International Journal of Financial Management
13 (2) 2023, 56-69
http://publishingindia.com/ijfm/

Working Capital Management of Selected Company During Pre and Post Pandemic Period

Parban Dutta*, Rajashik Sen, Sarbani Mitra*****

Abstract

This study focuses on working capital management and their various financial ratios to understand various aspects of Indian Banking industry guided by Reserve Bank of India (Central Bank of India). Indian banking industry undergoes huge transformation from earlier years due to their various innovation in banking industry in terms of technological aspect, globalisation and privatisation. For this study, five major banks, namely State Bank of India, HDFC, ICICI, AXIS and KOTAK MAHINDRA, having market share of 73% in Indian banking industry, have been considered and data was collected from money control website of these five major banks from 2011 to 2022. The analysis of these data depicts status of working capital management during pre-COVID and post-COVID period. Main focus of the study is to find the relationship of Return On Assets (ROA) of the bank with other financial ratios and to explore whether there is any significant difference among ROA of selected banks and finally to find status of ROA for selected banks during the pre and post pandemic period.

Keywords: Working Capital, Banking Industry, ROA, Financial Ratio, COVID, India

Introduction

Whatever is the size of a business and type of business, working capital is the life blood and controlling nerve centre of that business. Thus, working capital is a very significant facet of financial management. Both excessive as well as inadequate working capital positions are dangerous from the firm's point of view. Working capital is considered to be the life-giving force to an economic entity. A firm's capital comprises of fixed capital and working capital, the dominant contributors of the total capital of a developing country. A firm's capital comprises of fixed capital and working capital, the dominant contributors of the total capital of a developing country. In many firms, current assets called working capital take up a remarkable part of total assets. Firms fail most often because they are unable to meet their working capital needs. Consequently, sound working capital is a requisite for a firm's survival. The overall success of a company depends upon its working capital position. Thus, the life-line of every concern, whether it is a manufacturing or trading or service enterprise, is working capital indeed.

According to Cohen and Robins (1978), "working capital is the portion that is circulated from one form to another in the ordinary conduct of a business". Working capital is an indicator of short-run solvency of a business. In today's competitive business environment, sound working capital is a pre-requisite for corporate success. Norgaard (1985) says that, "the inadequacy or mismanagement of working capital is one of the leading causes of business failure".

A business organisation cannot run effectively without sufficient quantity of working capital. According to Gitman (1982), "the goal of working capital management is to manage each firm's current assets and liabilities in such a way that an acceptable level of net working capital is maintained". A company with sufficient working capital is always in a position to take advantage of any favourable opportunity either to short term liability or to execute a special order or to wait for better market position.

Adequacy of working capital raises the creditworthiness of a corporation facilitating better for credit terms. Excessive

* Senior Analyst, Infosys BPM Ltd., India. Email: parban.dutta@infosys.com
** Assistant Professor, St. Xavier's College, West Bengal, India. Email: sen.rajashik@gmail.com
*** Professor & Head, Department of Executive Management; Head, Department of Supply Chain & Logistics Management, Indian Institute of Social Welfare and Business Management, Management House, College Square West, Kolkata, West Bengal, India. Email: sarbani_iiswbm@yahoo.co.in

working capital implies idle funds which earn no profit for the firm while paucity of working capital not only impairs the firm's profitability but also results in business operation interruptions and inefficiencies. Therefore, the amount of working capital in every concern should be neither more nor less than what is required. Besides having an optimal level of working capital, a firm has to concentrate on efficient management of working capital as it facilitates maximisation of profitability. Zenoff and Zwick (1969) observed that "Proper management of working capital is very important for the success of an enterprise. It aims at protecting the purchasing power of assets and maximising the return on investment".

Working Capital Management

Working capital management has always been a fascinating subject from the academic and business point of view. So, the management of working capital is regarded as an extremely crucial area of financial management. In the words of Smith (1979), "working capital management is concerned with the problems that arise in attempting to manage the current assets, current liabilities and the inter-relationships that exist between them". The basic objective of working capital management is to manage the firm's current assets and current liabilities in such a way that a satisfactory level of working capital is maintained. In other words, a firm should neither have too high nor too low investment in working capital because both of them will adversely affect the profitability of the firm.

Indian Banking Industry

As per the Reserve Bank of India, India's banking sector is sufficiently capitalised and well-regulated. The financial and economic conditions in the country are far superior to any other country in the world. Credit, market and liquidity risk studies suggest that Indian banks are generally resilient and have withstood the global downturn well.

The Indian banking industry has recently witnessed the rollout of innovative banking models like payments and small finance banks. In recent years India has also focused on increasing its banking sector reach, through various schemes like the Pradhan Mantri Jan Dhan Yojana and Post payment banks. Schemes like these coupled with major banking sector reforms like digital payments, neo-banking, a rise of Indian NBFCs and fintech have significantly enhanced India's financial inclusion and helped fuel the credit cycle in the country.

The digital payments system in India has evolved the most among 25 countries with India's Immediate Payment Service being the only system at level five in the Faster Payments Innovation Index India's Unified Payments Interface has also revolutionised real-time payments and strived to increase its global reach in recent years.

The Indian banking system consists of 12 public sector banks, 22 private sector banks, 46 foreign banks, 56 regional rural banks, 1,485 urban cooperative banks and 96,000 rural cooperative banks in addition to cooperative credit institutions (www.ibef.org). As of September 2021, the total number of ATMs in India reached 213,145 out of which 47.5% are in rural and semi urban areas.

In 2020–2022, bank assets across sectors increased. Total assets across the banking sector (including public and private sector banks) increased to US$ 2.67 trillion in 2022 (www.ibef.org).

In 2022, total assets in the public and private banking sectors were US$ 1,594.51 billion and US$ 925.05 billion, respectively. During FY16–FY22, bank credit increased at a CAGR of 0.62%. As of FY22, total credit extended surged to US$ 1,532.31 billion. During FY16–FY22, deposits grew at a CAGR of 10.92% and reached US$ 2.12 trillion by FY22. Bank deposits stood at Rs. 173.70 trillion (US$ 2.12 trillion) as of November 4, 2022 reached US$ 2.12 trillion by FY22. Bank deposits stood at Rs. 173.70 trillion (US$ 2.12 trillion) as of November 4, 2022.According to India Ratings & Research (Ind-Ra), credit growth is expected to hit 10% in 2022–23 which will be a double digit growth in eight years. As of November 4, 2022 bank credit stood at Rs. 129.26 lakh crore (US$ 1,585.09 billion). As of November 4, 2022 credit to non-food industries stood at Rs. 128.87 lakh crore (US$ 1.58 trillion) (www.ibef.org).

Market share of Indian banking industry such as State Bank of India Bank, ICICI Bank, HDFC Bank, Axis Bank and Kotak Mahindra Bank rose to 73% in June 2022 from 68.5% in March 2016, data from Investment Information and Credit Rating Agency of India Limited.

Significance of the Study

The significance of the study highlights the value that the project outcomes may provide in the field of real-world practice. In a fiercely competitive business world, aspiration to grow in quick succession is necessary. In a viewpoint, achieving growth in short run is difficult without enhancing efficiency and it takes own time. Investigation from several perspectives of working capital phenomenon as a financial and strategic management for bank and banking industry in India. This study evaluates and analyses selected banks in India for working capital and their various financial ratio of Indian listed banking company in India.

Financial Ratios for Banking Industry

Net Interest Margin: Net interest margin is an especially important indicator in evaluating banks because it reveals a bank's net profit on interest-earning assets, such as loans or investment securities. Since the interest earned on such assets is a primary source of revenue for a bank, this metric is a good indicator of a bank's overall profitability, and higher margins generally indicate a more profitable bank. A number of factors can significantly impact net interest margin, including interest rates charged by the bank and the source of the bank's assets. Net interest margin is calculated as the sum of interest and investment returns minus related expenses; this amount is then divided by the average total of earning assets.

$$\text{Net interest Margin} = \frac{\text{Investment Return} - \text{Interest Expense}}{\text{Average Earning Assets}}$$

Return on Assets: The return-on-assets (ROA) ratio is frequently applied to banks because the cash flow analysis is more difficult to accurately construct. The ratio is considered an important profitability ratio, indicating the per-dollar profit a company earns on its assets. Since bank assets largely consist of money the bank loans, the per-dollar return is an important metric of bank management. The ROA ratio is a company's net, after-tax income divided by its total assets. An important point to note is since banks are highly leveraged, even a relatively low ROA of 1–2% may represent substantial revenues and profit for a bank.

$$\text{Return on Assets} = \frac{\text{Net Income}}{\text{Total Assets}}$$

Return on Equity: Return on equity (ROE) is a measure of financial performance calculated by dividing net income by shareholders› equity. Because shareholders› equity is equal to a company's assets minus its debt, ROE is considered the return on net assets.

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Average Shareholder}}$$

Operating Profit Margin: The operating margin measures how much profit a company makes on a dollar of sales after paying for variable costs of production, such as wages and raw materials, but before paying interest or tax. It is calculated by dividing a company's operating income by its net sales.

$$\text{Operating Margin} = \frac{\text{Operating Earnings}}{\text{Revenue}}$$

Net Profit Margin: The net profit margin, or simply net margin, measures how much net income or profit is generated as a percentage of revenue. It is the ratio of net profits to revenues for a company or business segment.

$$\text{NPM} = \frac{\text{Revenue} - \text{cost of goods sold} - \text{Operating and other expenses} - \text{Interest} - \text{Taxes}}{\text{Revenue}} * 100$$

$$= \frac{\text{Net income}}{\text{Revenue}} * 100$$

Return on Capital Employed: This ratio can help to understand how well a company is generating profits from its capital as it is put to use. Return on capital employed (ROCE) is one of several profitability ratios financial managers, stakeholders and potential investors may use when analysing a company for investment.

$$\text{ROCE} = \frac{\text{Earning before interest and tax}}{\text{Capital employed}}$$

Current Account Savings Account: A current account savings account (CASA) is aimed at combining the features of savings and checking accounts to entice customers to keep their money in the bank. It pays very low or no interest on the current account and an above-average return on the savings portion. CASA is most commonly used in West and Southeast Asia, though the CASA structure is available globally.

$$\text{CASA} = \frac{\text{CASA Deposits}}{\text{Total Deposits}}$$

Cost of Income: The term cost of income refers to the total cost of manufacturing and delivering a product or service to consumers.

Interest Income to Total Asset: Revenue generated from a bank's interest-bearing assets, a typical bank's assets consist of all forms of personal and commercial loans, mortgages, and securities.

$$\text{Interest Income} = \frac{\text{Net Interest Income}}{\text{Total Deposits}} * 100$$

Non-Interest Income: Non-interest income is bank and creditor income derived primarily from fees including deposit and transaction fees, insufficient funds (not sufficient fund) fees, annual fees, monthly account service charges, inactivity fees, check and deposit slip fees and so on. Credit card issuers also charge penalty fees, including late fees and over-the-limit fees. Institutions charge fees that generate non-interest income as a way of increasing revenue and ensuring liquidity in the event of increased default rates.

Operating Profit: A company's operating profit is its total earnings from its core business functions forgiven period, excluding the deduction of interest and taxes. It also excludes any profits earned from ancillary investments, such as earnings from other businesses that a company has a part interest in. An operating loss occurs when core business income ends up being lower than expenses.

Literature Review

A number of studies have been undertaken by eminent researchers who have put stress on working capital management (Thakur, 2021; Karia & Thorat, 2019; Jana, 2018; Singh et al., 2017). Even some studies (Rajak & Sur, 2014) focussed on performance of companies in India in respect of working capital management during the pre-liberalisation and post-liberalisation periods. Pal Garg (2014) studied on the capital structure practices in India during pre and post financial crisis period. Accordingly, based on various literatures, following section describes the detail of working capital performance including the status of inter-relationship between working capital and profitability. Finally, from these review of literatures, existing gaps will be identified.

Thakur (2021) made a study on an anatomy of working capital management in large steel companies in India. To analyse the size and composition of working capital, she examined the working capital policies of select steel companies in India, assessed the working capital performance and examined the inter relationship between working capital and profitability. This analysis will provide a base to judge whether the prevailing policy of management with regard to liquidity is satisfactory.

Karia and Thorat (2019) made a study on companies' pre and post working capital situation of Indian listed manufacturing companies. The study revealed that achieving growth in short run is difficult without enhancing efficiency and it takes own time. Ultimately, amalgamation that includes mergers as well as acquisitions provides a remedy to corporates for accomplishing growth rapidly.

Jana (2018) focused on working capital management and profitability of the selected listed FMCG companies in India. The main object of finding of the study was to find the assess and evaluate the efficiency of the working capital management strategies that FMCG Company was employing and to establish the relationship between working capital management and business profitability for FMCG company.

Singh et al. (2017) made a study on the working capital management of selected Indian tyre companies. Administration of working capital management determines to a very large extent the success and failure of overall operations of an enterprise. Many times, in the event of a failure of a business concern the shortage of working capital is its main cause. The study examined the financing pattern of the working capital and made suggestions for the improvement in the working capital management. The study has made detailed analysis of different aspect of working capital such as cash management, receivable management, inventory management, financial of working capital and give several business answer of selected companies such as do the selected tyre companies plan their working capital requirement properly, have these companies utilise the investment in current asset effectively, are cash resource utilised effectively and properly, what is the practice followed for collecting accounts receivable, what is the pattern of financing working. Capital requirement of these type companies.

Rajak and Sur (2014) undertook a study on the performance of the selected public sector oil companies in India in respect of working capital management during the pre-liberalisation and post-liberalisation periods and selected companies were ONGCL, HPCL, BPCL, IOCL and GAIL (India) Limited.

Pal Garg (2014) studied on the capital structure practices of Indian fast moving consumer goods industry during pre and post financial crisis period.

Research Gap

A research gap analysis, which is also referred to as a needs analysis, is important to understand for any type of organisational, industry performance or any other gap within the research. It allows companies or industry to determine where they are today and where they want to be in the future. Companies or industries can re-examine their goals through a gap analysis to figure out whether they are on the right track to accomplishing them. A company or industry may choose to directly analyse where its company or industry may be falling short compared to other competitors specifically looking at financial metrics or other metrics. This may include pricing comparisons, margin percentages, overhead costs, revenue per labor, or fixed vs. variable components, etc. The ultimate goal of a research gap analysis is to determine areas in which a competitor is being more financially efficient. This information can then be used in further broadening the gap analysis or so called research gap types.

Though a number of studies have been undertaken to identify various aspects of capital structure in foreign countries, focussing upon studying various theoretical aspects and the factors affecting the capital structure, but no research has been undertaken on working capital management and their financial ratio on banking industry in India to evaluate various aspects of the bank for their finance stability and also comparison of financial performance and working capital management in banking industry not yet done during pre and post pandemic period.

Objectives of the Study

The prime objectives of the study are as follows:

- To analyse return on asset of banks compared with Indian banking industry.
- To find relationship of return on asset with other financial ratios of the selected banks.
- To reveal whether there is any significant difference among ROA of selected banks.
- To explore the status of ROA for selected banks during pre and post pandemic period.

Research Methodology

Various Literatures have been reviewed to know the status of select companies in banking industry. For further analysis, this study concentrated on India's top five nationalised banks namely SBI, HDFC, ICICI, AXIS and KOTAK MAHINDRA. The logic behind the selection of these 5 banks are:

- These 5 banks include 73% market share of Indian banking industry.
- They have international presence in the financial market.
- They have better market capital compared to other nationalized banks.
- In terms of receiving awards for overall contribution in financial market, these five banks are dominating - SBI has received three highest Gold awards at ET HC Awards under the categories of 'HR Leader of the year - Large scale organisations', 'Excellence in Business Continuity Planning & Management' and 'Most Valuable Employer During COVID-19'. HDFC has received Best Corporate Bank Award. ICICI has bagged with Economic Times Award for corporate excellence. Axis bank has feathered with Asian Bank of the Year Award and Kotak Mahindra is blessed with The Asian Country Award.

The quantitative data has been handpicked from money control website from 2011 to 2022 to analyse their yearly data of various financial ratio. Data are basically coming from balance sheet, profit and loss statement, cash flow statement, annual report from their respective company's website. Main financial ratio under studies are ROA, ROE, net profit, ROCE, net interest margin, operating profit margin, net profit margin, CASA, interest income to total asset, interest income to total asset, non-interest income, operating profit, etc.

Statistical Hypothesis of the Study

H0: There is no significance difference among ROAs of major five banks.

H1: There is significance difference among ROAs of major five banks.

Tools Used for Data Analysis

For analysing the collected data, two different tools namely, financial tool and statistical tools were used. Financial tool comprised several financial ratio analyses, whereas as statistical tool Analysis of Variance (ANOVA) was used for analysing data and to test the hypotheses and random effects regression model for finding relation.

Analysis and Findings

The brief statuses of select banks are described as follows:

SBI Bank: The origin of the SBI goes back to the first decade of the nineteenth century with the establishment of the Bank of Calcutta in Calcutta on June 2, 1806. SBI, a Fortune 500 company, is an Indian Multinational, Public Sector Banking and Financial services statutory body headquartered in Mumbai. The rich heritage and legacy of over 200 years, accredits SBI as the most trusted Bank by Indians through generations. The largest Indian Bank with 1/4th market share, serves over 45 crore customers through its vast network of over 22,000 branches, 62,617 ATMs/ADWMs, 71,968 BC outlets, with an undeterred focus on innovation and customer centricity, which stems from the core values of the Bank - Service, Transparency, Ethics, Politeness and Sustainability. Vision of the organisation is to be the bank of choice for a transforming India and mission is committed to providing simple, responsive and innovative financial solutions.

HDFC Bank: HDFC Bank is one of India's leading private banks and was among the first to receive approval from the Reserve Bank of India to set up a private sector bank in 1994. Today, HDFC Bank has a banking network of 6,499 branches and 18,868 ATM's in 3,226 cities/ towns and headquarter of HDFC bank. HDFC Bank offers a diverse range of financial products and banking services to customers through a growing branch and ATM network and digital channels such as Net banking, *Phone banking and Mobile Banking:* HDFC Bank offers a wide gamut of commercial and transactional banking services to businesses and organisations of all sizes. Their services include working capital finance, trade services, transactional services and cash management. Under treasury services, businesses, which generate better returns on their funds and manage financial risk, are helped. Three main product areas are focused: foreign exchange and derivatives, local currency money market and debt securities and equities.

ICICI Bank: ICICI was formed in 1955 at the initiative of the World Bank, the Government of India and representatives of Indian industry. With the liberalisation of the financial sector in India in the 1990s, ICICI transformed its business from a development financial institution offering only project finance to a diversified financial services provider that, along with its subsidiaries and other group companies, offered a wide variety of products and services. ICICI Bank was incorporated in 1994 as a part of the ICICI group. In 1999, ICICI became the first Indian company and the first bank or financial institution from non-Japan Asia to be listed on the New York Stock Exchange. The issue of universal banking, which in the Indian context meant conversion of long-term lending institutions such as ICICI into commercial banks, the managements of ICICI and ICICI Bank formed the view that the merger of ICICI with ICICI Bank would be the optimal strategic alternative for both entities, High Court of Gujarat at Ahmedabad in March 2002, and by the High Court of Judicature at Mumbai and the Reserve Bank of India in April 2002. Consequent to the merger, the ICICI group's financing and banking operations, both wholesale and retail, were integrated in a single entity.

Axis Bank: Axis Bank is the third largest private sector bank in India. The Bank offers the entire spectrum of financial services to customer segments covering Large and Mid-Corporates, MSME, Agriculture and Retail Businesses. The Bank has a large footprint of 4,758 domestic branches (including extension counters) with 10,990 ATMs & 5,972 cash recyclers spread across the country as of March 31, 2022. The Bank has six Axis Virtual Centres with over 1,500 Virtual Relationship Managers as of 31st March 2022. The Overseas operations of the Bank are spread over eight international offices with branches in Singapore, Dubai (at DIFC), and Gift City-IBU; representative offices in Dhaka, Dubai, Abu Dhabi, Sharjah and an overseas subsidiary in London,

UK. The international offices focus on corporate lending, trade finance, syndication, investment banking, liability businesses and private banking/wealth management offerings. Axis Bank is one of the first new generation private sector banks to have begun operations in 1994. The Bank was promoted in 1993, jointly by Specified Undertaking of Unit Trust of India (then known as Unit Trust of India), Life Insurance Corporation of India, General Insurance Corporation of India, National Insurance Company Ltd., The New India Assurance Company Ltd., The Oriental Insurance Company Ltd. and United India Insurance Company Ltd. The shareholding of Unit Trust of India was subsequently transferred to Specified Undertaking of Unit Trust of India, an entity established in 2003. With a balance sheet size of Rs. 11,75,178 crores as on March 31, 2022, Axis Bank has achieved consistent growth.

Kotak Mahindra Bank: Kotak Mahindra Bank Ltd. is an Indian private sector bank headquartered in Mumbai, Maharashtra, India. It was founded in February 2003, when Kotak Mahindra Finance Ltd., the Group's flagship company, received banking license from the Reserve Bank of India, becoming the first non-banking finance company in India to convert into a bank - Kotak Mahindra Bank Ltd. Established on 1985 as a Kotak Capital Management Finance Ltd focused on Bill Discounting and later it is merger of ING Vysya Bank. The company operates through Personal Banking: the Personal segment provides accounts, deposits, cards, loans, insurance and investments, Business: The Business segment involves accounts, loans, trade services, payments and working capital. Corporate: The Corporate segment provides foreign exchange, payments, long-term finance, working capital finance, acquisition financing and others. Wealth: The Wealth segment involves wealth products & services.

Table 1 shows trend of financial status viz., average net profit per share, net profit per employee and net profit per branch, etc. of selected banks in the month of March during the period of 2011-2022. The analysis shows that in terms of net profit per share, HDFC occupies the highest position followed by SBI. Whereas in terms of net profit per employee; net profit per branch, ROCE, Net profit margin, ROA, ROE, SBI's performance is the least among five, though in terms of retention ratio, SBI occupies 3rd position among five.

Table 1: Financial Status of Selected Banks in March during the Period of 2011-2022

Description	*SBI*	*HDFC*	*ICICI*	*Axis*	*Kotak*
Net Profit/Share (Rs.)	51.92	52.66	32.98	49.84	22.83
Net Profit/Employee (Rs.)	502901.89	1645861.01	1231606.28	1071934.10	990762.83
Net Profit/Branches (Rs.)	6411737.52	34213159.08	23005574.25	19041324.52	31065327.19
ROCE (%)	1.79	3.20	2.88	2.74	2.82
Net Profit Margin (%)	6.89	21.79	18.09	14.28	20.25
Operating Profit Margin (%)	-9.39	2.22	-7.26	-10.27	1.52
Return on Assets (%)	0.47	1.67	1.24	1.03	1.63
Return on Equity	8.14	16.42	10.26	11.16	12.00
Net Interest Margin	2.56	3.76	2.79	2.88	3.85
Operating Profit	-0.62	0.16	-0.49	-0.71	0.11
Price To Sales (X)	2.04	5.29	3.72	2.87	9.20
Retention Ratios (%)	84.60	86.56	81.04	46.57	97.37

Analysis of Variance (ANOVA)

An ANOVA test is a type of statistical test used to determine if there is a statistically significant difference between two or more categorical groups by testing for differences of means using variance.

In one-way ANOVA, it is intended to compare t population means, where t>2. Therefore, the null hypothesis for analysis of variance for t population means is:

$H0: \mu 1 = \mu 2 = ... = \mu t$

The alternative, however, cannot be set up similarly to the two-sample case. If it is intended to see if two population

means are different, the alternative would be $\mu 1 \neq \mu 2$. With more than two groups, the research question is "Are some of the means different?" If the alternative is set up to be $\mu 1 \neq \mu 2 \neq \ldots \neq \mu t$, this means that at least one of the pairs is not equal. The more common presentation of the alternative is:

Ha: at least one mean is different or Ha: not all the means are equal.

For more than two populations, the test statistic, F, is the ratio of between group sample variance and the within-group-sample variance. That is,

$$F = \frac{\text{Between group variance}}{\text{Within Group variance}}$$

Assumptions for One-Way ANOVA Test

There are three primary assumptions in ANOVA:

- The responses for each factor level have a normal population distribution.
- These distributions have the same variance.
- The data are Independent.

Tukey Test

The Tukey Test (or Tukey procedure), also called Tukey's Honest Significant Difference test, is a post-hoc test based on the studentized range distribution. An ANOVA test can tell if results are significant overall, but it won't tell exactly where those differences lie. After an ANOVA is run and significant results are found, then Tukey's HSD can be run to find out which specific groups's means (compared with each other) are different. The test compares all possible pairs of means.

Assumptions for the Test

- Observations are independent within and among groups.
- The groups for each mean in the test are normally distributed.
- There is equal within-group variance across the groups associated with each mean in the test (homogeneity of variance).

Fix Effect Regression Model

A panel data set contains data that is collected over a certain number of time periods for one or more uniquely identifiable "units". Examples of units are animals, persons, trees, lakes, corporations and countries. A data panel is called a balanced or an unbalanced panel depending on whether or not all units are tracked for the same number of time periods. If the same set of units is tracked throughout the study, it's called a fixed panel.

They can't control for variables that vary over time. However, these variables can be included in the model by including dummy variables for time or space units. This may seem like a good idea, but the more dummy variables are introduced, the more the "noise" in the model is controlled for; this could lead to over-dampening the model, reducing the useful as well as the useless information.

The panel regression model is:

$$Y_{it} = \beta_{0+} \beta_1 X_{it+} \beta_2 Z_i + u_{it}$$

Where the Z_i are unobserved time-invariant heterogeneities across the entities i = 1,2,3,….,n. It is aimed to estimate $\beta_{1,}$ the effect on Y_i of a change in X_i holding constant $Z_{i.}$ Letting $\acute{\alpha}_{i=} \beta_0 + \beta_1 Zi$, the model is as follows:

$$Y_{it}=\acute{\alpha}_i + \beta_1 X_{it} + u_{it.}$$

Having individual specific intercepts$\acute{\alpha}_{i,}$ i=1,2,…,n, where each of these can be understood as the fixed effect of entity i, this model is called the fixed effects model. The variation in the $\acute{\alpha}_i$, i= 1,2,3,…,n comes from the Z_i can be rewritten as a regression model containing n-1 dummy regressors and a constant:

$Y_{it} = \beta_0 + \beta_1 X_{it} + \gamma_2 D_{2i} + \gamma_3 D_{3i+\ldots.+} \gamma_n D_{ni+} u_{it}$, model has n different intercepts.

In observational studies with repeated measures, fixed-effects models are used principally for controlling the effects of unmeasured variables if these variables are correlated with the independent variables of primary interest.

Analysis of Variance for ROA of major five banks of India reveals the following result, as presented in Table 2:

Table 2: General Linear Model: Return on Assets (%) versus Bank

Method

Factor coding (-1,, +1)

Factor Information

Factor	*Type*	*Levels*	*Values*
Bank	Fixed	5	Axis, HDFC, ICICI, Kotak, SBI

Analysis of Variance

Source	*DF*	*Adj SS*	*Adj MS*	*F-Value*	*P-Value*
Bank	4	11.599	2.8998	21.34	0.000
Error	55	7.472	0.1359		
Total	59	19.071			

Model Summary

S	*R-sq*	*R-sq(adj)*	*R-sq(pred)*
0.36859	60.82%	57.97%	53.37%

Coefficients

Term	*Coef*	*SE Coef*	*T-Value*	*P-Value*	*VIF*
Constant	1.2087	0.0476	25.4	0.000	
Bank					
Axis	-0.1828	0.0952	-1.92	0.060	1.60
HDFC	0.4638	0.0952	4.87	0.000	1.60
ICICI	0.0347	0.0952	0.36	0.717	1.60
Kotak	0.4197	0.0952	4.41	0.000	1.60

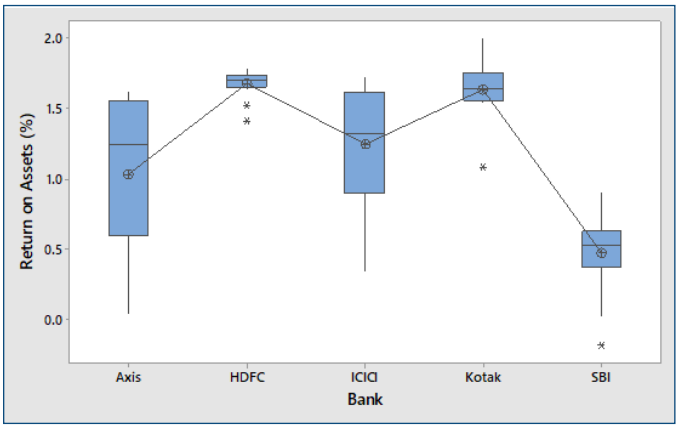

Fig. 1: Boxplots on Return of Assets for Selected Banks

Fig. 1 depicts individual boxplot for five major Banks of their ROA. From the above graph, it is clearly found that Axis bank and ICICI bank are having their high variation in ROA compared to other banks. Also it is observed that HDFC bank is having less variation among these five banks in term of ROA and it is creating more for their stakeholder.

The status of Residual plot for ANOVA analysis is shown in Fig. 2 for selected five banks of India. It is observed from residual plot that model that residual almost equally scatters around the horizontal and model best fit with the data.

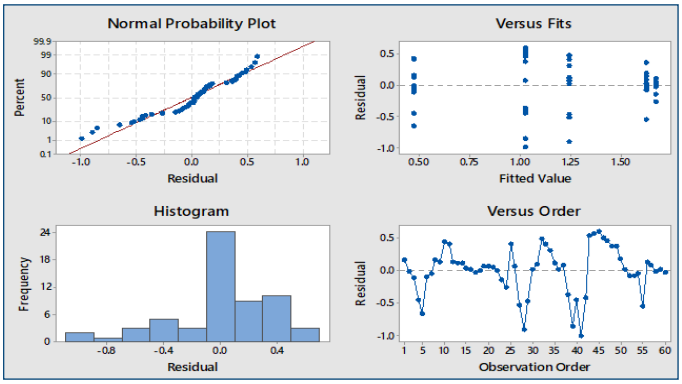

Fig. 2: Residual Plots on Return of Assets for Selected Banks

Fig. 3 makes a comparative study of ROA among selected five banks of India. From the ANOVA analysis, it can be concluded that ROA has significant difference among their banks and from Tukey analysis it is observed that mainly Axis bank makes the difference among other banks in terms of their ROA.

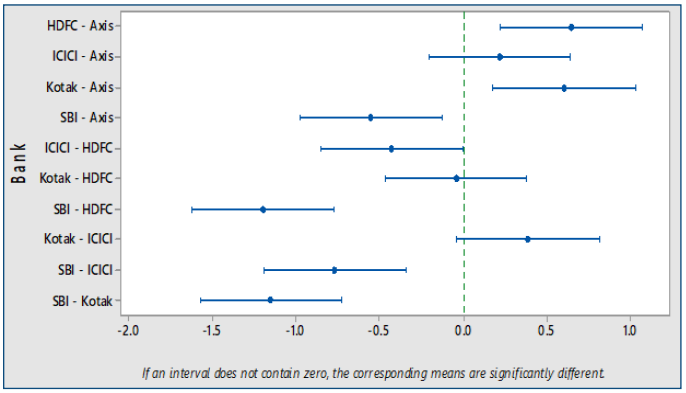

Fig. 3: Difference of Means for Return of Assets for Selected Banks - Tukey Simultaneous 95% Cls

Fig. 4 compares ROA for selected five banks. Considering average ROAof banking industry compared to that of selected banks, it is reflected that only HDFC bank shows

higher value of ROA consistently from 2011 to 2022. SBI bank's return on asset always lowers than average industry's return on asset throughout the years. Axis bank's ROA is not showing any predictable pattern during this period, which is also reflected from the ANOVA analysis.

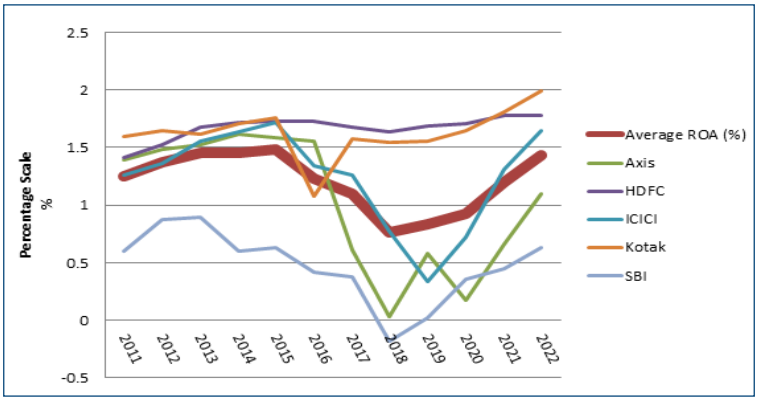

Fig. 4: Comparative Status of ROA for Selected Five Banks

Fig. 5 shows ROA of the selected five banks before and after COVID-19 pandemic period. It is well observed from the analysis that return on asset is continuously rising even during pandemic, so fairly it can be concluded that pandemic does not affect banking industry in terms of their ROA.

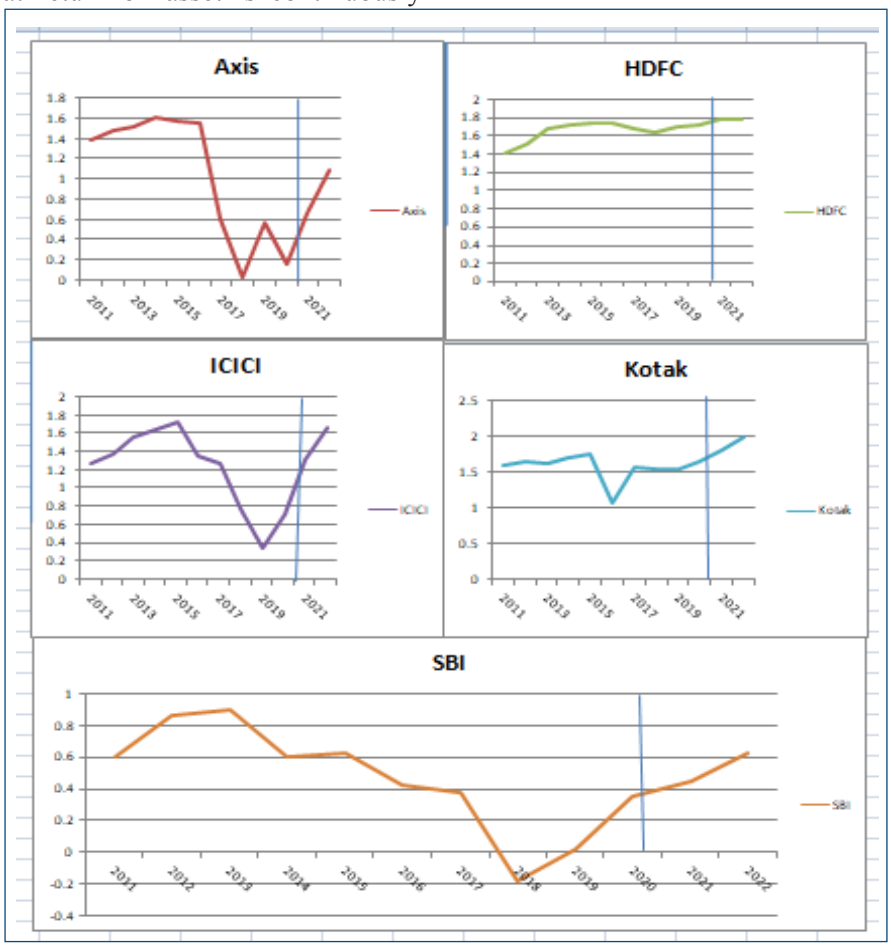

Fig. 5: Comparative Status of ROA for Selected Five Banks During Pre and Post Pandemic Period

From the Table 3, it is revealed that ROA of Axis Bank ranges between 0.03 and 1.62 and standard deviation of ROA of Axis Bank is the highest.

Table 3: Summary Statistics of ROA for Selected Banks

Sr. No.	Bank	Count	Mean	Std Dev	Min	25%	50%	75%	Max
1	SBI	12	0.473333	0.313030	-0.18	0.3750	0.525	0.6300	0.90
2	HDFC	12	1.672500	0.107460	1.41	1.6700	1.700	1.7300	1.78
3	ICICI	12	1.243333	0.424892	0.34	1.1375	1.325	1.5725	1.72
4	Axis	12	1.025833	0.585809	0.03	0.6025	1.245	1.53	1.62
5	Kotak	12	1.628333	0.214596	1.08	1.5725	1.635	1.7225	1.99

From the correlation matrix (Table 4), it has been revealed how ROA can be related to other parameter of financial ratio and financial parameters of Indian Bank. From the analysis, it is observed that net profit margin (%) is having a high positive correlation with return on asset.

From the scatter plot (Fig. 6), it is found that majority of the data points for return on asset and net profit margin lie on 15–20 (NPM%) and 1–1.5 (ROA%). As per Indian banking standard if ROA is near to 2 or above then it is considered to be excellent performance. From the above graph, it is revealed clearly that HDFC bank's ROA is consistently near to 2%, so it is good sign for all the stakeholders of HDFC banks.

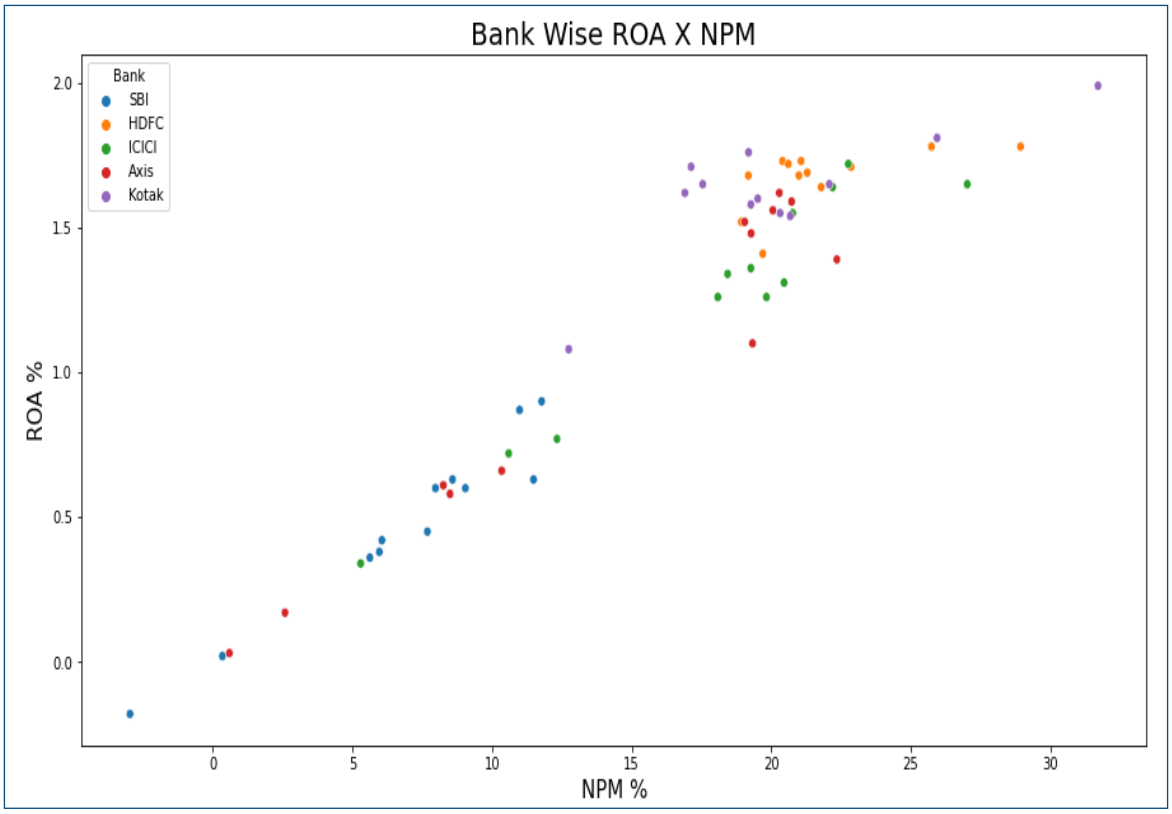

Fig. 6: Scatter Plot of NPM vs. ROA of the Select Five Major Banks

Further, fix effect model (Table 5) among ROA, list of bank and net profit margin (NPM) have been developed. Fix effect model is attempted to develop to understand bank wise what quantity of NPM can impact on ROA. From the above model, it is observed that NPM is highly significant on ROA. HDFC and Kotak are two banks observing high significant impact on the model due to their p-value less than 0.05. It means that these two banks' predictive ability of NPM on ROA are quite accurate compared with other banks and the impact on ROA due to average unit change of NPM for bank HDFC and Kotak become 0.26 and 0.31 respectively. R-square (94%) signifies strength of the model for their predicting ability consideration of these variables.

Table 4: Correlation Analysis

Description	*Net Profit/ Share (Rs.)*	*Net Profit/ Employee (Rs.)*	*Net Profit/ Branches (Rs.)*	*Business/ Branches (Rs.)*	*ROCE (%)*	*Net Profit Margin (%)*	*Operating Profit Margin (%)*	*Return on Assets (%)*	*Return on Equity/ Networth (%)*	*Net Interest Margin (%)*	*Operating Profit/Total Assets (%)*	*Price to Sales (X)*	*Retention Ratios (%)*
Net Profit/Share (Rs.)	1.000000												
Net Profit/Employee (Rs.)	0.231976	1.000000											
Net Profit/Branches (Rs.)	0.147800	0.881806	1.000000										
Business/Branches (Rs.)	-0.068214	0.67240	0.678540	1.000000									
ROCE (%)	0.125774	0.61620	0.651734	0.432261	1.000000								
Net Profit Margin (%)	0.266624	0.82165	0.917339	0.443612	0.696431	1.000000							
Operating Profit Margin (%)	0.312993	0.67246	0.800891	0.319111	0.403189	0.830100	1.000000						
Return on Assets (%)	0.247569	0.74531	0.865659	0.304181	0.725497	0.954303	0.856540	1.000000					
Return on Equity/Net-worth (%)	0.501406	0.67971	0.637076	0.167359	0.569140	0.787751	0.777799	0.835213	1.000000				
Net Interest Margin (%)	0.009875	0.40471	0.640562	0.277511	0.615062	0.609361	0.709779	0.733620	0.55227	1.000000			
Operating Profit/Total Assets (%)	0.299666	0.66543	0.794319	0.32423	0.386249	0.818082	0.997258	0.845363	0.766460	0.706545	1.000000		
Price to Sales (X)	-0.182307	0.25712	0.590798	0.3192	0.369810	0.557074	0.585083	0.572394	0.22916	0.698914	0.579548	1.000000	
Retention Ratios (%)	0.084031	0.23583	0.249184	0.05098	0.072280	0.283141	0.326481	0.279085	0.27501	0.163243	0.322531	0.140232	1.000000

Table 5: Fix Effect Regression Model

ROA versus NPM, Axis, HDFC, ICICI, Kotak

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	5	17.9406	3.58811	171.33	0.000
NPM	1	6.3413	6.34128	302.78	0.000
Axis	1	0.0384	0.03842	1.83	0.181
HDFC	1	0.2265	0.22648	10.81	0.002
ICICI	1	0.0179	0.0179	0.85	0.359
Kotak	1	0.3577	0.35768	17.08	0.000
Error	54	1.1309	0.02094		
Total	59	19.0715			

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.144718	94.07%	93.52%	92.51%

Coefficients

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	0.0408	0.0486	0.84	0.404	
NPM	0.0628	0.0036	17.4	0.000	2.06
Axis	0.0878	0.0648	1.35	0.181	1.93
HDFC	0.2628	0.0799	3.29	0.002	2.93
ICICI	0.0662	0.0716	0.92	0.359	2.35
Kotak	0.3153	0.0763	4.13	0.000	2.67

Regression Equation

ROA = 0.0408 + 0.06282 NPM + 0.0878 Axis + 0.2628 HDFC + 0.0662 ICICI + 0.3153 Kotak

Fits and Diagnostics for Unusual Observations

Obs	ROA	Fit	Resid	Std	Resid
13	1.7800	2.1209	-0.3409	-2.50	R
49	1.9900	2.3474	-0.3574	-2.70	R
57	1.7100	1.4321	0.2779	2.01	R

It is observed from residual plot (Fig. 7) that model residual almost randomly scatters around the horizontal line and it can be easily concluded from the Figure that fix effect regression model fit best with the given data for that reason predicting ability utmost.

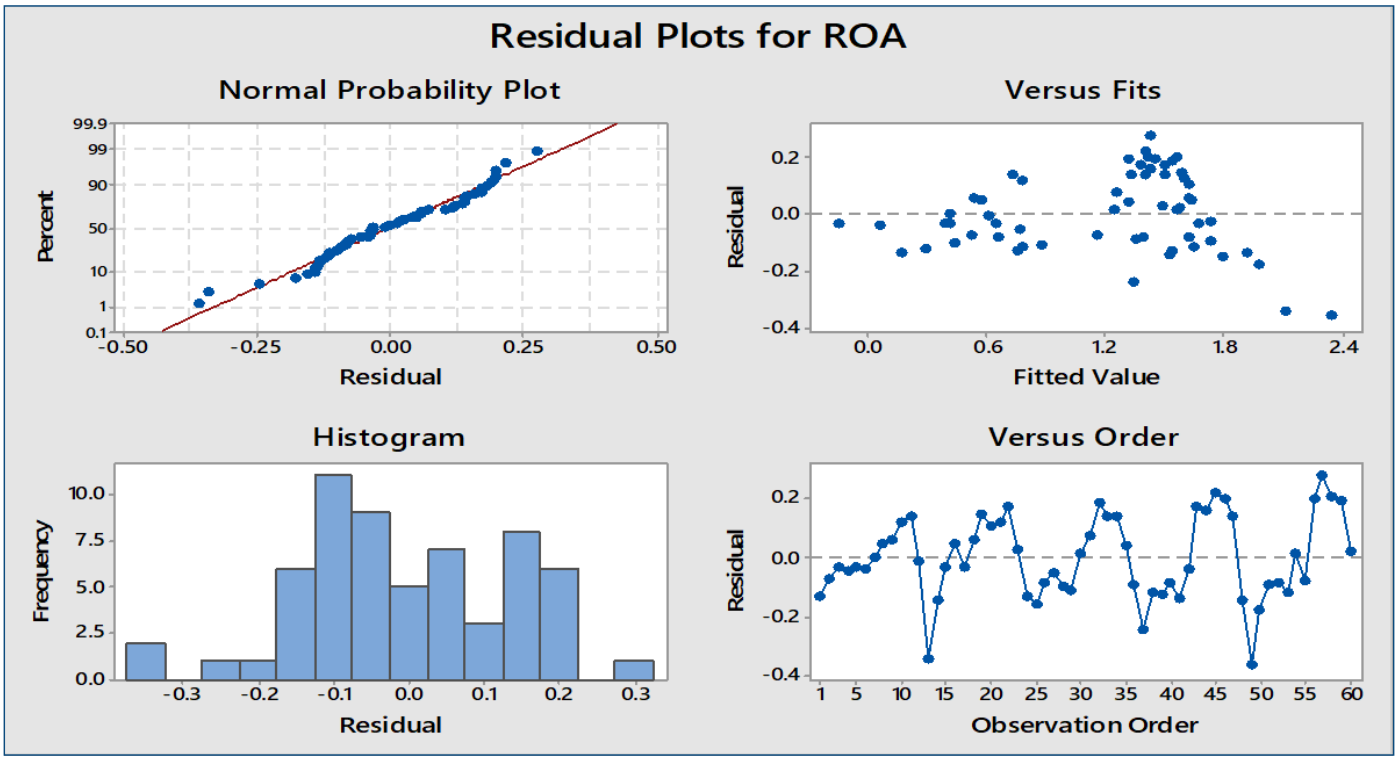

Fig. 7: Regression Residual Plot

Conclusion and Recommendation

The Indian banking sector has undergone huge transformation in the past few years. With the rollout of various technologies, banking services have become more accessible and affordable in far-flung and unreached parts of India. As per the selected five banks in India, their combined market share is 73% and out of these five banks, SBI only shares the market for 23% of the Indian banking industry. But, it is never true for any industry that having the highest market share always performs better in terms of profit or other criteria within the same industry. As in this study also, it is evident that SBI's return on asset is less compared to Indian banking industry's ROA. One of the recommendations for improving ROA for SBI Bank is proposed to conduct a proper market survey in terms of various aspects such as the number of households in the area, educational level, income, earning person, expense behaviour and others, all of which would give an idea to launch a new branch in the locality and how it would impact in the bank profit or other parameters in the financial ratio. Also, SBI bank would utilise mobile bus banking service and portable digital banking to serve remote area of the country, in this obvious way SBI bank can improve their ROA with industry standard.

Limitation of the Study

Consideration of the data from 2011 to 2022 for various financial ratios for the major banks such as SBI, HDFC, ICICI, AXIS, Kotak Mahindra bank, as these five major banks in India consider the 73% market share of Indian banking industry. Due to limitation of the time and data for this study, following limitations were faced:

- Five top most banks represent the Indian banking industry, as it is listed in the stock exchange in India and their combined market share is 73%.
- The research work is restricted for 12 years duration.
- Most of the data parameter under study in banking industry is financial ratio and other financial parameters.
- The evaluation is primarily completed through secondary data to find the research answer of the research objective.
- More dummy variables are introduced, the more is the noise in the model, so here five banks were introduced to capture Indian banking industry for 73% market share.

References

Cohen, P., & Robins, D. (1978). In B. Rajni, S. K. Misra, & D. Tandon (2020), Working capital management of central public sector enterprises (CPSEs) in India during the post-financial recession period: Empirical evidence on aggregation. *Journal of Critical Reviews, 7*(15), 1455-1462.

Gitman, L. J. (1982). Cost of capital techniques used by major US Firms: A survey and analysis of fortune's 1000. *Financial Management, 11*.

Jana, D. (2018). Impact of working capital management on profitability of the selected listed FMCG companies in India. *International Research Journal of Business Studies, 11*, 21-30.

Karia, A. N., & Thorat, H. D. (2019). *A critical study of working capital pre and post situation of acquiring Indian listed companies during 1995 to 2015*. Savitribai Phule Pune University. Retrieved from http://hdl.handle.net/10603/323283

Norgaard, C. T. (1985). *Management accounting*. Prentice Hall. ISBN10: 013548488X.

Rajak, N., & Sur, D. (2014). *Working capital management in select Indian public sector oil companies during pre and post liberalisation periods*. Department of Commerce, The University of Burdwan. Retrieved from http://hdl.handle.net/10603/198860

Singh, H. P., Kumar, S., & Colombage, S. (2017). Working capital management and firm profitability: A meta-analysis. *Qualitative Research in Financial Markets*, *9*(1).

Smith, K. V. (1979). Guide to working capital management. McGraw-Hill.

Thakur, L. G. (2021). *A study on working capital management* (Submitted as Summer Project Report, RashtrasantTukadoji Maharaj Nagpur University, Nagpur).

Zenoff, D. B., & Zwick, J. (1969). *International financial management*. Englewood Cliffs, N.J.: Prentice-Hall, Inc.

Website

Retrieved February 25, 2023, from https://www.ibef.org/industry/banking-india