Cost of Funds Vs Return on Advances – A Comparative Study of Scheduled Commercial Banks in India

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DOI: https://doi.org/10.23874/amber/2022/v13/i12/219188

Abstract

In the light of shrinking gap between interest income and interest cost, this paper examines the trend in interest cost and income ratios, and also the differences among three groups of scheduled commercial banks viz., public sector banks, private sector banks and branches of foreign banks in India. For this purpose, data for 16 years from 2004-05 to 2019-20 are used and analysed with descriptive statistics besides t-test and Levene's test. The study finds that the cost of fund ratios are lower for branches of foreign banks followed by private sector banks and public sector banks. As far as the return on advances/ investment ratios are concerned, private sector banks have improved their performance more than the public sector banks and branches of foreign banks. Further, in terms of return on advances and investments adjusted to cost of funds, the branches of foreign banks are more profitable among three groups of scheduled commercial banks, and between two groups of domestic scheduled commercial banks, private sector banks are more profitable than the public sector banks.

Keywords: Cost of Deposits, Cost of Funds, Return on Advances/Investment, Returns adjusted to Cost of Funds, Scheduled Commercial Banks.

1. Introduction

Banking companies are primarily associated with the acceptance of deposits and lending activities. Over the years, they have diversified their lines of servicesby designing and introducing many new banking services. Still, mobilization of deposits and lending activities continue to be the major lines of business of banking companies. This becomes evident from the fact that the interest cost on deposits/borrowings of scheduled commercial banks (SCBs) in India accounts for 68.70% of their total cost for 2019-20. Similarly, for 2019-20, interest income from loans and advances, and from investment of these SCBs account for 84.19% of their total income. Comparatively lower interest cost to total cost ratio is due to the exclusion of 'wages and salaries' from 'interest cost' category and their inclusion in 'non-interest costs' category.

Both the amount and rate of profit depend upon the ability of banking companies to keep the interest cost at the lower possible/permissible level and to earn the maximum possible interest income. These two are influenced by the rates of interests on deposits and borrowings, and the rates of returns on loans and advances and investments. Of course, they are also influenced by the amounts of deposits and borrowings, and loans and investments.

1.1. Unavoidability Vs Uncertainty

Banking sector plays a pivotal role in the overall development of the economy by providing a safe place for the public to park their surplus fund and also by channelizing the fund so mobilized for different sectors of the economy. And this deposit is one of the major sources of fund for banking companies for their second important business viz., lending. Therefore, banking companies have designed a few deposit schemes (also called, financial products) keeping in mind the requirements of different categories of depositors and also different purposes for which they park their funds

with the banks.Besides, the banks also borrow some amounts from a few sources which normally include inter-branch borrowings, inter-bank borrowings and other debts.What is important is, no bank is permitted to accept interest-free deposits (other than in Current Account). And the borrowings by banks are always associated with interest at specific/agreed rates depending upon the source, duration, purpose, amount of borrowings, etc.And the payment of interest by the banks on both deposits and borrowings periodically is mandatory irrespective of whether they (i.e., banks) earn profit or not. This is compulsory and therefore, this payment is unavoidable/inescapable.

The funds so mobilized are used by the banking companies for the purpose of their lending activities.Lending by the SCBs comprises bills purchased and discounted, cash credits, overdrafts and loans, and term loans. These loans include both the loans secured by tangible assets and/or covered by bank/government guarantees, and unsecured loans. Further, they comprise both the advances in India and outside India.Besides lending, banks also make certain investments and major portion of this investment (about 80%) in government securities which are risk-free investments. For the loans, the banking companies charge interest based on Base Rate and by including customer specific charges. However, there is an element of uncertainty about the receipt of interest income from their lending and/or investment as a few borrowers (including corporate borrowers) fail to pay the interest. Therefore, there is an element of uncertainty about the receipt of interest income.

These two aspects viz., unavoidability of interest cost payment and uncertainty about the receipt of interest income are disrupting the banking companies – the gap between income and expenses is shrinking leading to decrease in profit and/or increase in loss.

2. Review of Literature

In the light of heightened competition in Indian banking industry during post-1991 financial sector reforms, Shollapur and Baligatti (November 2010) examined the profitability of funds management in the selected Indian banks withan emphasis on cost-benefit perspective. They used the relevant data for 12 public sector banks (PSBs) for eight years, 1999-2000 to 2006-07. Based on their performance, these banks were classified into three groups as high-profile banks (HPBs), medium profile banks (MPBs) and low-profile banks (LPBs). And each group comprised four PSBs selected randomly. The study showed that the overall cost of funds has registered a declining trend in the case of HPBs as better performing HPBs were able to obtain funds in the call money market. Further, returns on advances of HPBs have improved during the study period. However,the LPBs have recorded higher return than other two categories of PSBs.**Mathuva (2009)** examined the relationship between Return on Equity (RoE) and Return on Assets (RoA) on the one hand, and capital adequacy ratios (CARs) and Cost-Income Ratio on the other selected Kenyan banks. The study found that, profitability is positively related to core capital ratio (i.e., risk adjusted capital adequacy measure) and negatively related to Cost-Income Ratio. It is also found that the non-risk weighted capital adequacy measure (i.e., equity capital ratio) is negatively related with both the profitability ratios viz., RoE and RoA.

Ronald (May/June 1978) identified the inappropriate method followed for the purpose of estimating the cost of funds as the weakness of Franklin National Bank of Philadelphia. During the period of high interest rate regime, the bank underestimated the cost of mobilizing money consistently. Further, the cost of money that the bank borrowed for investment was higher than the return on investment (it was making).Roshni (July-August 2014) analysed the relationship between Statutory Liquidity Ratio (SLR) and Cash Reserve Ratio (CRR) on the one hand, and the loans and advances on the other. The researcher used the data of State Bank of India (SBI) for six years, 2005-06 to 2010-11 (the period that witnessed high volatility in both SLR and CRR). The study reiterated that both SLR and CRR have significant negative impact on their lending activities. Using the datasets for both wholesale funding costs and deposit rates for a large sample of

euro area banks, **Guillaume**, **Cosimo and Dawid (January 2020)** examined the relationship between bank funding costs and solvency. They also examined the relationship between senior bond yields, term deposit rates and overnight deposit rates on the one hand, and bank solvency on the other. It was observed that the interest rates for overnight deposits are least sensitive. Besides, it is found that the asset quality, profitability and liquidity of banks play a minor role in driving funding costs. Contrarily, monetary policy, sovereign risk and uncertainty in financial markets appear to be the major forces driving the funding costs.

With the help of statistics (pertaining to six major lenders of Qatar for a period of eight years, 2008-2015,collected from 'worldwide bankscope database'), El-Kassem (31 August 2017) examined the major determinants of profitability of banking companies, and the implications of liquidity and risk variables on their performance. The author considered the RoA as dependent variable, and the liquidity and risk variables as the independent variables. The results showed that, variation in the independent variables has a significant positive effect on the explained variation in the performance, RoA. On the other hand, Cost-Income Ratio has significant negative impact on the performance of banking companies in Qatar. Besides, the study found significant negative impact of variation in 'reserves for NPAs' and in 'Loan to Assets Ratio' on the RoA.Swain (2007-08) undertook a study to delve into the existing pricing mechanism in the Indian banking sector and to develop an effective pricing model for the banks functioning in a highly competitive environment. It is assumed that a price structure can be provided where a series of price levels would represent how a product/service will be priced. These price levels may permit flexibility in pricing by providing variations in price depending upon the product features, customer differences, purchase behaviour, etc.Using a large sample of individual loans, borrowers and banks, **Glenn, Kenneth and Darius (7 June 1999)** examined the implications of borrower and bank characteristics on loan interest rates. The study found that, (i) cost of borrowing from low-capital banks is higher than that from well-capitalized banks, (ii) weak bank effects on cost of funds are higher in periods of aggregate contractions in bank lending, and (iii) the companies facing high information costs hold more cash.

Anna and Peter (July 2020) analysed the implications of changes in regulatory framework on the cost of capital and lending of banking companies. They noted that, during the post Dodd-Frank Act, the cost of capital of banks has averaged 10.50% declining by more than 4%. It was further observed that the decrease in the cost of capital was much higher for larger banks subjected to new regulations than for other banks. On the other hand, increase in the cost of capital of banking companies is associated with tightening of credit supply and lending.In its white paper, Oracle Financial Services (September 2017) felt that the banks should treat their challenges(rising costs, shrinking margins, increasing competition and stringent regulations) as drivers and not as impediments to their growth.And to remain sustainable, competitive and profitable, the banks should manage their costs efficiently. However, 'cost management'does not necessarily mean cost reduction and cost control.Although short-term cost reduction exercises may ensure quick benefits, they may not be sustainable in the long-term. Further, theymay result in the loss of competitive edge of banks. Therefore, it is suggested to undertake a comprehensive cost-benefit analysis of processes, products, people and infrastructure to manage their costs efficiently and to improve their profitability.With the help of data from 534 banks from 19 emerging market economies, **Kohlscheen, Murcia and Contreras (2018)** analysed the important determinants of profitability of banking companies. They found that, higher long-term interest rates tend to boost profitability while higher short-term interest rates reduce profitability by increasing funding costs. In normal times, credit trend plays a crucial role in the profitability of banking companies than the growth rate in gross domestic product.The study also

showed that the increase in sovereign risk premia significantly lowers the profitability of banks.

Rita and Marco (April 2014) analysed the determinants of bank funding costs of a few internationally active banks from 2001 to 2012.They found that the changes in banks' funding costs are associated with the bank-specific characteristics like credit worthiness of institution, return on its market value, and the level and quality of capital. Besides, the market forces such as the level of investor risk appetite and shocks to financial markets have acted as key drivers of sharp increase in the bank funding costs. Further, the study showed that the increased amount of capital buffers supports the bank lending to real economy by lowering bank funding costs. Gowda (May-August 2020)examined the lending by PSBs, private sector banks (PVSBs) and branches of foreign banks (FBs)to priority and non-priority sectors, and also the extent to which these loans are causing the increase in their NPAs. Using the data for 12 years, 2007-08 to 2018-19, significant difference was found between non-priority sector lending and priority sector lending from the point of view of NPAs of SCBs. The study further showed that the general perception, 'priority sector lending is contributing heavily for the mounting NPAs of SCBs' is unfounded.

3. Objectives and Hypothesis

The important objectives of this study are, (a) to examine the trend in the costs of funds and returns on advances/investment of SCBs,(b)to ascertain whether the performance of SCBs has improved over the years, and (c) to analyse the gap between costs of funds and returns on advances/investments of SCBs. In this backdrop, three null hypotheses are formulated as presented below:

- **Hypothesis Testing (H_{01})**: There exists no significant difference between the funding costs of PSBs, PVSBs and FBs.
- **Hypothesis Testing (H_{02})**: There exists no significant difference between the returns on advances and/or investments of PSBs, PVSBs and FBs.
- **Hypotheses Testing (H_{03})**: There exists no significant difference between the net interest margin rates of PSBs, PVSBs and FBs.

Each of the above three null hypotheses is tested from the point of view of three measures. In the process of analysis and hypothesis testing, the paper also examines and tests whether changes/improvements over the years in the funding costs, returns and net returns are significant or not.

4. Other Aspects of Methodology

For the purpose of addressing the objectives and for testing the hypotheses,necessary data are collected from secondary sources including the reports of RBI, reference books, reports, research papers, websites, etc.

The units of study comprise three ownership groups of SCBs viz., PSBs, PVSBs and branches of FBs functioning in India. However, only the relative measures (i.e., percentages) for each group of SCBs(not the absolute amounts and not for individual banks) are used. One of the reasons for using the percentages/averages is the substantial difference in the size of three groups of SCBs. And the study period is 16 years from 2004-05 to 2019-20.

Three sets of measures are used for addressing the objectives and for testing the hypotheses. And each set of measures comprise three variables/parameters as identified below:

(1) Interest Cost:

- Cost of Deposits,
- Cost of Borrowings and
- Cost of Funds,

(2) Interest Income:

- Return on Advances (RoA),
- Return on Investments (RoI), and
- Return on Advances and Investments, and

(3) Interest Income adjusted to Cost of Funds:

(a) Return on Advances adjusted to Cost of Funds,

- Return on Investment adjusted to Cost of Funds, and
- Return on Advances and Investment adjusted to Cost of Funds.

For the purpose of analysis and interpretation of data, and for testing the hypotheses, the descriptive statistics of mean, standard deviation (SD, σ), Coefficient of Variation(CV) and skewness are used besides compound annual growth rate(CAGR),and *t*-test and Levene's test. It may be noted here that,Levene's test, an inferential statistic, is carried out to measure the equality of variances for a variable calculated for three ownership groups of SCBs. It tests the null hypothesis that the population variances are equal.

However, this study is subject to a limitation pertaining to the return on advances and investment ratio. This ratio is computed by considering (i) aggregate of interest on advances and investments, and (ii) aggregate of advances and investment at the end of each year. This has also influenced even the return on advances and investment adjusted to cost of funds. It may be noted here that other ratios are computed using the average of current and previous years' end balances. But the implications of this difference on the results and conclusions are not material as the same base is used for all the three groups of SCBs and for all 16 years.

5. Results and Discussion

In the above backdrop, performance of three groups of SCBs from the points of view of each of the nine parameters is examined, and also the trend in, and differences between, funding costs and returns on advances/investment of three ownership groups of SCBs are analysed.

5.1. Interest Costs - Costs of Deposits, Borrowings and Funds

It is known that the rate of interest differs from one kind of deposit scheme to another, and also from deposits to borrowings. For example,

- With effect from 25 October 2011, interest rate on Savings Bank Account is deregulated and the banks are now free to fix the interest rates on their savings bank deposits.
- On the other hand, the banking companies may pay differential rates of interest on term deposits.For instance, with effect from 18 March 2021, Axis Bank is offering 5.25% interest for term deposits maturing in 1½-2 years, 5.40% for long-term deposits maturing in 2 to 5 years, etc (Sangeeta Ojha, 22 March 2021).
- Cost of deposits differs from cost of borrowings.

Further, cost of funds is influenced by many factors – both macro and micro environmental factors such as government policy, monetary policy, inflation rate, demand for funds, maturity period, etc.The costs of deposits, borrowings and funds (i.e., the aggregate of deposits and borrowings) are computed as follows:

$$\text{Cost of Deposits} = \frac{\text{Amount of Interest on Deposits}}{\text{Average of Amounts of Deposits at the end of current and previous years}} \times 100 \quad ..(1)$$

$$\text{Cost of Borrowings} = \frac{\text{Interest Expended-Interest on Deposits}}{\text{Average of Amounts of Borrowings at the end of current and previous years}} \times 100 \quad ..(2)$$

$$\text{Cost of Funds} = \frac{\text{Interest Expended}}{\text{Average of Amounts of Deposits \& Borrowings at the end of current and previous years}} \times 100 \quad ..(3)$$

In the below backdrop, average costs of deposits/ borrowings (%ages) are presented in Annexure 1. Based on the details in Annexure 1, a few descriptive statistics are calculated and tests are carried out, and the summary of these results is presented below (Table 1).

A careful observation of the content of Annexure 1 and Table-1 provides some insights into costs of deposits, borrowings and funds as summarised below. Initially, costs of deposits, borrowings and funds registered continuous increase followed by continuous reduction (with a few exceptions). More specifically, the ratios moved in both the directions. In spite of these fluctuations, the variations (with regard to each of three cost measures and for each of three groups of SCBs) are not wide as both the SD and CV are on lower side e.g., the higher CV is 33.52% in the case of cost of borrowings by PSBs.

Table 1: Costs of Deposits, Borrowings and Funds – Descriptive Statistics and Test Results

Descriptive Statistics and Test Results	Cost of Deposits (%)			Cost of Borrowings (%)			Cost of Funds (%)		
	PSBs	PVSBs	FBs	PSBs	PVSBs	FBs	PSBs	PVSBs	FBs
Mean	5.63	5.64	3.96	7.21	7.87	4.36	5.72	5.94	4.06
SD	0.71	0.81	0.60	2.42	1.82	1.15	0.66	0.71	0.52
CV	12.62	14.37	15.02	33.52	23.10	26.32	11.52	12.02	12.85
Skewness	-0.04	-0.26	-0.20	0.69	0.89	0.41	0.02	0.16	?0.39
CAGR	0.34	1.51	1.01	-4.80	-2.90	-1.52	-0.02	0.66	0.16
t value	31.743	27.845	26.614	11.929	17.314	15.205	34.695	33.236	31.087
f value	1.3042 (0.2815)			5.1086 (0.01001)			1.8301 (0.1721)		

Source: Compiled the table based on the calculations made using the data in Annexure 1

As far as the cost of deposits ratio is concerned, it increased during the 16-year period in all three groups of SCBs and the ratio in the last year is higher than in the first year of the study period. Therefore, the CAGRs are positive -PSBs: 0.34%, PVSBs: 1.51% and FBs: 1.01%. This is also supported by the results of '*t*' test. As is known, at 5% level of significance (á = 0.05) for degree of freedom 15 (*df* = 15), the critical/table value of '*t*' is 2.131 (t_{tab} = 2.131). Calculated values of '*t*' (t_{cal}) for cost of deposit ratio are 31.743, 27.845 and 26.614 for PSBs, PVSBs and FBs respectively. As $t_{cal}>t_{tab}$ for each group of SCBs, it signifies the existence of significant improvement/change in the cost of deposits ratio. However, keeping in mind positive CAGRs, it is inferred that the 'change' is in the form of increase which is not desirable as the increase is in undesirable value viz., cost of deposits ratio. However, the skewness values are negative (PSBs: 0.04, PVSBs: 0.26 and FBs: 0.20) signifying that the ratio, in all three groups of SCBs, skewed towards negative value than positive during the study period which is desirable.The 16-year annual average cost of deposits ratio is lowest in the case of FBs (3.96%) followed by PSBs (5.63%) and PVSBs (5.64%).However, Levene's test carried out to test the first null hypothesis, 'H_{01}: *There exists no significant difference between the funding costs* (in terms of cost of deposits) *of PSBs, PVSBs and FBs*', shows that the calculated value of '*f*' of 1.3042 is lower than the critical/table value of '*f*' is 3.2 (á = 0.05, and *df* = 2 and 45).Further, '*p*' value of 0.2815 is higher than á 0.05 - higher the *p*-value, stronger it supports the 'H_0'. Therefore, the null hypothesis is tested and accepted with regard to cost of deposits ratio.

On the other hand, in the case of cost of borrowings ratio, CAGRs are negative (PSBs: 4.80%, PVSBs: 2.90% and FBs: 1.52%) as the ratio in the last year is lower than in the first year of the study period. This is desirable. But the skewness values are positive (PSBs: 0.69, PVSBs: 0.89 and FBs: 0.41). This signifies that the ratio skewed towards positive value than negative during the study period which is not desirable.Besides, the calculated values of '*t*' are 11.929, 17.314 and 15.205 for PSBs, PVSBs and FBs respectively against the critical value of '*t*' of 2.131 (á = 0.05 and *df* = 15). As $t_{cal}>t_{tab}$ in each of three groups of SCBs, there exists significant improvement/change in the ratio of cost of borrowings which is again not desirable as the increase is in undesirable value (cost of borrowings ratio). Considering the year-wise cost of borrowings ratio and also the 16-year annual average, it is inferred that the branches of FBs are more cost efficient/effective as they have kept the ratio at the lower level (4.36%) followed by PSBs (7.21%) and PVSBs (7.87%).However, the calculated value of '*f*' of 5.1086 is higher than the critical value of 3.2 (á = 0.05, and

df = 2 and 45). Even, '*p*' value, 0.01001 <á, 0.05. Therefore, the first null hypothesis is tested and rejected accepting the alternative hypothesis, '$H_{a1:}$ *There exists significant difference between the funding costs* (in terms of cost of borrowings ratio) *of PSBs, PVSBs and FBs*'.

Consequent to the changes in both the cost of deposits ratio and cost of borrowings ratio, cost of funds ratio moved in both the directions during the study period. In the case of PSBs, the ratio declined marginally from 4.93% to 4.92% during this 16-year period and therefore, CAGR is negative at 0.02% which is desirable. But the skewness value is positive at 0.02. On the other hand, in other two groups, the ratio increased during the 16-year period and therefore, the CAGRs are positive at 0.66% and 0.16% for PVSBs and FBs respectively.Skewness values are 0.16 and 0.39 for PVSBs and FBs respectively. However, cost of fund ratio is lowest in the case of FBs for all years than for both the groups of domestic SCBs. Between two groups of domestic SCBs, it is lower in the case of PSBs for 12 years. Besides, in all three groups of SCBs, improvement/increase is significant as the calculated values of '*t*' are (34.695, 33.236 and 31.087 for PSBs, PVSBs and FBs respectively) are higher than the critical value of '*t*' of 2.131 (á = 0.05 and *df* = 15). As already stated, this significant improvement is not desirable as it is an indication of significant increase in the cost of funds ratio.However, the calculated value of '*f*' of 1.8301 is lower than the critical value of 3.2 (á = 0.05 and *df* = 2 and 45). Besides, '*p*' value, 0.1721 >á 0.05. Therefore, the first null hypothesis, 'H_{01}*:There exists no significant difference between the funding costs* (in terms of cost of funds ratio) *of PSBs, PVSBs and FBs*' is tested and accepted.

5.2. Interest Income – Returns on Advances, Investment, and on Advances and Investment

As already stated, interest income accounts for a major portion of total income of banking companies. In this regard, the following points should be noted:

(a) Interest on advances made and discount earned on bills account for a major portion of total interest income of banking companies (for 2019-20 for PSBs, it works out to 68.66%). And income from investment accounts for about a quarter of total interest income of banks(27.24% for 2019-20 for PSBs).

(b) As is known, interest income depends upon the amount lent/invested and the interest rate which differs from one sector to another.

(c) Similarly, the rate of interest on advances differs from that on investment.

In this backdrop, three interest income ratios are used, as presented below, for the purpose of this study:

$$\text{Return on Advances} = \frac{\text{Interest and Discount on Advances and Bills}}{\text{Average of Amounts of Advances at the end of current and previous years}} \times 100 \quad \ldots (4)$$

$$\text{Return on Investment} = \frac{\text{Income from Investment}}{\text{Average of Amounts of Investment at the end of current and previous years}} \times 100 \quad \ldots (5)$$

$$\text{Return on Advances and Investment} = \frac{\text{Total Interest Income}}{\text{Aggregate of Advances and Investmentat the end of the current year}} \times 100 \quad \ldots (6)$$

In the light of the above, details of returns on advances, investment, and on the aggregate of advances and investment are presented in Annexure 2, and a few descriptive statistics calculated and the summary of tests carried out (based on data in Annexure 2) are presented below (Table 2).

It is evident from the content of Annexure 2 and Table 2 that all three income ratios moved in both the directions – changing the direction every few years. In spite of these changes, there is no wide variation in the ratios for all the three groups of SCBs from one year to another as both the SD and CV are on the lower side higher CV is 14.13% in the case of Return on Advances and Investment of FBs.

As far as the return on advances ratio (RoA ratio) is concerned, although there is no consistency,the banks have improved their performance over the years. The ratio is higher in the last year when compared to the first year and therefore, CAGR is positive for all the three groups of SCBs(PSBs: 0.15%, PVSBs: 1.09% and FBs: 0.23%).

Table 2: Returns on Advances, Investment, and on total of Advances and Investment – Descriptive Statistics and Test Results

Descriptive Statistics and Test Results	Return on Advances (%)			Return on Investment (%)			Return on Advances and Investment (%)		
	PSBs	PVSBs	FBs	PSBs	PVSBs	FBs	PSBs	PVSBs	FBs
Mean	8.97	10.20	9.31	7.37	6.92	7.40	8.25	8.69	8.56
SD	0.84	0.93	1.17	0.44	0.43	0.73	0.45	0.74	1.21
CV	9.38	9.12	12.55	5.96	6.20	9.91	5.46	8.50	14.13
Skewness	0.10	0.24	1.63	0.21	0.38	0.01	0.47	0.71	2.10
CAGR	0.15	1.09	0.23	1.12	0.42	0.24	0.13	1.10	0.02
t value	42.697	43.882	31.843	67.113	64.325	40.369	73.282	47.083	28.312
f value	0.1781 (0.8374)			3.925 (0.02684)			2.026 (0.1437)		

Source: Compiled the table based on calculations made using the data in Annexure 2

This is a sign of improvement in the performance of SCBs which is desirable. The ratio for FBs is higher only for three years (2006-07 and 2008-09 to 2009-10) and in all other 13 years, it is higher for PVSBs. The ratio is also higher in the case of PVSBs than that of PSBs for all 16 years. Further, annual average (for 16-year period) is highest in the case of PVSBs (10.20%) followed by FBs (9.31%) and PSBs (8.97%).Even the'*t*' test results show the existence of significant improvement in the RoA ratio of all the three groups of SCBs as the calculated values of '*t*' (PSBs: 42.697, PVSBs: 43.882 and FBs: 31.843) are higher than the critical value of '*t*' of 2.131 (á = 0.05 and *df* = 15). But the difference in the ratio for three groups of SCBs is not significant as calculated value of '*f*' of 0.1781 is lower than the critical value of '*f*' of 3.2 (á = 0.05, and *df* = 2 and 45). Further, '*p*' value of 0.8374 >á 0.05. Therefore, the second null hypothesis, 'H_{02}:There exists no significant difference between the return on advancesof PSBs, PVSBs and FBs' is tested and accepted.

Return on investment ratio (RoI ratio) has also moved in both the directions during the study period. However, it is lower for all years (except for 2004-05 for PSBs) than the RoA ratio of SCBs. In the case of PSBs,the RoI ratio, for all other years, is lower than in the first year.But the RoI ratio of PVSBs, for all other years, is higher than in the first year signifying the improvement in their results. But the ratio of PSBs, for all years except for 2016-17,is higher than that of PVSBs.However, the RoI ratio of PSBs and FBs for the last year is lower than for the first year and therefore, CAGRs are negative (PSBs: 1.12% and FBs: 0.24%) which is a sign of decline in the performance. But in the case of PVSBs, the CAGR is positive at 0.42%. And the 16-year annual average is highest in the case of FBs (7.40%) followed by PSBs (7.37%) and PVSBs (6.92%). In spite of this, all the three groups of SCBs have improved their RoI ratio as evident from the results of '*t*' test. As the calculated values of '*t*' of 67.113, 64.325 and 40.369 for PSBs, PVSBs and FBs respectively are higher than the critical value of '*t*' of 2.131 (á = 0.05 and *df* = 15), there exists significant improvement in the RoI ratio in all three groups of SCBs. However, the improvement differs from one group of SCBs to others significantly as evident from the results of Levene's test. As the calculated value of '*f*' of 3.925 is higher than the critical value of '*f*' of 3.2 (á = 0.05, and *df* = 2 and 45), and as '*p*' value (0.02684) <á 0.05, the second null hypothesis, '*H_{02}: There exists no significant difference between the return on investment of PSBs, PVSBs and FBs'*, is tested and rejected accepting the alternative hypothesis,'H_{a2}: There exists significant difference between the return on investment of PSBs, PVSBs and FBs'.

As far as the return on advances and investment ratio is concerned, one can observe changes in the direction every 2 – 3 years. The ratio registered increase for more number of years (when compared to their immediately preceding years and also when compared to the results in the first year) during the study period. In the case of PVSBs and FBs, CAGR is positive at 1.10% and 0.02% respectively signifying improvement in their performance. But in the case of PSBs, CAGR is negative (0.13%). In the first year, PSBs had the highest ratio and the PVSBs, the lowest. But for the last 11 years, the PVSBs had higher ratio than other two groups of SCBs. However, as the calculated values of '*t*' of 73.282, 47.083 and 28.312 for PSBs, PVSBs and FBs respectively are higher than the critical value of '*t*' of 2.131 (á = 0.05 and *df* = 15), there exists significant improvement in the return on advances and investment ratio of all three groups of SCBs. Further, as the calculated value of '*f*' of 2.026 is lower than the critical value of '*f*' of 3.2 (á = 0.05, and *df* = 2 and 45) and as '*p*' value, 0.1437 >á 0.05, the second null hypothesis, 'H_{02}: There exists no significant difference between the return on advances and investment ratio of PSBs, PVSBs and FBs' is tested and accepted.

5.3. Interest Income adjusted to Cost of Funds – RoA adjusted to Cost of Funds, RoI adjusted to Cost of Funds, and Return on Advances and Investment adjusted to Cost of Funds

The third set of measures use the returns on advances and/or investments adjusted to cost of funds as detailed below:

$$\left[\begin{array}{l}\text{Return on Advances}\\ \text{adjusted to Cost of Funds}\end{array}\right] = \left[\begin{array}{l}\text{Return on}\\ \text{Advances}\end{array}\right] - \left[\begin{array}{l}\text{Cost of}\\ \text{Funds}\end{array}\right] \quad \text{.... (7)}$$

$$\left[\begin{array}{l}\text{Return on Investment}\\ \text{adjusted to Cost of Funds}\end{array}\right] = \left[\begin{array}{l}\text{Return on}\\ \text{Investment}\end{array}\right] - \left[\begin{array}{l}\text{Cost of}\\ \text{Funds}\end{array}\right] \quad \text{.... (8)}$$

$$\left[\begin{array}{l}\text{Return on Advances and Investment}\\ \text{adjusted to Cost of Funds}\end{array}\right] = \left[\begin{array}{l}\text{Return on Advances}\\ \text{and Investment}\end{array}\right] - \left[\begin{array}{l}\text{Cost of}\\ \text{Funds}\end{array}\right] \quad \text{.... (9)}$$

The details about the above three ratios are presented in Annexure 3, and the summary of a few descriptive statistics calculated and the testscarried out in the following table (Table 3).

Table 3: Returns on Advances, Investment and on total of Advances and Investment adjusted to Cost of Funds – Descriptive Statistics and Test Results

Descriptive Statistics and Test Results	RoA adjusted to Cost of Funds (%)			RoI adjusted to Cost of Funds (%)			Return on Advances and Investment adjuste to Cost of Funds (%)		
	PSBs	PVSBs	FBs	PSBs	PVSBs	FBs	PSBs	PVSBs	FBs
Mean	3.25	4.26	5.25	1.65	0.98	3.34	2.53	2.75	4.50
SD	0.34	0.37	0.99	0.76	0.55	0.60	0.37	0.52	0.96
CV	10.38	8.76	18.9	45.91	56.32	17.89	14.56	18.78	21.37
Skewness	0.40	-0.96	1.66	0.74	?0.18	0.61	-0.39	-0.21	2.29
CAGR	0.42	1.63	0.29	-3.21	-0.57	-0.71	-0.33	1.82	-0.11
t value	38.487	45.676	21.164	8.708	7.151	22.329	27.47	21.299	18.722
f value	7.2728 (0.00183)			0.8518 (0.43350)			2.4981 (0.09359)		

Source: Compiled the table based on calculations made using the data in Annexure 3

A close observation of content of Annexure 3 and Table - 3 show movements in the ratios in both the directions during the study period. However, the variations are not wide (except for PVSBs with regard to RoI adjusted to cost of funds where CV is 56.32%) as both the SD and CV are on lower side.

As far as RoA adjusted to cost of funds ratio is concerned, it is higher for the branches of FBs for all years compared to both the groups of domestic SCBs. And between two groups of domestic SCBs, the PVSBs had achieved higher net results compared to PSBs.Further, CAGR is positive for all three groups of SCBs (PSBs: 0.42%, PVSBs: 1.63% and FBs: 0.29%) signifying higher ratio in the last year compared to first year of the study period. The 16-year average is highest for FBs (5.25%) followed by PVSBs (4.26%) and PSBs (3.25%). And all three groups of SCBs have improved the ratio significantly as evident from '*t*' test results that the calculated values of '*t*' of 38.487, 45.676 and 21.164 for PSBs, PVSBs and FBs respectively are higher than the table value of '*t*'of 2.131 (á = 0.05 and *df* = 15).Further, Levene's test carried out to test the third null hypothesis,'H_{03}: There exists no significant difference between the net interest margin rates (from the point view of return on advances adjusted to cost of funds) of PSBs, PVSBs and FBs' shows that the calculated value of '*f*'of 7.2728 is higher than the critical value of '*f*' is 3.2 (á = 0.05, and *df* = 2 and 45). Further, '*p*' value, 0.00183 <á 0.05. Therefore, the null hypothesis is tested and rejected accepting the alternative hypothesis, 'H_{a3}: There exists significant difference between the net interest margin rates (in terms of return on advances adjusted to cost of funds) *of PSBs, PVSBs and FBs*'.

Even inthe case of RoI adjusted to cost of funds, the SCBs achieved mixed success/results as the ratio moved in both the directions during the study period. But the ratio in the last year is lower than for the first year, and therefore, the CAGR is negative – PSBs: 3.21%, PVSBs: 0.57% and FBs: 0.71%.However, the 16-year average is highest in the case of FBs (3.34%) followed by PSBs (1.65%) and lastly, PVSBs (0.98%).Performance of FBs is better/higher than both the groups of domestic SCBs for all years (except for 2004-05). And between PSBs and PVSBs, the performance of PSBs is better than that of PVSBs for all 16 years. In spite of these differences, what is common is that, all the three groups of SCBs have improved the ratio significantly as the calculated values of '*t*' (PSBs: 8.708,PVSBs: 7.151 and FBs: 22.329) are higher than critical value of '*t*' of 2.131 (á = 0.05 and *df* = 15). Besides, Levene's test is carried to test the third null hypothesis, 'H_{03}*: There exists no significant difference between the net interest margin rates of PSBs, PVSBs and FBs*'. As f_{cal}0.8518<f_{tab} 3.2 (á = 0.05, and *df* = 2 and 45) and '*p*' value, 0.4335 >á 0.05, the null hypothesis is tested (from the point of view of RoI adjusted to cost of funds) and accepted.

The pattern of changes in return on advances and investment adjusted to cost of funds is similar to that of RoA adjusted to cost of funds and RoI adjusted to cost of funds. However, the ratio moved in both the directions in all the three groups of SCBs during the study period. But the ratio in the last year, in the case of PSBs and FBs, is lower than for the first year, and therefore, in these two groups, the CAGR is negative (PSBs: 0.33% and FBs: 0.11%). Contrarily, the CAGR is positive at 1.82% in the case of PVSBs which is desirable. Even from the point of view of this ratio, the branches of FBs have earned higher rate of return than PSBs and PVSBs for all years. Between PSBs and PVSBs, the PSBs have earned higher return for five years (2004-05 to 2007-08 and 2011-12) whereas the PVSBs earned higher rate of return in the remaining 11 years. Besides, all the three groups of SCBs have improved their performance/ratio significantly as evident from the calculated values of '*t*' of 27.47 (PSBs), 21.299 (PVSBs) and 18.722 (FBs)which are higher than the critical value of '*t*' of 2.131 (á = 0.05 and *df* = 15). In order to test the third null hypothesis, 'H$_{03}$: There exists no significant difference between the net interest margin rates of PSBs, PVSBs and FBs', Levene's test is carried out. The test results (Table 3) show that the calculated value of '*f*' of 2.4981 is lower than the critical value of '*f*' of 3.2 (á = 0.05 and *df* = 2 and 45). Further, '*p*' value is, 0.09359 >á

0.05. Therefore, the null hypothesis is tested and accepted.

6. Conclusions

From the above factual analysis, it is obvious that the performance of SCBs differs from one group to another. However, this difference is either statistically significant or not significant. These findings, based on their performance evaluation from the point of view of each of nine parameters, are presented above at the appropriate places. However, summary of these findings is presented below:

- Among three groups of SCBs, based on 16-year average, the branches of FBs are more cost efficient (from the points of view of all three cost ratios) followed by PSBs and lastly, PVSBs.In terms of returns, PVSBs are more profitable from the point of view of RoA ratio, and return on advances and investment ratio. In terms of RoI, branches of FBs are more profitable followed by PSBs. From the point of view of returns adjusted to cost of funds (from the points of view of all three ratios), the branches of FBs are more profitable. Overall, the branches of FBs are efficient not only in minimizing interest cost but also in maximizing interest income which enabled them to post higher returns adjusted to cost of funds.
- From the point of view of all nine measures, there is a significant improvement in the performance of all three groups of SCBs as $t_{cal}>t_{tab}$. However, significant improvement in three cost measures is not desirable as the 'improvement' is in the form of 'change' which may take the form of either increase or decrease.
- As far as the difference among three groups of SCBs, there exists no significant difference with regard to six measures (two measures from each of interest cost, interest income and net interest margin ratios) viz., cost of deposits, cost of funds, RoA, return on advances and investments, RoI adjusted to cost of funds, and return on advances and investment adjusted to cost of funds as $f_{cal}<f_{tab}$ (also, '*p*' value>á 0.05). Hence, in these cases, the null hypotheses are tested and accepted. Contrarily, there exists significant difference with regard to the remaining three measures (one each from interest cost, interest income and net interest margin ratios) viz., cost of borrowings, RoI, and RoA adjusted to cost of funds as $f_{cal}>f_{tab}$ (also, '*p*' value<á 0.05).

It is, therefore, necessary for the PSBs to exercise necessary control over their interest costs and also to maximize their interest income. Even the PVSBs have to exercise control over their interest costs. This enables them to increase the gap between interest income and interest cost which in turn enables them to improve their profits and profitability.

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Annexure 1 - Funding Costs – Average Rates of Interest on Deposits, Borrowings and Total Funds

Year	Cost of Deposits (%)			Cost of Borrowings (%)			Cost of Funds (%)		
	PSBs	PVSBs	FBs	PSBs	PVSBs	FBs	PSBs	PVSBs	FBs
2004-05	4.70	4.14	3.11	10.02	9.90	5.20	4.93	4.87	3.63
2005-06	4.58	4.46	3.16	10.07	10.52	5.74	4.93	5.14	3.82
2006-07	4.91	5.37	3.59	11.11	10.93	6.38	5.29	5.97	4.30
2007-08	5.97	6.47	4.20	11.64	11.17	6.27	6.30	7.00	4.70
2008-09	6.26	6.60	4.58	9.23	9.19	5.20	6.47	6.96	4.74
2009-10	5.68	5.36	3.10	6.57	6.58	2.76	5.75	5.55	3.02
2010-11	5.12	4.97	3.30	6.99	7.00	3.52	5.27	5.29	3.35
2011-12	6.36	6.43	4.34	7.10	7.54	3.52	6.42	6.62	4.10
2012-13	6.63	6.72	4.67	6.15	7.42	4.06	6.59	6.85	4.47
2013-14	6.47	6.40	4.78	6.36	7.40	4.00	6.46	6.58	4.53
2014-15	6.43	6.39	4.61	5.90	6.41	4.87	6.39	6.39	4.68
2015-16	6.19	6.08	4.46	5.27	6.27	4.00	6.11	6.11	4.36
2016-17	5.70	5.59	4.24	4.80	6.56	4.26	5.62	5.76	4.24
2017-18	5.12	4.94	3.85	4.72	6.23	2.96	5.08	5.16	3.70
2018-19	5.01	5.14	3.79	4.81	6.64	2.93	4.99	5.40	3.61
2019-20	4.96	5.26	3.65	4.56	6.17	4.07	4.92	5.41	3.73

Source: Compiled the Annexure based on the data collected from, Reserve Bank of India, ***Report on Trend and Progress of Banking in India, 2004-05 to 2019-20,*** Mumbai.

Annexure 2 - Returns on Advances and on Investments

Year	Return on Advances (%)			Return on Investment (%)			Return on Advances and Investments (%)		
	PSBs	PVSBs	FBs	PSBs	PVSBs	FBs	PSBs	PVSBs	FBs
2004-05	7.97	8.49	8.15	8.29	6.16	6.98	8.00	7.65	7.74
2005-06	8.01	8.72	8.54	7.84	6.64	8.30	7.97	7.12	8.16
2006-07	8.68	9.55	9.78	7.26	6.50	8.61	7.82	7.88	8.98
2007-08	9.52	11.01	10.93	7.25	7.22	8.24	8.23	8.91	12.23
2008-09	10.08	11.41	12.61	6.95	6.93	7.63	8.34	9.65	10.24
2009-10	9.10	9.89	9.99	6.65	6.23	6.39	7.81	8.39	8.17
2010-11	9.09	9.65	8.75	6.80	6.53	7.39	7.90	7.93	7.89
2011-12	10.31	11.06	9.61	7.54	7.26	8.02	8.98	9.01	8.36
2012-13	10.08	11.52	9.55	7.60	7.28	8.13	8.88	9.39	8.60
2013-14	9.69	11.24	9.38	7.69	7.32	7.34	8.75	9.48	8.31
2014-15	9.50	10.90	9.27	7.64	7.16	7.73	8.85	9.39	8.70
2015-16	9.02	10.46	8.95	7.80	7.49	7.28	8.76	9.06	8.12
2016-17	8.44	9.99	8.77	7.49	7.49	6.83	8.34	9.09	8.99
2017-18	7.77	9.45	8.12	7.06	6.92	6.61	7.72	8.31	7.62
2018-19	8.07	9.78	8.15	7.20	6.99	6.23	7.89	8.65	7.13
2019-20	8.16	10.10	8.45	6.92	6.59	6.71	7.83	9.12	7.77

Source: Compiled the Annexure based on the data collected from, Reserve Bank of India,
Report on Trend and Progress of Banking in India, 2004-05 to 2019-20, Mumbai and calculations made based on these details.

Annexure 3 - Returns on Advances and on Investments adjusted to Cost of Funds

Year	Return on Advances adjusted to Cost of Funds (%)			Return on Investment adjusted to Cost of Funds (%)			Return on Advancesand Investment adjusted to Cost of Funds (%)		
	PSBs	PVSBs	FBs	PSBs	PVSBs	FBs	PSBs	PVSBs	FBs
2004-05	3.03	3.62	4.52	3.35	1.29	3.34	3.07	2.78	4.11
2005-06	3.08	3.58	4.71	2.92	1.50	4.47	3.04	1.98	4.34
2006-07	3.39	3.58	5.48	1.97	0.53	4.32	2.53	1.91	4.68
2007-08	3.22	4.01	6.23	0.95	0.22	3.54	1.93	1.91	7.53
2008-09	3.61	4.45	7.87	0.48	0.03	2.89	1.87	2.69	5.50
2009-10	3.35	4.34	6.97	0.90	0.69	3.37	2.06	2.84	5.15
2010-11	3.83	4.36	5.40	1.53	1.24	4.04	2.63	2.64	4.54
2011-12	3.89	4.44	5.51	1.12	0.64	3.92	2.56	2.39	4.26
2012-13	3.49	4.68	5.08	1.01	0.43	3.67	2.29	2.54	4.13
2013-14	3.23	4.66	4.85	1.23	0.74	2.81	2.29	2.90	3.78
2014-15	3.12	4.51	4.59	1.25	0.77	3.05	2.46	3.00	4.02
2015-16	2.92	4.35	4.60	1.70	1.37	2.92	2.65	2.95	3.76
2016-17	2.82	4.23	4.53	1.87	1.73	2.58	2.72	3.33	4.75
2017-18	2.68	4.29	4.42	1.98	1.76	2.91	2.64	3.15	3.92
2018-19	3.07	4.37	4.54	2.21	1.58	2.62	2.90	3.25	3.52
2019-20	3.24	4.69	4.73	1.99	1.18	2.98	2.91	3.71	4.04

Source: Compiled the table based on the data collected from, Reserve Bank of India,
Report on Trend and Progress of Banking in India, 2004-05 to 2019-20, Mumbai and calculations made based on these details.