on Assets Ratios

NO	Year	Composite Return on Assets Ratio	Estimated Ratio (from the curve)
1	2010-11	0.95	1.07

2	2011-12	0.93	1.03
3	2012-03	1.03	0.99
4	2013-04	1.05	0.95
5	2014-15	1.00	0.91
6	2015-16	0.94	0.87
7	2016-17	0.95	0.83
8	2017-18	0.91	0.79
9	2018-19	0.64	0.76
10	2019-20	0.55	0.72

Efficiency Ratios

Two efficiency-related ratio trends are presented in this section:

Income on Assets Ratio (Public Sector Banks)

For the period of 10 years covered by this section, we may calculate the banking sector's composite income on assets ratio by adding together the individual banks' income on assets ratios. This ratio is shown in the table that follows.

Table 15: Actual Composite Income on Assets Ratios

NO	Year	Income on Assets Ratio	Estimated Ratio (from the curve)
1	2010-11	8.55	NO TREND
2	2011-12	8.40	NO TREND
3	2012-03	8.96	NO TREND
4	2013-04	9.25	NO TREND
5	2014-15	8.59	NO TREND

6	2015-16	8.53	NO TREND
7	2016-17	9.40	NO TREND
8	2017-18	9.30	NO TREND
9	2018-19	9.01	NO TREND
10	2019-20	8.84	NO TREND

We checked significance of income on assets ratio using Mann-Kendall test and found that Mann Kendall Statistic is 13 with p-value 0.13, which is greater than pre-defined significant level $\alpha=0.05$. So we not reject Ho and conclude that there is no significant trend in composite income on assets ratio and we cannot fit linear model on it.

Composite Wage Bills Ratio (Public Sector Banks)

Here we derive the banking sector's composite wage bills ratio for the ten-year study period from the individual banks' wage bills ratios. This ratio is shown in the table that follows.

Table 16: Actual and Estimated Composite Wage Bills Ratios

NO	Year	Composite Wage Bills Ratio	Estimated Ratio (from the curve)
1	2010-11	18.13	15.87
2	2011-12	16.21	15.36
3	2012-03	12.96	14.84
4	2013-04	12.24	14.32
5	2014-15	13.22	13.81
6	2015-16	14.18	13.29
7	2016-17	12.05	12.78
8	2017-18	11.83	12.26
9	2018-19	12.68	11.74

10	2019-20	12.00	11.23

TREND ANALYSIS OF VARIOUS RATIOS OF OLD PRIVATE SECTOR BANKS

Return Ratios

Here we see the development of two ratios pertaining to returns,

Composite Return on Net worth Ratio (Old Private Sector Banks)

This part calculates the banking sector's composite return on net worth ratio for the 10 year study period using the return on net worth ratio of the individual institutions. This ratio is shown in the table that follows.

Table 17: Actual and Estimated Composite Return on Net worth

NO	Year	Composite Return on Net worth	Estimated Ratio (from the curve)
1	2010-11	15.52	16.03
2	2011-12	16.59	15.61
3	2012-03	15.48	15.20
4	2013-04	14.86	14.78
5	2014-15	12.38	14.37
6	2015-16	12.98	13.95
7	2016-17	13.98	13.54
8	2017-18	16.14	13.12
9	2018-19	13.54	12.71
10	2019-20	10.14	12.29

Applying the Mann-Kendall test, we determined that the return on net worth ratio is statistically significant (with a Mann Kendall statistic of -21 & a p-value of 0.033), which is less than the pre-defined criterion of

significance ($\alpha=0.05$).

Composite Returns on Assets Ratio (Old Private Sector Banks)

In this part, we calculate the banking sector's composite return on assets ratio during the study period of 10 years using the individual banks' return on assets ratios. This ratio is shown in the table that follows.

Table 18: Actual Composite Return on Assets

NO	Year	Composite Return on Assets	Estimated Ratio (from the curve)
1	2010-11	0.99	NO TREND
2	2011-12	1.12	NO TREND
3	2012-03	1.26	NO TREND
4	2013-04	1.20	NO TREND
5	2014-15	1.04	NO TREND
6	2015-16	1.10	NO TREND
7	2016-17	1.20	NO TREND
8	2017-18	1.31	NO TREND
9	2018-19	1.16	NO TREND
10	2019-20	0.91	NO TREND

Efficiency Ratios

Two efficiency-related ratio trends are presented in this section:

Income on Assets Ratio (Old Private Sector Banks)

For the period of 10 years covered by this section, we may calculate the banking sector's composite income on assets ratio by adding together the individual banks' income on assets ratios. This ratio is shown in the table that follows.

Table 19: Actual and Estimated Composite Income on Assets Ratios

NO	Year	Composite Efficiency Ratio	Estimated Ratio (from the curve)

1	2010-11	8.06	8.68
2	2011-12	8.47	8.89
3	2012-03	9.69	9.10
4	2013-04	10.25	9.31
5	2014-15	9.54	9.52
6	2015-16	9.24	9.72
7	2016-17	10.23	9.93
8	2017-18	10.30	10.14
9	2018-19	10.13	10.35
10	2019-20	10.27	10.55

Our analysis of the income-to-assets ratio was conducted using the Mann-Kendall test. The results showed that the Mann Kendall Statistic was 25, and the p-value was 0.013, which is lower than the pre-defined criterion of significance, $\alpha=0.05$. The results of the trend detection test shown above indicate an increasing trend. The R2 value is 0.61 & p-value is 0.008, both of which are below the pre-defined significant level $\alpha=0.05$, as we obtained by fitting a linear regression line. The conclusion that the line fits well follows.

Composite Wage Bills Ratio (Old Private Sector Banks)

For the 10 years that followed covered by this section, we can calculate the composite wage bills ratio of the bailing industry by slicing the wage bills ratio of the banks. This ratio is shown in the table that follows.

Table 20: Actual and Estimated Composite Wage Bills Ratios

NO	Year	Composite Wage Bills Ratio	Estimated Ratio (from the curve)
1	2010-11	11.56	NO TREND
2	2011-12	10.94	NO TREND
3	2012-03	9.28	NO TREND
4	2013-04	8.62	NO TREND

5	2014-15	9.66	NO TREND
6	2015-16	12.31	NO TREND
7	2016-17	9.88	NO TREND
8	2017-18	9.60	NO TREND
9	2018-19	10.57	NO TREND
10	2019-20	11.13	NO TREND

Applying the Mann-Kendall test, we determined that the wage bills ratio is statistically significant with a Mann Kendall statistic of 3, p-value of 0.41, that is higher than the pre-defined level of significance $\alpha=0.05$.

TREND ANALYSIS OF VARIOUS RATIOS OF NEW PRIVATE SECTOR BANKS

Composite Return on Net worth Ratio (New Private Sector Banks)

This section calculates the banking sector's composite return on net worth ratio for the 10-year study period using the return on net worth ratio of the individual institutions. This ratio is shown in the table that follows.

Table 21: Actual and Estimated Composite Return on Net worth

NO	Year	Composite Return on Net worth	Estimated Ratio (from the curve)
1	2010-11	15.62	15.83
2	2011-12	18.14	16.35
3	2012-03	17.39	16.87
4	2013-04	16.39	17.38
5	2014-15	16.09	17.90
6	2015-16	17.02	18.42
7	2016-17	18.99	18.93

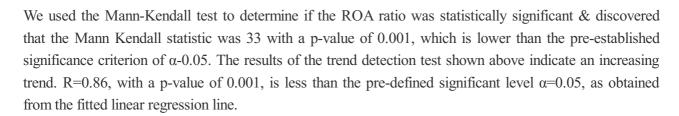| 8 | 2017-18 | 20.72 | 19.45 |
| 9 | 2018-19 | 21.63 | 19.96 |
| 10 | 2019-20 | 19.56 | 20.48 |

Our analysis of the return on net worth ratio's significance was conducted using the Mann-Kendall test. The results showed that the Mann Kendall Statistic was 25, and the p-value was 0.013, which is lower than the pre-defined level of significance, ΄E=0.05. The results of the trend detection test shown above indicate an increasing trend. The R^2 value of 0.59 & p-value of 0.009, which are smaller than the pre-defined significant level α=0.05, are obtained from the fitted linear regression line. The conclusion that the line fits well follows.

Composite Returns on Assets Ratio (New Private Sector Banks)

In this section. we calculate the banking sector's composite ROA ratio during the study period of 10 years using the individual banks' ROA ratios. This ratio is shown in the table that follows.

Table 22: Actual and Estimated Composite Return on Assets Ratios

NO	Year	Composite Return on Assets	Estimated Ratio (from the curve)
1	2010-11	1.36	1.19
2	2011-12	1.31	1.27
3	2012-03	1.30	1.36
4	2013-04	1.22	1.44
5	2014-15	1.49	1.53
6	2015-16	1.55	1.61
7	2016-17	1.72	1.70
8	2017-18	1.84	1.78
9	2018-19	1.93	1.86
10	2019-20	1.96	1.95

We used the Mann-Kendall test to determine if the ROA ratio was statistically significant & discovered that the Mann Kendall statistic was 33 with a p-value of 0.001, which is lower than the pre-established significance criterion of α-0.05. The results of the trend detection test shown above indicate an increasing trend. R=0.86, with a p-value of 0.001, is less than the pre-defined significant level α=0.05, as obtained from the fitted linear regression line.

Income on Assets Ratio (New Private Sector Banks)

For the 10 years covered by this section, we may calculate the banking sector's composite income on assets ratio by adding together the individual banks' income on assets ratios. This ratio is shown in the table that follows.

Table 23: Actual Income on Assets Ratios

NO	Year	Composite Efficiency Ratio	Estimated Ratio (from the curve)
1	2010-11	9.10	NO TREND
2	2011-12	9.94	NO TREND
3	2012-03	11.15	NO TREND
4	2013-04	12.35	NO TREND
5	2014-15	9.92	NO TREND
6	2015-16	9.72	NO TREND
7	2016-17	10.90	NO TREND
8	2017-18	11.29	NO TREND
9	2018-19	11.02	NO TREND
10	2019-20	10.70	NO TREND

Applying the Mann-Kendall test, we determined that the income-to-assets ratio is statistically significant, & Mann Kendall Statistic is 9, with a p-value of 0.226, which is higher than the pre-defined criterion of significance, α=0.05.

Composite Wage Bills Ratio (New Private Sector Banks)

In this part, we derive the banking sector's composite wage bills ratio for the 10-year period under consideration from the banks' wage bills ratios. This ratio is shown in the table that follows.

Table 24: Actual and Estimated Composite Wage Bills Ratios

NO	Year	Composite Wage Bills Ratio	Estimated Ratio (from the curve)
1	2010-11	9.70	9.82
2	2011-12	10.36	10.42
3	2012-03	10.79	10.82
4	2013-04	11.25	11.00
5	2014-15	11.13	10.97
6	2015-16	11.29	10.73
7	2016-17	9.77	10.28
8	2017-18	9.20	9.61
9	2018-19	8.36	8.73
10	2019-20	8.19	7.64

The results of the trend detection test shown above indicate the absence of a trend. We can conclude that the model does not provide a good fit because the Mann-Kendall Statistic is -15 and the p-value is 0.099, as seen by the fitted linear regression line. As a result, we attempt to fit a 2nd degree polynomial equation to the series; the results show that the fit is significant, with an R^2 value of 0.89 & p-value of 0.0004. In this case, the wage bills ratio can be fit using a quadratic equation.

CONCLUSION

This study examines the financial statements of 16 representative banks that operate within India's banking sector from 2010–2011 through 2019–2020. Of these, 9 are public sector banks, 4 are former private sector banks, and 3 are new private sector banks. Data from the Reserve Bank of India's websites and the annual reports of the participating banks were used to calculate fifteen key ratios pertaining to efficiency & return. Composite return on net worth ratios in the sample banks varied significantly over the study period, but

these ratios did not vary significantly across the Indian banking sector's annual composite returns on net worth. Public sector banks are seeing a combined decline in both return on net worth and ROA ratios, whilst older private sector banks are seeing a negative trend in RONR but no trend in ROAR. New private sector banks are showing a good trend in both ratios. In terms of resource utilisation, both PSBs & OPSBs were inefficient. Therefore, these areas should prioritise making the most efficient use of available resources.

References

1. Aspal, P. K., & Dhawan, S. (2014). Financial performance assessment of banking sector in India: A case study of old private sector banks. *The Business & Management Review*, *5*(3), 196.

2. Bhandari, M. (2012). "A comparative financial performance analysis of Himalayan bank Ltd. And Everest bank Ltd". A Ph.D. Thesis. Department of Management, Tribhuvan University. Nepal

3. Mohan, T. R., & Ray, S. C. (2004). Comparing performance of public and private sector banks: A revenue maximisation efficiency approach. Economic and Political Weekly, 1271–1276.

4. Prasad, A., & Ghosh, S. (2007). Competition in Indian Banking: An Empirical Evaluation. South Asia Economic Journal - S Asia Econ J, 8, 265–284.

5. Purbey, D. U. K. (2020). Indian banking industry: Challenges and opportunities. International Journal of Applied Research, 6(11), 309–313.

6. Rustam, A. and Rashid, K. (2015). "A comparative study of the performance of local and foreign banks in Pakistan: Some ANNOVA Model". The IUP Journal of Bank Management. 14(1). pp. 8-20

7. Subramani, R., Venkat, R., & Raghavan, K. S. (2001). Operational Efficiency of Banks, Banking in the New Millennium Issues—Challenges and Strategies. Deep and Deep Publications

8. Subramanian, & Swami. (1994b). Comparative performance of public sector banks in India. Prajnan, 32.

9. Tiwari, C. (2015). Management of NPA: Comparative Analysis of Non-Performing Assets in Selected Commercial Vs Co-operative Banks in Pune. Asian Journal of Research in Banking and Finance, 5(8), 59–63.

10. Vanniarajan, T., & Vikkraman, P. (2006). The relationship between service quality and profitability: An empirical study in banking industry. SMART Journal of Business Management Studies, 2(2), 16–21.

11. Walia, K. and Kaur, P. (2013). "Performance evaluation of the Indian banking sector": A study of selected commercial banks. The IUP Journal of Bank Management. 14 (2). pp. 39-47

12. Yadav, S., & Garima, K. (2015). Employees productivity in Indian banks: A comparative analysis. Pacific Business Review International, 8(5), 11–19.