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Impact of Credit Risk Management on the profitability of private Commercial Banks in Pakistan During the years of 2017- 2022

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Abstract

The purpose of this research is to explore the correlation between CRM and profitability of private commercial banks in Pakistan for the period of 2017-2022. The method used for conducting the study and the analysis, as well as to determine the relationship between CRM practices and financial performance is quantitative research methodology. This secondary data for this study are financial statements, annual reports and regulation documents of several private commercial banks for the purpose of enhancing reliability and validity of the study. From the data gathered in the study it was possible to define several major categories that may help to answer the research question. Private commercial banks in Pakistan should focus on enhancing revenue generation by strictly adhering to various CRM measures such as maintaining low NPLs (non-performing loans) and ensuring proper capital adequacy. They should also utilize efficient credit risk management instruments, implement frameworks like the Basel III Accord, and develop well-formulated CRM strategies to address critical issues arising from economic situations and political volatility, while building up a portfolio of loans and systematically reviewing credit risks to increase the risk/return on assets. This study will contribute towards filling the existing gap in literature concerning the relationship between CRM and bank profitability in the banking sector of Pakistan. Also, this paper

will provide practical recommendation to the bank executive, regulators and policymakers on how to apply CRM to enhance the resilience of the banking system.

Introduction

The evaluation of the financial position of the Private Commercial Banks is helpful to measure economic stability and growth (Phan et al., 2019). The banking industry has encountered several challenges in the last few years, particularly in Credit Risk Management (CRM) such as complex regulatory requirements, rapid change in market condition and cybersecurity risks etc. (Rehman et al., 2019). Banks, being financial institutions, are exposed to various types of risks; however, credit risk is one of the most significant risks that are involved. CRM is, therefore a critical factor in the Bank's capacity to protect its assets and, at the same time, work hard to stay profitable in the long run (Rehman et al., 2019).

Credit risk management can be defined as the process of identifying credit risk, assessing it, continuously supervising it, and mitigating it (Bello, 2023). Some of the CRM practices have been supported and elaborated through some financial performance measures, including the NPLR, LPR, CAR, and other related measures (Gadzo et al., 2019). Hence, these metrics provide signals on how well a bank can manage the credit risk and, thus its financial health (Siddique et al., 2022).

In Pakistan, private lending institutions (PLIs) are crucial to the nation's economy, providing essential funding for individuals and organizations (Qamar et al., 2021). Their credit risk management skills, particularly reflected in the Non-Performing Loan Ratio (NPLR), play a significant role in sustainability and financial stability (Siddique et al., 2022). Maintaining a low NPLR is essential for PLIs to minimize capital loss and ensure profitability. Effective credit risk management is key to promoting stability and profitability in the private lending sector (Kitonyi, 2019).

The expected relationship between CRM and financial performance is most appropriate in the current economic environment (Mustafa, 2019). There has been an increase in competition and an unpredictable economic environment, as well as regulation changes, which is why banks need

to improve CRM strategies to avoid possible risks and achieve higher financial results (Rehman et al.,2019). This article seeks to establish how credit risk management practices affect the financial performance of private commercial banks.

Literature Review

The banking industry plays a significant role in enhancing economic development and financial health of such developing countries as Pakistan (Haris et al., 2020). It constitutes around 74 % of the financial sector's assets and measures up to 55 % of GDP (SBP, nd). Pakistan's banking structure is under the Pakistan Financial Institutions Ordinance 1962 and comprises investment banks, Islamic banks, conventional banks, development banks, and foreign banks (Siddique et al., 2020; Haris et al., 2019). These different banking institutions which are five public limited banks, twenty-two local private banks, one development bank, eleven microfinance banks, four foreign banks and five Islamic banks play important roles in mobilising national savings, investing in the economy and promoting economic development (Mwai,2021). Nevertheless, there are some current issues in Pakistan's banking sector, for instance, lack of capital, political instability, and socioeconomic problems (Zia ur Rehman, 2020). Market risk, capital adequacy risk, liquidity risk, credit risk and Foreign exchange/Legal risk pose a hindrance to the sector's growth and sustainability (Rehman et al., 2020). The literature is concerned with credit risk management, an important determinant of the profitability of private commercial banks in Pakistan, and a review of the challenges and practices concerning credit risk management in the context of Pakistan's banking system.

Risk in Banking

In the banking sector, there are two main types of risks: systematic and unsystematic. Systematic risks are inherent in the sector, while unsystematic risks are specific to individual banks sector (Sukrianingrum and Manda, 2020). The sector faces risks such as market, portfolio, credit, operational, and interest rate risks (Pelger,2020). To manage these risks, annual risk assessments are conducted based on financial statements, internal and external audits, and market research (Hussain et al., 2019).

Credit Risk Management

Since the financial crisis in 2007, credit risk management has received attention (Ali and Puah, 2019). Pakistan's managerial inefficiency and ineffective credit risk management are increasing the banking sector's inability to perform well and its reliance on macroeconomic factors (Khan et al., 2023). However, some technical coefficients such as return on assets and equity have not shown any improvement, and ineffective policies have added more pressure to the sector's performance (Chupradit et al., 2021).

Indicators of Credit Risk

There are different approaches to estimating credit risk in the banking industry, and they are outlined below; Such indicators are useful in evaluating the standards of credit risk management and their efficiency concerning profitability (Boateng,2019).

- Non-Performing Loans Rate: Measures credit risk and reflects bad credit risk management (Orlando and Pelosi, 2020).
- Loans Provision Ratio: Indicates the amount of total loans provided in case of any loss, with a high ratio meaning lower short-term profits but better long-term risk management (Ozili,2022).
- Ratio of Loan Provision to Total Asset: Measures the proportion of total assets covered against possible loss through non-performing loans (Rajindra et al.,2021).
- Provision for Non-Performing Loans to Total Loans: Measures the extent of total loans provided and reflects the bank's approach to credit risk management (Kumar et al.,2020).

Impact of Credit Risk Management

CRM plays a very crucial role in determining the profitability of the banks. The value of loan portfolios will be constant, and banks will be able to avoid a situation when clients with high credit risk fail to meet their obligations. On this ground, CRM has the most significant implication for the profitability of a bank in the reduction of NPLs, which has a direct bearing on the net income (Siddique et al.,2022). In the context of Pakistan, it was also revealed that the commercial

banks which have well-developed CRM practices have comparatively higher profitability during the economic crises as well (Shaifq, 2024).

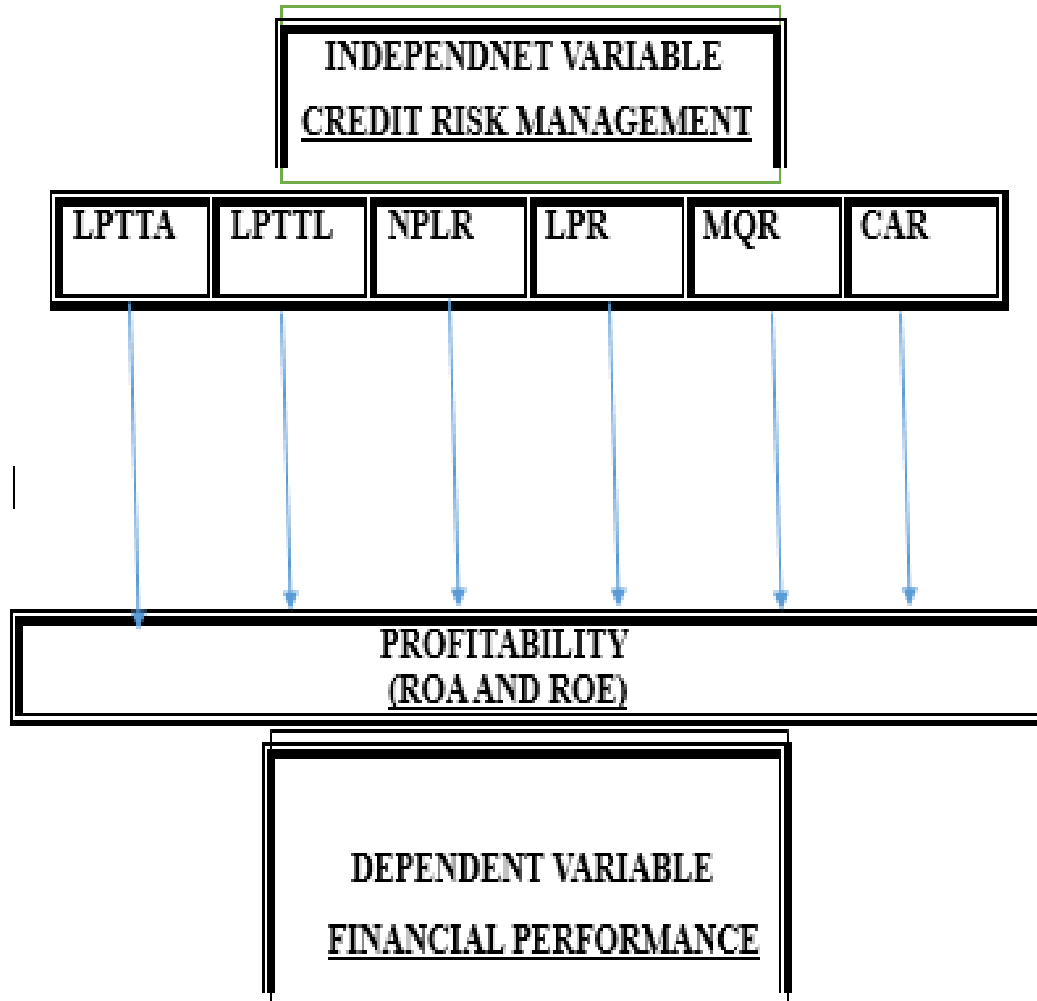
Hypothesis

Main Hypothesis: Credit risk management has an effect on private commercial banks' financial performance.

- H₁: The benefit of private Lending institute is impacted by (CRM) NPLR.
- H₂: The profitability of private lending firms is impacted by (CRM) LPR.
- H₃: The financial performance of private fiscal bodies is impacted by (CRM) LPTTA.
- H₄: (CRM) LPTTL has an effect on private banks' profitability.
- H₅: Private economic firm's income convinced by (CRM) CAR.
- H₆: (CRM) MQR affects the profitability of private lending institutes.

Conceptual Framework:

The effectiveness of credit risk management significantly impacts the financial performance and investment for commercial banks (Ahmed et al.,2021). Providing a higher level of risk control leads to better performance and increased customer attraction for investment. **Credit risk management and profitability** are the main variables in this study (Andros,2020). This study suggests that efficient risk management leads to increased profitability in the financial sector. Measurement of bad debt recovery includes Impaired Loans Ratio, Loans Provision Rate, Loans Provision to Total Asset, Loans Provision to Total Loans, Capital Adequacy Ratio, and Management Quality Ratio. Profitability and financial performance are measured using Asset income (ROA) and profit on equity (ROE).

Conceptual Framework***Model & Research Methodology***

The researcher has adopted the panel data model used by Ken & Peter in 2008 (Rahman et al., 2020) to analyse the role of credit risk management on bank performance. The model examines profitability using Return on Asset (ROA) and Return on Equity (ROE). Risk indicators in the model include Non-Performing Loan Ratio (NPLR), Loan Provision Ratio (LPR), Loan Provision relative to Total Assets (LPTTA), Loan Provision relative to Total Loans (LPTTL), Capital Adequacy Rate (CAR), and Management Quality Ratio (MQR).

Model

$$\text{PROFITABILITY (ROA AND ROE)} = \beta_0 + \beta_1 \text{ NPLR} + \beta_2 \text{ LPR} + \beta_3 \text{ LPTTA} + \beta_4 \text{ LPTTL} + \beta_5 \text{ CAR} + \beta_6 \text{ MQR} + e$$

Where;

- β_0 = consistent parameter
- β_1 - β_7 = Coefficient of an independent variable
- **ROA**: Rate of return on Assets OR Assets based income
- **ROE**: Return on Equity OR Equity based income
- **NPLR**: Non-Performing Loan Ratio
- **LP**: Loan Provision
- **LPTTA**: Loan Provision relative to Total Assets
- **LPTTL**: Loan Provision relative to Total Loan
- **CAR**: Capital Adequacy Rate
- **MQR**: Management Quality Ratio
- **e**, represent the Error Term

In this study, secondary research data collection techniques were used to gather quantitative information from trustworthy websites. Data was systematically collected from specific years and sorted in Excel format for testing by statistical software applications. Efforts were made to establish the reliability and validity of the data by critically analysing and comparing the sources (Djafar et al., 2021).

Data Collection & Variables of the Study

The researcher used a quantitative design for research because the study uses numerical data for computation purposes (Matović & Ovesni, 2023). This design was effective in illustrating the relationship between **credit risk management and the profitability** of private commercial banks in Pakistan, providing clear insights into the interaction of these variables. (Ghanad, 2023).

This was done because quantitative research allowed the researcher to eliminate subjectivity and was helpful in fulfilling the aim, objectives, and research questions of the study (Hodge, 2020).

Variables and Descriptions

Dependent Variables:

The research-dependent variables are ROE and ROA. Return on equity (ROE) and return on assets (ROA) are the two core measures used to determine the efficiency of a bank in generating profits (Maenuddina et al., 2020). ROA represents how well critical operations can generate returns, while ROE includes the effect of financing decisions (Doan, 2020).

Independent Variables:

- **NPLR** (Non-Performing Loan Ratio) Stands for the share of non-performing credits, meaning that the company may face financial problems and cannot repay some of the credits on time (OWONYE & OBONOFIEMRO, 2022).
- **LPR** (Loan Provision Ratio): This is the amount that banks hold in reserve to provide for losses that may arise if borrowers fail to repay their loans (Dempsey & Ionescu, 2021).
- **LPTTA** (Loan Provision relative to Total Assets) and
- **LPTTL** (Loan Provision relative to Total Loan): These ratios provide the evaluation of the bank's capability of providing the loan provisions compared to the total assets of the bank or total loans of the bank (Prabowo et al., 2018).
- **CAR** (Capital Adequacy Ratio): Assesses the capacity of the bank to cover the risk-weighted assets in case of financial troubles (Rafique et al., 2020).
- **MQR** (Management Quality Ratio): Assesses how well a bank uses deposits to fund high-earning assets such as advances (AWOGBEMI et al., 2023).

Research Analysis Tools and Techniques

This research employed convenience sampling, which is a non-probability technique of accessing the targeted banks in Pakistan. This method was preferred because of its availability and convenience despite the influence on the outcome. The data is analysed using EViews software, which is effective in handling panel data and estimating econometric and statistical models, making forecasts, fixed and random effect tests, and correction of heteroscedasticity and autocorrelation (Beenstock & Felsenstein, 2019). Besides, EViews also provides a graphical way of analysing data, thus guaranteeing neutral research and logical analysis of outcomes.

Results

The chapter aims to identify and describe quantitative data related to specific financial ratios, such as CAR, Loan Provision to Total Assets, and ROA. Understanding these measures helps in identifying patterns and changes, establishing a baseline for statistical comparisons, and identifying correlations and interactions in the dataset for analysis and hypothesis testing.

Descriptive Statistics

Descriptive statistics are important for analyzing financial ratios like **CAR, LPTTA, LPTTL, MQR, NPLR, LPR, ROA, and ROE**, including mean, median, mode, standard deviation, skewness, and kurtosis.

According to the figure 1 analysis, the CAR has a mean of (16. 18), and a median of (15. 71) with the range going from (11. 95) to (25. 40). The variance of the above data is 2. 78, which indicates there is a large spread in the data points from the mean. The value of skewness is (1. 02) and depicts the distribution with positive skewness, which means the rightward tail and kurtosis of (3. 89) depict the distribution with more heavy tails than actual normal distribution.

The mean for LPTTA is (1. 93), the median is (1. 78), and the range is from (0. 53) to (4. 91). The standard deviation of (0. 99) also means that there is considerable volatilities. Additional measures include skewness of (0. 66) and kurtosis of (2. 89). The ROA with a mean of 0. 88 and

median of 0.91 ranges from (-0.05) to (1.74). The standard deviation is (0.38) the skewness (-0.14) and kurtosis (2.94) indicate that are relatively symmetric bell-shaped distribution with lighter tails.

The normality test by Jarque-Bera also shows mixed results with p-values of less than 0.05 for most of the variables, showing that the distribution is not normal. This is further illustrated in NPLR and ROA, where the p – p-values are relatively low and close to zero, meaning the deviation from normal distribution is significant.

ROA

Fixed Effects

The fixed effects model figure 2 analysis of ROA shows the effect of several financial ratios on ROA using panel least squares regression. The findings also show that while the CAR coefficient is (0.019), its p-value is (0.0442), which means that there is a positive and significant impact between CAR and ROA at a 5% significance level. The coefficient for the Loan Provision to Non-Performing Loans Ratio (NPLR) is (0.425), and the p-value is (0.0002), which shows that it has a significant positive relationship. On the other hand, Loan Provision to Total Assets (LPTAA) and Loan Provision to Total Loan (LPTTL) have similar results with an insignificant relationship with ROA, with p-values of (0.9351) and (0.3412), respectively.

The Management Quality Ratio (MQR) has a very high positive correlation with ROA with a (0.310) coefficient and (0.0000) p-level, meaning that it has a significant impact. The coefficient for the Non-Performing Loans to Total Loans (NPTL) is (0.042), but it is insignificant with p- the value of (0.2369). The fixed effects model has relatively high coefficients of determination of (0.951) and an adjusted coefficient of determination of (0.936). This indicates an excellent explanatory power of the model where the F-statistic values are also significant enough to support the model. First, the Durbin-Watson statistic of (1.892) indicates a low degree of residual autocorrelation.

Random Effects

The Figure 3 random effects model for ROA offers another angle, employing panel EGLS with cross-section random effects. The CAR coefficient in this model is (0.009), with a p-value of (0.0499), showing a positive and significant impact on ROA. The coefficient of the Management Quality Ratio (MQR) is (0.496), and the p-value is (0.0000), which illustrates that MQR has a positive and significant relationship with ROA.

Even after analysing the Loan Provision to Total Assets (LPTTA) and the other ratios, it is possible to observe that there is no evident influence on the ROA, as the p-values are equal to 0.1681, which is higher than the (0.05) threshold. Concerning the random effects model, an R-squared of (0.857) and an adjusted R-squared of (0.844) is obtained, implying that the model well fits the data. The calculated F-statistic of (64.889) and the calculated p-value of (0.000000) justified the strength of the model, and the calculated Durbin-Watson statistic of (1.348) reflected slight autocorrelation.

Hausman

The Hausman test in figure 4 indicates that the fixed effects model is more suitable for estimating ROA compared to the random effects model. The test resulted in a Chi-square of (101.481) and a p-value of (0.0000), showing a significant difference between the models. The coefficients also indicate that the fixed effects model is more accurate.

Heteroskedasticity

The heteroskedasticity test in figure 5 checks whether the variance of the residuals is constant across different levels of the independent variables. The result of the heteroskedasticity test is a likelihood ratio of (59.816) and a p-value of (0.0000), suggesting that there is indeed heteroskedasticity in the residuals. This implies that the variance of residuals depends on the observations, and this could pose a challenge to the reliability of the regression estimates.

Model with PCSE (Panel Corrected Standard Errors)

The figure 6 results show that MQR and NPLR have a positive effect on the dependent variable, with high levels of significance. Capital Adequacy Ratio also has positive relationship while Loan Provision to Total Assets, Loan Provision to Total Loan and Non-Performing Loans to Total Loans are not significant. The model shows high fit as indicated by R-square values of (0.97) and the F-statistic shows the overall significance of the model.

ROE

Fixed Effects

The analysis of figure 7 the fixed effects model for ROE shows that some predictors have a statistically significant effect. In particular, the Management Quality Ratio is positive and significant, with a coefficient of (5.888913) and a p-value (0.0000). The Capital Adequacy Ratio, on the other hand, has a coefficient of (0.045178) and a p-value of (0.8036); thus, it has no significant effect on ROE. The model has a good fit, giving an R-squared of (0.950695) and an adjusted R-squared of (0.935174) With an F-statistic of (61.24908) and p- the value of (0.000000). Nevertheless, the Durbin-Watson statistic of 1.784857 indicates the existence of autocorrelation in the residuals of the model.

Therefore, it would be seen that loan provision to non-performance loans and management quality ratio are significantly affecting the ROE as the p-values are less than 0.05. But, capital adequacy ratio ($=0.8036 < 0.05$), loan provision to total assets ($= 0.1994 < 0.05$), loan provision to total loans ($= 0.4088 < 0.05$) as well as non-performance loans to total loans ($= 0.1652 < 0.05$) do not affect ROE in a significant manner.

Random Effects

On the other hand, the random effects model for ROE in Figure 8 comes up with different results. In this model, the capital adequacy ratio has a coefficient of 0.010196 with a value of 0.9529, which implies that it has no significant impact. The coefficient of the Management Quality

Ratio is (5. 833687). This is the same as the fixed effect, but the R-squared is (0. 672682), and the adjusted R-squared is (0. 642468). The F-statistic is (22. 26393) shows that the model is statistically significant. Additionally, Durbin Watson's statistic of (1. 354716) shows the existence of autocorrelation in the residuals of the model.

Hausman

Hausman test in Figure 9 was done, and the Chi-square statistic was 9. 752810 with a p-value of 0. 1355, which indicates that there is no significant difference between fixed and random effect models for ROE. This result also strengthens the use of the random effects model, especially since coefficients for Capital Adequacy Ratio and Management Quality Ratio are almost similar in both models

Heteroskedasticity.

Heteroskedasticity In Figure 10, the likelihood ratio test of the ROE model shows a test statistic of 95.14864 and a p-value of 0.0000, indicating the presence of heteroskedasticity. This implies that error variance is heteroskedastic, affecting standard errors and model statistics. This highlights the importance of considering model fit and error properties when analysing the effects of financial ratios on ROE.

Conclusion:

This study indicates that Credit Risk Management (CRM) is important to increase the profitability of private commercial banks in Pakistan. This depicts a positive relationship where CRM intensity and the profitability factors comprising return on equities and return on assets. The study, devoted to the analysis of risk management in banking, underlines that the banks, which used strict CRM provisions, protect from failure and work at the same time with higher indicators of financial performance. The modification of CRM practices can help to develop stability and further growth of the banking industry in conditions of changes in the economic and regulating conditions. The use of technology and strict adherence to the laws and regulations should be employed in dealing with risks so that profits can be improved. CRM processes in the banks can also reduce risks with the help of the increased usage of data analysis and machine learning. Basel III reforms also provide reliability and sustainability for banking organisations. CRM should be

considered as an instrument against financial risks and as a component of strategic management in banks, which defines the origin and development of financial value. Hence this research urges a change of attitude towards CRM as the key to business accomplishment and profitability in the banking sector in Pakistan.

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