CHAPTER: 4

PERFORMANCE OF COMMERCIAL BANKS IN INDIA

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Banks are considered to be the vital channel of deposit mobilization, credit delivery, payment system, and monetary policy transmission. A sound and stable banking system is a key requisite for financial stability and overall economic growth. The banking industry in India is the most dominant segment of the financial sector. Banks in the country have been at the forefront, mobilizing resources in urban as well as rural areas, extending banking services in the remotest locations, and serving as an essential means of enabling financial inclusion. The structure of the Indian banking industry includes the scheduled banks and non-scheduled banks. Scheduled banks are incorporated in the second schedule of the Reserve Bank of India Act, 1934. As per the Reserve Bank of India regulations, banks included in this category need to fulfill two pre-requisites. One, the bank's paid-up capital should be more than five lakhs; and second, any activity of the bank should not adversely affect the interest of depositors. Scheduled banks are required to follow all the rules and regulations stated by the Reserve Bank of India (RBI). Banks not included in the second schedule of the RBI Act (1934) are non-scheduled banks. Local area banks and non-scheduled cooperative banks are included in the non-scheduled bank category. Scheduled banks are further classified into scheduled commercial banks and scheduled cooperative banks. These banks are playing a crucial role in financial inclusion. Thereby, creating a cohesive society, bringing about balanced development, and accelerating economic growth in the country. Scheduled commercial banks are the backbone of modern business. They engage in commercial activities and finance trade and commerce with the aim of generating profits for the institution. The scheduled cooperative banks cater to small finance needs in rural, semi-urban and urban areas. Scheduled commercial banks in India are categorized into public sector banks, private sector banks, foreign banks, and regional rural banks. Regional rural banks were incorporated in 1975 under RBI regulation for developing the rural economy. These banks provide financial assistance for the development of agriculture, industry, trade, and commerce in rural India.

Scheduled commercial banks constitute an integral part of the Indian financial system. Almost 70 percent of the financial resources of the banking sector are mobilized and disbursed by scheduled commercial banks alone. These banks have exhibited tremendous

growth over the past five decades. They have grown in terms of size as well as reach. The total number of scheduled commercial banks has gone up from 73 in 1969 to 143 in 2018. The number of bank branches has also increased manifold from 8,262 to 1,52,275 during the same period. There has been a remarkable reduction in the burden of population served per branch with an increase in the number of bank branches. In 2018, commercial banks catered to only 8,700 population per branch as against 64,000 in 1969. The total assets of commercial banks in India have amplified from Rs. 68.7 billion in 1969 to over Rs. 1,41,211 billion in 2018. The banking business has also undergone massive expansion over this period. Deposits of scheduled commercial banks have increased from Rs. 46 billion in 1969 to as high as Rs. 1,25,738 billion in 2018, while credit advanced by these banks has scaled up from Rs. 36 billion to Rs. 97,717 billion over the five decades. Since the introduction of financial reforms in India in the year 1993, the banking industry has undergone major transformation. The Narasimham Committee recommendations led to a series of reforms in the sector that brought about phenomenal changes in the banking landscape. The banking sector responded promptly and positively to these reform measures; strengthening the capital base of banks, ensuring financial stability of the sector, and improving economic growth.

The objective of the research study is to evaluate the performance of commercial banks in India. Regional rural banks are not taken for the study as these banks are not comparable with other commercial banks in the industry. They are established principally to advance credit to the rural segment; in particular the small and marginal farmers, artisans, agriculture labour, and small entrepreneurs. Regional rural banks differ from commercial banks in terms of size, scope, business, and services provided. Hence, the study focuses on financial performance analysis of scheduled commercial banks in India, specifically the public sector banks, private sector banks, and foreign banks.

A large population of the country relies on public sector banks for meeting their financial needs. Since the seventies, nationalized banks have been actively mobilizing resources, providing safe, easy, and affordable credit and other financial services to the rural as well as urban population. Public sector banks have a prominent rural presence with one-third of its total 92,000 branches spread in rural India, and some of the remotest locations. The burden of social agenda has largely been shouldered by the government banks. These banks account for nearly two-third of the total business generated by scheduled commercial banks in the country. Private sector banks have simplified organizational structure that enables quick

decision-making. They have always been an important pillar of the Indian banking industry and have been fast to adapt to the changing banking scenario. These banks with the use of technology and professional management have gained realistic goals in the banking industry. Private sector banks offer innovative banking products, customised services, and attractive interest rates, giving healthy competition to nationalized banks. Private sector banks have a branch spread of more than 33,000 branches and contribute nearly 30 percent of scheduled commercial banking business. Foreign banks contribute a small proportion of total business but have shown an increasing presence in the country after the introduction of reforms in 1993. The number of foreign banks operating in India increased from 26 in 1995 to 45 in 2018. Although foreign banks concentrate on high net worth customers, these banks have stimulated foreign direct investment in the sector, encouraged the use of advanced technology, emphasised upon customer-centric banking approach, and have brought in some of the finest banking practices in the industry. Foreign banks are located largely in metropolitan and wealthier urban cities.

Post reforms, particularly after the nineties, the performance of public sector banks deteriorated in comparison to its private competitors. Private sector banks and foreign banks exhibited improved financial performance with rising profits, higher net interest margins and relatively lower non-performing assets. Public sector banks constitute a lion's share in banking business, have an extensive national presence, enable broader financial inclusion, and are important channels of financial intermediation for economic development. Yet, they have lagged behind in financial performance and were confronted with problems of mounting bad loans, falling profitability, and high operating costs. Any weakness in commercial banks could have serious implications for the financial system and for the economy as well. Therefore, it is imperative to engage an analysis of financial performance of scheduled commercial banks in India to understand their inherent strengths and weaknesses. For this purpose, the study attempts to measure, assess, and compare the performance indicators of scheduled commercial banks and bank groups in the country.

The present chapter on bank performance analysis is spread over *five broad sections*. The performance parameters and financial ratios examined in the study are presented in the *first section 4.1*. The *second section 4.2* throws light on the criteria of bank selection and presents a brief profile of the selected banks. The methodology adopted for performance analysis is explained in the *third section 4.3*. The *fourth section 4.4* undertakes an empirical analysis of

performance of commercial banks and bank groups in India under two sub-sections – trend analysis and comparative analysis. The *last section 4.5* concludes the chapter and summarizes the results.

4.1 Performance Parameters and Financial Ratios

The financial performance of commercial banks and bank groups is assessed on the basis of different financial parameters by estimating financial ratios. The financial ratios engaged for bank performance analysis are standard ratios and their measurement is based on Reserve Bank of India definitions. The selected parameters and ratios are discussed in detail in the current section.

Parameter 1:   Capital Adequacy

The approach of the capital adequacy framework of RBI (2014) is that a bank should have sufficient capital to provide a stable resource to absorb any losses arising from the risks in its business. Sufficient capital-to-risk (weighted) assets ensures that banks have enough capital to cushion a reasonable amount of loss before they become insolvent and lose depositors' funds. It is important for a bank to boost depositor confidence, safeguard the investor interest, maintain financial stability, and prevent itself from bankruptcy. Hence, majority of the central banks and bank regulators across world economies have established capital adequacy benchmarks to prevent commercial banks from taking excess leverage and becoming insolvent in the process (BIS, n.d).

Capital-to-Risk (weighted) Asset Ratio (CRAR)

The financial ratio taken for assessing the capital adequacy of banks is Capital-to-Risk (weighted) Asset Ratio (CRAR). CRAR is measured by expressing bank's capital as a percentage of bank's risk-weighted assets and current liabilities. Capital is divided into Tier I and Tier II capital for supervision purposes. Tier I capital is the core capital of bank comprising of shareholders' equity and retained earnings. It is available on a permanent basis to absorb losses of banks without having to cease its operations. Tier II capital includes revaluation reserves, subordinated debt, general loan loss reserves, hybrid capital instruments, and undisclosed reserves (RBI, 2015a). This capital absorbs losses in the event of winding up

of bank or liquidation. However, it provides a lesser degree of protection to depositors as the loss absorption capacity of Tier II capital is lower than that of Tier I capital.

In April 1992, the Reserve Bank of India decided to introduce a risk-asset ratio system for banks in India as a capital adequacy measure, following the norms prescribed by the Basel Committee on Banking Supervision (BCBS). To meet the primary goal of minimizing credit risk, the committee defined the minimum capital requirements for financial institutions. Under Basel I, the committee prescribed a minimum CRAR of 8 percent to be maintained by all banks. Basel I norms for capital adequacy of banks failed to address the issue of differences in the risk exposure of one bank from another bank. Besides, it did not keep pace with the innovations in the banking industry making its regulations obsolete. Basel I was centred on credit risk, ignoring other important risks such as operation and market risks which led to inadequate capital for banks.

In 2004, the Basel II accord was introduced as an instrument of prudential regulation. It centred around three main pillars, namely strengthening of minimum regulatory capital requirements, enhanced supervisory mechanism and transparency, and better market discipline. This accord intended to provide a variety of benefits to the banking industry by way of enhanced risk management system, efficient operations, and higher revenues. Basel II addressed most of the shortcomings of Basel I. Although the minimum CRAR remained unchanged under Basel II, the credit risk calculation was revised, and operational and market risks were added (Ong, 2006; Swamy, 2013a).

The Basel Committee issued Basel III accord in 2009 as a comprehensive reform package to the global financial crisis. Basel III is an enhancement to Basel II accord with amendment in market risk framework. The core objective of this accord was to improve the banking sector's ability to absorb shocks arising from financial and economic stress, and thus reduce the risk of spill-over from the financial sector. According to Basel III, a minimum CRAR of 10.5 percent must be maintained by all banks. It requires a capital conservation buffer of 2.5 percent in addition to the minimum capital requirement of 8 percent. As per the RBI norms, scheduled commercial banks in India are required to maintain a CRAR of 11.5 percent. Of which, the minimum capital requirement is 9 percent and capital conservation buffer is 2.5 percent (RBI, 2011). Higher CRAR indicates that a bank has adequate capital to deal with unexpected losses, while lower CRAR suggests the risk of failure and requires intervention by regulatory authorities for sufficient capital management. CRAR as a measure of capital

adequacy has been taken across the bank performance studies reviewed in literature, to mention some, Staikouras and Wood (2004), Heffernan and Fu (2008), Dietrich and Wanzanried (2009), Alper and Anbar (2011), Ongore and Kusa (2013), Swamy (2013b), Căpraru and Ihnatov (2014), Alyousfi, Saha and Rus (2017), Kohlscheen, Murcia and Contreras (2018), and Le and Ngo (2020).

Parameter 2:   Profitability

Profit is the motivating force for any economic activity and quintessential for accelerating the pace of economic growth. Profit is the excess of revenue over costs. Besides, profitability is the ability of an enterprise to earn profit, or the capacity of an investment to earn a return from its use. Of late, profitability analysis has gained centre stage in the interpretation of financial statements. An analysis of profitability helps in critically analysing and interpreting the current and prospective earning capacities of business entities.

Profitability is a measure of efficiency, financial stability and control of a firm. Bank profitability is an important indicator of financial crisis. Profits are the first line of defence against losses from credit impairment. Profitability based measurement can serve as a robust and inclusive means to measure the performance of banks by gauging the extent of operational efficiency as well as capturing the nuances of bank's diversifying earnings through non-interest income activities and management of their costs (PwC, 2011).

Majority of the studies referred for bank performance reveal three important indicators of bank profitability; namely return on assets, return on equity, and net interest margin. Studies by Heffernan and Fu (2008), Naseem et al. (2012), Ongora and Kusa (2013), San and Heng (2013), Căpraru and Ihnatov (2014), Haque (2014), Eze (2014), Mbekonize and Mapharing (2017), and Kohlscheen, Murcia and Contreras (2018) have taken return on assets, return on equity as well as net interest margin as measures of bank profitability. Few other studies such as Biswal and Gopalakrishna (2014), Ozili (2015), and Gadzo, Kportorgbi and Gatsi (2019) have focused mainly on net interest margin as the profitability measure. A study by RBI (2008) employed return on assets and return on equity for examining profitability of banks in India. Another study by Mishra, Majumdar and Bhandia (2013) also highlighted return on assets and net interest margin variables as proxy for profitability measure for banks. Researchers have found net interest margin to be a good indicator of efficiency of management and banks' financial performance. In the present study, all the three variables –

return on assets, return on equity, and net interest margin are taken to assess the profitability of banks.

(1) *Return on Assets* *(ROA)*

Return on Assets (ROA) is the simplest measure of bank profitability. ROA of bank indicates how much profit a bank is able to generate per unit of its assets. It shows bank's capability to generate profits from its asset management functions. It is a key ratio for evaluation of bank profitability. ROA is the ratio of net income of bank to total assets. A higher value of ROA is indicative of higher profitability for bank. An increasing trend in ROA depicts increasing profits with each investment. On the other hand, a fall in ROA indicates that a bank might have over invested in assets that have failed to produce the required revenue growth.

(2) *Return on Equity* *(ROE)*

Return on Equity (ROE) is an alternative measure of bank profitability. ROE is calculated by dividing the net profit of bank by its shareholders' equity. ROE is the ratio of net profit for the year to the average of capital, reserves and surplus for current and previous years. A higher value of ROE indicates higher profitability for bank. ROE measures the amount of profits that a business unit, in this instance a bank generates from its equity investors. This ratio is a useful indicator for equity investors in investment decision making. A rise in ROE implies efficient use of shareholders' capital, whereas decline in ROE suggests that bank is less efficient at generating profits and has poor equity capital usage.

(3) *Net Interest Margin* *(NIM)*

Net Interest Margin (NIM) is a popular measure of bank profitability and business growth (RBI, 2008). NIM measures the gap between what the bank pays to its depositors and what it receives from borrowers. It reveals the profit a bank makes out of its average earning assets in the course of performing its traditional borrowing and lending operations (Shen et al., 2009; Gadzo, Gatsi and Akoto 2014; Gadzo, Kportobrgbi and Gatsi 2019). Higher NIM convinces banks to give out more loans, which increases their credit and operational risk management levels. NIM is computed as the difference between total interest earned and total interest expended, as a ratio of average total assets for current and previous years.

The ratio indicates how efficiently bank deploys its funds to generate income from credit and investment operations. A positive NIM suggests that the bank is operating profitably, while a negative figure implies investment inefficiency. Monetary policies by central banks also influence the net interest margin of banks as they govern the demand for savings and credit. Lower interest rates make borrowing cheaper for consumers, increasing NIM for banks over time. On the other hand, higher interest rates make borrowing dearer and encourages depositors to save more. This would lead to a reduction in net interest margin for banks. Non-performing assets (NPA) and net interest margin share an inverse relationship. A rise in NPA leads to fall in interest earned and consequently a fall in NIM.

Parameter 3:   Efficiency

The efficiency of a financial system in resource generation and its allocation is an important factor determining economic growth (Mohan, 2005). The more efficient a financial system is in this task, the greater is the contribution to economic growth. Enhanced efficiency in banking can result in greater and more appropriate innovations, improved profitability as well as greater safety and soundness (Casu, Giraradona and Molyneux, 2002). Bank efficiency is the ability of a bank to convert its available resources into maximum revenue. It is a normative concept and needs to be evaluated by comparing with others in the industry. Banks need to maintain regular screening of their cost efficiency for gauging any early warning signals of managerial problems. For the study, efficiency of banks is measured using the cost to income ratio.

Cost to Income Ratio (CIR)

A good number of studies on bank performance have analysed the cost efficiency of banks. These studies have used cost to income ratio as the measure of bank efficiency [Mishra, Majumdar and Bhandia (2013); San and Heng (2013); Ozili (2015); Alyousfi, Saha and Rus (2017); Gadzo, Kportorgbi and Gatsi (2019)]. A study by RBI (2008) analysed bank efficiency by engaging two indicators of cost efficiency for bank groups in India, namely operating cost to income ratio and operating cost to assets ratio. The study reported cost to income ratio to be a better measure of bank efficiency as it is able to capture the impact of off-balance sheet operations. Similarly, the present study has also examined the cost to income ratio to assess bank efficiency.

Cost to Income Ratio (CIR) measures the operating efficiency of banks. It reflects the ability of bank to generate revenue from its expenditure. CIR shares an inverse relationship with bank's efficiency. Lower the ratio, more efficient is the bank. Contrarily, higher CIR indicates lower efficiency for the bank. CIR is defined as the ratio of operating cost of bank to its total income. Here, operating cost of a bank includes payments to and provisions for employees, rent, taxes and lighting, printing and stationery, advertisement and publicity expenses, depreciation on bank's property, directors' fees, auditors' fees, law charges, postage, telegrams, telephones repairs and maintenance, insurance, and other allowances and expenses. On the other hand, total income of bank is an aggregate of its interest and non-interest incomes.

Theoretically, an efficiency ratio of 50 percent is considered optimal for banks (Thakur, n.d.; Jain, 2018; Westmonroe, 2019). However, Indian banks have been found to obtain lower CIR of less than 20 percent. A study by RBI (2007) on assessment of productivity, efficiency and soundness revealed that in the early years following the financial reforms, CIR was quite high in the range of 45 to 50 percent. However, after 2001, scheduled commercial banks witnessed decline in CIR that settled in the range of 20 to 25 percent. Banks strive for lower efficiency ratios as it means higher earnings for banks than spending.

Parameter 4:   Productivity

Productivity is expressed as the ability and willingness of an economic unit to produce the maximum possible output with given inputs and technology (Kalirajan and Shand, 1994). Bank productivity measures the quantity of bank output per unit of input used in the banking business. As the productivity of bank increases, it can turn its resources into revenues for future growth and expansion. A bank is considered to be more productive than another if it yields higher output with given inputs, or if it creates a given quantity of output with lesser inputs. The higher the output per unit of input, the higher is the productivity.

Productivity and efficiency are often used alternatively to assess bank performance and the distinction between the two is blurred. The concept of efficiency relates to comparison of bank performance using efficiency ratio in relation to the others in the industry, while productivity refers to the performance of bank as a whole (Oster and Antioch, 1995). Improvement in productivity can be channelled to enhance efficiency for banks. Besides, efficiency and productivity measures could act as leading indicators of strengths or

weaknesses of the banking system and enable pre-emptive steps by regulators when necessary. Investigation of the same have been paramount in economic research. The present study undertakes an evaluation of both these parameters separately, by estimating financial ratios for each.

Productivity of banks has been examined by a large number of studies. RBI (2008) study engaged two variables for analysing bank productivity in India, namely business per employee and business per branch. Studies by Kumar and Sreeramulu (2007), Chaturvedi and Sharma (2012), and Yadav and Garima (2015) have assessed bank productivity by analysing business per employee and profit per employee for banks. Rao (2013) and Thangam and Thoushifa (2016) have taken business per employee, business per branch as well as profit per employee as measures of bank productivity. Three variables are computed to measure productivity of banks in the present study. These are business per employee, business per branch, and profit per employee. Of the three, business per employee and profit per employee are used to assess employee productivity in banks, while business per branch examines branch productivity.

(1)   *Business Per Employee* (BPE)

Business Per Employee (BPE) is a measure of employee productivity of banks. BPE is a ratio of business generated by bank to total number of employees of the bank. Here, bank's business is the sum total of deposits and credit advanced by the bank. Higher BPE would mean an increase in labour productivity or employee productivity for bank. A similar positive relationship between BPE and employee productivity is expected when there is a fall in the bank's business to employee ratio.

(2)   *Business Per Branch* (BPB)

Bank branch productivity is measured by Business Per Branch (BPB) ratio. BPB is the ratio of total business generated by bank (sum of deposits and credit) to total number of bank branches. A higher BPB ratio means increase in branch productivity, whereas a lower ratio indicates a fall in productivity for each bank branch.

Profit Per Employee (PPE)

Profit Per Employee (PPE) measures how efficiently is a bank able to utilize its employees. It is also an estimate of employee productivity or the contribution of each employee towards profit generation. PPE is calculated as the ratio of profit/loss earned by the bank to total number of its employees. A higher PPE ratio indicates higher productivity for banks, while a lower PPE ratio implies lower bank productivity.

Parameter 5:   Asset Quality

Banks are the custodian of funds deposited by their customers. They create banking assets with these funds in the form of loans and investments. The overall condition of a bank is determined by the quality of assets it possesses. Asset quality is important as it has direct effect on the income that bank earns and its cash flow management. It also affects banks liquidity and solvency status. Poor quality of bank assets is the root cause of bank failures as it ultimately leads to insufficient liquidity for banks.

Banks face a variety of risks such as operational risk, interest risk, credit risk, market risk and foreign exchange risk. Among these, credit risk or risk of non-return of funds advanced to borrowers is one of the most critical banking risks. Many banks have turned into failures on the grounds of mounting bad loans. A bad loan is an amount owed to a borrower that is unlikely to be paid. In case of such loans, repayment of interest or principle is overdue for more than 90 days. Banks often get into aggressive lending and irresponsible expansion. Lack of due diligence and inefficient system for loan recovery, MIS issues and misuse, and non-compliance of RBI directives are some of the operational issues behind increase in bad debts or non-performing assets (NPA) of banks. Lack of proper systems and inadequate staff monitoring have also been identified as triggers to NPA. Governance issues such as under reporting of NPA, standardized policies and procedure of asset classification, delay in warranted action, and overall management failures are augmenting the problem of NPA in Indian banks (Budhedeo, 2019).

Non-performing assets can be measured in gross as well as net terms. A number of studies have evaluated asset quality of banks using gross non-performing assets, namely Gupta (2012), Joseph and Prakash (2014), Kashif, Iftikhar and Iftikhar (2016), Dudhe (2017), and Mohanty, Das and Kumar (2019). Few studies like Siraj and Pillai (2013), Debnath and Dash (2015), Singh (2016), and Singh and Brar (2016) have used gross as well as net non-

performing assets to examine the problems of bad debts in the banking industry. In the present study, the asset quality of banks is examined using the gross non-performing asset ratio.

Gross Non-Performing Asset Ratio (GNPA)

Gross Non-Performing Asset ratio (GNPA) is calculated as the ratio of gross non-performing assets to gross advances. Banks with high NPA effectively have lesser funds for lending and business; and in turn lesser potential to earn interest income. A high level of NPA needs higher loan loss provisioning by banks as per the RBI regulatory guidelines so as to prepare for expected losses. High NPA would adversely impact the earnings and profitability of bank. Besides, reduced capital formation and erosion of capital resources would create stress for bank. This could dampen the confidence of depositors and have a serious implication on the financial performance of bank in the long-run (Lokare, 2014; Batra, 2003). Higher NPA would lead to lower NIM for banks and create difficulties in CRAR management.

Parameter 6: ***Resource Utilization***

The banking sector plays a vital role in financial intermediation by mobilizing resources and disbursing credit to various sectors of the economy. Banks have always been an important means of resource mobilization in the economy and enjoy the special privilege of credit creation by way of multiple expansion in deposits. Credit-deposit ratio is a monetary tool of the Reserve Bank of India for optimizing the credit flow in the economy.

Credit-Deposit Ratio (CDR)

Credit-Deposit Ratio (CDR) measures the extent of utilization of bank's resources. It shows the share of each rupee of deposit that goes towards credit markets (RBI, 2017). The magnitude of CDR shows management's eagerness to improve income by engaging into higher lending operations. Although the Reserve Bank of India does not stipulate a minimum or maximum limit for CDR, a very low ratio suggests the inability of banks to utilize their resources optimally. On the contrary, a very high ratio would mean an overly aggressive business strategy by banks, pressure on resources and issues of capital adequacy.

Ideally, banks would resort to credit-deposit ratio in the range of 65 to 75 percent (Verma, 2011; Advay 2022). However, there is no prescribed benchmark for the same. In the case of

Indian banking sector, the industry as a whole has an average CDR of 75 percent. A higher growth in CDR suggests that credit growth is rising quickly, which could lead to excessive risks and leveraging on the borrowers side. In case of banks, it could imply a possible rise in NPA when economic cycle reverses. This ratio serves as a useful measure to understand the systemic risks in the economy (RBI, 2017). The present study evaluates the CDR of banks and bank groups as an estimate of resource utilization, so as to understand its implication for the health of banks. Studies by Badola and Verma (2006), Ahmad (2009), Hooda (2011), Shiralshetti (2012), Sethi and Bajaj (2013), Chou and Buchdadi (2016), Edem (2017), Hakim (2017), Mohanty, Das and Kumar (2019), and Dao and Nguyen (2020) have also examined credit-deposit ratio for assessing bank performance.

Parameter 7:   Liquidity

Liquidity is a critical aspect for financial institutions, especially banks as they need to be cautions towards maintaining requisite amount of liquidity. Banks need to take additional care towards maintaining liquidity. Bank liquidity refers to the ability of bank to meet its financial obligations without incurring unacceptable losses. The level of liquidity influences the ability of banks to withstand shocks.

For instance, a large shock which contributes to credit or market losses would lead to loss of confidence in bank amongst depositors. This may result into liquidity crisis that could potentially propel the solvent banks into a state of insolvency. Banks might lose access to funding and may be forced to sell their assets at lower prices to raise liquidity. Banks need to manage requisite liquidity to overcome the risk of insolvency as liquidity should neither be in excess nor inadequate. Excessive liquidity means accumulation of idle funds, which could possibly result in lower profitability, whereas insufficient level of liquidity may lead to interruptions in banking operations. A balance between these two extremes is needed for efficient operation of banks. Through skilful liquidity management, banks must hold on to ideal liquidity level to increase their profitability as well as to set off their financial liabilities.

A study by IMF (2006) examined three measures of liquidity for assessing the financial soundness of financial institutions – liquid asset ratio, current ratio, and customer deposit to total loan ratio. Dincer et al. (2011) evaluated the performance of Turkish banking sector after the global crisis. The study employed three ratios – liquid assets to total assets, liquid assets to short term liabilities, and liquid assets to deposit and non-deposit, as important

measures of liquidity of banks. The present study engages two variables for measuring liquidity of scheduled commercial banks in India, namely current ratio and liquid asset ratio.

(1) *Current Ratio (CR)*

Current Ratio (CR) is an important measure of bank's liquidity. The ratio evaluates bank's capacity to meet its short-term obligations. It gauges the ability of bank to meet its current liabilities from its current assets. As reported by ICSI (2014), an ideal current ratio for banks would be 1.33, that is 1.33 part of current assets to 1 part of current liabilities held by banks. However, this could differ across banks depending on their asset-liability compositions. Studies such as Sahoo and Mishra (2012), Alzorqan (2014), Akter and Mahmud (2014), Nimer, Warrad and Omari (2015), Akinwumi, Micheal and Raymond (2017), Otekunrin et al. (2019), and Alta'ani and Dali (2020) assessed liquidity of banks using current ratio. Current asset of banks is divided by its current liabilities to arrive at the current ratio. High current ratio indicates idle current assets with banks that could be used in business to generate profits, whereas a low ratio could trigger a liquidity crisis.

(2) *Liquid Asset Ratio (LAR)*

Liquid Asset Ratio (LAR) is a common estimate of liquidity of banks. It indicates how much balance sheet shrinkage the bank can absorb before being forced to sell its illiquid assets. It is the proportion of liquid assets available with bank to meet its expected and unexpected demand for cash, a higher LAR signifies lower risk for banks. Studies such as Alshatti (2015), Singh and Sharma (2016), Bustamante, Cuba and Nivin (2019), Morales, Osorio and Esquivel (2019), Brei et al. (2020), and Rafique, Toor and Bashir (2020) have examined liquidity of banks using the liquid assets to total assets ratio. The present study also computes LAR for assessing the liquidity status of bank. Here, liquid asset of bank is synonymous with current asset of bank as taken in the estimation of current ratio. The main difference between liquid asset ratio and current ratio is the denominator in the two ratios. LAR demonstrates liquid assets (or current assets) as a ratio of total assets, whereas CR expresses current assets (or liquid assets) as a ratio of current liabilities.

Parameter 8:   *Solvency*

Solvency refers to the capacity of a firm to meet its long-term debt obligations. Long-term solvency is also known as financial leverage as it involves the use of debt rather than equity to run business. Financial leverage reveals the proportion of debt and equity used by firms to finance their assets. As debt increases, financial leverage too increases. Management prefer equity financing over debt as it carries lesser risk of insolvency (Matt, 2000; Abubakar, 2015). The financial leverage employed by a company is intended to earn more return on the fixed-charge funds than their costs. The surplus (or deficit) will increase (or decrease) the return on the owners' equity (Pandey, 2011). Debt-equity ratio is a key financial metric and a popular measure of financial leverage that estimates the potential financial risk of the bank.

Debt-Equity Ratio (DER)

Debt-Equity Ratio (DER) shows the relative proportion of bank's equity and debt used for financing bank's assets. If the ratio increases, it implies that the bank is being financed by creditors instead of its own financial resources, which could be a matter of serious concern for the bank in long-run. DER is calculated as a ratio of total liabilities to shareholders' equity. A higher debt-equity ratio indicates higher borrowings in relation to bank's own funds. This affects the viability of bank as higher borrowings means higher costs and lower operating income. In general, a high debt-equity ratio signals that bank is in financial distress and would not be able to pay its debts. A relatively low DER signifies over-reliance of bank on equity to finance its business, which can be costly and inefficient. From a risk perspective, a lower debt-equity ratio is considered to be better for banks. Though a suitable debt-equity ratio differs from industry to industry, the Reserve Bank of India has suggested the requisite debt-equity ratio for banks to be not more than 3:1 (RBI, 2015b). Studies like Kouser and Saba (2011), Goel and Rekhi (2013), Sai and Sultana (2013), Abubakar (2015), Al-Kaseasbah and Albkour (2018), and Rehmadi (2020) have employed debt-equity ratio to measure long-term solvency in banks. The present study has also examined DER of banks and bank groups to analyse their long-term solvency. Both solvency and liquidity are important for banks. Banks that are solvent and also possess adequate liquidity are considered to be financially healthy.

Table 4.1 presents the parameters of bank performance, financial ratios, and the formulae for the measurement of ratios engaged in the study for bank performance analysis.

Table: 4.1   Financial Ratios

Sr. No.	Parameter	Financial Ratio	Measurement
1.	Capital Adequacy	Capital-to-Risk (weighted) Asset Ratio	$CRAR = \dfrac{Tier\ I\ Capital + Tier\ II\ Capital}{Risk\ Weighted\ Assets}$
2.	Profitability	Return on Assets	$ROA = \dfrac{Net\ Income}{Average\ Total\ Assets}$
		Return on Equity	$ROE = \dfrac{Net\ Profit\ for\ the\ Year}{Average\ (Capital + Reserves + Surplus)\ for\ Current\ and\ Previous\ Years}$
		Net Interest Margin	$NIM = \dfrac{Interest\ Earned - Interest\ Expended}{Average\ Total\ Assets\ for\ Current\ and\ Previous\ Years}$
3.	Efficiency	Cost to Income Ratio	$CIR = \dfrac{Operating\ Cost}{Total\ Income}$
4.	Productivity	Business Per Employee	$BPE = \dfrac{Business\ (Deposits + Advances)}{Total\ Employees}$
		Business Per Branch	$BPB = \dfrac{Business\ (Deposits + Advances)}{Total\ Number\ of\ Branches}$
		Profit Per Employee	$PPE = \dfrac{Profit\ (or\ Loss)}{Total\ Employees}$
5.	Asset Quality	Gross Non-Performing Asset Ratio	$GNPA = \dfrac{Gross\ Non\ Performing\ Assets}{Gross\ Advances}$
6.	Resource Utilization	Credit-Deposit Ratio	$CDR = \dfrac{Total\ Credit}{Total\ Deposit}$
7.	Liquidity	Current Ratio	$CR = \dfrac{Current\ Assets}{Current\ Liabilities}$
		Liquid Assets Ratio	$LAR = \dfrac{Liquid\ Assets}{Total\ Assets}$
8.	Solvency	Debt-Equity Ratio	$DER = \dfrac{Total\ Liabilities}{Shareholders'\ Equity}$

Note: The formulae and measurement of above financial ratios are based on Statistical Tables Relating to Banks in India and RBI glossary.

4.2   Scheduled Commercial Banks in India: *Sample Selection and Profile*

The current section highlights the bank selection criterion adopted in the study for performance analysis of scheduled commercial banks in India. This is followed by a brief profile of the selected banks.

Bank Selection

The total number of scheduled commercial banks in India stood at 87 in the year 2018-19. Of these, there were twenty public sector banks, twenty-two private sector banks, and forty-five

foreign banks. Five banks from each of the public, private and foreign bank groups are selected for the purpose of bank performance analysis; which is a total of fifteen scheduled commercial banks.

Table: 4.2   Selection of Banks

Public Sector Banks		Private Sector Banks		Foreign Banks	
State Bank of India	SBI	Housing Development Finance Corporation Bank Limited	HDFC	Citibank N.A.	CITI
Bank of Baroda	BOB	Industrial Credit and Investment Corporation of India Bank Limited	ICICI	Hongkong and Shanghai Banking Corporation Limited	HSBC
Punjab National Bank	PNB	Axis Bank Limited	AXIS	Standard Chartered Bank	STCH
Canara Bank	CB	Yes Bank Limited	YES	Deutsche Bank AG	DEUT
Bank of India	BOI	IndusInd Bank Limited	IND	Development Bank of Singapore Limited	DBS

Studies on bank performance reviewed in the literature have been found to adopt different criteria for the selection of banks. Quite a good number of researchers have taken 'bank size' or 'size of total assets' for bank sample selection [Goel and Rekhi (2013); Eze (2014); Aladwan (2015); Kohischeen, Murcia and Contreras (2018); Abusharbeh (2020); Mayakkannan and Jayasankar (2020)]. Pastor, Lovell and Tulkens (2006), and Hirtle (2007) have chosen the sample banks on the basis of 'expansion in branch network'. Few studies have been found to engage 'paid-up capital' as the criterion for bank selection [Ahooja (2011); Bansal and Mohanty (2013); Adeoye and Olojede (2019)]. Several studies have also selected the sample banks based on 'ownership' criterion of the bank and its 'historical presence' or 'market share' in the country [Ataullah and Le (2006); Rao, Rezvanian and Nyadroh (2009); Kabir and Dey (2014); Ghebregiorgis and Atewebrhan (2016); Srinivasan and Britto (2017)]. In order to select the fifteen banks for performance analysis, the present study has applied the criterion of the *'size of total assets'* of banks. Total assets of bank comprises of current assets, fixed assets, advances and investment. Advances and investment contribute a major share in total assets, which has a direct bearing on banking business and the size of bank. Accordingly, five banks with the biggest size of total assets have been selected from each bank group for performance analysis of individual banks. The selected banks and their abbreviations are reported in table 4.2.

Bank group refers to public sector bank group (PSBG), private sector bank group (PvtSBG), and foreign bank group (FBG). Performance analysis of bank groups involves inclusion of all banks in each of the respective group or category in the industry.

Brief Profile of Banks

The profile of fifteen banks selected for analysis is presented in brief here. The public sector banks are discussed first, followed by private sector banks, and then the foreign banks.

State Bank of India

State Bank of India (SBI) is the first bank in the country to get the status of nationalized bank in the year 1955. The All India Rural Credit Survey Committee recommended the creation of state-partnered and state-sponsored bank to serve the needs of the rural sector and the economy. The government took control of the Imperial Bank of India and integrated it as the first state-owned and state-associate bank. An act was passed in the parliament in May 1955, whereby the Imperial Bank of India was renamed as the State Bank of India on 1st July 1955, and was entrusted with a new sense of responsibilities towards the society.

Today, SBI is the largest bank in India and one of the top 50 largest banks in the world. SBI is one of the biggest employers in the country and gives employment to more than 2.5 lakh people. SBI has more than 23,300 branches in rural, semi-urban, urban, and metropolitan areas. As on March 2019, the bank held total assets worth over Rs. 36,80,900 crore. SBI has the highest rural presence with more than 7,700 branches in rural areas. Since 1973, the bank has been actively involved in non-profit activity under 'Community Services Banking'. The bank believes in touching the lives of people in the best possible way, and contribute towards nation building goals (State Bank of India, n.d).

Bank of Baroda

Bank of Baroda (BOB) is the state-owned, international banking and financial services company headquartered in Vadodara, Gujarat, India. It was established by the Maharaja Sayajirao Gaekwad III on 20th July 1908. BOB is the second largest bank in India after SBI. The bank was nationalized in 1969 along with 13 other major commercial banks in the country. BOB has traversed a long and eventful journey of over a century now, with presence in more than 21 countries across the globe. As on March 2019, the bank had more than 5,700

branches, gave employment to more than 54,800 people, and had total assets of Rs. 7,80,987 crore. Bank's mission is to be the best bank in the country by providing financial services at par with international standards (Bank of Baroda, n.d).

Punjab National Bank

Punjab National Bank (PNB) is India's first Swadeshi Bank. It started its operations on 12th April 1895 from the city of Lahore. PNB was the first bank to be managed solely by Indians and was led by the spirit of patriotism. Over the years, nine banks have been merged with PNB. The image of the bank and trust of customers is reflected in the growing number of customers and expansion of bank business. The mission of the bank is to create value for all its stakeholders, it aims at becoming the most preferred bank by its customers, employees, and investors. As on March 2019, the total assets held by PNB was over Rs. 7,75,000 crore, making it the third largest public sector bank in the country. The bank has a branch network of more than 7,000 branches, with over 36 percent branches in rural areas. The bank gives employment to more than 65,000 people (Punjab National Bank, n.d).

Canara Bank

The founder of Canara Bank was Shri Ammembal Subba Rao Pai, a great visionary and philanthropist. Canara Bank was established on 1st July 1906 in Mangalore, Karnataka. Growth of Canara Bank has been phenomenal, especially after the nationalization of the bank in 1969. Canara Bank has several firsts to its credit, which include the launching of an inter-city ATM network, obtaining ISO certification for branch, commissioning of exclusive Mahila bank branch, issuing credit cards to farmers, and providing agricultural consultancy services. As on March 2019, the bank had more than 6,600 branches spread across India, employed more than 58,300 people, and held assets worth Rs. 6,94,700 crore. The bank strives to become the preferred bank in the country by adopting global standards and best international practices (Canara Bank, n.d).

Bank of India

Bank of India (BOI) was established on 7th September 1906 by a group of eminent businessmen in Mumbai. The bank was nationalized in July 1969. BOI has made rapid progress over the years, has a strong national presence, extensive scale of international

operations, and voluminous size of business. As on March 2019, BOI had over 5,300 branches in India spread over the states and union territories. The bank is the first among the nationalized banks to establish a fully computerized branch way back in 1989. It is also a founder member of SWIFT in India. The bank has total assets of over Rs. 6,25,000 crore and gives employment to more than 48,800 people. It's vision is to become the leading bank of choice by providing superior, pro-active, innovative, and state-of-art banking services to its customers (Bank of India, n.d).

Housing Development Finance Corporation Bank Limited

Housing Development Finance Corporation Bank Limited (HDFC) is one of the India's leading private sector banks. HDFC was among the first banks to receive RBI's approval to set up a private sector bank in 1994. HDFC bank has given employment to more than 98,000 people. As on March 2019, the bank had total assets worth Rs. 12,44,541 crore. It has a banking network of over 5,000 branches spread across 2,866 cities and towns in India. The bank's core values include operational excellence, customer-centric approach, product leadership, and sustainable growth (HDFC Bank, n.d).

Industrial Credit and Investment Corporation of India Bank Limited

Industrial Credit and Investment Corporation of India (ICICI) was formed in 1955 as an initiative of the World Bank, the Government of India, and other representatives of the Indian industry. The principal objective of ICICI was to provide medium and long-term project financing to Indian businesses. The liberalization movement in the financial sector in the 1990s led to a market-oriented approach, integrating the Indian economy with the world economy. To provide a wide range of financial products and services to a broader spectrum of customers, ICICI bank was incorporated in 1994 as a wholly-owned subsidiary of the ICICI group. As on March 2019, ICICI bank had total assets worth Rs. 9,64,459 crore, an extensive branch network inclusive of 4,874 bank branches, and gave employment to more than 86,750 people (ICICI Bank, n.d).

Axis Bank Limited

Axis bank is one of the new generation private sector banks that began its operations in 1994. The promoters of the bank include Specified Undertaking of Unit Trust of India (SUUTI),

Life Insurance Corporation of India (LIC), General Insurance Corporation of India (GIC), National Insurance Company Ltd., New India Assurance Company Ltd., Oriental Insurance Company Ltd., and United India Insurance Company Ltd. The bank was renamed from Unit Trust of India to Axis Bank Limited on 30th July 2007. It performs banking activity with a vision of being the preferred financial solutions provider, delivering excellent customer services, empowering employees, and adopting modern technology. As on March 2019, the bank had total assets of Rs. 8,00,996 crore and provided employment to more than 61,700 people. The bank has an extensive footprint in the country with over 4,100 branches (Axis Bank, n.d).

Yes Bank Limited

Yes bank came into existence in the year 2004. Despite its short history, Yes bank is recognized as one of the fastest growing private sector banks in India. It is a customer-centric and service driven bank, built upon key pillars of growth, trust, human capital, innovation and technology, transparency, and responsible banking. As on March 2019, the bank held total assets worth Rs. 3,80,826 crore, employed 21,136 people, and had a branch network of over 1,120 branches across the country. In addition to the traditional banking operations, Yes bank is engaged in corporate investment banking, treasury, transaction banking, and sustainable practices through responsible banking (Yes Bank, n.d).

IndusInd Bank Limited

IndusInd bank was established in 1994. The name 'IndusInd' Bank was inspired by the Indus Valley Civilization – one of the greatest cultural examples of a combination of innovation with sound business and trade practices. IndusInd bank is one of India's renowned new generation private sector banks with over 1,650 branches spread across the country. The bank provides a wide array of banking products and services to individual as well as corporate customers. The bank's mission is to add value for stakeholders and emerge as best bank in innovative banking services. As on March 2019, the bank gave employment to more than 27,739 people and had total assets worth Rs. 2,77,819 crore. The bank has introduced a new range of market first products such as the IndusInd Bank Duo Card which is a debit-cum-credit card; the IndusInd Bank Nexxt Credit Card, which is an interactive credit card, and IndusAssist that provides banking services on Amazon Echo (IndusInd Bank, n.d).

Citibank N.A.

Citibank was established in the year 1812 as the 'City Bank of New York'. The bank is headquartered at New York in United States. It began its operations in Kolkata city in India, over a century ago in 1902. The bank provides best-in-class products and services to its customers. As on March 2019, Citribank has 43 branches in major cities of India with total assets of over Rs. 1,86,600 crore, and employed more than 4,750 people. In 1985, the bank launched a dedicated platform focused on serving the unique banking and wealth management needs of the Non-Resident Indians. The credit for launch of the first smart banking branch in India goes to none other than Citibank (Citibank, n.d).

Hongkong and Shanghai Banking Corporation Limited

Hongkong and Shanghai Banking Corporation Limited (HSBC) is one of the world's largest organization offering banking and financial services in Europe, Asia, Middle East, Africa, North America, and Latin America. The bank has its headquarter in London in the United Kingdom. HSBC was set up in India in 1853 with the establishment of the Mercantile Bank of India. The Mercantile Bank of India was bought by the Hongkong and Shanghai Banking Corporation Limited in 1959. Since then, the bank has grown steadily offering a variety of products and services to its corporate, commercial, and retail customers. HSBC is one of India's leading bank, with total assets of over Rs. 1,76,000 crore, a network of 26 branches, and employees over 3,850 in number (as on March 2019). HSBC gave India its first ATM in the year 1987. The bank aims to be the preferred international financial partner of its customers (HSBC Bank, n.d).

Standard Chartered Bank

Standard Chartered Bank has a 'Client First' approach and provides niche banking services to its clientele. Its origin in India can be traced to the merger of Standard Bank of British South Africa, and Chartered Bank of India, Australia and China in 1969. Standard Chartered Bank is headquartered in London in the United Kingdom. The bank is India's largest foreign bank in terms of branch network with more than 100 branches operating in the country. As on March 2019, the bank had an employee base of 6,356 and total assets worth Rs. 1,71,249 crore (Standard Chartered Bank, n.d).

Deutsche Bank AG

Deutsche bank is originally a German bank, that was established in 1870 to finance foreign trade and promote exports in Germany. In 1980, Deutsche bank established its first branch in India and today has 20 branches spread across the country. The bank is client-centric and provides banking services to corporates, institutions, and retail customers. The bank offers a variety of banking services like on-shore investment banking, asset and private wealth management, retail banking, institutional equities broking, and business process outsourcing. As on March 2019, the bank had more than 1,650 employees and total banking assets worth Rs. 1,06,289 crore (Deutsche Bank, n.d).

Development Bank of Singapore Limited

Development Bank of Singapore (DBS) was the first Singaporean bank to set up its representative office in India in 1994. A year later, the bank upgraded to a formal bank branch. The bank focuses on SDGs based on three sustainability pillars – responsible banking, responsible business practices, and creating social impact. In 2016, DBS launched India's first mobile-only bank called the 'digibank'. It incorporated ground breaking technology from biometrics to artificial intelligence to facilitate customers. As on March 2019, the bank had 25 branches in India and gave employment to over 1,500 people. Total assets held by DBS in India was close to Rs. 58,000 crore (Development Bank of Singapore, n.d).

4.3   Methodology

The focus of the present chapter is to evaluate the financial performance of scheduled commercial banks in India. Financial ratio analysis is employed for the purpose. The research methodology adopted for examining the financial performance of banks is discussed under three sub-sections. The methods and techniques of data analysis are explained in section 4.3.1. The time period of the study and sources of data are stated in sections 4.3.2 and 4.3.3, respectively.

4.3.1 Financial Ratio Analysis

The *financial ratio analysis* is undertaken to identify the strengths and weaknesses of banks. Financial ratio analysis throws light on the financial health of the bank. It is a tool used by bankers to examine the financial data in their books of accounts. Financial ratios are developed by establishing an appropriate relationship between items of the balance sheet, profit and loss account, and other bank statements. Financial ratios of banks are compared to understand if a bank is performing better or worse in relation to the industry average. It also provides a base for forecasting the future performance of bank on the basis of its past and present performance. Selected financial ratios (refer Table 4.1) based on different parameters such as capital adequacy, profitability, efficiency, productivity, asset quality, resource utilization, liquidity, and solvency are estimated to examine and assess the performance of individual banks as well as bank groups in the study (refer Table 4.2 for bank selection).

The financial ratio analysis for bank performance is carried out in two parts. In the first part, trend behaviour of financial ratios of banks and bank groups is examined using trend analysis. In the second part, a comparative performance analysis of bank groups is engaged to assess their relative performance. The steps engaged for the following analysis are discussed ahead in the section:

- Trend Analysis (Banks and Bank Groups); and
- Comparative Analysis (Bank Groups)

Trend analysis is carried out to examine the trends in financial ratios for each bank and bank groups in the study. Trend analysis is used to observe the changes in the financials of bank over time. It helps the management to make strategic and informed decisions for the success of bank. Trend of time-series data is a deterministic function of time, where future prediction is possible. The trend in financial variables is observed using the linear trend model as well as log-linear trend model.

Linear Trend Model

The linear trend model is employed to determine the upward or downward trend in financial ratios engaged for the study. It reveals an absolute change in financial ratio over time. The model can be stated as:

Financial Ratio $= f$ (Time)

FR $= \beta_1 + \beta_2 t + u_t$

where, FR $=$ alternative financial ratios

In the above model, a positive slope coefficient β_2 demonstrates an upward trend in the financial ratio indicating an absolute rise in an average of the financial ratio over the period, whereas a negative coefficient implies that there is a downward trend in the ratio suggesting an absolute decline in an average of the financial ratio over time.

Log-linear Trend Model

The log-linear trend model is used to find the rate of growth in financial ratios. The model shows a relative change in financial ratio over an absolute change in time. The log-linear trend model is estimated as:

ln (Financial Ratio) $= f$ (Time)

ln (FR) $= \beta_1 + \beta_2 t + u_t$

where, ln (FR) $=$ natural log of alternative financial ratios

The model is like any other linear model in which parameters β_1 and β_2 are linear. The only difference is that the regressand financial ratio (FR) is in the logarithmic form, and the regressor time (t) is linear. This model has the regressand in logarithmic form and is called the log-lin model or semi-log model. A positive slope coefficient β_2 in the log-linear function indicates a positive growth rate in financial ratio. In contrast, if β_2 is negative, there is a negative growth rate in the ratio (Gujarati, 2004). In addition to the above models, descriptive statistics for financial ratios such as mean, compound annual growth rate (CAGR), maximum, and minimum values have also been taken for the discussion of bank performance results.

A comparative performance analysis of bank groups is engaged to determine the significant difference in financial performance between bank groups. This analysis requires the null hypothesis to be stated as - *H0: There is no significant difference between the financial performance of bank groups.* Comparative analysis of bank performance is conducted in two steps. The first step involves employing one-way ANOVA technique to find the significant difference in performance between the three bank groups. In case of significant difference,

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posteriori test called Post Hoc Test is employed in the next step. This test validates the results of one-way ANOVA and is carried out for determining whether and which bank group performs *significantly better* amongst competing bank groups.

The one-way ANOVA technique compares the mean values of financial variable for the bank groups. It compares the variance *between* the bank groups caused by the independent variable (individual bank group) and variability *within* the bank groups referred to as error term. F-ratio is the ratio of the *between* group variance to the *within* group variance. The calculated F-ratio is compared to the critical F-value for rejecting or accepting the null hypothesis, to establish whether or not there is *any significant difference* between and within the bank groups. A large F-ratio indicates that there is more variability between the groups caused by the independent variable (individual bank group) than within the bank groups, referred to as error term. F-ratio is tested at 5% level of significance. If the significance value is less than or equal to 0.05, it indicates a significant difference between the mean values of dependent variable (or, financial ratio) for the bank group. If the significance value is greater than 0.05, it implies an absence of any significant difference between the mean values of dependent variable (or, financial ratio) for the bank group. The test results do not indicate which bank group performs better amongst competing bank groups. For determining which bank group performs *significantly better* between competing bank groups, the post hoc test is engaged.

There are a number of post hoc tests that vary in terms of their nature and strictness. Tukey Honest Significant Difference Test (Tukey HSD) is the most conservative test and reduces the Type I error. Hence, this test is undertaken for conducting post hoc test in the study. The test provides evidence of statistical significant difference between each pair of bank groups and helps to determine which bank group in the pair performs relatively better. The mean difference of bank group pairs obtained from post hoc test is examined at 5% level of significance. If the significance value is less than or equal to 0.05, it indicates a significant difference between the pairs of bank groups, as the case may be. The mean difference of bank group pair will indicate which group is better between the two. A positive mean difference implies that the first bank group in the pair has a greater mean as compared to the other, and hence the first bank group performs relatively better than the other on a specific parameter. A negative mean difference specifies that the second bank group in the pair has a greater mean as compared to the former, indicating that the second bank group performs relatively better.

4.3.2 Time Period of the Study

In the early nineties, the Indian banking industry suffered from lack of competition, low capital base, low productivity, and high intermediation cost. The role of technology was limited and service quality was almost missing. Banks did not follow proper risk management system and their prudential standards were weak. All these resulted in poor asset quality and low profitability in the sector. Reforms became imperative as despite impressive quantitative growth, there was an alarming deterioration in the health and integrity of the Indian financial system. Financial reforms were initiated in India in 1993 to take corrective measures and stabilize the financial sector, followed by a second round of banking reforms in 1998. Reforms led to marked improvement in the structure, functioning, and financials of banking industry, which could be felt only by the turn of the century. Hence, the study has focused on the time period beginning from 2001-02 to 2018-19[1] for analysing the performance of scheduled commercial banks in India.

4.3.3 Data Sources

Secondary time series data is engaged for examining the performance of scheduled commercial banks in India. Annual observations of financial variables have been considered. The data required for performance analysis of individual banks and bank groups have been sourced from various issues of the Reserve Bank of India publications such as Statistical Tables Relating to Banks in India, Handbook of Statistics on Indian Economy, CMIE ProwessIQ, and Annual Reports of banks.

4.4 An Empirical Analysis of Performance of Commercial Banks and Bank Groups

The empirical analysis of bank performance has been executed in two parts. The results of trend analysis for banks and bank groups are presented in section 4.4.1, while that of comparative performance analysis of bank groups are reported in section 4.4.2.

4.4.1 Trend Analysis

The financial ratios defined for parameters such as capital adequacy, profitability, efficiency, productivity, asset quality, resource utilization, liquidity, and solvency have been examined to evaluate the performance of commercial banks and bank groups (refer Table 4.1). Trends[2]

in financial ratios of selected banks and bank groups in the study have been assessed by estimating linear and log-linear trends[3]. The trend analysis results and their interpretation are presented under multiple tables, from Tables 4.3 to 4.15.

(1) *Capital Adequacy*

The minimum capital adequacy requirement to be met by commercial banks in India at present is 11.5 percent. The growth and trends in CRAR held by public, private, and foreign banks as well as bank groups have been presented in Table 4.3.

Table: 4.3   Capital-to-Risk (weighted) Asset Ratio (CRAR)

Banks	Minimum (%)	Maximum (%)	Mean (%)	CAGR (%)	Linear Trend	Log-linear Trend
Public Sector Banks						
SBI	11.88	14.25	12.94	-0.28	-0.03	-0.001
BOB	11.32	14.67	13.07	1.01	0.01	0.0003
PNB	9.20	14.78	12.21	-0.56	-0.13	-0.005
CB	10.56	15.38	12.62	0.01	-0.03	-0.001
BOI	9.97	14.19	11.93	1.69	0.05	0.002
PSBG	*11.21*	*13.49*	*12.37*	*-0.13*	*-0.07*	*-0.003*
Private Sector Banks						
HDFC	11.12	17.44	14.69	1.22	0.28	0.009
ICICI	10.36	19.54	15.53	2.32	0.47	0.014
AXIS	10.65	17.00	13.80	2.36	0.34	0.011
YES	13.60	20.60	16.71	-0.93	0.04	0.001
IND	10.54	15.89	13.49	0.73	0.20	0.006
PvtSBG	*12.10*	*17.45*	*14.54*	*1.39*	*0.17*	*0.005*
Foreign Banks						
CITI	10.78	18.14	14.33	2.39	0.43	0.01
HSBC	10.59	18.76	15.43	2.95	0.33	0.01
STCH	9.28	15.82	11.96	3.05	0.31	0.01
DEUT	10.62	17.35	14.73	0.57	0.03	0.001
DBS	12.99	55.49	21.03	2.33	-0.89	-0.01
FBG[4]	*37.00*	*87.00*	*55.33*	*2.25*	*1.40*	*0.01*

The important observations drawn from Table 4.3 are:

- The public sector bank group (PSBG) has observed a CRAR ranging between 11.21% to 13.49%, which meets the standard for CRAR stipulated by the RBI. The average CRAR for the group is 12.37%. The highest CRAR of 15.38% is held by CB, whereas PNB saw a major dip in its CRAR in the last two years, falling to 9.2%. The compound annual growth rate (CAGR) of SBI and PNB is negative, indicating a fall in CRAR over the study period; while BOB, CB and BOI reported positive CAGR implying an increase in CRAR over the period. The CAGR of the bank group is also

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negative. The log-linear trend of banks indicate growth in CRAR over the eighteen year analysis period. BOB and BOI have shown positive growth over the study period, whereas SBI, PNB, CB and the PSBG reported a negative growth rate. BOI reported the highest trend growth in CRAR at 0.2% in contrast PNB recorded a negative growth of (-)0.5%.

- In case of private sector banks, the minimum CRAR of private sector bank group (PvtSBG) is 12.1% and maximum is 17.45%, while the mean of CRAR is 14.54%. The average CRAR of the five selected banks has ranged between 13.49% to 16.71%. Except for YES bank, CAGR for other private sector banks as well as the group is positive. The highest trend growth rate is observed for ICICI bank at 1.4%, while the growth rate for PvtSBG is 0.5%.

- Foreign banks maintained highest CRAR across the banking industry, much above the required standard. Although the average CRAR of foreign banks selected in the study range between 12% and 21%, the bank group (FBG) has a high mean CRAR of 55%. This is mainly because few smaller foreign banks have very high CRAR, in some cases even more than 100%. Foreign banks as well as the bank group witness a positive CAGR in their CRAR values. The trend growth rate in CRAR of foreign banks is 1% for most banks. However, it is (-)1% for DBS.

- A comparison of the behaviour and trends in CRAR for the three bank groups – PSBG, PvtSBG, and FBG reveals that PSBG has maintained the requisite CRAR. PSBG has reported a negative CAGR, linear trend, and log-linear trend. On the other hand, PvtSBG and FBG have maintained higher CRAR than the RBI norms. PvtSBG has maintained high CRAR with positive CAGR and increasing linear and log-linear trends throughout the study period. FBG has a very high CRAR of over 55% during the analysis period. The considerable rise in CRAR of foreign banks is visible post global economic crisis as the banks became more cautious and risk-averse. FBG has also reported a positive CAGR in its CRAR alongside increasing trends.

(2)   *Profitability*

The performance of banks and bank groups in the study has been assessed on the basis of three indicators of profitability – Return on Assets (ROA), Return on Equity (ROE), and Net

Interest Margin (NIM). The results for the same have been presented in Tables 4.4, 4.5, and 4.6, respectively.

Table: 4.4   Return on Assets (ROA)

Banks	Minimum (%)	Maximum (%)	Mean (%)	CAGR (%)	Linear Trend
Public Sector Banks					
SBI	-0.19	1.04	0.71	-18.87	-0.05
BOB	-0.78	1.33	0.69	-14.20	-0.07
PNB	-1.60	1.44	0.64	-202.89	-0.12
CB	-0.75	1.42	0.74	-15.40	-0.09
BOI	-0.91	1.49	0.58	-200.44	-0.09
PSBG	*-0.84*	*1.15*	*0.59*	*-199.01*	*-0.09*
Private Sector Banks					
HDFC	1.28	2.02	1.65	1.48	0.04
ICICI	0.39	1.86	1.26	-3.13	0.005
AXIS	0.04	1.83	1.26	0.80	-0.01
YES	-0.29	2.13	1.48	-10.27	0.02
IND	0.22	1.91	1.26	6.20	0.07
PvtSBG	*0.63*	*1.68*	*1.23*	*-1.60*	*0.02*
Foreign Banks					
CITI	0.96	3.60	2.40	-1.96	-0.06
HSBC	0.80	1.97	1.46	3.91	0.04
STCH	0.75	3.13	2.17	-3.89	-0.09
DEUT	0.72	3.17	1.87	-3.28	-0.03
DBS	-1.69	2.72	0.72	-6.51	-0.09
FBG	*1.26*	*2.28*	*1.72*	*0.64*	*-0.02*

The important observations from Table 4.4 are:

- PSBG has witnessed an average ROA of 0.59%. Average ROA of the government banks either compares to the group average or are higher. Overall, the public sector banks have seen a falling trend in ROA for the analysis period. Post crisis, banks witnessed a prominent decline in their ROA, which turned negative after 2013. CAGR of ROA is negative for all the public sector banks as well as bank group. PNB and BOI show the maximum fall in ROA with CAGR of (-)202.9% and (-)200%, respectively.

- The mean of ROA for the selected private sector banks is between 1.26% and 1.65%. The group average is 1.23%. Bank group has a negative CAGR of ROA (-1.6%), while HDFC, AXIS, and IND banks reveal a positive CAGR. There is a positive linear trend in ROA for private sector banks, except for AXIS bank.

- The average ROA of DBS is as low as 0.72% while that for CITI bank is as high as 2.4%. The FBG has an average ROA of 1.72%. Except for HSBC, other foreign banks and the bank group reveal an overall declining trend in their ROA. The CAGR is positive for HSBC and FBG, while it is negative for the other banks.

- Except for PvtSBG, both public and foreign bank groups reported a falling trend in ROA for the analysis period. CAGR of PSBG is (-)199.01%, revealing a massive decline in ROA for this group. Although accompanied with fluctuations, the private sector banks have managed a positive ROA with overall increasing trend by using their assets wisely. Yet, a distinctive decline in ROA of private sector banks is visible after 2013. The slowdown effects of financial crisis appear to have impacted the foreign banks as well. Foreign banks and bank group witnessed major dips in their ROA in 2009 and 2013.

Table: 4.5   Return on Equity (ROE)

Banks	Minimum (%)	Maximum (%)	Mean (%)	CAGR (%)	Linear Trend
Public Sector Banks					
SBI	-3.21	19.69	12.86	-19.90	-1.07
BOB	-13.48	23.47	11.85	-14.94	-1.17
PNB	-29.54	24.12	10.05	-201.32	-2.07
CB	-12.19	28.47	13.47	-17.12	-1.84
BOI	-19.5	26.71	9.88	-198.56	-2.26
PSBG	*-14.62*	*20.88*	*8.52*	*-198.64*	*-1.57*
Private Sector Banks					
HDFC	16.30	21.28	18.54	-1.36	-0.08
ICICI	3.15	20.93	11.81	-4.20	-0.42
AXIS	0.46	29.28	17.77	-7.93	-1.09
YES	-1.73	25.02	17.61	-5.70	0.44
IND	4.34	37.37	15.63	2.11	-0.05
PvtSBG	*5.45*	*17.81*	*13.59*	*-5.47*	*-0.26*
Foreign Banks					
CITI	6.87	23.70	17.21	-1.02	-0.33
HSBC	6.94	16.38	11.74	-1.30	-0.06
STCH	3.97	39.26	18.22	-8.39	-1.61
DEUT	7.73	31.04	12.92	-4.37	-0.63
DBS	-11.59	20.38	5.06	-19.30	-0.67
FBG	*7.16*	*16.05*	*11.61*	*-3.23*	*-0.47*

The important highlights from Table 4.5 are:

- The overall trend as well as CAGR for all the selected public sector banks and bank group is negative. The fall in profitability of banks is predominantly noticeable after

2013 when return on equity turned negative. PNB is the worst hit bank with a CAGR of (-)201.32%. The average ROE for PSBG is 8.52%.

- The ROE of private sector bank group ranges between 5.45% (minimum) and 17.81% (maximum), averaging at 13.59%. There is a falling trend in ROE for the bank group as well as individual banks, except for YES bank. ROE for PvtSBG has been falling at a CAGR of (-)5.47%.

- The foreign banks and bank group reveal a declining trend in ROE over the analysis period. The average ROE for FBG is 11.61%. DBS is one foreign bank that has an average ROE of only 5.06% and a negative CAGR of as high as (-)19.3%. Among the foreign banks, STCH bank stands out with a high average ROE of 18.22%. After flaunting a peak in ROE at 39.26% in 2002-03, STCH bank touched its lowest ROE of 3.97% in the year 2015-16.

- A comparison of public, private, and foreign bank groups reveals that ROE has been trending downwards and CAGR is negative for the bank groups. A decline in ROE is most prominent in case of PSBG. The three bank groups faced a massive dip in their profitability levels in the year 2004-05 and 2015-16. Among the public sector banks, PNB faced a major fall in ROE over the analysis period. In case of private sector banks, YES bank reported negative ROE in the initial years (that is 2004-05) of its establishment. Like foreign bank group, DBS also suffered from a decline in ROE, reporting a high negative ROE of (-)11.59% in 2017-18.

The following observations are made from Table 4.6:

- The average NIM of PSBG is 3.37%, and that of the selected public sector banks ranges from 2.34% to 3.08%. Despite a high average NIM, the public sector banks have witnessed a negative CAGR and falling linear as well as log-linear trends. The trend growth is negative at 1% for majority of public sector banks and bank group, indicating a fall in NIM over the analysis period.

- PvtSBG has an average NIM of 2.9%. The private sector banks also have an average NIM higher than 2%. An upward rising trend in NIM has been observed for private sector banks with a positive CAGR. In particular, ICICI, YES and IND banks are

found to exhibit high CAGR in NIM. The growth rate of private sector banks as well as bank group is more than 1%, except for HDFC bank.

- The average NIM for foreign banks ranges from 2.59% to as high as 4.4%. The highest average NIM is reported by CITI bank, while the lowest by DBS. Overall, there is a falling trend in NIM for foreign banks, except for DEUT bank. CAGR is negative for majority banks and the bank group.

- All three bank groups as well as individual banks have an average NIM that is comparable to the industry average of 3%. The average NIM for PSBG is 3.37%, that of PvtSBG is 2.90%, and FBG is 3.75%. Trends in NIM for PSBG and FBG is falling, while that of PvtSBG is rising at a growth rate of 1% for the analysis period.

Table: 4.6   Net Interest Margin (NIM)

Banks	Minimum (%)	Maximum (%)	Mean (%)	CAGR (%)	Linear Trend	Log-linear Trend
Public Sector Banks						
SBI	2.35	3.38	2.79	-.0.58	-0.02	-0.003
BOB	1.84	3.31	2.52	-0.69	-0.07	-0.01
PNB	2.01	3.93	3.08	-2.40	-0.09	-0.01
CB	1.74	3.01	2.34	-1.02	-0.07	-0.01
BOI	1.70	2.84	2.36	-1.46	-0.06	-0.01
PSBG	*2.08*	*4.36*	*3.37*	*-0.93*	*-0.06*	*-0.01*
Private Sector Banks						
HDFC	3.07	4.69	4.06	1.56	0.04	0.005
ICICI	0.96	3.11	2.30	6.78	0.11	0.02
AXIS	1.59	3.37	2.79	3.62	0.07	0.01
YES	1.42	3.24	2.63	5.05	0.05	0.01
IND	1.36	3.77	2.77	4.30	0.13	0.02
PvtSBG	*1.97*	*3.41*	*2.90*	*3.02*	*0.08*	*0.01*
Foreign Banks						
CITI	3.91	5.20	4.41	0.73	-0.01	-0.001
HSBC	2.89	4.97	3.61	0.49	-0.01	-0.001
STCH	3.59	4.70	4.18	-1.38	-0.03	-0.004
DEUT	0.88	6.31	3.82	-0.56	0.12	0.02
DBS	0.13	4.23	2.59	-17.38	-0.16	-0.04
FBG	*3.23*	*4.36*	*3.75*	*-0.32*	*-0.02*	*-0.003*

(3)   Efficiency

Increased efficiency contributes towards improved profitability for banks. Here, operating efficiency of banks has been examined, using Cost to Income Ratio (CIR). An increase in efficiency ratio indicates either increasing costs or decreasing income. As lower cost equates

with greater efficiency, the lower the CIR, the more efficient is the bank. Table 4.7 presents the growth and trends in CIR for the selected banks and bank groups.

Table: 4.7   Cost to Income Ratio (CIR)

Banks	Minimum (%)	Maximum (%)	Mean (%)	CAGR (%)	Linear Trend	Log-linear Trend
Public Sector Banks						
SBI	20.46	27.01	23.08	0.95	-0.07	-0.001
BOB	15.32	29.16	20.47	-0.65	-0.44	-0.01
PNB	16.68	32.34	21.74	-1.07	-0.47	-0.01
CB	13.81	23.41	18.01	-0.24	-0.32	-0.01
BOI	14.94	26.89	20.29	0.13	-0.29	-0.01
PSBG	*16.65*	*25.82*	*20.51*	*0.02*	*-0.28*	*-0.01*
Private Sector Banks						
HDFC	20.53	30.21	26.37	0.52	-0.17	-0.003
ICICI	16.06	27.05	20.67	0.10	-0.12	-0.002
AXIS	12.88	24.85	21.47	3.53	0.23	0.006
YES	13.02	83.21	22.84	-10.25	-1.96	-0.02
IND	10.60	25.75	20.57	4.65	0.65	0.02
PvtSBG	*18.54*	*27.79*	*22.36*	*1.34*	*-0.01*	*0.0002*
Foreign Banks						
CITI	23.28	38.87	29.18	-0.01	-0.43	-0.01
HSBC	24.31	33.57	28.51	-0.21	-0.26	-0.004
STCH	20.34	29.43	25.90	1.83	0.133	0.003
DEUT	18.98	45.81	31.86	-0.23	-0.36	-0.004
DBS	14.67	48.59	23.45	5.66	0.46	0.01
FBG	*24.89*	*49.52*	*29.52*	*0.10*	*0.08*	*0.00003*

The observations made from Table 4.7 are:

- The average CIR for BOB, PNB, and BOI is comparable to that of the PSBG group. SBI reports the highest CAGR of 0.95%, whereas PNB records the lowest CAGR of (-)1.07%. Linear as well as log-linear trends in CIR have been falling for public sector banks and bank group, indicating increasing cost efficiency.

- Except for HDFC bank, rest of the private sector banks have an average CIR comparable to the bank group. Of the private sector banks, YES bank is the one to witness the steepest fall in CIR from 83.21% in 2004-05 to 18.31% in 2018-19. YES bank also reports a negative CAGR of 10.25%, and falling linear and log-linear trends. AXIS and IND banks exhibit positive linear and log-linear trends over the analysis period, meaning cost inefficiency for the banks.

- CIR for FBG ranges from a minimum 24.89% to a maximum 49.52% with an average of 29.52%. DBS reveals the highest CAGR in CIR (or, cost inefficiency) at 5.66%,

which is the highest among all the selected public, private, and foreign banks in the study. Linear as well as log-linear trends in CIR are positive for FBG implying issues of cost inefficiency in foreign banks.

- Among the bank groups, the highest operating inefficiency in terms of CAGR is exhibited by PvtSBG, followed by FBG. However, the mean CIR is found to be highest for FBG alongside increasing linear and log-linear trends.

(4)   Productivity

In the present study, productivity performance of banks has been measured by three financial ratios – Business Per Employee (BPE), Business Per Branch (BPB), and Profit Per Employee (PPE). The results for the same have been presented in Tables 4.8, 4.9 and 4.10, respectively.

Table: 4.8   Business Per Employee (BPE)

Banks	Minimum (Rs. in Mn)	Maximum (Rs. in Mn)	Mean (Rs. in Mn)	CAGR (%)	Linear Trend	Log-linear Trend
Public Sector Banks						
SBI	17.30	187.70	80.27	15.06	10.21	0.06
BOB	22.28	188.90	110.04	13.39	11.88	0.06
PNB	16.78	168.00	85.67	14.51	9.52	0.06
CB	21.49	170.70	96.77	12.96	9.49	0.05
BOI	21.88	206.90	111.59	13.34	12.52	0.06
PSBG	*15.97*	*170.16*	*90.80*	*14.93*	*10.60*	*0.07*
Private Sector Banks						
HDFC	44.60	168.70	87.49	4.66	4.10	0.02
ICICI	48.65	122.20	90.80	5.57	0.72	0.004
AXIS	80.80	165.30	119.23	3.67	4.13	0.01
YES	53.05	232.70	147.56	9.09	10.79	0.04
IND	71.71	158.79	97.92	-0.96	-0.54	-0.01
PvtSBG	*33.39*	*143.51*	*83.73*	*8.95*	*5.31*	*0.03*
Foreign Banks						
CITI	135.90	376.10	212.60	5.29	11.43	0.02
HSBC	52.90	427.20	174.98	13.07	19.74	0.05
STCH	78.00	259.60	136.63	7.16	9.91	0.03
DEUT	89.40	616.20	235.45	11.38	27.96	0.05
DBS	60.00	420.20	242.50	5.40	19.38	0.04
FBG	*87.57*	*414.61*	*193.23*	*9.08*	*18.21*	*0.04*

Table: 4.9   Business Per Branch (BPB)

Banks	Minimum (Rs. in Mn)	Maximum (Rs. in Mn)	Mean (Rs. in Mn)	CAGR (%)	Linear Trend	Log-linear Trend
Public Sector Banks						
SBI	430.59	2179.81	1192.94	10.01	104.12	0.04
BOB	351.11	1962.14	1243.82	10.57	112.07	0.05
PNB	250.49	1591.52	919.00	11.49	86.41	0.05
CB	384.78	1551.93	1087.32	8.55	68.02	0.03
BOI	370.87	1850.10	1153.71	9.02	94.28	0.04
PSBG	*304.02*	*1561.16*	*987.09*	*10.10*	*81.14*	*0.04*
Private Sector Banks						
HDFC	1388.34	3460.86	1972.70	4.76	79.46	0.01
ICICI	1737.98	5980.03	2781.02	0.80	-113.87	-0.02
AXIS	1589.10	2521.80	2118.50	2.75	45.54	0.01
YES	2305.95	5907.78	3377.04	-0.93	-105	-0.01
IND	1569.89	3408.29	2049.39	-2.24	-38.19	-0.006
PvtSBG	*512.50*	*2141.24*	*1364.50*	*8.77*	*79.56*	*0.03*
Foreign Banks						
CITI	11,313	44,066	23,833	5.49	1592	0.03
HSBC	6364	65,198	22,265	14.30	2867	0.06
STCH	4435	17,022	10,536	5.30	732	0.03
DEUT	6962	52,214	22,171	11.10	2480	0.05
DBS	3160	40,691	20,297	10.66	1731	0.05
FBG	*5492*	*30,600*	*15,246*	*10.63*	*1491*	*0.05*

Table: 4.10   Profit Per Employee (PPE)

Banks	Minimum (Rs. in Lakhs)	Maximum (Rs. in Lakhs)	Mean (Rs. in Lakhs)	CAGR (%)	Linear Trend
Public Sector Banks					
SBI	-2.43	6.45	3.23	-7.13	0.07
BOB	-10.00	12.00	4.56	10.80	-0.005
PNB	-17.00	8.42	1.52	-217.48	-0.59
CB	-7.00	9.76	3.20	-2.87	-0.19
BOI	-12.30	7.49	0.97	-214.33	-0.61
PSBG	*-10.11*	*6.52*	*1.84*	*-212.59*	*-0.39*
Private Sector Banks					
HDFC	4.18	23.00	10.46	5.18	0.65
ICICI	4.00	16.00	10.63	-1.67	0.08
AXIS	0.47	18.00	10.52	-1.92	0.10
YES	-1.82	23.00	14.80	0.07	1.20
IND	1.56	14.98	8.34	3.27	0.28
PvtSBG	*2.59*	*12.49*	*7.15*	*4.85*	*0.47*
Foreign Banks					
CITI	17.33	88.00	41.42	8.46	3.43
HSBC	4.50	65.35	26.92	14.42	3.43
STCH	11.50	41.79	24.03	3.02	0.87
DEUT	18.57	79.16	45.07	5.71	2.27
DBS	-44.85	72.16	16.46	-17.71	-2.28
FBG	*11.43*	*62.40*	*30.81*	*9.93*	*2.80*

The important findings from Table 4.8 are:

- Employee productivity of public sector banks has increased manifold over the analysis period. Public sector banks as well as bank group exhibit rising trends in BPE and a positive CAGR. On an average, BOI generates the highest BPE worth over Rs. 111 million. The average BPE of the bank group is worth Rs. 90.8 million. Trend growth in BPE for public sector banks is comparable to that of the bank group.

- In case of private sector banks, with the exception of IND bank, other banks reveal a positive CAGR and increasing trend in BPE. YES bank records a CAGR of over 9% and a trend growth rate of 4%, which is highest among private sector banks.

- Productivity of foreign banks in terms of BPE has been on an increasing path throughout the analysis period. HSBC and DEUT banks have grown at a CAGR of over 13% and 11%, respectively. These banks also exhibit a trend growth rate of 5%. CITI bank reports the lowest CAGR at a little over 5% with a trend growth of 2%.

- Productivity has been increasing throughout the analysis period for all the three bank groups. FBG has the highest average BPE. CAGR is highest for PSBG at 14.93% and so is the trend growth at 7%.

The observations drawn from Table 4.9 are:

- Public sector banks have witnessed a prominent increase in branch productivity. These banks record a positive CAGR and increasing trend in business per branch (BPB). In particular, PNB and BOB have the highest CAGR in BPB with a trend growth rate of 5%.

- Despite an expansion in branch productivity of private sector banks, YES and IND banks report a negative CAGR as well as declining growth trends. However, the productivity performance of the bank group is relatively better with an average BPB amounting to Rs. 1,364.5 million, CAGR over 8%, and a trend growth rate of 3%.

- Overall, the foreign banks have shown higher productivity in terms of average business per branch. All the five foreign banks exhibit a positive CAGR in branch productivity and a trend growth rate of at least 3% and above. HSBC is the best performer amongst the competitors.

- The productivity performance in terms of BPB has been increasing for all the three bank groups. The FBG reveals the highest average BPB of Rs. 15,246 million, a CAGR of 10.63%, and a trend growth rate of 5%.

The important highlights from table 4.10 are:

- In case of public sector banks, the profit per employee (PPE) of banks increased for the first decade of analysis period but deteriorated thenafter. The CAGR and linear trend are largely negative for the banks. BOB is an exception with a positive CAGR of 10.8%. In stark contrast, PNB reports a negative CAGR of around (-)217% in PPE.

- Overall, the private sector banks have shown an improvement in productivity in terms of PPE. The bank group has an average PPE of Rs. 7.15 lakhs with 4.85% CAGR. ICICI and AXIS are the two banks that report a negative CAGR, although with an increasing linear trend.

- Foreign banks and bank group exhibit an increase in PPE over the analysis period albeit with fluctuations. Except for DBS, other foreign banks show a high and positive CAGR and increasing linear trend.

- Of the bank groups, productivity performance in terms of PPE has been the best for FBG and the least for PSBG. FBG reveals a CAGR of 9.93% and a positive linear trend in PPE. The average PPE for this bank group amounts to Rs. 30.81 lakhs.

(5) *Asset Quality*

In times of economic crisis, asset quality is a key concern as many borrowers default on their loans and volume of non-performing asset increases. Here, gross non-performing asset ratio (GNPA) is used to assess the asset quality of banks. The growth trends in GNPA of public, private, and foreign banks have been presented in Table 4.11.

Table: 4.11   Gross Non-Performing Asset Ratio (GNPA)

Banks	Minimum (%)	Maximum (%)	Mean (%)	CAGR (%)	Linear Trend	Log-linear Trend
Public Sector Banks						
SBI	2.92	12.82	5.92	-3.08	-0.05	-0.0001
BOB	1.27	13.34	6.14	-1.91	-0.04	-0.0001
PNB	1.71	18.38	7.44	1.49	0.32	0.02
CB	1.32	11.84	4.60	1.93	0.27	0.02
BOI	1.68	16.58	6.79	2.92	0.39	0.02
PSBG	*2.01*	*14.58*	*6.24*	*0.26*	*0.22*	*0.01*
Private Sector Banks						
HDFC	0.85	3.27	1.43	-5.07	-0.08	-0.02
ICICI	1.51	10.66	5.45	-2.14	0.06	0.01
AXIS	0.81	6.79	2.30	-5.43	0.03	0.001
YES	0.00	3.22	0.61	78.06	0.14	–
IND	0.81	7.48	2.29	-7.20	-0.26	-0.04
PvtSBG	*1.77*	*9.65*	*3.80*	*-3.52*	*-0.20*	*-0.01*
Foreign Banks						
CITI	0.94	5.10	2.21	2.27	-0.05	-0.01
HSBC	0.89	6.84	2.95	-10.35	-0.21	-0.03
STCH	2.14	14.14	5.64	5.80	0.58	0.04
DEUT	0.24	3.66	1.45	-1.33	0.01	0.006
DBS	0.00	13.45	3.64	19.14	0.27	–
FBG	*1.92*	*5.49*	*3.55*	*-3.51*	*-0.04*	*-0.003*

Note: Log-linear trend growth of YES and DBS banks is not possible to obtain as the log of zero is mathematically undefined.

The main observations from Table 4.11 are:

- GNPA of public sector bank group ranges between a minimum of 2.01% and maximum of 14.58%. PNB records the highest average GNPA of 7.44%. Largely, the public sector banks reveal a positive CAGR and a trend growth rate of 1% and over. However, SBI and BOB exhibit a negative CAGR as well as declining trends in GNPA.

- Despite a negative CAGR in GNPA for majority private sector banks, some of the banks barring HDFC and IND, have exhibited positive trends in GNPA. YES bank started with very low GNPA, but there was a sudden spurt in bad debts over the second half of the analysis period. The CAGR as well as linear trend in GNPA is found to be positive for YES bank. The average GNPA of ICICI bank is by far the highest (5.45%) and exceeds the group average.

- Overall, the foreign banks and bank group do not have an issue of poor asset quality with an average GNPA of 3.55% for bank group. Only STCH bank has a mean GNPA as high as 5.64%. There is a positive and high CAGR in GNPA for STCH and DBS

banks, but STCH, DEUT and DBS banks have shown rising trends in GNPA primarily over the post-crisis period. CITI, HSBC and FBG have witnessed falling trends in GNPA.

- Amongst bank groups, the problem of poor asset quality for private and foreign bank groups is not as profound as in case of PSBG, which was particularly noticeable after the global financial crisis. All the public sector banks and majority of private sector banks in the study witnessed a peak in their GNPA in 2017-18. PSBG has alone witnessed a positive CAGR and increasing trends in GNPA with the highest mean GNPA of 6.24%.

(6)   Resource Utilization

Credit-Deposit Ratio (CDR) is a measure of resource utilization by banks. There is no defined minimum or maximum level of CDR stipulated by RBI, but a very low CDR would mean suboptimal use of bank's resources. Alternatively, a very high CDR could trigger possible risks. The preferred range of CDR is between 65% and 75%. The trends and growth in CDR for banks and bank groups have been displayed in the Table 4.12.

Table: 4.12   Credit-Deposit Ratio (CDR)

Banks	Minimum (%)	Maximum (%)	Mean (%)	CAGR (%)	Linear Trend	Log-linear Trend
Public Sector Banks						
SBI	44.65	86.94	72.21	3.10	1.90	0.01
BOB	48.79	74.87	66.23	1.77	1.05	0.01
PNB	53.06	78.86	68.61	1.39	1.08	0.01
CB	51.74	73.96	67.31	1.91	0.86	0.01
BOI	64.16	78.20	70.97	0.12	0.17	0.001
PSBG	*55.38*	*77.85*	*69.64*	*1.28*	*0.94*	*0.01*
Private Sector Banks						
HDFC	38.60	88.76	72.36	5.02	2.29	0.015
ICICI	84.97	146.59	98.78	-2.84	-0.77	-0.003
AXIS	42.32	96.92	71.35	3.90	3.23	0.02
YES	70.20	114.77	84.84	-0.56	0.70	0.004
IND	62.04	95.65	78.20	2.17	2.19	0.01
PvtSBG	*63.64*	*90.30*	*78.73*	*1.48*	*1.45*	*0.01*
Foreign Banks						
CITI	48.17	87.62	71.19	-2.55	-1.68	-0.01
HSBC	42.11	74.18	60.06	0.16	-0.53	-0.004
STCH	63.60	124.70	87.75	-3.88	-0.77	-0.004
DEUT	58.95	111.11	83.37	0.71	1.47	0.01
DBS	28.96	179.29	79.97	-6.86	-2.04	-0.003
FBG	*68.18*	*91.51*	*79.12*	*-0.59*	*-0.33*	*-0.002*

The following observations emerged from Table 4.12:

- Overall, the resource utilization by public sector banks has been in the preferred range. The mean CDR of the selected public sector banks is comparable to that of the bank group, that is 69.64%. These banks have witnessed a positive CAGR and increasing growth trends in CDR.

- The private sector banks have higher resource utilization with a group average of over 78% CDR. The bank group has seen a CAGR of 1.48% and trend growth of 1% in its CDR. ICICI bank exhibits the highest mean CDR at 98.78%, a negative CAGR of 2.84%, and a declining linear as well as log-linear trends.

- The foreign bank group reveals the highest resource utilization amongst bank groups. It has a CDR ranging from 68.18% (minimum) to 91.51% (maximum). Alongside FBG, other foreign banks such as CITI, STCH and DBS banks have also experienced a negative CAGR and falling trends in their CDR. DEUT bank has a high average CDR of over 83% with a positive CAGR of 0.7% accompanied by increasing growth trends.

- Private sector banks and foreign banks have been found to resort to higher resource utilization with credit-deposit ratios beyond the preferred industry range. However, foreign banks have largely seen falling trends in their CDR as against the private sector and public sector banks.

(7)   *Liquidity*

The liquidity position of banks in the study has been examined in terms of two ratios – current ratio and liquid asset ratio. The ratio of current assets to current liabilities is ideally 1.33:1 for commercial banks in India (ICSI, 2014). The liquidity position of banks and bank groups have been presented in Tables 4.13 and 4.14, respectively.

Table: 4.13   Current Ratio (CR)

Banks	Minimum	Maximum	Mean	CAGR (%)	Linear Trend	Log-linear Trend
Public Sector Banks						
SBI	0.78	1.53	1.08	1.32	0.03	0.01
BOB	1.18	7.35	3.83	2.68	0.30	0.04
PNB	0.91	5.52	2.60	8.46	0.23	0.04
CB	1.19	4.01	2.66	-0.69	0.11	0.02
BOI	1.31	10.00	3.57	6.75	0.37	0.05
PSBG	*1.05*	*3.92*	*2.04*	*3.69*	*0.11*	*0.03*
Private Sector Banks						
HDFC	0.53	2.69	1.06	-0.48	0.04	0.01
ICICI	0.47	3.80	1.57	5.99	0.05	0.02
AXIS	0.90	7.73	2.48	-7.56	-0.14	-0.02
YES	0.64	2.24	1.28	-1.53	0.02	0.004
IND	1.08	3.90	2.11	-4.92	-0.03	-0.004
PvtSBG	*0.10*	*2.39*	*1.36*	*2.00*	*0.06*	*0.03*
Foreign Banks						
CITI	0.68	1.93	1.18	-4.87	-0.04	-0.01
HSBC	0.35	2.87	1.03	-3.19	0.03	0.02
STCH	0.12	1.45	0.45	-4.74	-0.01	-0.0004
DEUT	0.39	7.28	2.30	-8.85	-0.27	-0.05
DBS	0.18	13.44	2.69	0.34	-0.39	-0.06
FBG	*0.48*	*2.69*	*0.92*	*-6.62*	*-0.04*	*-0.01*

Important findings from Table 4.13 are:

- The short-term liquidity as measured by current ratio (CR) for PSBG is 2.04. Majority of public sector banks suffice to the expected current ratio benchmark. BOB maintains highest average current assets to current liabilities ratio of 3.83:1, while SBI has the lowest CR of 1.08.

- The CR average for PvtSBG is 1.36, but for HDFC and YES banks, it falls below the ideal ratio of 1.33. The liquidity position of ICICI bank is consistent with that of the group, exhibiting a positive CAGR in CR and increasing trends.

- Except DEUT and DBS banks, rest of the foreign banks and bank group maintain a lower current ratio than the ideal yardstick. At large, foreign banks have witnessed a CR with negative CAGR and falling trends.

- In case of bank groups, besides FBG, others have maintained sufficient short-term liquidity in terms of CR. Public and private sector bank groups have also shown a positive CAGR and increasing trends in their current ratios.

Table: 4.14   Liquid Asset Ratio (LAR)

Banks	Minimum	Maximum	Mean	CAGR (%)	Linear Trend	Log-linear Trend
Public Sector Banks						
SBI	0.06	0.19	0.09	-6.41	-0.004	-0.02
BOB	0.09	0.22	0.14	-0.58	0.005	0.015
PNB	0.06	0.17	0.10	0.60	0.0003	0.001
CB	0.07	0.17	0.10	-3.45	-0.002	-0.006
BOI	0.08	0.16	0.11	2.81	0.004	0.014
PSBG	*0.07*	*0.13*	*0.09*	*-2.82*	*-0.001*	*-0.006*
Private Sector Banks						
HDFC	0.05	0.15	0.09	-4.59	-0.003	-0.014
ICICI	0.06	0.12	0.08	-2.26	-0.0001	0.0005
AXIS	0.05	0.23	0.10	-2.17	-0.006	-0.022
YES	0.04	0.12	0.07	3.88	-0.0003	0.0003
IND	0.05	0.15	0.09	-5.78	-0.003	-0.015
PvtSBG	*0.01*	*0.13*	*0.08*	*-3.23*	*-0.001*	*0.002*
Foreign Banks						
CITI	0.06	0.19	0.13	-3.47	-0.004	-0.01
HSBC	0.06	0.40	0.13	-3.24	0.0002	0.01
STCH	0.01	0.10	0.06	2.76	-0.0001	-0.01
DEUT	0.05	0.46	0.20	-3.09	-0.01	-0.03
DBS	0.02	0.57	0.20	-2.98	-0.02	-0.04
FBG	*0.09*	*0.18*	*0.11*	*-2.30*	*-0.001*	*-0.004*

Table 4.14 reveals the following points:

- PSBG has an average LAR of 0.09 with a negative CAGR and declining trends. Similar changes in LAR have been observed for SBI and CB. On the other hand, PNB and BOI have witnessed a positive CAGR and increasing trends in LAR. Amongst, public sector banks, BOB has the highest average LAR of 0.14.

- Liquidity as measured by liquid asset ratio for private sector banks is found to be comparable to the bank group. Except for YES bank, other private sector banks and bank group have witnessed a negative CAGR in their LAR. However, the trend growth rate is mildly positive for ICICI, YES and bank group.

- For foreign banks, besides STCH bank, all other banks have maintained LAR at comparable levels or higher than the group average. HSBC reports a negative CAGR but increasing growth trends in LAR, whereas STCH bank exhibits a positive CAGR but negative trends in LAR.

- The ratio of liquid assets to total assets measuring liquidity of banks has been found to be < 1 for all the three bank groups and the selected banks in the study. FBG holds the

highest liquidity, in particular DEUT and DBS banks exhibit a liquidity of as high as 0.20 as a proportion of total assets. The average LAR of PSBG and PvtSBG is 0.09 and 0.08, respectively.

(8)   Solvency

The long-term solvency of banks and bank groups has been analysed using the debt-equity ratio (DER). The requirement of debt to equity for banks is not supposed to be more than 3:1 (RBI, 2015). Higher DER would lead to rise in costs and fall in profitability. The growth and trends in DER of banks have been presented in Table 4.15.

Table: 4.15   Debt-Equity Ratio (DER)

Banks	Minimum	Maximum	Mean	CAGR (%)	Linear Trend	Log-linear Trend
Public Sector Banks						
SBI	14.72	22.79	17.75	-1.01	-0.25	-0.01
BOB	14.46	21.39	17.93	-1.41	0.01	0.001
PNB	16.01	27.04	19.09	-2.11	-0.24	-0.004
CB	18.05	23.37	20.35	0.46	0.07	0.001
BOI	15.61	31.08	22.09	-3.97	-0.35	-0.01
PSBG	*19.07*	*27.93*	*20.79*	*-2.22*	*-0.24*	*-0.004*
Private Sector Banks						
HDFC	8.34	15.64	11.50	-2.19	-0.28	-0.01
ICICI	7.04	15.79	10.05	-3.15	-0.43	-0.02
AXIS	10.03	23.38	14.35	-3.84	-0.72	-0.02
YES	5.99	17.06	12.63	6.33	0.22	0.01
IND	8.25	20.96	14.53	-3.15	-0.74	-0.02
PvtSBG	*9.04*	*13.66*	*10.41*	*-1.12*	*-0.22*	*-0.01*
Foreign Banks						
CITI	6.93	10.83	8.55	-1.70	-0.19	-0.01
HSBC	6.55	16.23	8.86	-4.20	-0.30	-0.01
STCH	5.20	13.49	9.09	-4.28	-0.52	-0.03
DEUT	4.47	9.36	6.71	-0.93	-0.15	-0.01
DBS	2.53	13.89	8.73	2.75	0.46	0.03
FBG	*5.67*	*10.93*	*7.33*	*-3.03*	*-0.25*	*-0.01*

The observations drawn from Table 4.15 are:

- Public sector banks have largely witnessed declining growth rate and falling trends in their DER. Yet, they have been able to maintain a high average DER as compared to the suggested RBI benchmark.

- Private sector banks also maintained a high DER with a 10.41% group average. Except for YES bank, rest of the private banks exhibit declining trends and growth in DER.

- Although higher than the preferred standard, foreign banks have relatively lower DER as compared to public and private sector banks. Other than DBS, all foreign banks and bank group reveal a negative CAGR and a fall in linear as well as log-linear trends in DER.

- All the three bank groups have been found to maintain an average DER much above the criterion of 3:1 prescribed by RBI. PSBG has the highest DER, followed by PvtSBG and then FBG. The bank groups exhibit declining growth and trends in DER over the analysis period.

4.4.2   Comparative Analysis

A comparative performance analysis of bank groups – public sector bank group, private sector bank group, and foreign bank group has been carried out in this section. Comparative analysis is engaged to assess the relative performance of bank groups in the study to determine which group performs significantly better on different financial parameters.

On the basis of financial ratios defined in the study, comparative performance analysis of bank groups has been carried out[5]. In the first step, ANOVA test results reveal the existence/absence of significant difference between the three bank groups. For the significantly different bank groups, post hoc test is engaged to determine which bank group performs better. To conduct this test, three pairs of bank groups are made: *Pair 1 represents PSBG and PvtSBG; Pair 2 represents PvtSBG and FBG; and Pair 3 represents FBG and PSBG.* The post hoc test results yield the mean difference for each pair of bank groups for financial ratios. Finally, the bank groups have been ranked on the basis of the mean difference to identify the relative performance of each bank group vis-à-vis the other two.

The results for ANOVA and Post Hoc Test for comparative analysis of bank groups have been displayed in Table 4.16.

<p style="text-align: center;">Table: 4.16   Comparative Performance of Bank Groups</p>

Sr. No.	Parameter	Financial Ratio	ANOVA F-Ratio	Post Hoc Test# Mean Difference			Ranks$		
				Pair 1	Pair 2	Pair 3	PSBG	PvtSBG	FBG
1.	Capital Adequacy	CRAR	174.72*	-2.16	-40.79*	42.96*	3	2	1
2.	Profitability	ROA	33.03*	-0.64*	-0.48*	1.13*	3	2	1
		ROE	3.01*	-5.06*	1.97	3.08	3	1	2
		NIM	10.08*	0.47*	-0.85*	0.38	2	3	1
3.	Efficiency	CIR	26.02*	3.92	-7.16*	9.01*	1	2	3
4.	Productivity	BPE	13.54*	7.07	-109.5*	102.4*	2	3	1
		BPB	53.44*	-377.41	13882*	14259*	3	2	1
		PPE	43.92*	-5.30	-23.7*	29.0*	3	2	1
5.	Asset Quality	GNPA	5.11*	2.43*	0.25	-2.69*	3	2	1
6.	Resource Utilization	CDR	9.41*	-9.09*	-0.39	9.48*	3	2	1
7.	Liquidity	CR	13.34*	0.68*	0.44	-1.12*	1	2	3
		LAR	12.33*	0.01	-0.03*	0.02*	2	3	1
8.	Solvency	DER	284.55*	10.38*	3.08*	-13.46*	1	2	3

*F-ratio and Mean Difference are significant at 5% level, #Pair 1: PSBG-PvtSBG, Pair 2: PvtSBG-FBG, Pair 3: FBG-PSBG, $ Ranks are based on mean difference of financial ratios. In case of GNPA and CIR, the bank group with lower mean difference gets the higher rank.

The following observations are drawn from Table 4.16:

- A comparison of computed F-ratios with the critical F-values for ANOVA reveals that the bank groups are significantly different at 5% level in case of all the financial ratios examined.

- As the bank groups are found to be significantly different from each other, the post hoc tests have been engaged to arrive at mean difference of financial ratios. In case of Pair 1 (PSBG - PvtSBG), mean difference for financial ratios such as NIM, GNPA, CR and DER are significantly different at 5% level of significance. The mean difference for these ratios is positive indicating that PSBG has higher mean as compared to PvtSBG. Financial ratios like ROA, ROE, and CDR are significantly different between the two bank groups with negative mean difference indicating that PvtSBG has higher mean. Mean difference for CRAR, CIR, BPE, BPB, PPE and LAR for Pair 1 is not significantly different at 5% level signifying that mean of these ratios are same for PSBG and PvtSBG.

In case of Pair 2 (PvtSBG - FBG), BPB and DER have significantly positive mean difference suggesting that PvtSBG has higher mean as compared to FBG. Financial ratios like CRAR, ROA, NIM, CIR, BPE, PPE and LAR have negative yet significant mean difference indicating that FBG has higher mean in relation to PvtSBG. Mean difference for ROE, GNPA, CDR and CR are same for both bank groups indicating absence of any significant difference.

The post hoc test results for Pair 3 (FBG - PSBG) reveals a significant and positive mean difference for CRAR, ROA, CIR, BPE, BPB, PPE, CDR and LAR suggesting that FBG has higher mean in comparison to PSBG. Variables such as GNPA, CR, and DER have negative and significant mean difference indicating higher mean value for PSBG. ROE and NIM are not found to be significantly different for this pair.

- On the basis of post hoc test results, it can be inferred that FBG maintains relatively higher CRAR and LAR, generates higher ROA and NIM, has higher productivity (BPE, BPB, PPE) and CDR, and lower GNPA in relation to PSBG and PvtSBG. On the basis of the mean difference of these financial ratios for bank groups, FBG is ranked first. The PSBG has relatively higher CR and DER, and lower CIR in comparison to the other two bank groups. Hence, PSBG is ranked first for these ratios. PvtSBG is ranked first for ROE as it has relatively higher ROE vis-à-vis the PSBG and FBG.

4.5   Findings and Conclusion

A detail evaluation of financial performance of scheduled commercial banks in India has been carried out by employing financial ratio analysis. Financial ratios based on different parameters such as capital adequacy, profitability, efficiency, productivity, asset quality, resource utilization, liquidity, and solvency are estimated to examine and assess the performance of individual banks as well as bank groups in the study. A comparison of financial ratios of banks is undertaken to determine whether a bank performs better or worse in relation to the industry average.

Performance analysis has been conducted for selected banks. Five banks from each bank group with the biggest size of total assets have been selected from public sector banks, private sector banks, and foreign banks. The financial ratio analysis has been carried out in

two parts. In the first part, trend behaviour of financial ratios of banks and bank groups is examined using trend analysis. In the second part, a comparative performance analysis of bank groups is engaged to assess their relative performance. The time period for analysis ranges from 2001-02 to 2018-19.

Linear and log-linear trends have been estimated along with other descriptive statistics for determining the trend and growth in financial ratios. Important highlights from the empirical results for trend analysis are listed below:

Public Sector Banks

- Public sector banks have maintained sufficient capital adequacy ratio (CRAR) in the range of 11.9% to 13.1%, as prescribed by the RBI.

- Profitability of public sector banks has been poor over the analysis period. These banks have reported a fall in their return on asset (ROA), return on equity (ROE), and net interest margin (NIM) primarily after 2013. Post global financial crisis, there was a false sense of security in the banking industry that it was immune to global shocks, which led to unplanned lending resulting in mounting bad loans and falling profits.

- Public sector banks have reported falling trends in their operating cost to income ratio (CIR), indicating higher cost efficiency by banks.

- A rising trend in productivity of public sector banks as measured by business per employee (BPE), business per branch (BPB), and profit per employee (PPE) has been observed over the analysis period. However, a sharp decline in PPE was witnessed by public sector banks after 2013.

- The Indian banking system became risk averse and adopted conservative regulatory policies in the aftermath of global financial crisis. The government and RBI took prompt actions to recover the financial system from the impact of global crisis. The financial system was flooded with money, policy rates were brought down to historic low, and banks were allowed to restructure their bad loans. Despite corrective measures, crisis had its distressing effects on the banking industry, that was realised after a gap of almost five years. Asset quality became a matter of major concern for

public sector banks as gross non-performing assets (GNPA) escalated to double-digit figures after 2013.

Business generated by public sector banks underwent expansion despite accumulation of bad debts. Serious issues in working and policies of public sector banks have been key factors contributing towards rising debts of these banks. Besides, the government banks followed liberal credit policies with deficiency in credit sanction processes. These issues coupled with MIS misuse, mismanagement, aggressive lending, under-reporting of NPA, and lack of systematic credit assessment mechanism have led to poor asset quality of these banks. Rising GNPA has been found to trigger a fall in NIM and profitability of public sector banks.

- Resource utilization as measured by credit-deposit ratio (CDR) is found to be in the range of 65% to 75% for public sector banks and is comparable to the industry average.

- Public sector banks have managed high liquidity in terms of current ratio (CR). Except for SBI, other banks in the study have an average CR in the range of 2.04 to 3.83. These banks have maintained higher current assets to current liabilities than the preferred 1.33:1 ratio. High CR implies idle current assets with banks that could have been used in business to generate profits. As public sector banks generate lower profits or even suffer losses, these excess current assets could have been channelized and deployed in profit generating assets. The liquid asset ratio (LAR) of public sector banks is in the range of 0.09 to 0.14 and are comparable to other bank groups.

- Public sector banks have maintained debt-equity ratio (DER) in the range of 17:1 to 22:1. This is much higher than the RBI recommended ratio of 3:1. Higher DER indicates potential financial risk on long-term solvency of banks. It implies over-dependency of public sector banks on borrowed funds in relation to own funds. As borrowed funds come with high cost it affects banks' profits.

Private Sector Banks

- Private sector banks have maintained high capital adequacy ratio in the range of 13.8% to 16.7%, which is way above the RBI stipulated norm of 11.5%. High CRAR

means that banks are adequately stocked with capital to deal with unexpected losses in future and are less likely to become insolvent.

- Profitability (ROA, ROE, NIM) has been on a rising trend for the private sector banks for most part of the analysis period. Yet, a distinctive decline in ROA and ROE were visible after 2013. Average NIM of these banks range between 2.3% to 4.1%.

- AXIS and IND banks have exhibited a positive growth in cost to income ratio (CIR) and are cost inefficient. The rest of the private sector banks - HDFC, ICICI, and YES banks have turned out to be cost efficient.

- Productivity of private sector banks has been rising (BPE, BPB, PPE) over the analysis period. However, these banks started reporting falling trends in PPE after 2013 as profits of private sector banks declined during the same period.

- Private sector banks did not face the NPA issue till the financial crisis. There was a steep rise in GNPA of these banks in 2009 and after 2013. Although private sector banks were challenged by a rise in their GNPA levels, they adopted strict loan recovery policies to manage their asset quality.

- Amongst the private sector banks, ICICI and YES banks have adopted aggressive lending strategies with high average CDR of 98.8% and 84.8%, respectively. Resource utilization by other banks in the group is in the range of 71% to 78%, comparable to the industry average of 75%.

- The average current ratio (CR) of private sector banks is in the range of 1.06 to 1.57, which is quite in the acceptable limit of 1.33:1. AXIS and IND banks have reported high average CR of 2.48 and 2.11, respectively alongside a declining trend growth. However, the escalation in CR of these banks is witnessed primarily over the post crisis period. After the crisis shock, banks became averse to lending and started sitting on surplus liquidity. This could have possibly hindered credit growth of banks and eventually hit profitability, as also noted in falling ROA and ROE for private sector banks. An overall falling trend in liquid asset ratio (LAR) has been observed for private sector banks, indicating shrinkage in the proportion of liquid assets as compared to total assets.

- The debt-equity ratio (DER) of private sector banks is in the range of 10:1 to 15:1, as against the RBI advocated ratio of 3:1. Solvency status of private sector banks as revealed by their DER indicates higher long-term financial risk. Higher DER leads to higher operating costs and fall in cost efficiency. AXIS and IND banks have been found to be cost inefficient for the assessment period.

Foreign Banks

- Foreign banks have maintained the highest capital adequacy ratio in the industry. Very high CRAR indicates idle funds with these banks that could have been used for business expansion and profit generation.

- Profitability (ROA, ROE, NIM) of foreign banks has been falling for majority banks for most part of the analysis period albeit with fluctuations. Prominent dips in profitability for foreign banks is observed after the financial crisis, in the years 2009 and 2013.

- Amongst the foreign banks; CITI, HSBC and DEUT banks have been found to be cost efficient with falling operating cost to income ratio (CIR). STCH and DBS banks are cost inefficient with positive trend in CIR.

- Foreign banks have reported rising productivity (BPE, BPB, PPE) for the assessment period. However, DBS bank exhibited a declining trend as well as negative CAGR in profit per employee (PPE).

- Foreign bank group has witnessed an overall falling trend in GNPA accompanied with fluctuations. CITI and HSBC banks have also experienced an improvement in their quality of assets. However, the asset quality of some banks as STCH, DEUT and DBS has taken a hit with noticeable jump in their GNPA post crisis. During this period, foreign banks have reported a decline in their net interest margin and profitability.

- Foreign banks have actively engaged in lending. The average credit-deposit ratio (CDR) of foreign bank group is 79%, which overshoots the industry average of 75%. Despite intense lending by foreign banks, their GNPA levels are relatively low. This is because foreign banks adopt proper evaluation of proposed loan projects with a continuous assessment of advances, and follow strict policies for recovery of

outstanding loans. STCH and DBS banks are exceptions with double-digit GNPA after 2013.

- Foreign banks have witnessed an overall falling trend in liquidity. However, an increase in current ratio (CR) and liquid asset ratio (LAR) is noticed post crisis. Foreign banks have been observed to maintain smaller amount of current balances, with current ratio below the industry benchmark of 1.33. Yet, average LAR of foreign bank group is comparable to that of other bank groups.

- Foreign banks have a high debt-equity ratio (DER) in the range of 6:1 to 9:1 on average. This is way above the ideal ratio of 3:1 recommended by RBI. High DER led to increase in costs and results in cost inefficiency for banks. STCH and DBS banks have been found to witness high DER alongside a high CIR.

ANOVA and Post Hoc tests have been carried out for determining which bank group is significantly different and which performs better amongst competing bank groups. The important observations drawn from the results of comparative performance analysis of bank groups are stated below:

- A significant difference between the three bank groups was found from ANOVA test results for all financial ratios examined in the study.

- The inference of post hoc test results is that foreign bank group has relatively higher CRAR, ROA, NIM, BPE, BPB, PPE, CDR and LAR. Also, this bank group has lower GNPA levels in relation to public and private sector bank groups. On the basis of the mean difference of these financial ratios for the three bank groups, the foreign bank group ranks first.

- The public sector bank group has a relatively higher CR and DER as compared to the other two bank groups. CIR is relatively lower for this bank group. Hence, public sector bank group ranks first on these three financial ratios.

- Private sector bank group is ranked first in case of ROE as it has a relatively higher ROE as compared to public sector and foreign bank groups.

The findings and conclusions from performance evaluation of scheduled commercial banks in India as conducted in the study have been summarized below:

- Public sector banks have high productivity, adequate capitalization and have maintained higher liquidity. These banks have appropriately utilized their resources and are cost efficient. However, they have the highest debt-equity ratio amongst bank groups that indicates higher long-term financial risk on solvency of these banks. Poor asset quality and low profitability are the major concerns of government banks.

- Private sector banks have reported rising productivity, and profitability with better asset quality. These banks have managed sufficient liquidity and capital adequacy. However, high debt-equity ratio signals a possible financial distress for banks. Besides, private sector banks are found to be cost inefficient and resort to aggressive lending strategies with increasing credit-deposit ratio.

- Foreign banks have the highest profitability, productivity and resource utilization capacity amongst the three bank groups. Also, these banks have relatively lower non-performing assets. However, foreign banks are over capitalized, have high debt-equity ratio indicating long-term financial risk and are cost inefficient with high operating cost to income ratio.

- Concerns in scheduled commercial banks were particularly noticeable after the onset of global financial crisis. Banks have reported an increase in non-performing assets, this had two impacts. Higher NPAs required higher loan loss provisions and hence limited fund availability had a negative impact on credit advancement, earnings, and profitability of banks. Besides, crisis made the banks risk averse and they started maintaining higher liquidity, which could have been used in business to generate profits. High NPAs and liquidity indicate possible adverse impact on bank profitability.

- Post crisis, scheduled commercial banks have been found to maintain higher debt-equity ratio than suggested by RBI. High debt-equity ratio adversely affects the financial viability and cost efficiency of banks. It also signals that banks could be under financial stress impacting their ability to pay off future debts.

Notes

1.   The overall time period for performance analysis in the study ranges from 2001-02 to 2018-19. Yes bank being an important bank has been taken for the analysis. However, the bank commenced its operations in India in 2004 and its data is available for the period 2004-05 to 2018-19 only. Therefore, the analysis for Yes bank is carried out for the time period 2004-05 to 2018-19.

2.   The changes in alternative financial ratios over the analysis period for individual banks and bank groups have been observed with the help of stacked line graphical charts. These are presented in Appendix I.

3.   The time series data for financial ratios such as ROA, ROE, and PPE are negative for some years over the analysis period. Log-linear trend is not calculated for these ratios as it is not possible to obtain logarithm of negative figures.

   For interpretation of results, log-linear trend values are multiplied by 100 to indicate growth rates, wherever applicable.

4.   Capital-to-Risk (weighted) Asset Ratio (CRAR) of foreign bank group is taken as an average of CRAR of all the foreign banks in India as group data is not available. CRAR of foreign bank group is very high since some of the smaller banks that have not been considered for analysis have very high CRAR, in some cases even more than 100%.

5.   SPSS software has been used for conducting ANOVA and Post Hoc tests.

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