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The Assessment of Operational Efficiency of Commercial Banks in India Using Cost to Income Ratio Approach

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ABSTRACT:
During the last two decades, financial institutions worldwide have witnessed a lot of stress in managing their margins in wake of the new risks, challenges and increase in the competition posed to them by the factors of liberalization and deregulation. The key to create value and achieve competitive edge lies in the better operational efficiency and productivity of these institutions under such conditions. Since long, banks have been using various ratios to assess their operational performance. Among these, cost to income ratio (CIR) has seen wider acceptability for its simplicity and intuitive nature. The current paper analyses cost to income ratio of commercial banks operating in India with the objective to explore a benchmark cost to income ratio (CIR) which could be used to differentiate banks for their operational efficiency. A comparative analysis has also been undertaken to examine the impact of size and ownership features of banks on their cost to income ratio (CIR). The study as a whole reveals that banks operating in India operate under competitive CIR ratio well in line with the international operational efficiency standards. Also, it is found that size and ownership characteristics influence strongly in determining the operational efficiency of banks operating in India.

Keywords: *Operational efficiency, Cost to income ratio, Key performance indicators, Safety threshold, Operating margin*

INTRODUCTION

Cost efficiency gives a financial institution flexibility to explore and try new markets, products or technologies, to reward its shareholders and an edge over its competitors in terms of providing its customers various services at an economic price. As against this, low cost efficiency restricts a financial institution's options in the market places, makes it vulnerable to take over threats and more fragile in the times of financial crisis. Over the past many years, traditional cost-income ratio has been a popular and critical measure for bank's productivity. Banks compare themselves with their peers, and bank managements impress on their staff the need to reduce cost to income ratios to international best standards. Market analysts also look at the ratios reported by banking institutions for making predictions about the future prospect and performance of these banks. The reason for its popularity appears to be its features, like easy and simplicity in estimation, and its intuitive nature. The Cost to income ratio (CIR) is a key financial measure, particularly important in valuing banks. It is an efficiency measure similar to operating margin. Unlike the operating margin, lower is better. Cost efficiency has a strong impact on the profitability and value creation in financial institutions. Varmez (2006) suggests that profitability of banks is particularly influenced by two factors, the respective market

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conditions regarding competition and price levels and the service production capability. The commonly held notion in financial industry claims that a high CIR is equivalent to low productivity and low efficiency and vice versa. Practically, banks have been found to highlight their cost to income ratio (CIR) in their periodical financial reports as an important performance indicator among their various achievements. The focus has been to reduce it to the industry benchmark levels and international best standards. Little (2008) examines European banks to investigate their average CIR which he puts at 59.2%. The Asian Banker reports a CIR of a very low of 27 – 30% among some of the Chinese banks in Asia. The current paper attempts to examine the CIR of Indian Banks to explore a benchmark rate.

In simple terms, Cost to income ratio (CIR) puts expenses (operating costs) and earnings (operating income) of a bank in relation to each other. The CIR shows that how many rupees were needed in a given time period to generate one rupee in revenue. Consequently, CIR measures the output of a bank in relation to its utilized input. The ratio gives investors a clear view of how efficiently the firm is being run – the lower it is, the more profitable the bank will be. Changes in the ratio can also highlight potential problems: If the ratio rises from one period to next, it means that costs are rising at a higher rate than income, which could suggest that the firm has taken its eye of the ball in the drive to attract more business. The standard definition of the cost to income ratio is as non-interest costs or operating costs, excluding bad and doubtful debt expense, divided by the total of net interest income and non-interest income. Non-interest costs are perceived that part of a bank's costs which are most controllable, and most responsive to management action as compared to interest costs which are highly influenced by exogenous factors. A reduction in costs, for a fixed level of revenue, should lead to increased profit, and thus increased return on equity and share price, thus a measure of great interest to investors in bank shares. Tripe (1998) suggests that focusing on bank's non-interest costs means that fluctuations in the general level of interest rates do no cause the volatility in the ratio that would arise if interest costs were included. Likewise, using net rather than total interest income in calculating the ratio reduces the volatility that fluctuations in the general level of interest rates would otherwise bring to income as a ratio's denominator. The cost to income ratio does not include bad and doubtful debt expense. The rationale for this is that such expense generally reflects the quality of credit decisions made in earlier periods, rather than the current performance of the bank. Moreover, if doubtful debt expense were included in the measurement of cost to income ratio, the ratio would be distorted when major write-offs were undertaken. However, higher levels of impaired assets and provisions would be expected to be accompanied by higher levels of operating costs and lower levels of income. Contrary to this, a bank with a better quality loan book may be expected to have lower cost to income ratios.

Literature Review

There is strong academic literature about the usefulness of cost to income ratio in financial industry. The discussion about productivity and efficiency in banks is mostly based on the *Cost to Income Ratio* (CIR), which is also known as *efficiency ratio or expense to income ratio* in scholarly journals and business practice, including evaluations of the rating agencies. Davidson (1997) suggests that publications targeted for practitioners frequently focus on well known accounting ratios such as, CIR and the cost-asset ratio. Despite some drawbacks, the ratio is widely recognized as a yardstick when comparing productivity and efficiency of banks. The commonly held notion claims that high CIR is equivalent low productivity and low efficiency and vice-versa. Cocheo (2000) in a survey conducted on US banks found that this ratio is generally considered an important benchmark, particularly among publicly traded banks. Asher (1994) mentions that CIR is the focus of many bank equity analysts when gauging relative efficiency in the sector. Francis (2004) observes that there is an inverse relationship between the cost to income ratio and the bank profitability. Ghosh et el. (2003), also find out that expected negative relation between efficiency and the cost-income ratio seems to exist. The study shows that the cost-income ratio is negative and strongly significant in all estimated equations, indicating that more efficient banks generate higher profits. Welsh (2006) argues that the

specific business model of a bank has a direct effect on its cost-income ratio. He finds significant difference in CIR of various categories of banks like, private banks, universal banks and banks having focus on capital markets. Berger and Moormann (2008) in their study of European banks reveals a strong relation between interest margins and their cost-income ratios, indicating that highest the interest margin, lower the CIR. Little (2008) identifies five characteristics of most efficient European banks, which include a cost conscious culture, high degree of automation and heavy investment in IT, flat hierarchy with short communication channels characterized by high degree of decentralization, focus on embracing revenue creating costs, while shunning costs that create no value and use of pragmatic list of key performance indicators. Wall (1983) argues that higher levels of equity can help a bank improve its cost to income ratio as equity is not only a regulatory requirement, but also a source of funds, which involves less administrative cost than the traditional deposits. Other things being equal, therefore a bank with more equity will have a lower cost-income ratio.

The limitations of the CIR have been discussed in numerous articles such as that by Osborne (1995) who found no clear correlation between the CIR's and return on equity for a sample of US banks. Tripe (1998) identified factors such as interest levels, the state of the economy or the balance sheet structure which influence this ratio. Bekier and Nickless (1998) in turn found substantial difference with regard to cost efficiencies of the countries following different payment systems. In particular, those OECD countries where cheques are widely used for non-cash payments (USA, Canada, Australia and the UK) tend to have more costly banking systems than the European countries that rely more on electronic transaction methods. Davidson (1997) noted that there is a timing problem in that unfavorable efficiency ratios might reflect investments, for example, into technology, in the long run, could well lead to an improved cost position. The opposite, an artificially low CIR, might cost a bank dearly long-term if it has laid off so many staff that a subsequent loss of market share bites into revenues. Toevs and Zizka (1994) argue that a bank lending in high risk loans may exhibit a good CIR as deferred credit losses will not be reflected in its cost-income ratio. McCoy, Frieder and Hedges (1994) point out another problem with the CIR that is the ratio for any particular bank is not necessarily stable.

CIR has been useful in estimation of bank capital requirement towards operational risk. Tripe (1998) demonstrates how an operational risk capital charge might be linked to volatility in the cost-to-income ratio, using a multiple of the standard deviation of the ratio. To date, tests for the 'safety threshold' of the cost-to-income ratio of banks do not appear to have been explored in the literature. The 'safety threshold' refers to the inflection point where efficiency gains associated with reductions in the cost-to-income ratio are offset by increases in operational risk associated with excessive cost reduction and alternate fee income sources. Lavelle (2000) examined S&P's 500 companies to conclude a strong evidence of existence of minimum safety threshold for the relationship between costs and income in non-financial firms. Davis (1994) suggests that a long-term but continuous approach to cost-cutting is what is necessary to run a successful low-cost bank. Finally, the focus on costs is taken even further by James et al. (1997), when they argue that banks must reduce their cost to income ratios below the 55 to 60% level if they are to avoid being taken over. This is because higher cost competitors are relatively disadvantaged as price competition drives down margins.

RESEARCH METHOD

The present study examines the operational efficiency of Indian banks using cost-to-income ratio approach. For the purpose of the study, a data sample of 5 year earnings and expenses of 26 commercial banks covering the period of 2007 to 2011 has been chosen. The said sample comprises of 16 public sector and 10 private sector banks which have been chosen randomly for the study (table 1).

The study intends to achieve following objectives:

- ✓ Explore a benchmark average cost to income ratio of Indian banks and rank operational efficiency of banks against the benchmark;
- ✓ Perform a comparison of the operational efficiency of sample banks on their basis of ownership and size features.

Table 1: Summary of descriptive statistics of annual cost to income ratio of Indian Commercial Banks (Sample 26 Banks)

Name of the Bank/Year	2007	2008	2009	2010	2011	Mean	Standard Deviation	Coefficient of Variation
Federal Bank Ltd	39.24	36.66	31.21	34.86	36.94	35.78	2.99	0.08
Corporation Bank	39.83	39.67	35.89	36.34	38.50	38.04	1.84	0.05
Jammu & Kashmir Bank Ltd	39.18	37.59	37.81	37.60	39.77	38.39	1.02	0.03
IDBI Bank ltd	44.33	41.67	46.91	36.57	32.38	40.37	5.88	0.15
Karur Vysya Bank Ltd	39.02	40.57	37.94	42.93	41.70	40.43	2.01	0.05
Indian Bank	46.24	43.01	42.27	37.78	35.59	40.98	4.26	0.10
Oriental Bank of Commerce	39.86	43.45	45.53	40.78	36.73	41.27	3.38	0.08
IndusInd Bank Ltd	33.86	41.21	36.13	51.11	48.25	42.11	7.47	0.18
Allahabad Bank	45.65	43.43	43.10	39.06	42.67	42.78	2.38	0.06
Union Bank of India	46.24	38.33	40.95	41.41	47.29	42.84	3.78	0.09
Yes Bank Ltd	52.01	48.90	43.23	36.53	37.74	43.68	6.77	0.15
Punjab National Bank	49.37	47.01	41.83	39.70	41.28	43.84	4.13	0.09
Bank of India	52.13	41.68	36.04	43.81	48.49	44.43	6.21	0.14
ICICI Bank	49.46	48.14	43.77	37.59	43.89	44.57	4.65	0.10
Canara Bank	46.32	49.38	44.55	40.73	41.98	44.59	3.45	0.08
Axis Bank	48.95	49.02	42.89	41.32	42.67	44.97	3.71	0.08
Andhra Bank	48.08	46.75	46.55	42.18	41.40	44.99	2.99	0.07
Bank of Baroda	51.94	49.56	45.70	41.43	39.32	45.59	5.31	0.12
HDFC Bank	47.04	45.99	49.60	44.87	46.67	46.83	1.75	0.04
Punjab & Sind Bank	49.13	46.40	46.95	45.43	48.94	47.37	1.62	0.03
Dena Bank	47.52	44.18	50.14	50.41	46.73	47.79	2.58	0.05
Karnataka Bank Ltd	39.26	43.53	41.91	58.04	60.71	48.69	9.92	0.20
Syndicate Bank	48.46	51.25	51.40	52.43	48.68	50.45	1.77	0.04
Bank of Maharashtra	50.85	52.67	52.65	53.81	60.41	54.08	3.69	0.07
Central Bank of India	52.64	56.92	56.44	52.15	60.68	55.77	3.49	0.06
Kotak Mahindra Bank Ltd	65.30	60.30	66.80	47.80	54.00	58.84	7.95	0.14
Average CIR of Banks	46.61	45.66	44.55	43.33	44.75	44.98	2.21	0.05
Rate of Change in CIR (%)	0.00	-2.0354	-2.4471	-2.722	3.2613	-4.002		

In line with the set objectives, the study intends to test the following null hypothesis:
H1: No difference exists between the cost to income ratio of public sector and private sector banks;
H2: No difference exists between the cost to income ratios of large sized and small sized banks.

For the purpose of the analysis, sample banks have been fragmented into following sub-groups;

In order to analyze the data, test the hypothesis and draw meaningful conclusions, various tools like descriptive statistics and F-test have been used.

RESULTS AND DISCUSSION

The study of cost-income ratio of Indian banks from 2007 to 2011 reveals that on an average annual bank cost-income ratio has been on a declining trend until 2010 from where it shows rising tendency (figure1). However, it has remained competitive and in line with the best standards. The annual average CIR of the sample banks representing commercial banks of India has shown remarkable progress in terms of consistent decline from 2007 to 2010. This ratio of the overall banks under study has consistently declined by more 2 percent for all these years with a cumulative decline of about 4 percent for the overall period of 5 years from 2007 to 2011.

Private sector banks on an average have recorded less cost-income ratio compared their Public sector counterparts, though following a trend in line with the movements in the overall cost-income ratio of Indian bank. In spite of the reason that for some years like 2008 and 2010, average cost-income ratio shows sharp declines in case of public sector banks, while for private sector, it has witnessed less change, cost-income ratio of public sector banks continues to be exceeding than the private counterparts. 2010 onwards, the CIR of public sector banks shows some signs of improvement as it rises with less pace than private sector banks and for the first time gets less than their average CIR. The average CIR of public sector banks has continuously declined through 2008 to 2010 recording a rate of decline of 3.07, 1.15, 4.52 percent, while the ratio of private sector banks has fell through 2008 to 2009 with a rate of decline of 0.29 and 4.47 percent (figure 2). As a whole for the period of 2007 to 2011, there has been a more improvement in the change of CIR of public sector banks against the banks operating in the private sector. The cumulative rate of change of average annual CIR has been witnessed more at 6.28 percent in public sector banks against a meager 0.40 percent in the banks falling under private sector category.

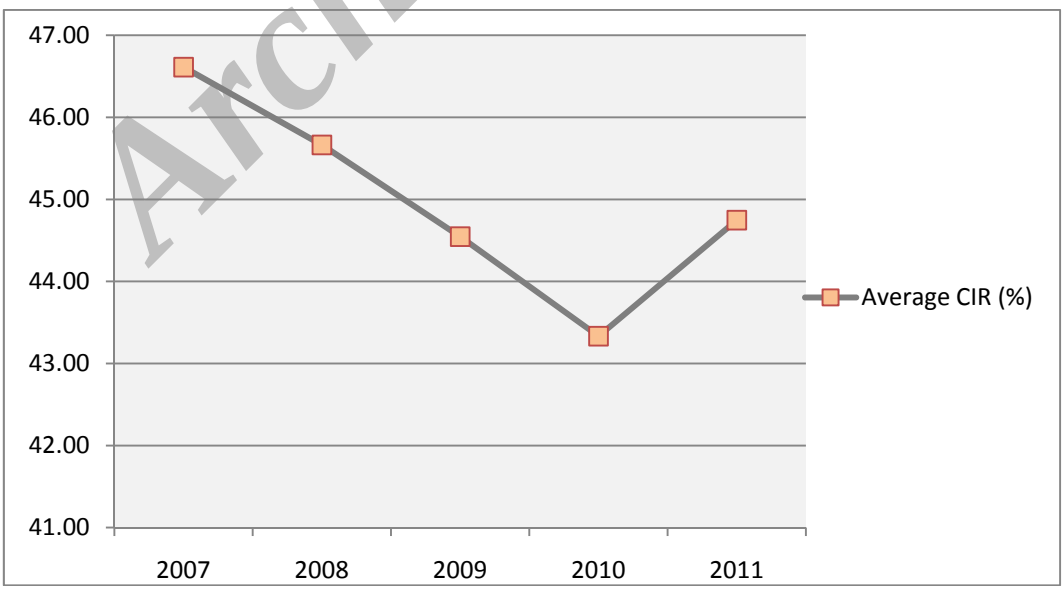

Figure 1: Average cost-income ratio of banks 2007-2011 (26 Sample Banks)

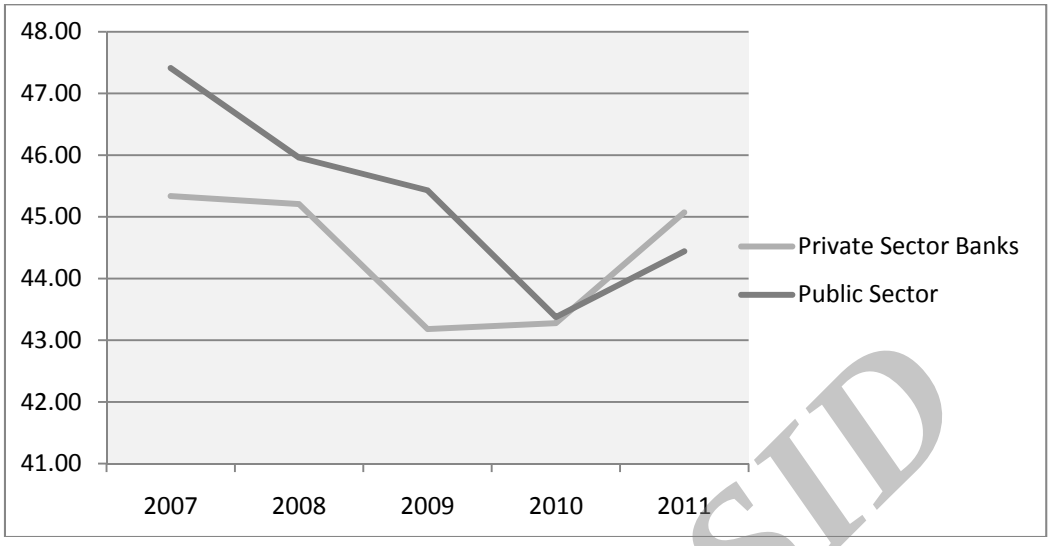

Figure 2: Average cost-income ratio of private v/s Public Sector Bank 2007 -2011 (10 private sector and 16 Public Sector Banks)

As mentioned in the previous paragraphs, there is a strong evidence of CIR being used as a performance or efficiency measure by banks across the world. Accordingly, to gauge the operational performance of individual banks in the sample and to draw conclusions from there in about the Indian commercial banks, an analysis of annual average cost to income ratio of the banks has been conducted to explore an average CIR which could be used as a benchmark to compare banks for their operational performance. The data of annual CIR of sample banks gives an overall average of 44.98%, which is chosen to rank all the sample banks to assess their operational performance. About 62 percent of the sample banks give an annual average CIR of less than the overall average of the sample, while as about 28% exceed the norm. Out of the total 26 banks, 16 banks comprising of 7 private sector and 9 public sector banks show good performance on account of operational efficiency by reporting a lower CIR than the overall average. As against this, 10 banks comprising of 3 private sector and 7 public sector banks who exceed in their annual average CIR than the overall average CIR of the sample. Among private sector banks, Federal Bank tops the list with a minimum average annual CIR of about 36 percent, while as Kotak Mahindra Bank records highest CIR at 59 percent. Corporation Bank among the public sector banks has been able to maintain a lowest average annual CIR at about 38 percent. In the same category of banks, Central Bank of India reveals low operational efficiency as its average annual CIR stands at highest. Though CIR of the sample banks show a large variation in terms of lowest to the highest, yet annual average CIR of the banks in India seems to be well within the standard norms, i.e. less than 60%. Finally, from the above analysis, it can be inferred that banks in India are doing well in terms of their CIR. Public sector banks have been slightly more efficient in managing their CIR as compared to the private sector banks (table 3).

A lot of research has been conducted on identifying the factors which influence CIR of banks. While both exogenous as well endogenous factors impact this ratio, it is being believed that since the components like operating expenses and operating income used in measurement of CIR are less sensitive to the changes in the general level of interest rates, however more responsive to the management decisions and actions, endogenous factors as such have a significant role to play to shape the course of this important efficiency ratio. In line with this evidence, an analysis of the sample

banks has been conducted to see whether size and ownership characteristic influence their CIR. As such, the sample banks have been divided into four groups, size wise and ownership wise into small and large sized and private and public sector banks to facilitate their comparison and find out whether or not the size and ownership differences influence CIR of banks (table 2).

F test output of the two comparable groups of large and small banks and public sector and private sector banks reveals that there is significant difference in the CIR of large size banks as against the small sized banks in our sample. Similarly, significant difference also exists in the CIR of public sector banks over private sector banks. As such, results defeat our null hypothesis that size and ownership features don't influence the cost to income ratio and therefore, operational efficiency of banks among various influencing factors is being highly influenced by the ownership and size characteristics of a banking institution (table 4).

Table 2: Composition of the sample banks

Size Wise	Sector Wise
Large Banks:	**Public Sector Banks:**
Punjab National Bank	Punjab National Bank
Central Bank of India	Central Bank of India
Bank of Baroda	Bank of Baroda
Bank of India	Bank of India
Canara Bank	Canara Bank
Union Bank of India	Union Bank of India
Syndicate Bank	Syndicate Bank
Allahabad Bank	Allahabad Bank
Axis Bank	Oriental Bank of Commerce
HDFC Bank	Andhra Bank
ICICI Bank	Indian Bank
Small Banks:	Bank of Maharashtra
Oriental Bank of Commerce	Corporation Bank
Andhra Bank	Dena Bank
Indian Bank	Punjab & Sind Bank
Bank of Maharashtra	IDBI Bank ltd
Corporation Bank	**Private Sector Banks:**
Dena Bank	Axis Bank
Punjab & Sind Bank	HDFC Bank
IDBI Bank ltd	ICICI Bank
Federal Bank Ltd	Federal Bank Ltd
Jammu & Kashmir Bank Ltd	Jammu & Kashmir Bank Ltd
Karnataka Bank Ltd	Karnataka Bank Ltd
Karur Vysya Bank Ltd	Karur Vysya Bank Ltd
IndusInd Bank Ltd	IndusInd Bank Ltd
Kotak Mahindra Bank Ltd	Kotak Mahindra Bank Ltd
Yes Bank Ltd	Yes Bank Ltd

Table 3: Banks ranked by average cost- income ratio 2007-2011 (ratio obtained by dividing operational cost including depreciation by aggregate of net interest income and non-interest income)

Name of the Bank	Ownership	Average CIR %	Rank	
Federal Bank Ltd	Private Sector	35.78	1	Below*
Corporation Bank	Public Sector	38.04	2	
Jammu & Kashmir Bank Ltd	Private Sector	38.39	3	
IDBI Bank ltd	Public Sector	40.37	4	
Karur Vysya Bank Ltd	Private Sector	40.43	5	
Indian Bank	Public Sector	40.98	6	
Oriental Bank of Commerce	Public Sector	41.27	7	
IndusInd Bank Ltd	Private Sector	42.11	8	
Allahabad Bank	Public Sector	42.78	9	
Union Bank of India	Public Sector	42.84	10	
Yes Bank Ltd	Private Sector	43.68	11	
Punjab National Bank	Public Sector	43.84	12	
Bank of India	Public Sector	44.43	13	
ICICI Bank	Private Sector	44.57	14	
Canara Bank	Public Sector	44.59	15	
Axis Bank	Private Sector	44.97	16	
Andhra Bank	Public Sector	44.99	17	Above*
Bank of Baroda	Public Sector	45.59	18	
HDFC Bank	Private Sector	46.83	19	
Punjab & Sind Bank	Public Sector	47.37	20	
Dena Bank	Public Sector	47.79	21	
Karnataka Bank Ltd	Private Sector	48.69	22	
Syndicate Bank	Public Sector	50.45	23	
Bank of Maharashtra	Public Sector	54.08	24	
Central Bank of India	Public Sector	55.77	25	
Kotak Mahindra Bank Ltd	Private Sector	58.84	26	

* Versus average CIR of the sample banks (44.98)

Table 4: F-Test summary

	large size banks	small size banks
Mean	46.05996467	44.18824185
Variance	14.85051232	39.32875058
Observations	11	15
df	10	14
F	0.377599392	
P(F<=f) one-tail	0.063391669	
F Critical one-tail	0.349073319	

	Public Sector Banks	Private Sector Banks
Mean	45.32404991	44.41505921
Variance	23.42192489	40.59274377
Observations	16	10
df	15	9
F	0.576997826	
P(F<=f) one-tail	0.166435064	
F Critical one-tail	0.386454546	

CONCLUSION

Cost to income ratio continues to be a popular tool for assessing operational efficiency of a bank despite its various known weaknesses, which include its sensitivity to factors like general interest rates, economic downturns and balance sheet structures. It is easy to work out, interpret and intuitive in nature. It is not bad for banks to focus on their costs, and other things being equal (which rarely are), banks with low cost to income ratio are likely to be more profitable. Although it has been observed that banks in practice lack transparent calculations of CIR, yet this study has attempted to ensure a uniform methodology for calculation of CIR of sample banks over the period of 5 years. The average CIR produced by the sample data is comparable to the CIR benchmarks in the financial industry. Size and ownership difference prove to be of a greater significance on the cost income ratio of banks. Other than these, balance sheet uniqueness in the form of capital funds, nature of deposits, technological development, level of decentralization and short communication channels also influence the quantum and magnitude of this ratio, however, further research is necessary before any appropriate conclusions could be drawn.

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