A Study On Financial Risk Analysis And Bank Profitability Performance Of Regional Rural And Cooperative Urban Banks In India

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ABSTRACT

The majority of firms rely heavily on financing from the banking industry. In India, rural residents who were formerly unserved by commercial banks can now access financial services through cooperative and regional rural banks. These banks encourage thrift and entrepreneurship among the rural populace while supporting the growth of small-scale industry and agriculture in rural regions. The degree to which banks have met their financial goals is gauged by their financial performance. A strong banking system depends critically on accurate and trustworthy assessment of banks' financial performance as well as practical evaluation of their financial risks. The objective of the present research is to identify any trends in the performance of the chosen Regional Rural Banks and Cooperative Banks in India over an eight-year period. Using a Multi-Criteria Decision Making (MCDM) approach, the ranking performance of the chosen banks is first evaluated. The decision-making method used in this article is the Technique of Order Preference by Similarity to the Ideal Solution (TOPSIS). The study's factors include capitalization, financing costs, operational efficiency, asset quality, bank size, deposits, net interest margin, profit margin on capital used, profit margin on net worth, liquidity to asset ratio, and risk associated with liquidity. To analyse the financial risk, a pooled regression model with random and fixed effects is used. Lastly, the Chi-squared automated interaction detector with Vector Error Correction Model (VECM) approach has been used to improve the examination of bank profitability.The SPSS programme is used to execute the results.The Indian agricultural sector receives financial support from regional rural and urban banks, which also aid individuals in resolving their financial difficulties. Two urban banks (Bombay Mercantile Cooperative Bank and Goa Urban Co-operative Bank) and four rural banks (Assam Gramin Vilash Bank, Baroda Gujarat Gramin bank, Himachal Pradesh Garmin Bank, and Karnataka Villas Gramin bank) were the focus of the study. Based on a balanced panel data set with multiple observations of leading Indian banks from 2015 to 2022, a

regression analysis is constructed. Additionally, the results showed that, among the bank-specific factors, ROE is significantly positively impacted by bank size, assets management ratio, assets quality ratio, and liquidity ratio, in that order.

Keywords: Banking, Financial risks, Bank profitability, financial performance, Multi-Criteria Decision Making, Liquidity Risk, Proxy Measurement.

1. INTRODUCTION

The banking industry plays an important role in the economic development of a country and is considered to be the most dominant segment of the financial sector. The banking sector plays a vital role in the growth and development of the economy of any nation [1]. Banks manage the loans and advances from their funds, various types of deposits from the public, or loans from other banks or financial institutions [2]. If the banks get the return or interest and repayment of the principal amount of loans and advances as per the schedule of the loan. There will not be a financial crisis for the bank and the bank will pay its debts and interest thereof duly [3]. However, the banking sector has recently shown the prolific growth of Islamic banks. Currently, 10 full-fledged Islamic banks are operating in Bangladesh, in which investment and deposit growth have reached 13.61% and 15.05%, respectively, from 2018 to 2019 [4]. Due to the bank's unique position in the economy, they have made a significant contribution to social and environmental causes [5]. Different stakeholders of banks are also interested to know their CSR performance along with financial performance since the banks play a crucial role in investing decisions [6]. Their CSR initiatives not only boost their public image but also impact the social behaviour of other businesses. CSR knowledge is critical for assessing investor and lender risk, maintaining regulators' goodwill, and increasing public trust in the financial system. Moreover, the stock market crash and numerous financial scandals in the banking industry demand banks restore their credibility and reputation in the eyes of public opinion [7].

In addition, the results of two tests were utilized to choose the best static model; the redundant fixed effects F test is 10.9 with a probability of less than 1%. As a result, reject the null hypothesis and accept the alternative, which asserts that there is a distinction between pooled and fixed effects and that the superior model is the fixed effects [8]. Then, the Hausman test is performed and the chi-squared is 14.3 with a probability of less than 1%. As a result, the alternative hypothesis that FE is better than RE for estimating the model is accepted [9]. Profitability and liquidity are the most important part of the banking sector. Otekunrin et al (2019) stated that banks are the primary providers of liquidity in the financial system, controlling the required liquidity position and reducing liquidity risk is crucial for day-to-day operations [10]. Regulatory authorities in many countries have initiated banking reforms intended to improve corporate governance, capital adequacy, disclosure and transparency, and prudential regulations to reduce bank risk-taking behaviour and enhance the financial stability of the banking systems [11]. Add value to this literature by investigating the influence of regulation and ownership on bank risk-taking using a large sample of banking institutions in 18 MENA countries, covering 14 years [12]. All the 21 selected banks have invested highly in rural development projects, which amount to 122,104.4 lakh rupees from 2014-2015 to 2017-

2018 [13]. Appropriate board characteristics are a critical precondition of (good) internal governance that can bring value to the bank in terms of not only shareholders' profitability but also stakeholders' interests and effective risk management [14]. The significance of the models appears quite high, with linear regressions explaining around 25–31% of the data. Additionally, the chi-squared statistics confirm the validity of the overall models [15]. Consequently, the research intends to analyze the selected bank financial risks and financial performance of regional rural and urban cooperative scheduled commercial banks in India by applying the multiple criteria decision-making approach. The introduction of the article is presented in section 1. Section 2 represents the literature survey collected from different research articles. Problem definition and motivation are presented in section 3. The proposed methodology of the study is presented in section 4. Section 5 delivers the experimentation and results discussion of the study. The conclusion of the article is presented in section 6.

2. LITERATURE SURVEY

Modina et al [16] studied a panel of 74,128 Italian SMEs analyzed to verify whether any syndromes could be identified and defined through financial ratios. Results show that a significant share of corporate insolvencies is characterized by a set of recurrent signs and symptoms so that the main syndromes can be identified. Bayangos et al [17] examined the presence of two competing views "competition-fragility" and "competition-stability" in analyzing the impact of competition on bank stability. The results concluded that at the industry level, bank competition significantly reduces bank-level solvency risk. The relationship between competition and risk is sensitive to other bank-specific characteristics and macroeconomic factors related to extent of a diversification strategy, cost-to-income ratio, deposit growth, capitalization and real GDP growth.

Aroleset al [18] explore how 'corporate colonization' (Sensu Deetz, 1992), fuelled by austerity, claims public institutions for commercial interests. Overall, argue that the austerity culture in the UK affects museums in largely negative ways by forcing them to respond to the progressive need to satisfy short-term financial interests. Pratheepkanth et al [19] investigated the effects of corporate governance and CSR disclosures and how they vary, depending on the level of economic development. The results are only applicable to the context of the study, which was restricted to listed Australian and Sri Lankan companies in 2020–2021.

Mandiri et al [20] analyzed the effect of Corporate Governance on Capital Structure and Corporate Performance in all profit-generating banking companies. The analysis in this study is descriptive analysis and Partial Least Square (PLS), using secondary data. Maccarthyet al [21] determined the relationship between financial assets and the performance of deposit money banks in Nigeria.The findings showed that there is a positive and significant relationship between cash equivalents and the return on investment of deposit money banks. Morrison et al [22] evaluate whether Somalia will reach Sustainable Development Goals 2 and 3 by 2030 and what the country requires to advance closer to these objectives. To achieve these, Somalia requires greater health improvements than observed between 1990 and 2019. Hakim et al [23] determined whether the influence of the Capital Adequacy Ratio (CAR) partially affects

mudharabah financing in Islamic commercial banks in Indonesia.The results show that CAR, NPF and BOPO simultaneously affect mudharabah financing, partially CAR and NPF do not affect mudharabah financing, while BOPO has a positive effect on mudharabah financing.

Wulan et al [24] analyzed the effect of third-party funds, non-performing loans, loan-to-deposit ratio, net interest margin, and operating-income-to-operating expenses on the growth of working capital loan disbursement in the Indonesian banking industry. The results show that third-party funds, loan-to-deposit ratio, net interest margin, and operating expenses-to-operating income have a statistically significant positive effect on the growth of working capital loans. Kariukiet al [25] examine the influence of interest rates and the performance of the lending institution in Africa. The study also concluded that interest rates on loans and advances became significant in affecting performance in terms of profits before tax and exceptional items (PBTEI) and also returns on equity (ROE).Subsequently, theliterature survey delivers aproper understanding of the research. The key motivation of the study is to analyze the financial performance and financial risk of selected Regional Rural Banks and Cooperative Urban Banks.

3. RESEARCH PROBLEM DEFINITION AND MOTIVATION

Technology is at the heart of most successful businesses, and greatly contributes to our nation's gross domestic product, we cannot ignore the power and advantages it has on the United States economy. Banking is known worldwide for predictable business practices and measurable evolution. However, banking like any other type of business relies on technology to be successful. Over the past few years, various studies have shown that there is a correlation between banking sector productivity and technology. At the same time, the industry is facing sweeping and unprecedented change. The lines between financial service segments are blurring, creating new opportunities while exposing institutions to new channels. Hence, the objective of this research is to analyze selected financial risks and financial performance of commercial banks for the period 2015-2022.

The banking industry plays an important role in the economic development of a country and is considered to be the most dominant segment of the financial sector. It plays a crucial role in the attainment of macroeconomic objectives and acts as a catalyst for socio-economic transformation by channelizing savings into investments in different sectors of the economy and fostering economic growth. The Scheduled Commercial Banks, having a massive share in the business operations have further diversified their activities to cater to the needs of trade and industry.The financial sector reforms stirred the banking industry from a regulated arrangement to a deregulated market economy, and have brought many private and foreign banks into the Indian banking scenario. Economic development through liberalization and globalization augmented the intermediation role of the banks. The expansion of international integration enabled Indian banks to explore global markets, and deregulation induced banks to explore new business opportunities. Based on the financial deepening theory and the imperfect competition market theory, this study analyzes the influence of marketization level on rural commercial banks' financial performance.

4. PROPOSED RESEARCH METHODOLOGY

Banks are instrumental in the economic growth and inclusive development of any country. For a developing nation like India, banks play a huge role and help the economy grow at a faster pace. An increase in population and growing disposable income have led to robust demand for banking and related services.Banks have vital importance in delivering the funds required for individuals and institutions in the country's economy, and in this respect, they play an important role in the economic development and growth of countries. The performance of banks is of interest to bank management, financial markets, banks supervisors, regulatory agencies and academics. This interest is driven by increasing consolidation in the banking sector, changes in production technology and regulation as well as dissolving geographic borders and vanishing boundaries of financial products and industries.
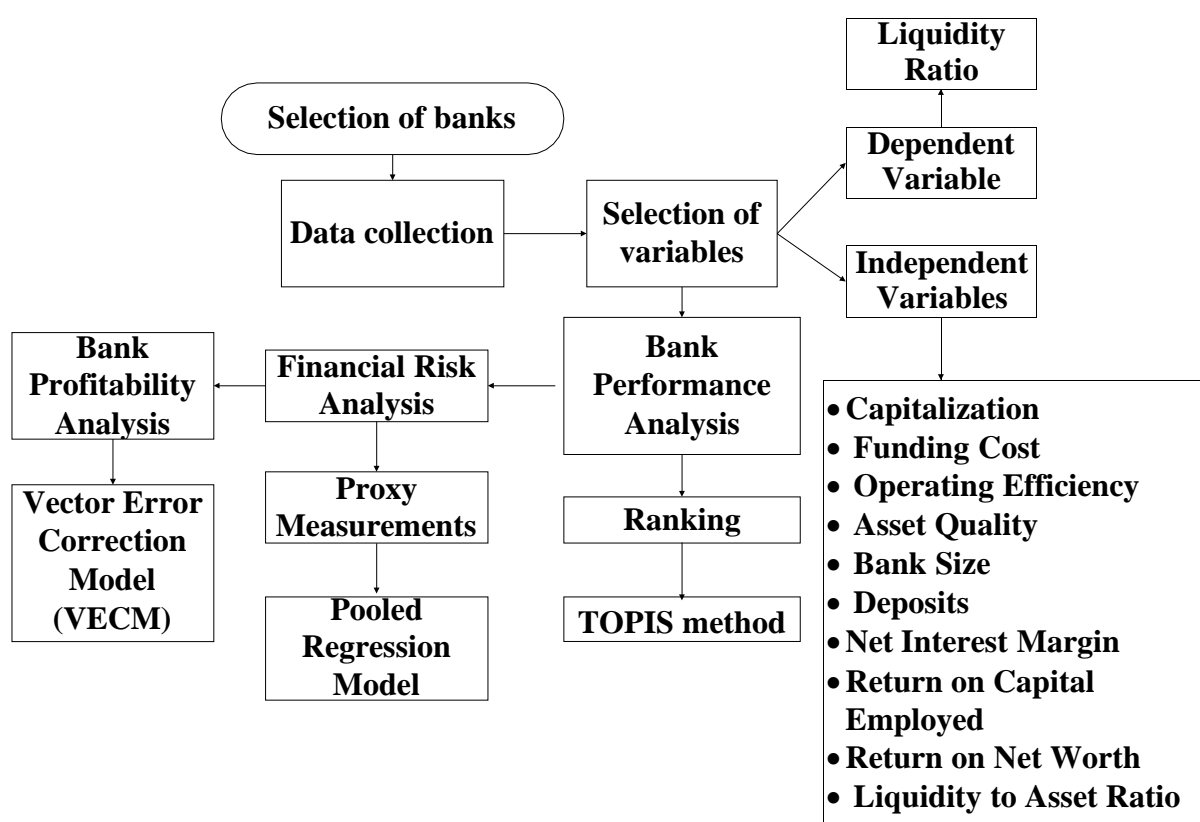

Figure 1: Block Diagram of Proposed Research

The block diagram of the research is depicted in figure 1. In this research, data were obtained from the annual accounts of different banks for 8 years from 2015 to 2022. Multiple criteria decision-making approach (TOPSIS) is applied to analyse the selected bank financial performance of regional rural and urban cooperative scheduled commercial banks in India. The pooled regression model using the fixed effects model and random effect models are applied to factors such as capitalization, funding cost, operating efficiency, asset quality, bank size, deposits, net interest margin, return on capital employed, return on net worth, and liquidity to asset ratio. The data was applied using different proxy measurements for the dependent variable, liquidity risk. The analysis of bank profitability has been refined using the Chi-

squared automatic interaction detector with Vector Error Correction Model (VECM) methodology.

a. Data Collection

To achieve the specific objectives of the current work, data are collected from the annual reports of selected Regional Rural and Cooperative,Urban Banks. In the present study, 7 Regional Rural and Cooperative Urban banks were considered as decision-making units.The input variables included capitalization, funding cost, operating efficiency, asset quality, bank size, deposits, net interest margin, return on capital employed, return on net worth, and liquidity to asset ratio.The data relating to various attributes from selected banks are collected from the annual reports of the banks.For measuring the performance of the banks, several Multiple criteria decision-making techniques have been used.

Multiple Criteria Decision-Making (MCDM)

MCDM methodologies attract attention in the last decade as decision-making tools. These methods have been applied in many fields of operation research. The methodologies usage has become easier and increased with the help of software for the decision-makers in business as well. The main concern in a multi-criteria decision problem is ranking the alternatives in order of importance. There are some alternatives for the decision-makers to choose from and some criteria to consider for the evaluation of alternatives. A general decision-making process should follow these steps: define the problem, establish goals, identify alternatives, define criteria, decide on a decision-making tool, and evaluate alternatives.An MCDM problem can be expressed in matrix form as:

$$A_{ij} = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{m1} & \cdots & a_{2n} \\ \ldots & \ldots & \ldots & \ldots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{bmatrix} \tag{1}$$

Where,m is the number of alternatives, n is the number of criteria and A_{ij} is the measured value of j-th criteria forj-th alternative. To rank the selected banks based on their performance the TOPSIS method is used.

i. TOPSIS Method (Technique of Order Preference by Similarity to Ideal Solution)

The TOPSIS method is one of the multi-criteria decision-making methods to solve multi-criteria decision-making problems. With this method, it is possible to rank alternative options according to certain criteria and by analyzing their distance to the ideal solution between the maximum and minimum values that the criteria can take. In this study, 10 variables are selected to analyse the performance of banks. TOPSIS method comprises the following steps and a series of mathematical calculations.

Step 1: Construct the Decision Matrix

The set of alternatives A_{ij} represents the available options for the decision maker which requires to be ranked.

$$A_{ij} = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ \cdots & \cdots & \cdots & \cdots \\ \cdots & \cdots & \cdots & \cdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{bmatrix} \tag{2}$$

In matrix A_{ij}, m shows the number of decision points and mshows the number of evaluation factors.

Step 2: Normalized Decision Matrix (R)

The Normalized matrix r_{ij} is calculated according to the following formula:

$$r_{ij} = \frac{a_{ij}}{\sqrt{\sum_{k=1}^{m} a_{kj}^2}} \tag{3}$$

$$R_{ij} = \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1m} \\ r_{21} & r_{22} & \cdots & r_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ r_{m1} & r_{m2} & \cdots & r_{mn} \end{bmatrix} \tag{4}$$

Where, a_i denotesj-th alternative where $i = 1,2,3,\ldots$ m, c_i representsj-th criterion where $j = 1,2,3,\ldots$ n, x_{ij} denotesj-th criterion value for the i -th alternative.

Step 3: Weighted Normalized Decision Matrix (V)

The weights are distributed thus the sum of the weight values is 1.

$$\sum_{i=1}^{n} w_i = 1 \tag{5}$$

Where, w_i denotes the weight of the j-th criterion. The elements in each column of the Matrix R are multiplied by w_i, creating the matrixV_{ij}.

$$V_{ij} = \begin{bmatrix} w_1 n_{11} & w_2 n_{12} & \cdots & w_n n_{1p} \\ w_2 n_{21} & w_2 n_{22} & \cdots & w_n n_{2p} \\ \cdots & \cdots & \cdots & \cdots \\ w_1 n_{m1} & w_2 n_{m2} & \cdots & w_n n_{mp} \end{bmatrix} \tag{6}$$

$$= \begin{bmatrix} v_{11} & v_{12} & \cdots & v_{1p} \\ v_{21} & v_{22} & \cdots & v_{2p} \\ \cdots & \cdots & \cdots & \cdots \\ v_{m1} & v_{m2} & \cdots & v_{mp} \end{bmatrix} \tag{7}$$

Step 4: Determination of Ideal (A+) and Negative Ideal (A-) Solution

At this stage, the maximum and minimum values in each column in the weighted decision matrix are determined.

$$A^+ = \{V_1^+, V_2^+, \ldots\ldots\ldots\ldots, V_n^+\} \quad \text{Max values} \tag{8}$$

$$A^- = \{V_1^-, V_2^-, \ldots\ldots\ldots., V_n^+\} \quad \text{Min values} \tag{9}$$

Step 5: Calculation of Distance Measures between Alternatives

In this step, the distance values to the maximum and minimum ideal points are calculated using the following formulas.

$$S_i^* = \sqrt{\sum_{j=1}^{n}(V_{ij} - V_j^*)^2} \tag{10}$$

$$S_i^- = \sqrt{\sum_{j=1}^{n}(V_{ij} - V_j^-)^2} \tag{11}$$

Where, S_i^* and S_i^- are distances from positive and negative ideal solutions.

Step 6: Calculation of the Relative Closeness to the Ideal Solution

The relative closeness of each decision point to the ideal solution is calculated according to the formula below.

$$C_i^* = \frac{S_i^-}{S_i^- + S_i^*} \tag{12}$$

The value of C_i lies in the range of 0 to 1. $C_i = 1$ shows the ideal solution, $C_i = 0$ shows the negative ideal solution. Final scores are calculated using the distance between negative and positive ideal solutions. TOPSIS score of an alternative will always be between zero and one. The ranking of banks is done based on the above-derived equations. To determine the financial risk of selected banks Pooled regression model is applied.

b.Pooled Data Regression Model for Financial Risk Analysis

This study investigates financial risk with the analysis of pooled regression model. The selection of sample size is important for any study and should depend on the purpose of the analysis. The convenience sampling method was used in choosing the banks for the study.Data were sourced from the annual reports of the banks in the sample. The data include time-series and cross-sectional data, i.e. pooled data set and estimated the effect of credit risk on the performance of commercial banks using pooled data regression. The dependent variable is liquidity risk (LR).Studying the bank performance concept may generate different results depending on the nature of the stakeholders who analyze the term. If they are depositors, the capacity of banks to manage their savings is the measure of performance; if they are equity-holders, then the performance is reflected in obtaining the satisfied levels of divisible profit

and if they are banks' managers, then the performance is considered from a profit point of view and also taking into considerations employees" requests.

The independent variables are capitalization (C), funding cost (FC), operating efficiency (OE), asset quality (AQ), bank size (BS), deposits (D), net interest margin (NIM), return on capital employed (ROC), return on net worth (ROW), and liquidity to asset ratio (LAR).The technique of pooled data estimation takes care of the problem of heterogeneity in the 7 banks selected for the study. The econometric model employed in the study is given as:

$$Y = \beta_0 + \beta X_{it} + \varepsilon_{it} \tag{13}$$

Where, Y is the dependent variable; β_0 is constant; β is the coefficient of explanatory variables; X_{it} is the vector of explanatory variables; and ε_{it} is the error term (assumed to have zero mean and independent across the period).The impact of risk (controlling the effect of cash reserve requirement and bank size) on the performance of commercial banks has been estimated with the following regression equation:

$$LR_{it} = \beta_0 + \beta_1 C_{it} + \beta_2 FC_{it} + \beta_3 OE_{it} + \beta_4 AQ_{it} + \beta_5 BS_{it} + \beta_6 D_{it} + \beta_7 NIM_{it} + \beta_8 ROC_{it} + \beta_9 ROW_{it} + \beta_{10} LAR_{it} + \varepsilon_{iy} \tag{14}$$

Where, LR_{it}, C_{it}, FC_{it}, OE_{it}, AQ_{it}, BS_{it}, D_{it}, NIM_{it}, ROC_{it}, ROW_{it}, LAR_{it} denotes Liquidity risk, Capitalization, funding cost, operating efficiency, asset qualitybank size, Deposits, net interest margin, return on capital employed, return on net worth,liquidity to asset ratio of ith bank in year t respectively.To analyze the nature of the correlation between the dependent and the independent variables and also to ascertain whether or not multicollinearity exists as a result of the correlation among variables, Pearson correlation analysis has been computed.

i. Liquidity Risk Proxy Measurement

Proxy measurements are applied to estimate indirect measurements when the direct variables are difficult to measure. Liquidity risk refers to both the time and costs associated with the transformation of a given position into cash and vice versa.Parallel to the importance of liquidity risk to be measured clearly by banks, many researchers measured the variable that will influence liquidity risk using the traditional proxy for example total deposit to total assets, cash to total assets, capital to total assets and the ratio of current assets to total liabilities. The main methodology is as follows.

$$LR_{ijt} = \beta_0 + \beta_1 Market\ Power_{ijt-1} + \beta_2 Bank_{ijt-1} + \beta_3 Country_{jt-1} + \theta_i + r_t + \varepsilon_{ijt} \tag{15}$$

Where LR_{ijt} denotes liquidity risk for bank i from country j in year t, $Market\ Power_{ijt-1}$ denotes the degree of market power, $Bank_{ijt-1}$ presents bank-specific characteristics, $Country_{jt-1}$ denotes country-specific characteristics, and ε_{ijt} represents the errorterm. All explanatory variables are one-year lagged values to mitigate the impact of the potential endogeneity between dependent variables and control variables. All regressions

include bank-fixed effects θ_i to capture time-independent differences across banks as well as time-fixed effects r_t to control for changes in the macroeconomic and business environment common to all banks in our sample. Standard errors are robust and clustered at the country level.

Price Impact Proxies

For price impacts, we examine three well-known low-frequency proxies, including the Amihud (2002) measure or AMIHUD, the Amivest measure (Cooper et al. 1985) or AMIVEST, and the Pástor and Stambaugh (2003) estimate PASTOR. AMIHUD captures the lack of liquidity by dividing the daily returns by the daily dollar volume. The measure shows the price shock that is triggered by a unit of dollar volume. For a given stock, AMIHUD is calculated as

$$AMIHUD = \frac{1}{T}\sum_{t=1}^{T}\frac{|r_t|}{Dollar\ Volume_t}$$

Where, T is the number of days with trading volume and r_t is the return on day t. AMIVEST compares the daily returns with daily volume measured as the number of shares.

$$AMIVEST = \frac{1}{T}\sum_{t=1}^{T}\frac{|Share\ Volume|e_t}{|r_t|}$$

This measure is obtained after regression of the daily returns over the daily market index returns on signed daily dollar volume.

c. Vector Error Correction Model (VECM) for Bank Profitability Analysis

To analyse the profitability of banks Vector Error Correction Model (VECM) is applied. To justify the use of the vector error correction model (VECM) there is a need to test for cointegration. A VECM is intended to be used with non-stationary series that are known to be cointegrated. The VECM has cointegration relations built into the specification so that it restricts the long-run behaviour of the endogenous variables to converge to their co-integrating relationships while allowing for short-run adjustment dynamics. Vector error correction models (VECMs) straightforwardly evaluate the quickness of the dependent variable to adjust to equilibrium. A VECM includes only $I(0)$ variables. This requires all the non-stationary variables of this study to be first-differenced, to produce stationary variables. The VECM was modelled as follows:

$$\Delta y_t = \beta_1 \Delta x_t + \beta_2(y_{t-1} - \gamma x_{t-1}) + u_t \qquad (16)$$

The error correction term is known as $(y_{t-1} - \gamma x_{t-1})$. Given that the co-integrating coefficient γ cointegrates y_t as well as x_t, what follows is that the error correction term above will be integrated of order $I(0)$ even if the parts that make up the error correction term are integrated of order $I(0)$. The interpretation of the VECMs is as follows: due to changes in

explanatory variables(s) such as x within the interval from $x - 1$ and x, y would be expected to vary between values of $t - 1$ as well as t these changes in explanatory variables in part were also expected to correct for any disequilibrium that had prevailed previously.The lag had to be included in the error correction term as its omission would suggest that the dependent variable (y) varies in the interval of $t - 1$ and t responding to a disequilibrium in the present period (t). The long-run relationship between x as well as y is defined by this variableγ. The two coefficients $\beta_1$and β_2 define both the short-run relationship as well as the speed of adjustment.

A VECM can be estimated for more than two variables. For example, if there were three variables, x_t, w_t, y_t, that were co-integrated, a possible error correction model would be as follows:

$$\Delta y_t = \beta_1 \Delta x + \beta_2 \Delta w_2 + \beta_3 (y_{t-1} - \gamma_1 x_{t-1} - \gamma_2 w_{t-1}) + u_t \qquad (17)$$

The VECM is a helpful model measuring the adjustment from the disequilibrium of the past period which has decent economic ramifications. VECMs are detailed regarding the first difference which normally wipes out patterns from the factors included; thereby resolving the problem of spurious regressions. The disequilibrium error term is stationary because the VECM has important implications such as that: there exists a correction process which prevents the persistent widening of errors in the long-run relationship.

5. EXPERIMENTATION AND RESULTS DISCUSSION

This section describes the data sources and the construction of the sample that we use in this study. The data are derived from three different sources. Regional rural banks (RRBs) were formed to serve the rural inhabitants of India, the majority, of who were not have access to banking. There are many institutions set up by the State and Central Govt. and some in collaboration. The main objective of this study is to serve both urban and rural populations. The analysis of this study is carried out using the SPSS tool. But how well have these banks performed banking being an economic activity should be profitable. The study took nine rural and urban cooperative bank which includes Assam Gramin Vilash Bank, Baroda Gujarat Gramin bank, Himachal Pradesh Garmin Bank, Karnataka Villas Gramin Bank, Bombay Mercantile Cooperative Bank, Goa Urban Co-operative Bank.
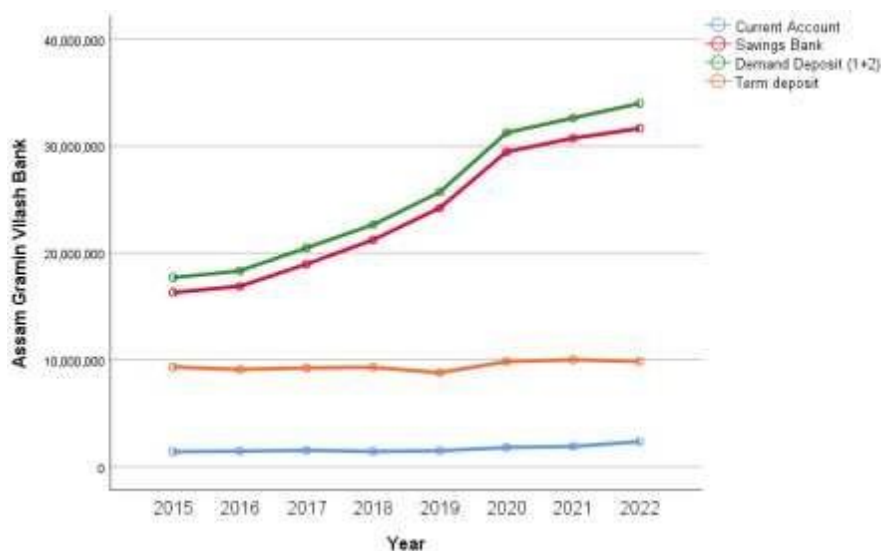
Figure 2: Assam Gramin Vilash Bank Deposits

Assam Gramin Vikash Bank offers attractive fixed deposit interest rates for its senior citizen customers at 8.50% p.a. for a 1-year tenure. Many small finance banks givethe highest fixed deposit interest rates for their senior citizen customers one of them is Assam Gramin Vikash Bank. Senior Citizens can take advantage to quickly double their money with good interest rates. The current interest rates available from different banks range between 7.60% and 9.25% per annum. The Assam VikasBank has a current account is in the range of 150797 in 2015 to 171096 in 2022, the growth rate is about 24.12 (figure 2).
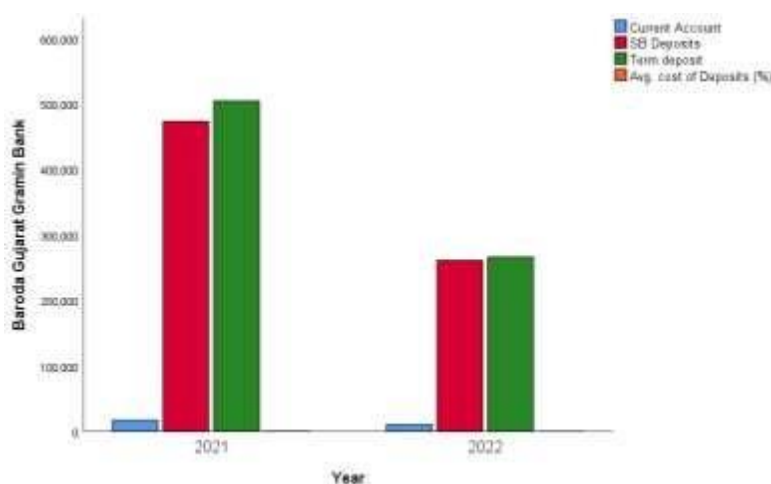

Figure 3: Baroda Gujarat Gramin Bank Deposits

Figure 3 depicts the account of the deposits of the Baroda Gujarat Gramin Bank. During the year under review, the Bank registered a growth of 4.59% with a net increase of 19829.54 lacs in deposits. The total deposits of the Bank reached the level of 451498.20 lacs as of 31" March 2019 as against 431668.62 lacs as on 31March 2018. The share of low-cost deposits in total deposits stood at 47.94%. For mobilizing resources, deposit/CASA campaigns were launched during the year. The category-wise break up of deposits is as under. The total deposits

of the bank reached the level of ₹ 914723.11 lahks at the end of 31.03.2020 by recording a growth of ₹ 76605.37 lakhs (9.14%) over the previous year.
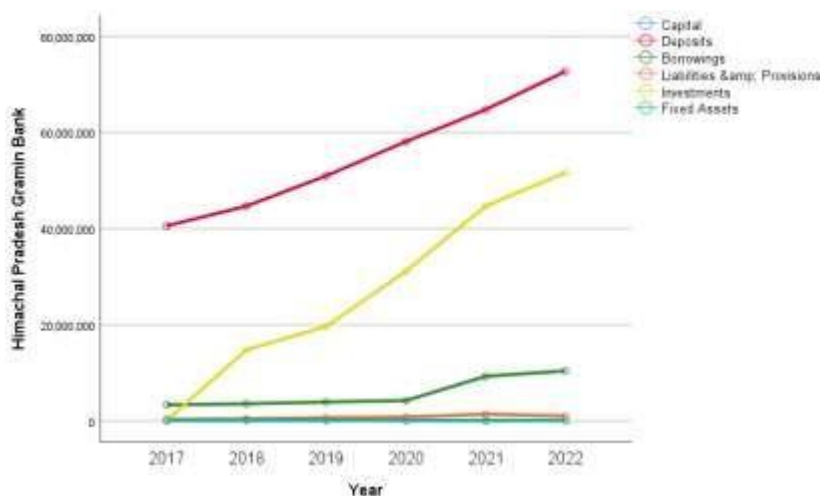

Figure 4: Himachal Pradesh Gramin Bank Deposits

The Bank has a total of 266 branches, covering almost all the unbanked areas in all 12 districts of Himachal Pradesh. Apart from serving through well-established branches, Bank is also following Bank Mitra and Bank Sakhi models to reach more unbanked areas. HPGB has the highest share in all the social security schemes as compared with the banking system in the state of Himachal Pradesh. The share of Deposits to total liabilities remained in the range of 73-81% and the share of CASA deposits to total deposits was in the range of 50-60% as shown in figure 4. The share of Priority Sector Loans O/S in Gross loans Outstanding was consistently over 80%, with the share increase in the later half of the decade to 90.6% as on 31 March 2020.
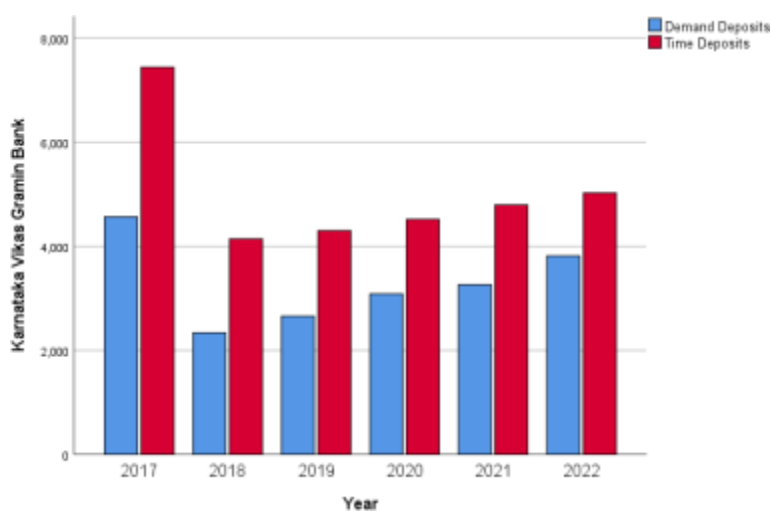

Figure 5: Karnataka Vikas Gramin Bank

The total deposits of the Bank reached a level of 12944.19 Crore as of 31/03/2018, registering a net increase of 942.92 Crore over the deposit level of the previous year. The comparative position of deposits as of 31/03/2018 vis-à-vis the previous year (figure 5). The Bank had taken

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a conscious decision to discourage bulk deposits and also shed deposits with high-interest rates during the current year. Due to this, the cost of deposit has come down from 6.44% as of 31.3.2017 to 5.82% during the reporting year.
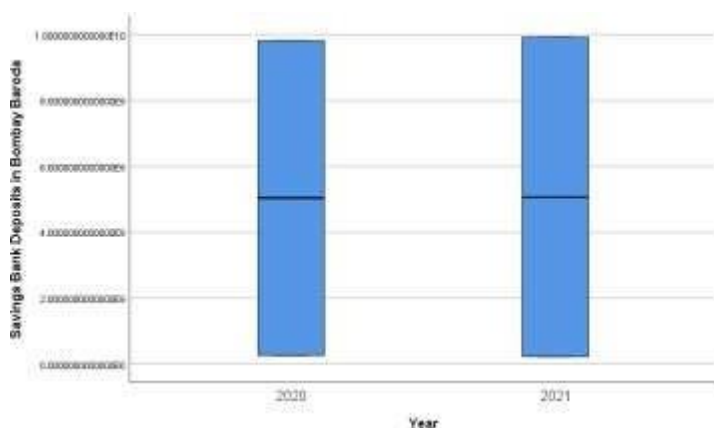

Figure 6: Bombay Mercantile Cooperative Bank

Bombay Mercantile Co-operative Bank more than doubled its NPA recoveries to Rs 13.54 crore in the fiscal ended in March 2022. The amount invested in fixed deposits with a maturity period of 5 years in a Scheduled bank is eligible for tax deduction under section 80C. However, the interest earned on the deposit is taxable. During the year 2021-22, the bank posted a net profit of Rs. 2.36 crores. To enhance profitability, the bank is in the process of designing and introducing new loan products and better deployment of surplus funds.
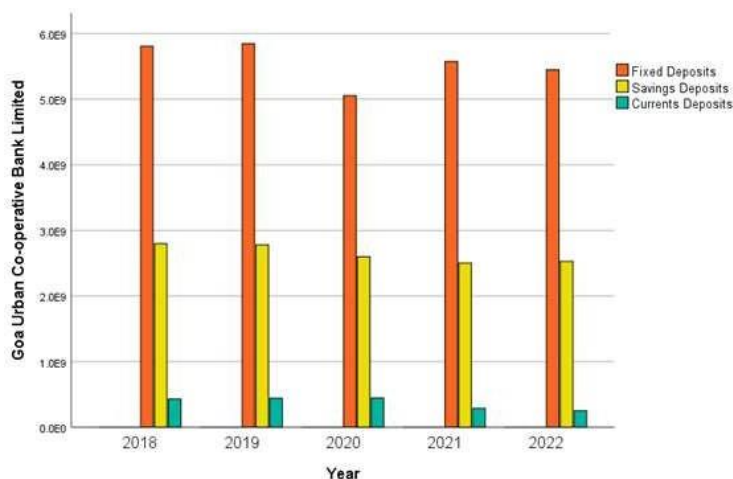
Figure 7: Goa Urban Cooperative Bank Limited

Figure 7 depicts the Goa Urban Cooperative Bank limited fixed, saving and current deposits. From the deposits and other accounts category, the fixed deposits reach the maximum value of 5844286800 in the year 2019, and for the saving deposits, it reaches 2797516315 for 2018 and 2528179292 for 2022. Moreover, the current deposits start from 429936942.4 in 2018 and ended with 250139938.8 in the year 2022 respectively.

a. OLS Regression Analysis

Regression analysis of panel data is a data structure which is panel data. Generally, parameter estimation in the regression analysis with cross-section data is done by estimating the least squares method called Ordinary Least Square (OLS). Regression Method Data Panel will give the result of estimation which is the Best Linear Unbiased Estimation (BLUE). A panel data model approach section data. This model is not considered a time and individual dimensions, so it is assumed that the behaviour of c uses the Ordinary Least Square (OLS) approach or the least squares technique to estimate the panel data model.

i. Assam Gramin Vilash Bank

Table 1: Assam Gramin Vilash Bank OLS Analysis

Coefficients[a]							
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**95.0% Confidence Interval for B**	
		B	**Std. Error**	**Beta**			**Lower Bound**	**Upper Bound**
1	(Constant)	2010.425	1.100		187.539	.000	1996.447	2024.403
	Cash at the year-end	-7.982 E-6	.000	-.962	-3.438	.180	.000	.000
	Average Cash as % to average deposit	3.308	.901	.817	3.670	.169	-8.145	14.761
	Recovery/Reduction of NPA	-3.171 E-6	.000	-1.214	-3.771	.165	.000	.000
	Addition to NPA during the year	-5.410 E-9	.000	-.006	-.039	.975	.000	.000
	NPA at the end of the year	2.246 E-6	.000	4.084	5.542	.114	.000	.000
	NPA net of provision	-1.190 E-6	.000	-2.008	-4.500	.139	.000	.000
a. Dependent Variable: Year								

Table 1 provides the coefficient table with unstandardized coefficients, which designate how much the dependent variable varies with an independent variable when all other

independent variables are held constant. This tests whether the unstandardized (or standardized) coefficients are equal to 0 (zero) in the population. The t-value and corresponding p-value are located in the "t" and "Sig**.**" columns, respectively. Here, $p > .05$, this concludes that the MH coefficients are not statistically significant. Further, checking for multicollinearity in the multiple regression model with tolerance, the obtained value was 0.595, 0.471 and 0.00, generally,the tolerance value was <0.1 it was satisfied with this condition.

Table 2: Residuals Statistics[a]

	Minimum	**Maximum**	**Mean**	**Std. Deviation**	**N**
Predicted Value	2014.93	2021.95	2018.50	2.445	8
Residual	-.213	.253	.000	.153	8
Std. Predicted Value	-1.459	1.412	.000	1.000	8
Std. Residual	-.524	.623	.000	.378	8
a. Dependent Variable: V1					
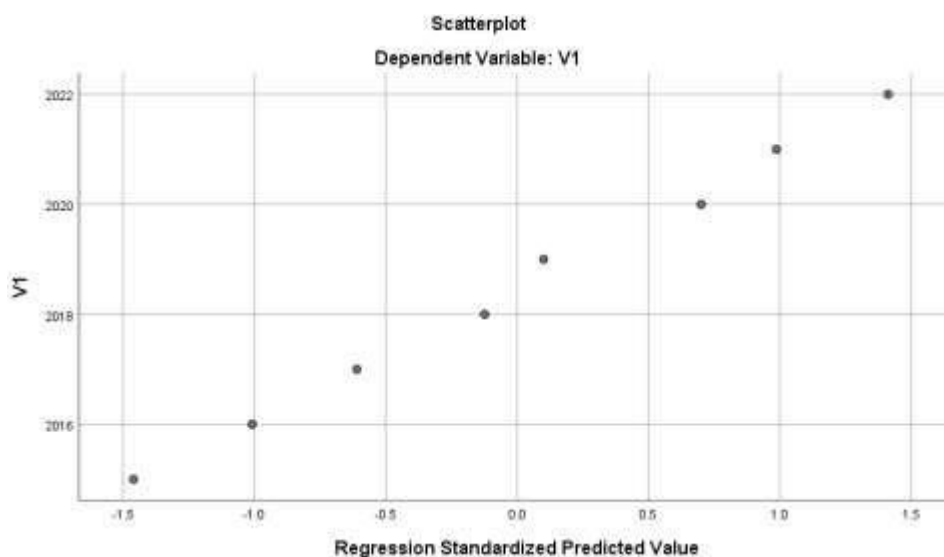
Figure 8: Residual Plot with Regression Analysis

A residual plot is a scatterplot that displays the residuals on the vertical axis and the independent variable on the horizontal axisas shown in figure 8. Residual plots help us to determine whether a linear model is appropriate in modelling the given data. The observations are represented by circular dots, and the best fit or predicted regression line is represented by the diagonal solid line. The residual is the vertical distance (or deviation) from the observation to the predicted regression line. Predicted values are points that fall on the predicted line for a given point on the x-axis.

ii. Karnataka Vikas Gramin Bank

Table 3: Karnataka Vikas Gramin Bank OLS Regression Analysis

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	2017.282	.159		12680.133	.000
	Average cash	-.005	.001	-.202	-6.411	.023
	NPA at the beginning of the year	.002	.000	.753	20.078	.002
	Financial Return	.001	.000	.211	6.569	.022
a. Dependent Variable: V1						

Table 3 provides the coefficient table with unstandardized coefficients, which designate how much the dependent variable varies with an independent variable when all other independent variables are held constant. This tests whether the unstandardized (or standardized) coefficients are equal to 0 (zero) in the population. The t-value and corresponding p-value are located in the "t" and "Sig**.**" columns, respectively. Here, $p > .05$, this concludes that the MH coefficients are not statistically significant. Further, checking for multicollinearity in the multiple regression model with tolerance, the obtained value was 0.595, 0.471 and 0.00, generally,the tolerance value was <0.1 it was satisfied with this condition.

Table 4: Residuals Statistics[a]Analysis

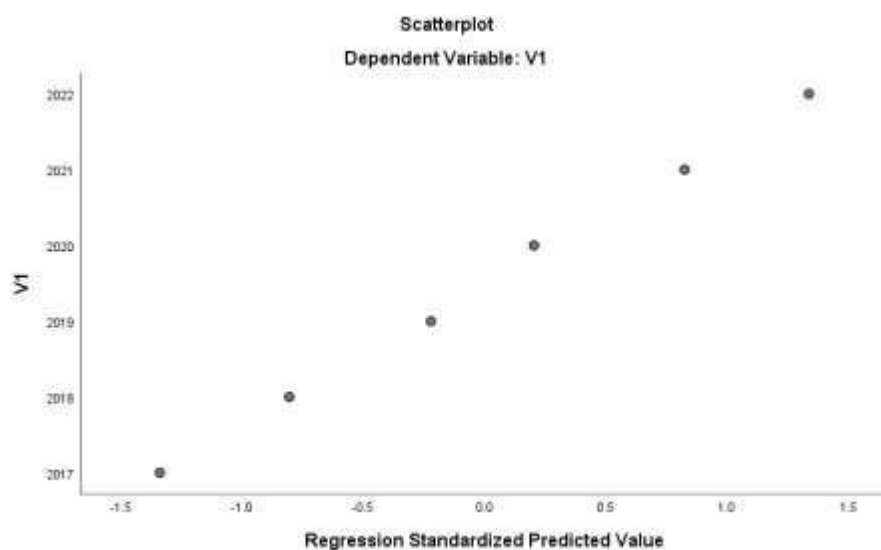|	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**	**N**
Predicted Value	2017.00	2022.00	2019.50	1.870	6
Residual	-.086	.120	.000	.069	6
Std. Predicted Value	-1.339	1.337	.000	1.000	6
Std. Residual	-.795	1.102	.000	.632	6
a. Dependent Variable: V1					

Figure 9: Residual Plot Analysis of Regression

A scatterplot called a residual plot shows the independent variable on the horizontal axis and the residuals on the vertical axis. This decides whether a linear model is suitable for describing the provided data with the use of residual plots. The diagonal solid line represents the best fit or anticipated regression line, while the circle dots represent the observations. The vertical distance (or divergence) between the observation and the anticipated regression line is known as the residual. At a specific position on the x-axis, predicted values are points that are on the predicted line.

iii. Goa Urban Co-operative Bank

Table 5: Goa Urban Co-operative Bank Coefficient Analysis

Coefficients[a]								
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**95.0% Confidence Interval for B**	
		B	**Std. Error**	**Beta**			**Lower Bound**	**Upper Bound**
1	(Constant)	2005.339	3.391		591.390	.000	1990.749	2019.928
	Deposit	6.231E-6	.000	.012	.219	.847	.000	.000
	Owned Funds	.001	.000	.948	11.016	.008	.000	.001
	Net Profit	.000	.000	.068	1.024	.414	-.001	.002

> a. Dependent Variable: V1

Unstandardized coefficients, which indicate how much the dependent variable varies with an independent variable while all other independent variables are held constant, are shown in table 5 coefficient table. This determines if the population's unstandardized (or standardised) coefficients are equal to 0 (zero). The "t" and "Sig." columns, respectively, contain the t-value and related p-value. The MH coefficients are not statistically significant in this case because p >.05. The resulting values of 847, .008, and .414, with a tolerance value of typically 0.1, satisfy the criteria for multicollinearity in the multiple regression model.

Table 6: Residual Statistics Analysis

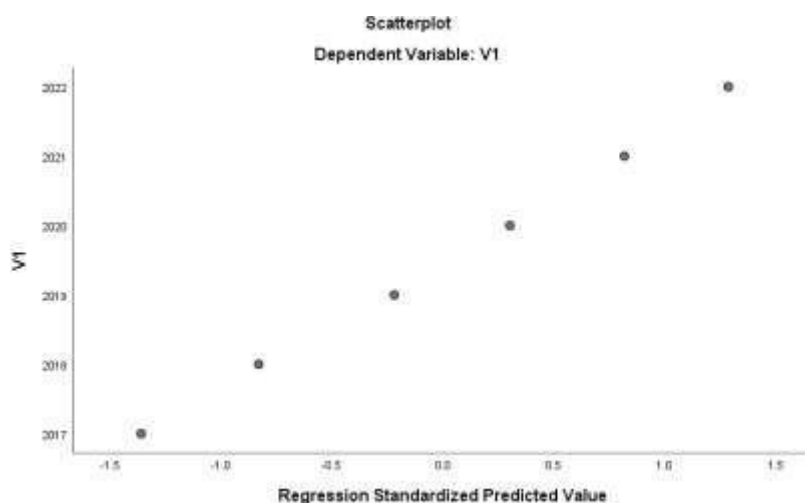|	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2016.96	2021.91	2019.50	1.869	6
Residual	-.092	.095	.000	.073	6
Std. Predicted Value	-1.359	1.287	.000	1.000	6
Std. Residual	-.792	.819	.000	.632	6
a. Dependent Variable: V1					

Figure 7: Residual Plot Regression Analysis of Goa Urban Co-operative Bank

The independent variable is shown on the horizontal axis and the residuals are shown on the vertical axis in a scatterplot called a residual plot. Residual plots enable us to assess the suitability of a linear model for the provided data. The diagonal solid line is the regression line that best fits the data or is predicted, while the circle dots indicate the observations. The residual is the vertical distance between the observation and the projected regression line (or deviation). The predicted values are the points that, for a specific position on the x-axis, lie on the predicted line. After running the logistic regression model, the Wald test can be used.

b. Asset Quality Analysis

Asset quality helps to understand the financial health of the financial institutions against loss of worth in the asset. Asset impairment severely affects the long-term solvency of financial institutions. The amount of severity of the Non-Performing asset directly hampers the overall quality of the financial institution. The following ratio can be used to measure the Asset quality of financial institutions.

$$Net\ NPA\ to\ Net\ Advances\ Ratio = (Net\ NPA/Net\ Advances) * 100 \qquad (18)$$

The net NPA to Net Advances Ratio helps to determine the credit efficiency of financial institutions. The lower ratio signifies credit efficiency and its proper management by a financial institution.

i. Wald Test Analysis

The Wald test (a.k.a. Wald Chi-Squared Test) is a parametric statistical measure to confirm whether a set of independent variables are collectively 'significant' for a model or not. It is also used for confirming whether each independent variable present in a model is significant or not. A variable is said to be 'significant' if that variable adds some incremental value to the model. Variables which fail to add value to the model can be omitted without affecting the model in any meaningful way.

Table 7: Chi-Square Tests Analysis with Karnataka Bank

| | Value | df | Asymptotic Significance (2-sided) | Monte Carlo Sig. (2-sided) | | | Monte Carlo Sig. (1-sided) | | |
| | | | | Significance | 99% Confidence Interval | | Significance | 99% Confidence Interval | |
					Lower Bound	Upper Bound		Lower Bound	Upper Bound
Pearson Chi-Square	96.000[a]	88	.263	1.000[b]	1.000	1.000			
Likelihood Ratio	51.320	88	.999	1.000[b]	1.000	1.000			
Fisher's Exact Test	117.094			1.000[b]	1.000	1.000			

Linear-by-Linear Association	.004c	1	.947	.921b	.914	.928	.470b	.457	.483
N of Valid Cases	12								
a. 108 cells (100.0%) have an expected count of less than 5. The minimum expected count is .08.									
b. Based on 10000 sampled tables with starting seed 2000000.									
c. The standardized statistic is -.067.									

The test statistic for the Wald test is obtained by dividing the maximum likelihood estimate (MLE) of the slope parameter by the estimate of its standard error (table 7). The p-value of a test gives the probability of observing a test statistic as extreme as the one observed if the null hypothesis were true. For the Wald test: p =0.470, where $Z \sim N(0,1)$ is a standard normal random variable.

Table 8: Himachal Pradesh Bank Chi-Square Analysis

	Value	df	Asymptotic Significance (2-sided)	Monte Carlo Sig. (2-sided)			Monte Carlo Sig. (1-sided)		
				Significance	99% Confidence Interval		Significance	99% Confidence Interval	
					Lower Bound	Upper Bound		Lower Bound	Upper Bound
Pearson Chi-Square	30.000a	25	.224	1.000b	1.000	1.000			
Likelihood Ratio	21.501	25	.664	1.000b	1.000	1.000			
Fisher's Exact Test	29.923			1.000b	1.000	1.000			
Linear-by-Linear Association	.006c	1	.938	.947b	.942	.953	.484b	.471	.496
N of Valid Cases	6								
a. 36 cells (100.0%) have an expected count of less than 5. The minimum expected count is .17.									

| b. Based on 10000 sampled tables with starting seed 329836257. |
| c. The standardized statistic is .078. |

Table 8 depicts the Himachal Pradesh bank chi-square analysis with bank asset details to predict the financial risk analysis. The null hypothesis can be 2 coefficients of interest are at the same time equal to zero. If the test rejects the null hypothesis, this suggests that the 2 variables are significant to that model fit. The significance value p=0.484 implies that is a positive correlation between the variables.

Table 9: Chi-Square Tests Analysis in Assam Bank

	Value	df	Asymptotic Significance (2-sided)	Monte Carlo Sig. (2-sided)			Monte Carlo Sig. (1-sided)		
				Significance	99% Confidence Interval		Significance	99% Confidence Interval	
					Lower Bound	Upper Bound		Lower Bound	Upper Bound
Pearson Chi-Square	30.000[a]	25	.224	1.000[b]	1.000	1.000			
Likelihood Ratio	21.501	25	.664	1.000[b]	1.000	1.000			
Fisher's Exact Test	29.923			1.000[b]	1.000	1.000			
Linear-by-Linear Association	4.307[c]	1	.038	.009[b]	.006	.011	.003[b]	.001	.004
N of Valid Cases	6								
a. 36 cells (100.0%) have an expected count of less than 5. The minimum expected count is .17.									
b. Based on 10000 sampled tables with starting seed 2000000.									
c. The standardized statistic is 2.075.									

Table 9 illustrates the Chi-Square Tests Analysis with Assam Bank asset values. This analysis of the correlation with the likelihood ratio of monte carlo at a 99% significance level.

From this study, the significance value of p<0.01, indicates that it is a non-standard variable and this rejects the null hypothesis.

Table 10: Chi-Square Tests Analysis with Bombay Mercantile Bank

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.000[a]	1	.157	1.000	.500	
Continuity Correction[b]	.000	1	1.000			
Likelihood Ratio	2.773	1	.096	1.000	.500	
Fisher's Exact Test				1.000	.500	
Linear-by-Linear Association	1.000[d]	1	.317	1.000	.500	.500
N of Valid Cases	2					
a. 4 cells (100.0%) have an expected count of less than 5. The minimum expected count is .50.						
b. Computed only for a 2x2 table						
c. For 2x2 crosstabulation, exact results are provided instead of Monte Carlo results.						
d. The standardized statistic is -1.000.						

c. Management Quality

It signifies the calibre of top-level management and their ability to make crucial decisions. Management quality helps to determine better management aims, objectives and goals. It helps to keep bottlenecks and inefficiency in the management at bay. Management quality promotes sustainable growth in the long run for a financial institution. The following ratios can be used to measure the management quality of financial institutions.

$$Total\ advances\ to\ Total\ Deposit\ Ratio = (Total\ advances/Total\ Deposits) * 100 \tag{19}$$

It helps to determine the financial institution's ability to convert its deposits into higher-return advances. The higher the ratio the better the financial institution's ability to earn a higher return.

$$Business\ per\ Employee = (Total\ business/Total\ no.\ of\ employees) * 100 \tag{20}$$

It shows the efficiency of the employees to generate business and their contribution to the overall growth of the business. The higher the ratio, the better it is for financial institutions.

i. Earnings Quality

Earnings Quality is crucial for a financial institution's well-being which helps to improve capital market efficiency. Financial Institution with higher Earnings Quality is considered less risky. The sustainability in income and growth of future earnings indicates the quality of earnings. Earnings Quality can be computed measure using the following ratios.

$$Return\ on\ Asset = (Net\ Income/Total\ Asset) * 100 \qquad (21)$$

Return on asset helps to measure the calibre of the financial institutions to check their ability to use their asset to generate net income. A higher ratio indicates that the financial institutions are using their asset efficiently and effectively

Table 11: Autocorrelation Analysis of Return Values

Series: Financial Return					
Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.463	.296	2.448	1	.118
2	.174	.274	2.850	2	.241
3	-.101	.250	3.014	3	.390
4	-.312	.224	4.962	4	.291
5	-.332	.194	7.902	5	.162
6	-.303	.158	11.585	6	.072
a. The underlying process assumed is independence (white noise).					
b. Based on the asymptotic chi-square approximation.					

The null hypothesis of the Box Ljung Test, H0, is that our model does not show a lack of fit (or in simple terms the model is just fine). The alternate hypothesis, Ha, is just that the model does show a lack of fit.The Ljung-Box test statistic (X-squared) gets larger as the sample auto-correlations of the residuals get larger (0.463), and its p-value is the probability of getting a value as large as or larger than that observed under the null hypothesis that the true innovations are independent with 0.118 is shown in table 11.

d. Liquidity Analysis

Liquidity is the solvency of the financial institution i.e. the ability to meet its obligation as and when they are due. Liquidity can be computed using the following ratios.

$$Liquid\ Assets\ to\ Total\ Asset\ Ratio = (Liquid\ asset/Total\ asset) * 100 \quad (22)$$

The higher ratios of the financial institution will denote the capability to meet its short-term obligation. It measures the overall liquidity position of the financial institution.

$$Cash\ Assets\ to\ Total\ Assets\ Ratio = (Cash\ Assets/Total\ Assets) * 100 \quad (23)$$

The higher ratio will denote the safety and liquidity amongst all the assets of the financial institution.

i. Wilcoxon Rank-Sum Tests for the Effectiveness of Liquidity Proxies

An analysis of the accuracy of the price proxies in table 1 and table 2 is descriptive, without any formal statistical test. To see whether the pattern that is described above is statistically discernible, we calculate the absolute difference (MERR) for price proxies.

Table 12: Wilcoxon Rank Analysis with Strike Price

Ranks				
		N	Mean Rank	Sum of Ranks
Turnover in Lacs - Strike Price	Negative Ranks	311[a]	167.45	52077.00
	Positive Ranks	84[b]	311.11	26133.00
	Ties	0[c]		
	Total	395		
a. Turnover in Lacs < Strike Price				
b. Turnover in Lacs > Strike Price				
c. Turnover in Lacs = Strike Price				

This implies that the sum of positive ranks should be close to the sum of negative ranks. This number (159 in our example) is our test statistic and is known as Wilcoxon W+. Table 12 shows a very different pattern: the sum of positive ranks (indicating that the "turnover in lacs with strike price" was rated better) is way larger than the sum of negative ranks.

Table 13: Test Statistics[a]

	Turnover in Lacs - Strike Price
Z	-5.714[b]
Asymp. Sig. (2-tailed)	.001
a. Wilcoxon Signed Ranks Test	
b. Based on positive ranks.	

The study prefers reporting Exact Sig. (2-tailed) for liquidity,the analysis is shown in table 13. Its value of 0.001 means that the probability is roughly 1 in 1,000 of finding the large sample difference if the variables have similar population distributions. This approximate p-

value is based on the standard normal distribution (hence the "Z" right on top of it). It's comforting to see that both p-values are 0.001. The normal approximation is accurate.

Table 14: Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum	Percentiles		
						25th	50th (Median)	75th
NO. OF SHARES	1733	2646398.81	3492131.581	60967	32386623	816519.50	1428883.00	3047958.00
NO. OF TRADES	1733	8449.86	8806.788	640	77325	3502.50	5589.00	9805.00

Table 14 illustrates the descriptive statistics analysis with several shares and trades. The mean and standard deviation with maximum and minimum values are estimated using the price values. These percentile columns give the values of the variable at various percentiles. Percentiles are determined by ordering the values of the variable from lowest to highest and then looking at whatever percent to see the value of the variable there. For example, in the column labelled 25, the value of the variable write is 816519.50, and for the 50th median, the value is 1428883.00.

Table 15: Wilcoxon Rank Analysis with Shares

Ranks				
		N	Mean Rank	Sum of Ranks
NO. OF TRADES - NO. OF SHARES	Negative Ranks	1733[a]	867.00	1502511.00
	Positive Ranks	0[b]	.00	.001
	Ties	0[c]		
	Total	1733		
a. NO. OF TRADES < NO. OF SHARES				
b. NO. OF TRADES > NO. OF SHARES				
c. NO. OF TRADES = NO. OF SHARES				

Table 15 depicts the Wilcoxon rank analysis with trades and shares. Thus, it follows that the sum of positive ranks ought to be somewhat close to the sum of negative ranks. This quantity, in this case, 159, is our test statistic and is referred to as Wilcoxon W+. A significantly distinct trend can be seen in the table: the sum of positive ranks, which shows that the "turnover in lacs with strike price" was rated better, is much higher than the sum of negative ranks.

Table 16: Test Statistics[a]

	NO. OF TRADES - NO. OF SHARES
Z	-36.057[b]
Asymp. Sig. (2-tailed)	.000
a. Wilcoxon Signed Ranks Test	
b. Based on positive ranks.	

For liquidity analysis, the study prefers reporting Exact Sig. (2-tailed) is shown in table 16. If the variables genuinely have similar population distributions, then the probability of finding the high sample difference is around 1 in 1,000, as indicated by the variable's value of 0.001. The standard normal distribution is the basis for this approximation of the p-value (thus the "Z" immediately above it). The fact that both p-values are 0.001 is consoling. It appears that the common approximation is correct.

Debt–Equity Ratio

This ratio indicates the relationship between the external term borrowings and the own funds of the concern. Bank takes total term liabilities as Debt i.e. total liabilities minus net worth and total current liabilities. Equity means the net worth of the concern minus intangible and fictitious assets. However, the subordinated funds (i.e. long-term unsecured loans from friends and relatives, etc.) may be considered as quasi-equity and included in equity while arriving at the ratio, if the borrower retains the same at the existing level / projected level and generally for non-corporate borrowers. The subordinated debt, however, should not exceed the borrower's capital i.e. capital plus free reserves less intangible assets.

$$Debt - Equity\ Ratio = Total\ Term\ Liabilities\ (TL)\ /\ Tangible\ Net\ Worth \quad (24)$$

A D.E. ratio of 4:1 is considered satisfactory for micro and small enterprises and 3:1 for Medium enterprises. However, a higher ratio is generally allowed keeping in view the activity of the borrower, industry, sectoral classification such as SSI units, other priority sector advances etc. Apart from DER (TTL/TNW) bank assesses the Debt Equity Ratio as Total outside Liabilities (TOL) to Tangible Net Worth also Total Outside liabilities (TOL) will be calculated as the total of all liabilities of a company/firm on the liability side of balance sheet minus the net worth. A Ratio of 4.5:1 of DER (TOL / TNW) may be considered satisfactory.

6. RESEARCH CONCLUSION

The banking system provides financial security to the people by providing loans at competitive rates, paying reliable remittance services, etc. The bank's performance is the capacity to generate sustainable profitability.Bank profitability tends to go hand-in-hand with economic activity. Slower growth prospects may dent bank profitability through a reduction in lending activity and a possible increase in credit impairments.Banks in the process of financial intermediation are confronted with various kinds of financial and non-financial risks viz.,

credit, interest rate, foreign exchange rate, liquidity, equity price, commodity price, legal, regulatory, reputational, operational, etc. This study proposes to analyse the selected bank financial risks and financial performance of regional rural and urban cooperative scheduled commercial banks in India by applying the multiple criteria decision-making approach (TOPSIS). The human capital (HC), capital employed (CE), structural capital (SC), and relational capital (RC) were utilized as independent factors together with three control variables (leverage, size, and GDP), and return on equity (ROE), which were used as dependent variables. The results show that rural bankshave a clear, statistically significant relationship with ROCE. Overall, all of the components have significant impacts on increasing the efficiency and profitability of Indian rural and urban banks. The dependent variables include return on average assets and return on equity, and independent variables include bank-specific factors, banking industry factors, and economic factors as the highly correlated factors for rural when compared to urban. Among the bank-specific factors, non-performing loans and cost-to-income ratio negatively affect the bank's profitability, and diversification measures do not affect the bank's profitability. Regional Rural and urban Banks to make them more viable and successful in meeting the needs of rural credit in the coming years.

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