Chapter 2

REVIEW OF LITERATURE

A Literature Review is "a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars, and practitioners."

-Arlene Fink

The reviews pertaining to the study were systematically arranged based on the objectives as follows:

2.1 Reviews based on performance and soundness of financial variables of banks,

2.2 Reviews based on Non-Performing Assets (NPA) and recovery of NPA of the banks,

2.3 Reviews based on multi criterion decision making approach,

2.4 Reviews based on survival analysis of banks.

After a through review, Research Gap was identified.

2.1 REVIEWS BASED ON PERFORMANCE AND SOUNDNESS OF FINANCIAL VARIABLES OF BANKS

Manuela Ender, Corinna Neuhofer (2021) investigated the effect of low interest rates on risk taking ability and profitability of the banks. The study was developed based on systematic literature review and qualitative content analysis. The results of the study showed that there was a positive relationship between interest rates and net interest income of the banks and an inverse relationship was found in relation to non-interest income. The influence of low interest rates on bank profitability highly depends on several factors that include capitalization, size, risk-taking, income structure of banks and banks business model. Further the author opined that the banks need to adopt, to design and to implement counter measures in order to survive with long-term effects of negative interest rates.

Ashenafi Nigusse Tibebe (2020) explored the financial performance of 16 private commercial banks in Ethiopia from 2016 to 2020. The performance was measured in terms of capital adequacy, asset quality, management ability, earning quality and liquidity. The study used panel form secondary data. The study applied descriptive statistics to describe the nature and dispersion of the data and correlation analysis to know the degree

of linear relationship between dependent and independent variables. Finally, Ordinary Least Square (OLS) method has been applied to assess the level of impact of independent variable on the dependent variables. The study concluded that there is a significant association between financial performance and capital adequacy, management ability & liquidity position of private commercial banks. There is an insignificant association between financial performance with asset quality and earning efficiency of private commercial banks in Ethiopia.

Girija Sankar, Bhagirathi Nayak (2020) evaluated the financial performance of banks in Odisha using CAMEL model from 2005 to 2019. The required data for the study was collected from secondary source. The sample for the study includes 20 public sector banks and 15 private sector banks in Odisha. The results of the study showed that the Bank of Baroda and IDBI Bank was at top position by recording stronger capital adequacy, better quality of assets and other parameters while, Indian Overseas Bank was at least position due to poor performance. Further, the author concluded that the position of banks may change as the financial ratios and period of time differs.

Shelly, Parmod Singhal (2020) conducted a study to measure the financial position and performance of select public sector banks in India. The study analyzed 21 public sector banks for the period of ten years from 2008-2009 to 2018-2019. The necessary data was collected from secondary source through capitalized database and annual financial statements of the respective banks. The study used CAMEL analysis to draw an overview of financial performance of banks. Findings of the study showed that the select public sector banks are making an effort to maintain adequate capital base. Yet, out of select 21 banks, Indian Bank showed better performance, and the least performance was registered by Central Bank of India. It was observed from the study that all the select banks required brainstorming innovative ideas to deploy more funds.

Venkatesh Thummalapenta and Ardar Gugloth (2020) evaluated the financial performance of select scheduled commercial banks in India using CAMEL model. The sample for the study was selected based on the level of equity shares being traded in either Bombay Stock Exchange or National Stock Exchange for not less than 10 years and higher market capitalization. Accordingly, it covers 10 banks by comprising 2 public sector banks and 8 private sector banks for the period of five years from 2009-2010 to 2018-2019. The required data for the study was collected from various secondary sources. To test the

hypothesis the author applied regression analysis, and the result showed that the variables capital adequacy, asset quality, earning efficiency and managerial efficiency had a significant influence on earnings per share.

Abdul Sami Sharifi (2019) examined the financial performance of select three public sector banks namely Bank-e-Millie, New Kabul Bank and Pashtany Bank in Afghanistan for the period of four years from 2013-2014 to 2016-2017 using CAMEL parameters. The results of the study showed that the bank Bank-e-Millie performed better in capital adequacy, asset quality, management ability and earning efficiency compared to other two banks. New Kabul Bank was at top position in terms of liquidity. The study found that overall bank performance was better in Bank-e-Millie followed by Pashtany Bank. New Kabul Bank reported the least position. The author further concluded that the position of banks under study was sound and satisfactory.

Aparna Bhatia, Megha Mahendru (2019) evaluated the financial efficiency of scheduled commercial banks in India for the period of 22 years from 1991-1992 to 2012-2013 by applying Data Envelopment Analysis (DEA). The required data was collected through the website of RBI, annual reports and reports on trend and progress of banking. The results of the study showed that both reformatory and post-reformatory era of Indian scheduled commercial banks are more efficient in generating revenues and profits rather than in using their resources efficiently reflecting a high level of cost inefficiency. The author further concluded that scheduled commercial banks in India exhibit higher efficiency in reformatory era than post-reformatory era.

Elizabeth Sameul (2018) made an attempt to compare the performance of three different banks (Indian overseas bank, Canara bank and Syndicate bank) in India. The study analyzed 17 ratios, which are related to CAMELS model. It covers a period of five years from 2011-2016. The study result showed that the syndicate bank showed better performance in terms of asset quality, management ability and earning efficiency, whereas, Canara Bank reported higher efficiency in relation to liquidity. In overall efficiency Syndicate Bank has better financial position compared to Canara Bank and Indian Overseas Bank. It is concluded that all the three banks are maintaining their capital adequately further they have to improve their earning efficiency and liquidity position to ensure the sustainable growth.

Lavanya, Srinivas (2018) analyzed the financial performance of five major private sector banks in India, namely, ICICI Bank, HDFC Bank, Axis Bank, Kotak Mahindra Bank and Yes Bank for the period of five years from 2012 - 2013 to 2016 - 2017. The study used CAMEL model to measure the performance in terms capital adequacy, asset quality, management ability, earning efficiency and liquidity position. The results of the study showed that ICICI Bank performed better by holding strong capital base and liquidity position, while HDFC Bank performed better in maintain improved asset quality and earning efficiency. Further, the results showed that Kotak Mahindra Bank also recorded better earning efficiency. Analysis ranked ICICI Bank on the top position followed by HDFC Bank, Kotak Mahindra Bank, Yes Bank and Axis Bank.

Princika Bothra, Ashwin Purohit (2018) made an attempt to study the financial performance of public and private sector banks for a period of 2012-2013 to 2016-2017. The sample for the study was taken as one public sector bank and one private sector bank namely State Bank of India and ICICI Bank. The results of the study concluded that the performance of State Bank of India was better when compared to ICICI Bank mainly due to higher capital adequacy and improved asset quality. While considering management efficiency, earning capacity and liquidity ICICI Bank was in top position. Further author suggested the ICICI Bank to focus more on capital adequacy and asset quality, as it is a major indicator for the financial health of the banks.

Swathi Sharma, Ishani Patharia Chopra (2018) conducted a study to measure the financial performance of select public and private sector banks in India. The study assessed the performance of banks through capital adequacy, asset quality, management ability, earning efficiency and liquidity parameters by covering a period of 4 years from 2014 – 2017. The required data was collected from secondary source. The hypothesis was framed and tested using Mann-Whitney U test to compare the significant difference in rank wise performance in all parameters of public sector and private sector banks. The study proved that there is no significant difference in rank wise parameter of public and private sector banks except liquidity. The author concluded that the private sector banks are performing well compared to public sector banks in all parameters. The author further suggested that the public sector banks must improve the soundness of financial parameters in order to avoid bankruptcy.

Sathyamoorthy, Shabane Ndzinge (2017) investigated the financial performance of three listed commercial banks in Botswana for the period of five years from 2010-2011 to 2014-2015. The required data was collected through secondary source, and hypothesis was tested to know the significant impact of capital adequacy, asset quality, management efficiency, earning ability and liquidity on financial performance of banks. The study revealed that the performances of all the select components are not positively influenced the overall performance of banks except liquidity. Liquidity component significantly affects the performance of banks at 5% level of significance. The author further highlighted that the performance in earning ability of select banks showed an increasing trend and have adequate capital and asset quality to meet the benchmarks.

Mohammad Khodaei, Mehrdad Barghil (2017) analyzed the financial soundness of banks through CAMELS framework from 2007 to 2015. The study used pooled regression model with fixed effect to test the effects of CAMELS indicator on return on assets on banking performance. The results of the study showed that capital adequacy, asset quality, management ability, liquidity and sensitivity to market risk have a significant impact on return on assets and earning quality alone does not have a significant impact on return on assets.

Nancy Bawa (2017) evaluated and compared the financial performance of public sector banks in India using CAMEL parameters during the period of ten years from 2006-2007 to 2015-2016. The parameters are capital adequacy, asset quality, management capacity, earnings ability and liquidity of the financial institutions. The sample for the study includes 15 public sector banks in India and the necessary data was collected from secondary source. The findings of the study reveals that Andhra Bank ranked first followed by Indian Bank, Corporation Bank and Syndicate Bank. The Central Bank of India occupied the least position by recording poor performance. Thus, there was a significant mean difference in the performance of public sector banks in India.

Vinod Kumar, Bhawna Malhotra (2017) made an attempt to study the financial performance of select five private sector banks based on CAMEL framework from 2006-2007 to 2016-2017. The results of the study showed that the banks have to improve their operations in capital adequacy, earning ability and liquidity context. The author suggested that the banks must improve the productivity of business by reducing operating cost and by increasing profitability.

Abdul Kaium Masud, Mahbubul Haq (2016) made an attempt to analyze the financial soundness and trend analysis of private commercial banks in Bangladesh. The study analyzed the financial performance of seven select banks of Bangladesh for the period of nine years from 2005-2006 to 2013-2014 and the required data was collected from books, journals and annual reports. Trend analysis and descriptive analysis were used to assess the financial performance of banks. The study analyzed the profitability of banking industry, which was measured using two factors namely, branch expansion and employment generation. The author concluded that the private commercial banks in Bangladesh plays a major role in the development of the economy and it was observed that all the select banks had positive results on branch expansion and employment generation.

Meena (2016) measured the soundness of banking sector using financial ratios of 20 public and private sector banks operating in India. The financial ratio includes the components of capital adequacy, asset quality, management ability, earning efficiency and liquidity. Regression analysis tool was applied to know the significant difference in CAMEL component of public sector banks and private sector banks. The results of the study shown that non-performing assets to total advances, debt-equity ratio, return on assets, profit per employee and total advances to total deposits ratio are highly correlated while compare to other factors. The identified ratio impacts more on performance of banks in India. The author further suggested to improve their earning capacity and liquidity to ensure the efficiency in banking system.

Arathy, Vijayachandran (2015) evaluated the financial performance through CAMEL model and a comparison was made on the basis of ranking. The study selected a sample of three banks namely State Bank of India from public sector, Federal Bank from private sector and ICICI Bank from new generation bank covered a period of four years from 2010 to 2014. The study concluded that ICICI bank showed better performance in capital adequacy, State Bank of India exposed improved operations in terms of asset quality and management efficiency. While taking earning efficiency and liquidity federal bank and ICICI bank was in a good position.

Surinder Singh Kundu and Deepak Kumar Sharma (2015) attempted to evaluate the earning quality of nationalized commercial banks in India for the period of ten years from 2004-2005 to 2013-2014. The study includes a sample of 10 nationalized banks and the required data was gathered from secondary source through Reserve Bank of

India, Report on Trends and Progress on Banking in India, IBA's Bulletins, Books and Journals. The results of the study showed that Indian Overseas Bank got the first rank and Bank of Baroda got least rank in respect of interest income to total income ratio. On the other side, Bank of Baroda was placed first and Indian Overseas Bank placed least in non-interest income to total income of select nationalized banks. ANOVA test was applied to test the hypothesis, and the result showed that there was no significant difference between interest income to total income and non-interest income to total income of select nationalized banks in India. The author concluded that nationalized banks have to strengthen their interest and non-interest income by improving their operational efficiency.

Aminul Islam (2014) conducted a study to measure the financial soundness of National Bank Limited, which is the largest and prominent private commercial bank in Bangladesh. The period of study covers from 2008 to 2013. The study primarily aims to identify the difference existed between a operation of banks and its performance during two periods (2008-2010 & 2011-2013). Financial Ratio Analysis (FRA) method was used to insight the overview of financial performance of National Bank Limited in terms of profitability, liquidity and credit performance. To test the hypothesis, the study used student t-test and analyzed the current and past performance of bank. The results of the study showed that the performance of the banks depends more on management ability in framing strategic plans and the implementation of its strategies.

Pravesh Aspal, Sanjeev Dhawan (2014) evaluated the financial performance of 13 old private sector banks through CAMELS model covering a period of five years from 2007-2012. Rank was assigned to the select banks to assess the top performance and low performance banks based on mean value of CAMELS component. The study revealed that Tamilnadu Mercantile Bank was at the top position by securing first rank and Dhanalaxmi Bank was at least position due to poor asset quality and deteriorated profitability and liquidity. The author suggested the banks to focus more on profitability and asset quality while compare to other parameters to ensure the solvency of banks in India.

Rohit Bansal (2014) evaluated and compared the financial performance of scheduled commercial banks in India by measuring profitability ratios, liquidity ratios, activity ratios, leverage ratios and market value ratios. The study investigates the performance for the period of four years from 2010-2011 to 2013-2014 and the required

data was collected through CMIE database, Prowess database, money control and yahoo finance. The study result showed that the Federal Bank and HDFC Bank show better asset turnover ratio, which indicates that the banks utilized their resources efficiently to generate revenue. In addition, Federal Bank reveals improved price earnings ratio among other banks. It was observed from the study that the Federal Bank is the most financially stable bank in comparison to other select banks.

Ruchi Gupta (2014) made an attempt to evaluate the performance of public sector banks in India using CAMEL approach by covering a period of five years from 2008-2009 to 2012-2013. The required secondary data was collected through Statistics published by RBI, IBA bulletin, Journals and the annual reports published by banks. The findings of the study revealed that Andhra Bank occupied the top position by holing first rank followed by Bank of Baroda, while United Bank of India occupied the least position. To test the hypothesis, ANOVA test was applied and the results showed that there was a significant mean difference between the mean values of CAMEL ratios. The author concluded by stating to improve the performance of low ranked banks in order to achieve the desired standards.

Asikhia Olalekan and Sokefun Adeyinka (2013) analyzed the effect of capital adequacy on profitability of domestic and foreign banks in Nigeria. The study used both primary and secondary data. The primary data was collected by involving a sample of 518 bank staffs and the required secondary data was collected from published financial statements of banks. It covers a period of five years from 2005-2006 to 2009-2010. The results of the primary data analysis exposed a insignificant relationship between capital adequacy and profitability but the secondary data analysis showed a positive and significant relationship between capital adequacy and profitability of the banks in Nigeria. The author also discovered that capital adequacy and profitability are the key indicators for risk management and cushion against losses.

Gazia Jamil, Najmus Sahar (2013) examined the financial performance, and ranked the banks by adopting CAMEL model and gave insight about sensitivity to market risk. The study covered a period of three years from 2008-2009 to 2010-2011 and data for the study was collected from secondary source. Among four select banks, Kotak Mahindra Bank was at top position and showed better result compared to other three banks, i.e., Axis Bank, HDFC Bank and ICICI Bank. Further, the author suggested the banks to create

quality assets to earn good return, and simultaneously, the banks have to take continuous effort to reduce non-performing assets.

Gowri, Ramya (2013) analyzed the financial soundness of banking sector in India covered a period of 2004-2005 to 2012-2013 using CAMEL component. The study selected a sample of 10 banks (5 public sector banks and 5 private sector banks). The required data was collected from Centre for Monitoring Indian Economy (CMIE) and the concern banks website. The results of the study showed that the Bank of Baroda secured first position followed by Andhra Bank among select banks stating the banks have higher capital adequacy and consistent asset quality and liquidity. The author suggested that the banks must improve management efficiency to withstand the top position in banking sector. Syndicate Bank obtained the least rank. The author noticed that the least performance bank reported lower asset quality and commended the bank to improve the performance in each component of CAMEL except capital adequacy.

Sridharsha Reddy (2012) evaluated the financial soundness of scheduled banks in India from 1999 to 2009. The study used modified CAMEL approach to assess the performance of banks. The result showed that the public sector banks have positive impact on reforms in liberalizing interest rates and rationalized credit and investment. The author stated that declined SLR and CRR investments, deregulation of interest rates, updated technology may be the reason for increased performance of select banks.

Prasad and Ravinder (2012) undertook a study to investigate the effect of capital adequacy, asset quality, management ability, bank size, liquidity and how it influence the financial performance as measured by return on assets, return on equity and net interest margin of private sector banks in Ethiopia. The result of the study concluded that capital adequacy, management ability and bank size were positively significant and asset quality and liquidity were negatively significant on financial performance. The author outlined that the banks have to give more attention in creating portfolio of assets and optimizing liquidity to project better performance.

Prasad and Ravinder (2011) undertook a study to analyze the profitability of four major commercial banks in India, namely State Bank of India, Punjab National Bank, ICICI Bank and HDFC Bank from 2005-2006 to 2009-2010. The various statistical tools like descriptive analysis, One-Way ANOVA and Tukey HSD Test were employed for the purpose of study. The profitability of these banks were assessed using various parameters

like operating profit margin, gross profit margin, net profit margin, earnings per share, return on equity, return on assets, price earnings ratio and dividend payout ratio. It is proved that State Bank of India performed better in terms of earnings per share and dividend payout ratio, whereas, Punjab National Bank performed better in maintaining good operating profit margin and return on equity. HDFC Bank showed an improved performance in gross profit margin, net profit margin, return on assets and price earnings ratio. The analysis ranked HDFC on the top position followed by Punjab National Bank, State Bank of India and ICICI Bank.

2.2 REVIEWS BASED ON NON-PERFORMING ASSETS (NPA) AND RECOVERY OF NPAs

Varuna Agarwala and Nidhi Agarwala (2019) explored the reason for growing level and recovery of non-performing assets by analyzing nationalized banks, private sector banks and SBI & its associates covering a period of eight years from 2010 to 2017. The study found that the level of NPA was significantly grown at a higher rate and impacted the profitability and liquidity of banks. The utmost level of NPA was observed in nationalized banks compared to private sector banks. To progress the level of NPAs, Insolvency and Bankruptcy Code was introduced to ensure the growth of recovery. The author concluded that nationalized banks and SBI & associate Bank's asset quality deteriorated ultimately and affects the earning efficiency of banks. The author suggested the banks to take measure to improve the asset quality for further prospects.

Samuel Gameli, Holy Kwabla and John Gartchie (2019) undertook a study to examine the impact credit risk and operation risk on financial performance of Universal Banks in Ghana. The study covered a period of ten years from 2007 to 2016 and the data was collected from various secondary sources. The study selected a sample of 24 universal banks in Ghana. The results of the study showed that credit risk and operational risk negatively influence the financial performance of the banks. The study indicated other specific variables namely asset quality, bank leverage, cost of income and liquidity ratio positively influences the credit risk, operational risk as well as financial performance of the banks.

Surojit Dey (2018) studied the various channels for recovery of non-performing assets and how it affects the prevailing level of NPAs of Scheduled Commercial Banks in India. The data for the study was collected through secondary source for the period of 14

years from 2003-2004 to 2016-2017. The various channels discussed in the study are Lok Adults, Debt Recovery Tribunal (DRT), Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act, Asset Reconstruction Company (ARC), Insolvency and Bankruptcy Code. Results showed that the rate of recovery under SARFAESI Act was higher and exposed an increasing trend till 2014-2015 and rapidly starts to fall. The amount recovered under the existing channel was lower than the expected level. As a result, IBC were introduced and started to recover huge amount. The study further proved that there is a significant difference in recovery amount of different channels.

Pradeep Bhardwaj and Isha Chaudhary (2018) studied the reason for higher level of non-performing assets and recovery mechanism of NPAs through different channels of scheduled commercial banks. The required data was collected from secondary source through RBI websites, Journals, Books and Research papers for a period of 14 years from 2000-2014. The study showed that the Gross NPA and Net NPA ratio was significantly increased and impacts erosion of capital and lowered earning capacity of banks. The recovery channel took effort to collect overdue of advances. Among different channels SARFAESI Act recovered Rs. 24,400 crores during 2014, which was higher compared to other channels and showed an increasing trend in recovery of NPA. Thus, it was considered as the most effective channel to recover NPAs.

Muluwork Keba Ebba (2016) made an attempt to study the level of non-performing assets and its impact on financial performance of commercial banks in Ethiopia. The study analyzed 14 commercial banks performance for five year period from 2011 to 2015. Fixed effect regression tool was applied to investigate the profitability with non-performing loan to total asset ratio, capital adequacy, asset quality, management efficiency and liquidity. It was found that NPL ratio has negative relationship and capital adequacy, asset quality, management efficiency and liquidity have a positive relationship with profitability ratios of Return on assets (ROA), Return on equity (ROE) and Net profit margin (NPM). Further, the study revealed that the volume of non-performing loan was decreased significantly and the performance of the banks increased during 2011-2015.

Nitin Bajirao Borse (2016) evaluated the effect of non-performing assets on return on assets of Scheduled Commercial Banks in India. The study comprises a period of 5 years from 2010-2011 to 2014-15 and 11 banks was selected as sample comprising 6

public sector banks and 5 private sector banks. Correlation tool was employed to test the effect of NPA on ROA. The results of the study exposed that the level of NPA is significantly rising in public sector banks compared to private sector banks. It was witnessed that the Non-performing Assets ratio showed an increasing trend and Return on Assets ratio showed a decreasing trend. Further, it was proved that there is a negative correlation between NPA and ROA. The increasing level of non-performing assets affected the lowering return on assets of Scheduled Commercial Banks in India.

Lucky Anyike and Anele Andrew (2015) undertook a study to examine the relationship between asset quality and the profitability of fifteen commercial banks in Nigeria from 1980 – 2013. The required data for the study was collected from secondary source. The select variables include Return on Investment (ROI), non-performing loans to Total Loans (NPL/TL), Nonperforming Loans to Total Customers Deposit (NPL//TCD), Loan Loss Provision to Total Loans (LLP/TL) and Loan Loss Provision to Total Asset (LLP/TA). Multiple regressions with econometric view statistical package were used as data analysis method. The Ordinary Least Square properties of Augmented Dickey Fuller Test, Co-integration and Granger Causality test were employed to determine the short and long –run relationship between the dependent and the independent variables. The findings of the study proved that there was a positive relationship between non-performing loans to Total Loans and Nonperforming Loans to Total Customers Deposit with Return on Investment while, there was a negative relationship between Loan Loss Provision to Total Loans and Loan Loss Provision to Total Asset with Return on Investment of the commercial banks. The study concluded by stating that there was a significant relationship between asset quality and profitability. Further, the author opined that the bank lending environment should be well examined before and after credit sanctioned, and the regulatory authorities should ensure sound bank lending environment to avoid the escalation of non-performing loans in order to enhance the profitability of commercial banks in Nigeria.

Ashly Lynn Joseph and Prakash (2014) examined the cause and level of non-performing assets of select public sector banks and private sector banks in India. The study covered a period of 5 years from 2008-2009 to 2012-2013 and the required data was collected through concern banks annual report and websites. Results of the study showed that the financial strength of the banks was weakening due to mounting level of non-performing assets. While compared to private sector banks, public sector banks recorded

higher level of NPA. The authors suggested the public sector banks to improve the earning efficiency and profitability to ensure the level of non-performing assets.

2.3 REVIEWS BASED ON MULTI CRITERION DECISION MAKING APPROACH

Manouchehr Khorramin and Ghodrat Allah Talebnia (2021) examined the efficiency and soundness of banking business using a combined method of Data Development Analysis and Fuzzy VIKOR based on financial ratios. The sample for the study was 18 commercial banks which are listed in Tehran Stock Exchange for over a period of five years from 2011-2015. The lack of efficiency leads to higher operating costs in the bank that results lower profitability as well as reduced level of financial health of banks, crisis and bankruptcy. The banks were divided into two groups as efficient and inefficient based on the results of DEA techniques using CCR model. The ratios namely ROA, ROE and total income were considered as inputs, and total equity, total deposits and fixed assets as outputs. Low efficiency of banks may be related to those banks which have inadequacy capital and operating cost. The results of the study suggest that Gardeshgari Bank has proved to be the most efficient and healthy bank between 2011 and 2015 based on the financial and non-financial criteria.

Mohamed Abdel, Rehab Mohamed, Mohamed Elhoeny et al. (2021) explored the performance of top 10 Egyptian Commercial Banks using multi criterion decision making approach. To evaluate the performance of select banks, three different MCDM methods were applied. First, the TOPSIS method was used to rank the banks based on the distance to the ideal positive alternative and negative ideal alternative. Second, the VIKOR method was applied to rank the banks based on different weights of the strategy. Third, the COPRAS method was used to evaluate the dependence of alternatives on given evaluation criteria. Analytical Hierarchical Process (AHP) method was employed to identify the weights of evaluation criteria. The results of the study showed CIB Bank as the best performance bank, while Faisal Islamic Bank and Bank Audi reported the least performance among top 10 commercial banks in Egypt.

Fathollah Tari, Seyed Hassan Ghavami, et al. (2020) evaluated and ranked banks based on efficiency of using electronic devices in Iran using two multi criterion decision making approaches TOPSIS and VIKOR. The required data was collected from Central Bank Database and the banks financial statement from 2007-2008 to 2016-2017.

Hypothesis was framed and tested using Analysis of Variance to know the difference between inter-group and intra-group means in using two methods. The results of the study shown Mellat, Keshavarzi and Kar Afarin banks ranked as top three banks in TOPSIS while, Mellat, Keshavarzi and Pasargad banks ranked top three under VIKOR method. The findings of the study proved that there was a significant difference in the mean of the ranking of banks in two methods. Further the author opined VIKOR method is more reliable compared to TOPSIS method.

Shivani guru and Mahalik (2018) made an attempt to combine AHP and VIKOR method to evaluate the financial performance of Scheduled Commercial Banks in India. The study considers 26 public sector banks for the period of 2015-2016 by including three input and output variable. The Analytical Hierarchy Process method was used to identify weights of the variable. VIKOR method was used to rank the banks based on the operating performance during the period of study. The study result revealed that State Bank of India performs well and ranked first by holding minimum Qij criterion value at 0.000. State Bank of Mysore held least performing bank with maximum Qij criterion value at 1.000. The author concluded by stating that State Bank of India showed better performance compared to other select banks, and sets benchmark for other alternative.

Elsayed, Shaik Dawood et.al (2017) evaluated and ranked the banks using multi-criteria decision making approach. The study considers three multi criteria approach namely Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), Vlse Kriterijumska Optimizacija Kompromisno Resenje (VIKOR) and Distance to the Ideal Alternative (DIA). Entropy method was used to assign weights to the select criterion. The result of the study shows that all the three methods reveal similar results while taking best and worst banks. The author concluded that DIA method not more suitable to solve the abnormality problem due to unchanged ranking order for alternatives. Finally, TOPSIS and VIKOR algorithm outperforms well to rank the banks.

Ilker Sakinc and Suleyman Acikalin (2015) measured financial performance of 15 Commercial Banks comprising three public sector banks, seven Turkish private and five foreign private banks which are operating in Turkey for the period of 2002-2012 based on the components of capital adequacy and profitability. The banks performance are analyzed and ranked by employing optimization and compromise solution (VIKOR) method. The results of the study showed that Akbank is the best performance bank among

select banks during the study period. The foreign banks are found to be least performance banks. In out of five select foreign banks, four banks are ranked from 11 to 15. The public sector banks in Turkey exposed a moderate performance and started to show an improvement after the implementation of new regulations in 2000. In addition, the author opined that the presence of foreign banks in Turkey is new and the financial performances need to be monitored in the near future.

Padmasai Arora (2014) identified the technical efficiency of 54 scheduled commercial banks operating in India during 1991-1992 to 2006-2007. The study used Data Envelopment Analysis (DEA) with a view to explore the effects of reforms and ownership on bank efficiency. The study considers profitability analysis and established financial reforms, ownership and listing of bank shares which are highly influencing the bank's efficiency in India. The study further found that the efficient banks were characterized by higher net profit to total assets and higher profit per employee, whereas, the least efficient banks reported higher level of non-performing assets.

Emrah Onder and Ali Hepsen (2013) conducted a study to investigate the financial performance of banks in Turkey for the period of 2002-2011. The sample for the study comprised 3 state banks (Ziraat bank, Halk Bank and Vakiflar Bank), 9 private banks (Akbank, Anadolubank, Sekerbank, Tekstil Bank, Turkish Bank, Turk Ekonomi Bank, Garanti Bank, Is Bank and Yapi Kredi Bank) and 5 foreign banks (Denizbank, Eurobank Teckfen, Finans Bank, HSBC Bank and ING Bank). The criteria of financial indicators including capital ratios, balance sheet ratios, asset quality, liquidity, profitability, income-expenditure, share in sector, share in group, branch ratios and activity ratios.AHP and TOPSIS method was used to assign rank to the select banks. AHP method identified the five most important criteria among ten criteria and TOPSIS method was used to rank the banks. The author further applied forecasting models such as Linear moving averages, Power trend function, Linear trend function, S trend function Logarithmic function, Exponential function, Compound trend function and Growth trend function to the financial data during 2012-2015 based on 2002-2011 data. The results of the study indicated that Garanthi Bank withstand top position followed by Ziraat Bank and Denizbank during the period of 2012-2015.

Hasan Dincer and Umit Hacioglu (2013) used Fuzzy VIKOR and AHP method to assess the performance results of banks based on customer satisfaction level in Turkish

banking sector. The study shows that the performance results of state-owned banks, privately owned banks and Foreign banks vary based on customer satisfaction level and ownership types. The state-owned banks met customer expectation in higher level when compared to other two groups. While comparing other two groups privately owned banks performance level is better and foreign banks group shown worst performance result based on customer satisfaction level and author suggested to improve the service to the customer to meet the satisfaction level of customers.

Meysam Shaverdi et al. (2011) used Fuzzy AHP and TOPSIS, VIKOR, ELECTRE methods with balanced scorecard approach in Iranic private sector banks. The study proposed to evaluate the financial performance of banks using multi criterion decision making approach in order to provide decision support to the decision makers. The author selected three banks for analysis, and it was revealed that all three method results are nearly close to each other. The logarithmic of TOPSIS and VIKOR are identical from ELECTRE. Further, the author opined that the banks want to ensure the customer's loyalty in addition to financial data and suggested to develop new markets to attract new customers and to sustain their retention. The results of the study proved that VIKOR is better method for assessment.

Koray and Emre Ipekci (2010) evaluated the banks financial performance in Turkey using multi-criteria decision making problem. The author analyzed 13 banks which are listed in ISE (Inter Connected Stock Exchange) and the indicators of financial performance are capital adequacy, asset quality and liquidity. The required data was gathered from publications of banks association in Turkey. The study uses VIKOR method for ranking the banks, and Fuzzy AHP method was used to identify the weights of the criterion. Results of the study revealed that Garanthi Bank satisfied both acceptable advantage and acceptable stability, and ranked first among thirteen banks followed by Akbank during 2008-2009.

2.4 REVIEWS BASED ON SURVIVAL ANALYSIS OF BANKS

Hamid Waqas and Rohani Md-Rus (2018) analyzed the financial ratios and predict the financial distress condition of Pakistan listed firms covering a period from 2007 to 2016. The study selected 14 financial ratios and 290 firms to predict distress condition. The study explored that Profitability, Liquidity, Leverage, Cash flow ratios and firm size are significant in forecasting financial distress condition. Net income to Total

assets, Retained earnings to total assets and earnings before interest and tax to total assets in profitability; current assets to total liabilities, current assets to current liabilities, working capital to total assets in liquidity; total liabilities to total assets, interest coverage ratio in leverage and out of three cash flow only cash flow from operation to sales in cash flow ratios are significant to predict the financial distress conditions of firms in Pakistan. Meanwhile, market ratios are not significant in predicting distress condition except firm size. The author suggested that large firm size has less likelihood to face financial distress condition as compared to small firm size.

Raymond and Randall et al. (2017) conducted a study to examine the cause of bank failure and to forecast the banks which are really in financial trouble in USA. Due to financial crisis there was a large number of bank failures in USA during 2008-2010. The study covers a period of five years from 2005-2010.The study primarily employs Cox proportional hazard model to forecast the bank failure during crisis period. The results of the study found that the variables return on assets, equity capital and liquidity from debt securities would reduce the likelihood of failure meanwhile the probability of failure is magnified by high volume of construction and land development loans, real estate loans and loan losses. This model works as an early warning signal for banks to forecast the bank failures in near future.

Babajide, Olokoyo et al. (2017) studied survival analysis to explore the bank failure in Nigeria from 2003-2011. The study analyzed 57 private Nigerian banks, out of which 39 are failure banks or acquired banks and 18 are survival banks. The study used financial ratios as predictor variable to predict the bank failure. Results found that non-performing loan to total loan plus lease and operating cost to average total assets have higher probability of failure when compared to other select variables. The author opined that the results of the study were highly useful to the regulators to ensure the health of the banks and to safe guard the banks from insolvency.

Babajide Abiola (2012) analyzed the distress condition which leads to failure of banks in Nigeria. The study selected a sample of 57 banks. Among them, 18 banks were observed as survival banks over a period of time and covered a period of 2003-2011. The study used survival analysis to identify the variables which influence bankruptcy. The results of cox regression method showed that the operating profit to total assets ratio followed by non-performing loan to total loan ratio variables were highly helpful to

predict the failure condition. Among the select nine variables, six variables were highly significant to predict the bankruptcy. Further, the author concluded that the cox regression model gave an early warning signal to safeguard the banks from failure.

Cheru Atsmegiorgis Kitabo and Jong Tae Kim (2014) examined the loan repayment rate of customers of commercial banks in Haswassa district in Ethiopaia using cox proportional hazard model. The study selected a sample of 183 customers who took loan from October 2012 to April 2015. The results of the study revealed that the majority of the customers are under 35 – 55 age group and more than three fourth of the customers are from high school graduates. The bank provides a different type of loans to the customers among that greater portion being disbursed for domestic trade service. In loan classification, higher portion was taken for working purpose. The cox model exposed that rate of loan repayment is significantly associated with education level, previous loan experience, mode of repayment, collateral type and purpose of loan. The predictor variable marital status and sex is not significantly associated with survival experience of loan repayment.

Rebel Allen and Quiongbing Wu (2009) examined the failure of banks using macro-economic variables along with financial variables. The study incorporated Real GDP growth rate, Interest rate as macro-variable and capital adequacy, earnings ratio, non-performing loan, investment securities and some other variable as financial variable and covered a period of 1985-1933. The study used Hazard model and Probit model to forecast the insolvency of banks. The author concluded that both shocks of macro-economic and crisis on financial variable will affect the performance of banks which lead to bank failure.

Jose Gomez-Gonzalez, Banco de le Republica and Nicholas (2009) carried out a study to analyze the causes and consequences of bank failure. The study selected 110 institutions as sample. Among those, 39 are commercial banks, 43 are financial companies and 23 are commercial leasing companies in Colombia. The study uses survival analysis to predict the bank failure using banks size, capitalization and profitability. The authors concluded that the capitalization ratio is highly significant to predict the failure of banks.

Allen Berger and Christa Bouwman (2009) examined the effect of banks capital on banks ability to survive during crises and how market share, profitability and stock return reflected around crises. Large volumes of capital enable them to improve their market share, profitability and stock return. The results of the study exposed that capital

helps small banks to survive during banking and market crises, and medium and large banks to survive during banking crises. During market crises, only small banks would be able to improve their market share while medium and large banks shows insignificant result based on profitability. During normal times between crises the benefit of holding huge volume of capital is experienced only by small size banks in US. The author opined that the importance of capital is elevated during crises and particularly banking crises.

Karina Lumena de Freitas Alves et al. (2009) articulated that the survival analysis is widely accepted model to predict the distress condition and long-term survival of banks. The study identified the indicator, which explains the probability of failure by analyzing 66 private banks in Brazil, in which 29 banks are insolvent and 37 banks are solvent banks. The study covered a period from 1994 to 2007. Results of the study demonstrates that tax and labor liability, Operating revenue from credit and leasing operations, operating margin and Immediate liquidity indicator showed negative impact, that indicates the select ratio may help them to reduce the likelihood of insolvency of banks. The other indicators equity resources in turnover, funding cost, return on cash, return on banks activity and inter-bank dependence showed inverse relationship between ratios and probability of bankruptcy of private sector banks in Brazil.

RESEARCH GAP

Based on the literature reviewed the following research gap was identified.

- Only a very few studies have focused on CAMELS model, covering theoretical aspects than performance aspects of S - Sensitivity to risk,
- Only limited studies adopted Multi Criteria Decision Making (MCDM) approaches to evaluate the financial position of the banks. Studies adopted VIKOR method in banking area is very rare in India.
- Survival analysis using cox proportional model is very rarely adopted to predict the financial distress of the banks in the Indian context.

Hence, an effort has been taken to predict the financial distress of the select scheduled commercial banks in India using survival analysis.