Journal of Accounting and Finance Review

Journal homepage: https://jafr.comsats.edu.pk/

CRM practices: A survey of banks and financial institutions

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Accepted January 27, 2025, Published February 03, 2025

Abstract

This study analyzes current Credit Risk Management (CRM) practices. A quantitative survey design was employed to collect data on credit risk practices. Closed-ended questionnaires were distributed to 600 employees in banking and financial institutions in Punjab, Pakistan, yielding 540 responses (response rate: 67%). Respondents comprised credit department employees from commercial banks, specialized institutions, and development financial institutions. The results show that the most of the employees working in the aforementioned department have a clear understanding of practices being used in the CRM. However, the board of directors clearly outlined the responsibility and authority for risk management practices which are clearly understood by the stakeholders. The internal stakeholders understood that management of the risk is crucial to the performance and attainment of the financial sector success. Furthermore, early identification of the credit default system put the loan on the watch list for monitoring and taking immediate corrective actions. These findings will help improve CRM practices in the banking and financial system.

Keywords: Credit Risk Management practices, financial institutions, Pakistan.

JEL Code: G20, G21, G28, L10.

1. Introduction

Financial intermediation is one of the main functions of the financial sector. Through the intermediation process, the banks collect the savings of inhabitants and then allocate those savings to firms and entrepreneurs for investments. These investments are the main source of the

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DOI: https://doi.org/*10.26652/jafr/24.02.001*. Journal of Accounting and Finance Review is published by Department of Management Sciences, COMSATS University Islamabad, Pakistan

growth of firms as well as a pivotal factor in economic growth (Berthelemy and Varoudakis, 1996). Credit risk management has evolved significantly since the 2008 financial crisis, with increased emphasis on proactive risk management (Basel Committee on Banking Supervision, 2020). Studies highlight the importance of credit risk assessment, measurement, and control in mitigating potential losses (Gupta et al., 2020; Singh et al., 2022).

Effective credit risk management practices have become crucial for banks' financial stability and performance. Since the bank deals with public money hence they have to remain more vigilant and focused while deciding the financing needs of entrepreneurs. Therefore, the development of an effective credit risk market is necessary since it ensures the soundness of the financial system. On this front, the role of a central bank is very crucial in introducing regulations for CRM. On implementation fronts, the formulation and implementation of policies and regulations rest with the board of directors of financial institutions, therefore, their effective role is very important in reviewing, revising, updating, and implementing the credit risk policies down the line. Therefore, the role of CRM practices is crucial in the financial industry. It is a fact that better credit risk analysis will minimize the risk of non-performing loans, which in turn enhances the profitability of the financial sector. These practices will enrich the quality portfolio of banks and financial institutions.

The analysis of credit risk is important since non-professional handling of credit risk practices may cost to distress in the financial sector. In the near past, many economies have witnessed a recession and a slowdown of activities in the financial sector, therefore, to probe the reasons behind the crisis and dismal situation, it is necessary to analyze the CRM practices prevailing in the financial industry. It is important since the weak financial system triggered the financial crisis. In 2007-2008, a number of banks faced financial crises. Likewise, the Asian Financial Crisis began in Thailand in 1997 with the devaluation of the Thai baht, and quickly hit other countries of the region like Indonesia, South Korea, and Malaysia. These crises were the result of a combination of factors, including high levels of foreign debt, speculative real estate bubbles, failure of implementation of effective credit risk mechanisms, and currency manipulation. Similarly, the financial crisis in the United States started in 2008. It was triggered by the collapse of the subprime mortgage market, which led to widespread defaults on mortgages and thereby a major credit crunch. Resultantly, this caused the failure of major banks and financial institutions in the USA (Al-Tamimi, 2008: Brown and Moles, 2014).

To get rid of this miserable situation, the intervention of the US government was necessary to stabilize the economy. The strong credit risk mechanism guarantees a successful financial system in the country. In this respect, an abnormal increase in Non- performing loans is also a cause of financial distress. Besides, poor CRM practices intensify the nonperforming loans, and such a non-performing portfolio becomes a headache for the board of directors of financial institutions. Due to higher non- performing loans, the banks face liquidity problems and hence are unable to lend aggressively to potential customers. Resultantly, the banks also avoid taking risks to fulfill the financial needs of firms. More specifically, with higher non-performing loans, the banks remain conservative in taking financial decisions. Moreover, poor CRM also

deteriorates the profitability of the financial sector. The main reason behind low profitability and higher non-performing loans is the weak credit risk control mechanism in the banking sector. Technological innovations, such as machine learning and artificial intelligence, enhance credit risk management (Mishra et al., 2022). These innovations improve risk identification, measurement, and mitigation (Kumar et al., 2020).

In a nutshell, the financial sector is the backbone of the economy. They collect savings from inhabitants and allow investments to firms. Through these investments, the firms expand their businesses and become the source of economic growth. Since the financial sector is the custodian of public savings, therefore, their role in deciding investments for firms is very important. With prudent credit decisions, not only non-performing loans can be minimized but investments may also become supportive in enhancing the firm's growth and economic development. Besides, banks may also mitigate the forthcoming liquidity, operational and reputational risks through the adoption of best credit management practices. Besides, the political and financial environment in Pakistan is also volatile, which exposes banks to a variety of risks. These risks include foreign exchange rate risk, liquidity risk, operational risk, credit risk, and interest rate risk. Pakistani financial institutions are generally risk-averse, especially when it comes to auto financing and mortgage loans, which have a higher risk of large losses. Many commercial banks also face problems with the verification of loan documentation and loan processing requests. Resultantly, the adoption of proper risk management strategies is essential for commercial banks in Pakistan to understand and mitigate credit risk.

Credit risk management practices in emerging markets face unique challenges, including limited regulatory frameworks and inadequate risk management infrastructure (Kumar et al., 2020). Research highlights the need for tailored approaches, addressing specific emerging market challenges (Mishra et al., 2022). Thus, the purpose of this research is to investigate the CRM practices adopted by the banking and financial industry in Pakistan. CRM practices are important for the banking sector of Pakistan because best practices help financial institutions and other lenders in the country to identify, measure, and manage the risks associated with lending money to individuals and businesses. By having effective CRM practices in place, financial institutions can make more informed lending decisions, which may help to reduce the probable risk of defaults and losses. By studying credit risk management practices, we can strengthen Pakistan's financial system and protect it from potential crises and instability. This study can have a profound impact on economic growth and development by contributing to a stable financial system. It also helps to bridge the financial gap by enabling lenders to reach underserved populations and promote financial inclusion.

This is important for Pakistan, where many people are excluded from the formal financial system and are unable to access credit to start or grow their businesses. Finally, the study of prevailing CRM practices adopted by financial institutions is also important for Pakistan because the findings can help to promote transparency and accountability in the financial sector, which may increase consumer trust and confidence in the financial system. Against the discussed backdrop, this study will investigate the opinion of respondents on the implementation of

prudential regulation related to credit as well as banks' CRM policies while taking exposure on any enterprise. It is pertinent to add that there is no single technique that can perfectly measure credit risk. The best approach is to use a combination of techniques to get a more comprehensive view of the borrower's risk profile. Specific credit risk techniques are used according to the nature of the loan and the borrower's circumstances.

Currently, Pakistan's financial institutions used multiple credit risk techniques to assess credit risk factors. For example, to access borrower's financial information and their creditworthiness financial institutions use the credit scoring technique, which is a statistical method. Credit scores are typically calculated using a variety of factors, including the borrower's income, debt-to-income ratio, credit history, and employment history. Secondly, the Debt-to-equity ratio measures the amount of debt a borrower has relative to their equity. A higher debt-to-equity ratio indicates that a borrower is more likely to default on their loan. Third, the interest coverage ratio measures the borrower's ability to cover their interest payments with their operating income. A lower interest coverage ratio indicates that a borrower is more likely to default on their loan. Fourth, cash flow analysis is to reviewing the borrower's cash flow statements to assess their ability to repay their loan. A borrower with a negative cash flow is more likely to default on their loan. Last but not least collateral analysis is used in assessing the value of the collateral that the borrower has pledged to secure their loan. If the value of the collateral is less than the amount of the loan, the borrower is more likely to default.

The role of the credit team is very important while deciding on credit exposure since they foresee future credit risk(s) and by applying their expertise mitigate such risks. This study will provide practical guidance for policymakers, board members, and credit teams in the banking and financial sector. By identifying opportunities to improve credit risk policy implementation, review, and updating, as well as credit risk management practices, the study aims to enhance the sector's resilience to credit risk. The findings of this research can inform policymakers in making timely adjustments to credit risk policies to mitigate potential future credit risks.

The remainder of the paper is organized as follows: Section 2 reviews the relevant literature. Section 3 outlines the data and methodology. Section 4 presents the results and discussion. Finally, Section 5 concludes the paper, highlighting policy implications and limitations.

2. Literature Review

The financial sector plays an important role in the economic growth process. The main role through which the financial sector enhances economic growth is financial intermediation. Through the financial intermediation process, the financial sector collects the savings from households and the corporate sector and lends those savings to firms and entrepreneurs. Therefore, the role of financial intuitions is very important while extending credit to the private sector. This role is also very important since financial institutions are the custodian of public money. Hence, the financial sector protects the rights of savers through stringent credit risk policies.

A number of studies (for example, King and Levine, 1993; Rajan and Zingales, 1998; Khan and Senhadji, 2000; Beck and Levine, 2004; Rahman et al., 2021) investigated the positive relationship between the financial sector development and economic growth. It is generally argued that financial sector development helps to boost economic growth. Therefore, the role of financial intermediation is vital in the process of the finance-growth nexus (Rahman et al., 2020). More specifically, financial intermediaries work on a simple benchmark that is, the financial sector gathers information about investment opportunities and directs savings toward more prolific investments. In pursuant to said goal, financial intermediaries borrow funds from savers and lend those funds to firms for the expansion of business (Berthelemy and Varoudakis, 1996).

Since financial intermediaries are the custodian of public money, therefore, their role is very important in the finance-growth relationship. The economic development of a country mainly depends on the growth of the agricultural and industrial sectors of the economy. Therefore, the role of credit extension is very much challenging, and thus financial institutions devise risk management measures to tackle the issues (Mari and Reno, 2005). The role of CRM is also important to avoid financial crises. Due to weak CRM practices, the nonperforming loans also caused liquidity and insolvency problems in the financial industry (Castro, 2013). In this respect, Iftikhar (2016) argued that the higher non-performing loans transpire weak credit discipline, fable monitoring of credit portfolio, and thus weak risk management practices in the financial industry.

While discussing the CRM practices in the industry, Bekhet and Eletter (2014) rightly argued that credit risk analysis is the most important and challenging part of the investment decision in banking and financial institutions. Thus, decision-making is very important in extending credit to entrepreneurs. The credit risk analyzing team may effectively evaluate the credit risk or may ignore the potential risks of transactions under- investment decisions. Their decision may be profitable or harmful for the institution as well as for the industry and economy. Likewise, Gouvea and Goncalves (2007) and Lahsasna et al. (2010) argued that investment decisions are the key determinants for the success or failure of financial institutions since the financial sector has to face irreparable losses due to wrong credit decisions. Similarly, Wu et al. (2010) rightly observed thatcredit risk assessment is the pivotal factor in financial decision-making and hence provides the basis for making the right investment decision for entrepreneurs.

Moreover, Incekara and Cetinkaya, (2019) also pointed out that credit risk analysis techniques that ignore the standard practices on investment decisions lead to the financial crisis. Similarly, BIS (2000) pointed out that wrong decisions on credit risk are the main root cause of financial instability in the financial industry. In this connection, Masood et al. (2012) explained that credit risk as “Credit risk can be simplified as a risk that a creditor or a debtor or a counterparty of a financial contract cannot fulfill its obligations in compliance with the agreed terms. Therefore, credit risk stems from the lending operations of the bank to the company, individuals, and other banks or financial institutions.” (p. 197). Therefore, this study has

significance in the existing literature since it evaluates the credit risk practices being adopted by the financial sector. This study will evaluate the existing CRM practices being adopted by the banking and financial industry while taking investment decisions.

Credit risk practices are also important for the growth of a firm. In this respect, Sathyamoorthi (2020) examined credit risk and firm performance. The results showed that the loan deposit ratio has a negative and significant impact on return on assets and return on equity. On the basis of these results, that banks should aim to protect their financial health while maximizing profitability. To achieve this, they must implement comprehensive risk management strategies that address market, credit, and liquidity risks.

While Bulbul et al. (2019) and Sleimi (2020) highlight the positive influence of CRM on bank performance, Chukwunulu et al. (2019) found a negative association between CRM and bank performance, particularly in the context of credit risk. This discrepancy may be attributed to factors such as the specific implementation of CRM strategies and the overall risk management framework. Additionally, Ekinc (2019) identified a negative correlation between credit risk and key financial performance metrics, reinforcing the importance of effective credit risk management. The findings indicate that effective CRM practices can positively impact the profitability of deposit banks in Turkey. To capitalize on this potential, banks should strengthen their CRM efforts, focusing on the management of non-performing loans. Additionally, exploring and implementing cutting- edge CRM strategies can further enhance bank performance. Credit risk assessment models have evolved to incorporate advanced statistical techniques and machine learning algorithms (Singh et al., 2022). These models enable banks to accurately predict default probabilities and make informed lending decisions. For instance, logistic regression and decision tree models have been used to predict credit risk in various studies (Kumar et al., 2020; Patel et al., 2022).

Against the above backdrop, this study will investigate the prevailing credit management risk practices and also point out the issues that cause weak CRM practices, and suggest policymakers improve the financial sector decision-making specifically on investment decisions.

3. Data and Methodology

This research is qualitative since the outcome is based on the survey data of employees working in the credit department in the Pakistan banking industry. The opinion on credit risk practices has been collected through closed-ended questionnaires containing questions on various credit risk measures required to be exercised by the financial sector while deciding on the financing required for the entrepreneur. The questionnaire is attached as Annexure A. To this end, we have adopted the questionnaire of Khalid and Amjad (2012) and Asfaw and Veni (2015).

To obtain feedback from employees on credit management practices, the questionnaire was distributed to 600 employees in the year 2023 who was working in banking and financial institutions, out of which 540 employees responded. We have used 525 responses since the remaining 15 responses were incomplete. The response rate was 67%, which is satisfactory since the data was collected from a homogeneous group of employees who are doing similar practices

in the banking and financial sector. The data have been collected from the employees who were working in the Credit department of commercial banks, specialized institutions, and development financial institutions in various cities of Punjab, Pakistan. It is added that the sample of 100 respondents is sufficient for this type of research. Because the credit department requires higher professional expertise and a very small number of employees are working in said department. Besides, the credit risk department is not working in every branch of the Bank but rather functioning in the specific branches or main hubs thus very few employees are working there. Further, the questionnaire was distributed to the employees personally and they were guided properly before filling the responses. The pilot testing was ensured before arranging regular responses.

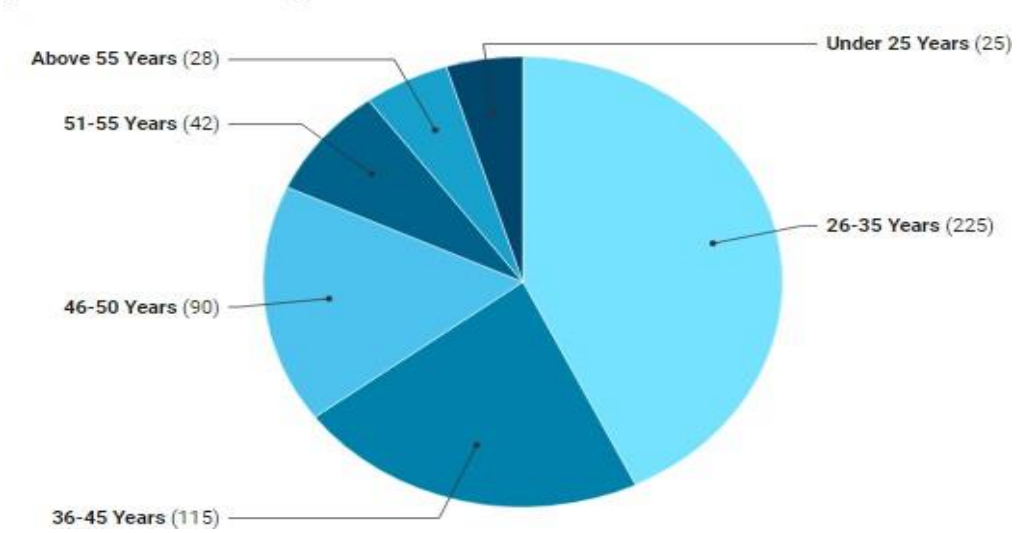
4. Results and Discussion

After analyzing the data using the SPSS software, we have concluded the outcome in terms of descriptive statistics and cross-tabulations. The summary of demographic information is given in Figure 1.

Figure 1: Department-Wise Demographic Statistics

Figure 1 shows that there were 525 respondents out of which 288 are from the credit department, 112 are from the CRM department and the remaining 125 employees are from the credit administration department. All the respondents were from the credit and credit-related departments of the banking industry of Pakistan. The demographic statistics are presented in Figure 2.

Figure 2: Demographic Statistics on Age of Respondents.



As depicted in Figure 2, the majority of respondents (225) were aged 26-35, followed by 115 respondents aged 36-45. This demographic trend suggests that a significant proportion of the sample population is composed of individuals in their prime working years, with the energy and experience necessary to drive innovation and implement new ideas.

Figure 3: Gender-wise demographic statistics are depicted in Figure 3.

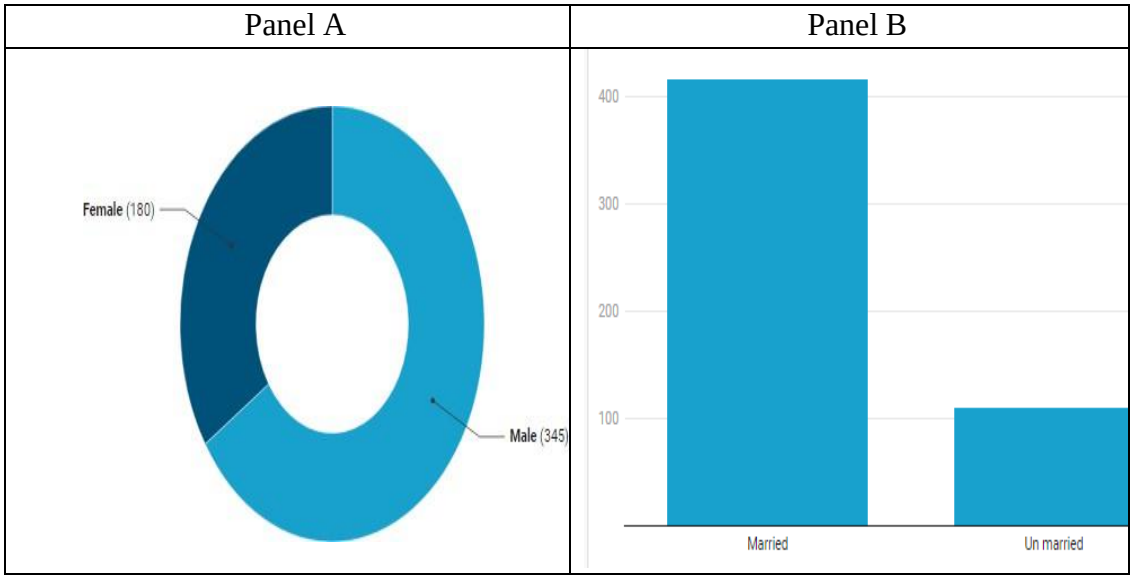


Figure 3 (panel a) shows that the majority of the respondents were Male, those were 345 out of 525, while the rest of the respondents were female employees. While panel b of Figure 3 shows that 79% of respondents were married while the remaining 21% of respondents were unmarried.

Figure 4: Demographic Statistics on Formal and Professional Qualification of Respondents

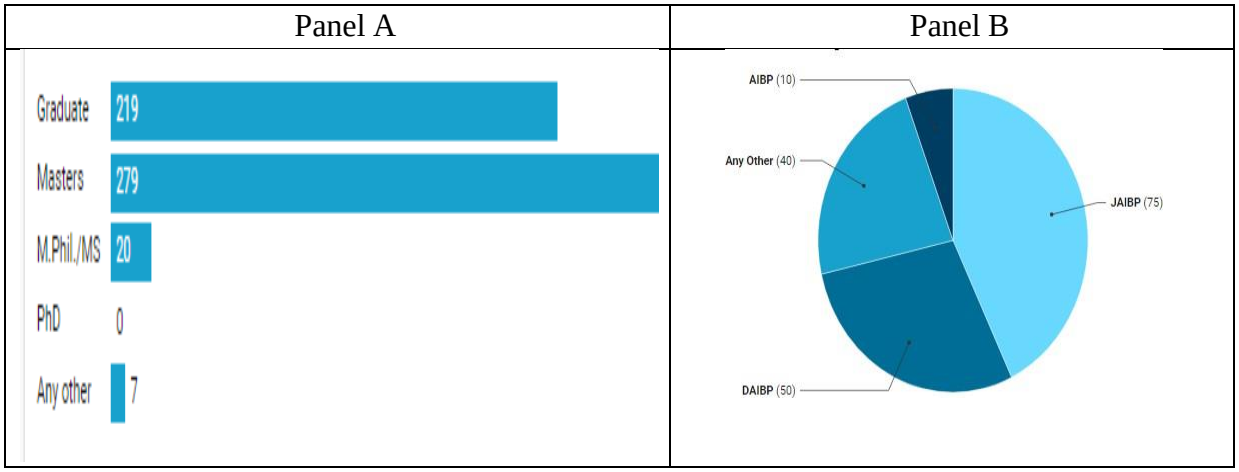
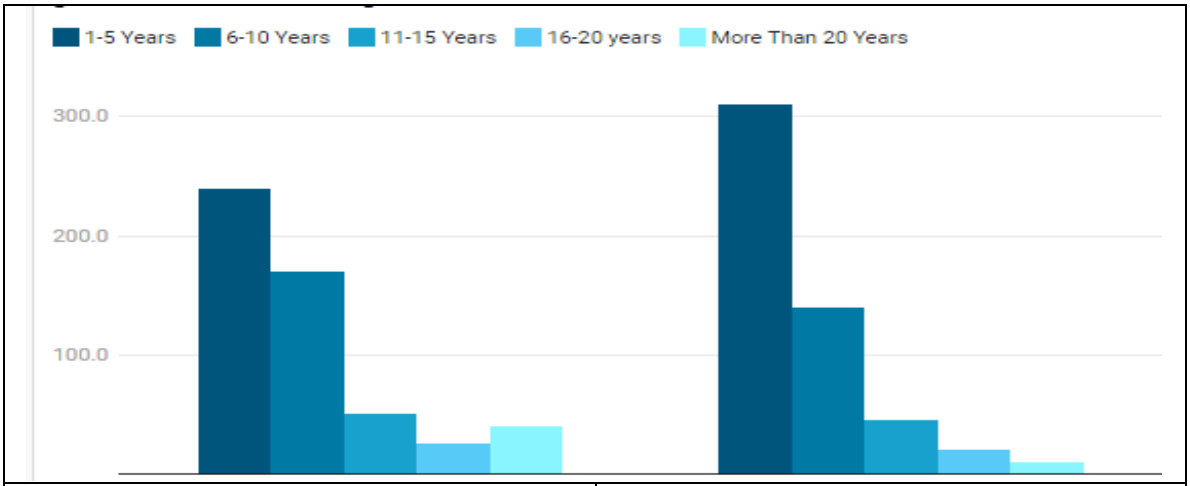


Figure 4 (see panel a) shows that the majority of the respondents were having Master's degrees in different disciplines and there were 279 in total number, 219 respondents were graduates, 20 respondents have completed M. Phil and M.S in different disciplines and 7 respondents were foreign qualifications. The bank's strong pool of talent is evident in the high level of professional qualifications among its employees. As shown in Figure 4b, 75 employees have completed JAIBP, 10 have completed AIBP, and 50 have completed DAIBP. This suggests that the bank is well-positioned to meet the challenges of the modern banking industry. The 40 respondents had acquired professional qualifications in ICMA, CA Inter, and FRM-related fields.

Figure 5: Demographic Statistics on Financial Sector Experience of Respondents



Banking Experience within same Institution	Financial sector experience with other institutions

Figure 5 shows the demographic experience on experience in the parent institutions and before switching the institution. The data suggests that the bank's workforce is relatively young, with a significant proportion of employees (240) having a tenure of 1-5 years. However, the presence of experienced employees with over 20 years of service (40 respondents) provides institutional memory and stability. In terms of prior experience, a majority of respondents (310) have worked at other banks or financial institutions for 1-5 years, indicating a diverse range of experiences and perspectives within the workforce.

Now, we discuss the descriptive statistics, the results of which are reported in Table 3. The mean value above 3 depicts that the respondents have a positive perception and satisfaction with the statement under response and in case the mean value is below 3, it means the employees have a negative perception and un-satisfactory behavior about the statement. It is added that we have also checked the reliability of the instrument being surveyed using Cronbach’s Alpha which is 0.790.

Table 1: Descriptive Statistics

No.	Items	Min	Max	Mean	SD
1	The employees working in the Credit department have an understanding of risk management practices.	3.0	4.33	3.68	0.4951
2	The Board of Directors has clearly outlined the responsibility and authority for risk management practices and these practices are clearly understood by the authorities.	2.67	4.67	3.51	0.5482
3	The Board of Directors has clearly outlined accountability for risk management practices and is understood by the authorities.	2.69	4.69	3.73	0.5274
4	Internal stakeholders understood that effective risk management is essential to safeguard the bank's performance and future success.	3.0	4.00	3.54	0.2551
5	The risk management group understands that the application of the most sophisticated techniques is crucial for the success of the quality portfolio.	2.56	3.52	3.77	0.2210
6	The risk management groups continually review and evaluate risk management techniques and apply them while deciding on a loan.	3.61	4.11	3.95	0.3380
7	The risk management group effectively monitors the use of risk management practices and amends the policies accordingly.	2.88	4.57	3.22	0.4512
8	The board of directors regularly reviews and updates the Bank’s Credit risk strategies, policies, and procedures and these policies ate available across the Bank.	3.12	3.67	3.31	0.4687
9	The senior management plays a role in implementing credit risk strategy approved by the board of directors and ensures the implementation and execution of credit policies and procedures.	2.98	3.87	3.57	0.5243
10	The boards of directors and senior management thoroughly monitor the major credit risk exposure of the Bank and guide internal stakeholders accordingly.	4.12	4.98	4.45	0.5162
11	The bank has credit manuals and the policies related to CRM are consistently updated in the manuals.	3.77	3.88	3.80	0.2249
12	The bank has a special asset department that continuously monitors the stuck/bad portfolio and takes appropriate primitive measures against default risk	2.64	3.67	3.21	0.2795
13	The CRM system and practice have been integrated with appropriate Management Information Systems (MIS) and Software based programs.	3.10	3.55	3.44	0.2689
14	The bank has developed its own internal credit risk rating system and applies it effectively while practicing CRM practices.	2.99	3.98	3.87	0.5971
15	The bank has an early identification of the credit default system and puts the loan on the watch list for taking immediate corrective action.	3.11	3.97	3.74	0.6185

16	I am involved in the process of updating my bank's credit risk models.	3.08	3.01	2.99	0.6011
17	I understand the different types of credit risk models and how they are used to assess credit risk.	3.81	3.73	3.64	0.7151
18	I believe that my bank's credit risk models are accurate and reliable.	3.13	3.89	3.68	0.6591
19	I am confident that my bank's credit risk models are used to make fair and responsible lending decisions.	3.34	3.90	3.78	0.7863
20	My bank regularly updates its credit risk models.	2.99	3.01	3.09	0.6541
21	I believe that my bank's credit risk models are effective in managing credit risk.	3.40	3.29	3.01	0.7811
22	I would recommend my bank's credit risk models to other banks.	3.22	3.01	2.99	0.6121
23	My bank regularly offer training and refresher courses.	3.19	3.21	3.09	0.7541

Note: SD stands for Standard Deviation, Min for Minimum, and Max for Maximum.

Table 1 displays the descriptive statistics of the statement(s) which were investigated by respondents. The results show that the mean value of statement No.10 which stipulates that “The boards of directors and senior management thoroughly monitor the major credit risk exposure of the Bank and guide internal stakeholder accordingly” is relatively higher as compared to other statements asked the respondents. This shows that statement No.10 has importance since the majority of the respondents view that senior management has a pivotal role in CRM practices. Similarly, statement No.5 which stipulates that “Risk management group understand that the application of most sophisticated techniques is crucial for the success of quality portfolio” has the lowest mean value which is 3.52. This shows that respondents give less weightage to the use of sophisticated techniques in CRM. With the advent of technology, financial institutions are supposed to opt for the latest technology and sophisticated techniques for CRM. The statement that “The boards of directors and senior management thoroughly monitor the major credit risk exposure of the Bank and guide internal stakeholders accordingly” has a maximum value which is 4.98.

Likewise, the statement that “The bank has a special asset department that continuously monitors the stuck/bad portfolio and takes appropriate primitive measures against default risk” has the lowest maximum value which is 3.21. The mean value of the statement that “The boards of directors and senior management thoroughly monitor the major credit risk exposure of the Bank and guide internal stakeholder accordingly” is the highest which is 4.45 showing the importance of CRM practices. While the statement that “The bank has a special asset department that continuously monitors the stuck/bad portfolio and takes appropriate primitive measures against default risk” has the lowest mean of 3.21 showing statements of least importance in the banking and financial sector. The statement “the bank has an early identification of credit default system and put the loan on the watch list for taking immediate corrective action” is highly volatile since the standard deviation is 0.6185. After that, the standard deviation of the statement “The bank has developed its own internal credit risk rating system and applies effectively while practicing CRM practices”

is high having SD 0.5971. Overall results shows that Banks and financial institutions face a number of challenges in implementing effective credit risk modeling, but these challenges can be overcome by investing in technology, partnering with external experts, and using cloud-based solutions.

5. Discussion & Conclusion

This study investigated the perception of banking and financial sector employees regarding the implementation of credit risk practices in the banking and financial sector. The main findings of the study showed that respondents strongly agreed with the statement that the employees working in the credit department have an understanding of risk management practices and they better understand these practices. The board of directors has clearly outlined the responsibility and authority for better risk management practices. These practices are clearly understood by the authorities and internal stakeholders. The respondents agreed with the statement that managing risk is crucial to the performance and success of the banking and financial sector. Further, the respondents agreed with the statement that the banking and financial sector have an early identification of the credit default system, and the banking and financial sector put the loan on the watch list for taking immediate corrective action. The respondents disagreed with the statement that the banking and financial sector has developed its own internal credit risk rating system and apply effectively while practicing CRM practices in their organization. Following are the shortcomings in credit risk practices in financial institutions that employees identify during the survey: First, financial institutions often have a large amount of data on their customers, but this data is often not preserved properly. Although now many banks have used the credit modules to access the client’s risk profile many banks have not adopted it yet. This can make it difficult to get a holistic view of a customer's credit risk. Second, financial institutions often use historical data to assess credit risk, but this data may not be accurate or relevant to the current economic environment. Third, financial institutions often use risk models to assess credit risk, but these models may not be accurate or up-to-date. CRM requires a team with specialized skills, but financial institutions often struggle to find and retain qualified personnel. Lastly, there is often a lack of communication between different departments within financial institutions, which can lead to misunderstandings and errors in credit risk assessment. The CRM process is often not subject to adequate oversight, which can lead to complacency and errors. By addressing these shortcomings, financial institutions can improve their CRM practices and reduce their exposure to losses. In addition to the above shortcomings, financial institutions need to be able to collect, store, and analyze large amounts of data to make informed decisions about credit risk. Further, employees need to be aware of the risks involved in lending money and need to be willing to challenge decisions that they believe are too risky. Moreover, credit risk is a complex issue that requires input from a variety of departments within a financial institution. By improving communication and collaboration, financial institutions can make better decisions about credit risk.

The results of this study advocates that credit risk modeling (CRM) practices are generally well- established in Pakistan. Banks and financial institutions in Pakistan have a broad

CRM structure in place. This structure usually comprises policies and procedures for credit risk identification, assessment, monitoring, and mitigation. The findings also found that banks and financial institutions in Pakistan are increasingly using technology to improve their CRM practices. Like as, many banks are now using credit risk modeling to assess the creditworthiness of borrowers and to identify potential risks. However, there is still some opportunity for improvement, particularly in areas such as credit risk modeling and data analytics. The lack of access to reliable credit data is another major challenge faced by banks and financial institutions in Pakistan. This makes it difficult to accurately assess the creditworthiness of borrowers and can lead to an increase in credit risk. The State Bank of Pakistan (SBP) has taken a number of steps to promote CRM practices in the country. Such as, SBP has issued guidelines on CRM for banks and financial institutions. The SBP has also established a Credit Information Bureau (CIB) to provide banks and financial institutions with access to credit data. Another challenge is the lack of skilled CRM professionals. This is due in part to the fact that CRM is a relatively new field in Pakistan. Despite the challenges, the results suggested that banks and financial institutions in Pakistan are committed to improving their CRM practices. This is a positive development, as it will help to protect the financial system and promote economic growth.

Based on the respondent's opinions we may recommend that the majority of respondents agreed that the employees working in the credit department have an understanding of risk management practices. Therefore, more training and awareness sessions are arranged for a better understanding of risk management practices. Secondly, the majority of respondents agreed that the board of directors has clearly outlined the responsibility and authority for risk management practices, and these practices are clearly understood by the authorities. Therefore BOD may conduct regular sessions for an overview of the policies and be deemed necessary may amend and transmit to employees for understanding and implementation. Thirdly, the respondents are neutral on the opinion that the board of directors has clearly outlined accountability for risk management practices and is understood by the authorities. It means that employees have no clear understanding of accountability therefore management may conduct special sessions to give awareness to the employees.

This study has a few limitations, first, this study is based on closed-ended questions. The study will be more interesting if based on open-ended questions to gauge the opinion of respondents. Second, this study is based on the opinion of internal employees, the opinion of other stakeholders is also very important and should require investigations. Third, this study is based on the only selected group of employees from Punjab, the other employees working in other provinces have been ignored.

Conflict of Interest: The authors declare no conflict of interest.

References

Al-Tamimi H (2008) Implementing Basel II: an investigation of the UAE banks' Basel II preparations. J Financ Regul Compliance 16(2):173–187.

Asfaw, A. H., & Veni, P. (2015). Empharical Study on CRM Practice of Ethiopian Commercial Banks. *Reseach Journal of Finance and Accounitng*, *6*(3), 134-147.

Basel Committee on Banking Supervision. (2020). Principles for the management of credit risk.

Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: Panel evidence. *Journal of Banking & Finance*, *28*(3), 423-442.

Bekhet, H. A., & Eletter, S. F. K. (2014). Credit risk assessment model for Jordanian commercial banks: Neural scoring approach. *Review of Development Finance*, *4*(1), 20-28.

Berthelemy, J. C., & Varoudakis, A. (1996). Economic growth, convergence clubs, and the role of financial development. *Oxford economic papers*, *48*(2), 300-328.

BIS (2000). *Principles for the management of credit risk*. Basle Committee on Banking Supervision, & Bank for International Settlements, Bank for International Settlements.

Brown, Moles (eds) (2014) CRM. Edinburgh, Edinburgh Business School, Heriot-Watt University

Bulbul, D., Hakenes, H., & Lambert, C. (2019). What influences banks' choice of CRM practices? Theory and evidence. Journal of Financial Stability, 40, 1-14.

Castro, V. (2013). Macroeconomic determinants of the credit risk in the banking system: The case of the GIPSI. *Economic Modelling*, *31*, 672-683.

Chukwunulu, J. I., Ezeabasili, V. N., & Igbodika, M. N. (2019). Risk Management and the performance of commercial banks in Nigeria (1994-2016). International Journal of Banking and Finance Research, 5(1), 64-71.

Ekinci, R., & Poyraz, G. (2019). The effect of credit risk on financial performance of deposit banks in Turkey. Procedia Computer Science, 158, 979-987.

Gouvêa, M. A., & Gonçalves, E. B. (2007, May). Credit risk analysis applying logistic regression, neural networks and genetic algorithms models. In *POMS 18th annual conference.*

Gupta, P., et al. (2020). Credit risk management in Indian banks. *Journal of Financial Stability*, 16(2), 1-20.

Iftikhar, M. (2016). Impact of CRM on financial performance of commercial banks of Pakistan. *University of Haripur Journal of Management (UOHJM)*, *1*(2), 110- 124.

Incekara, A., & Çetinkaya, H. (2019). CRM: A panel data analysis on the Islamic banks in Turkey. *Procedia Computer Science*, *158*, 947-954.

Khalid, S., & Amjad, S. (2012). Risk management practices in Islamic banks of Pakistan. *The Journal of Risk Finance*.

Khan, M. M. S., & Senhadji, M. A. S. (2000). Financial development and economic growth: An overview. *IMF Working Paper No. WP/00/29*, International Monetary Fund Washington DC.

doi:10.5089/9781451874747.001

Kumar, R., et al. (2020). Credit risk management in emerging markets. *Journal of International Banking and Finance*, 10(1), 1-10.

Lahsasna, A., Ainon, R. N., & Teh, Y. W. (2010). Credit Scoring Models Using Soft Computing Methods: A Survey. *Int. Arab J. Inf. Technol.*, *7*(2), 115-123.

Mari, C., & Reno, R. (2005). Credit risk analysis of mortgage loans: an application to the Italian market. *European Journal of Operational Research*, *163*(1), 83-93.

Mishra, A., et al. (2022). Technological innovations in credit risk management. *Journal of Risk Management*, 14(1), 1-15.

Patel, R., et al. (2022). Integrating credit risk management and risk management. *Journal of Financial Regulation and Compliance*, 30(1), 1-12.

Rahman, A., Khan, M. A., & Charfeddine, L. (2020). Financial development–economic growth nexus in Pakistan: new evidence from the Markov switching model. *Cogent Economics & Finance*, *8*(1), 1716446.

Rahman, A., Khan, M. A., & Charfeddine, L. (2021). Regime-specific impact of financial reforms on economic growth in Pakistan. *Journal of Policy Modeling*, *43*(1), 161- 182.

Rajan, R. G., & Zingales, L. (1998). Financial dependence and growth. *The American Economic Review*, 88(3), 559–586.

Sathyamoorthi, C., Mapharing, M., Mphoeng, M., & Dzimiri, M. (2020). Impact of financial risk management practices on financial performance: Evidence from commercial banks in Botswana. Applied Finance and Accounting, 6(1), 25-39.

Singh, S., et al. (2022). Credit risk management and loan repayment performance. *Journal of Banking and Finance*, 15(1), 1-12.

Sleimi, M. (2020). Effects of risk management practices on banks' performance: An empirical study of the Jordanian banks. Management Science Letters, 10(2), 489- 496.

Wu, C., Guo, Y., Zhang, X., & Xia, H. (2010). Study of personal credit risk assessment based on support vector machine ensemble. *International Journal of Innovative Computing, Information and Control*, *6*(5), 2353-2360.

Annexure-A

Questionnaire

Note: Respondents' identities will be kept confidential and that their responses will only be used for research purposes.

	Items	Strongly Disagreed	Disagreed	Neutral	Agreed	Strongly
1	The employees working in the Credit department have an understanding of risk management practices.	1	2	3	4	5
2	The Board of Directors has clearly outlined the responsibility and authority for risk management practices and these practices are clearly understood by the authorities.	1	2	3	4	5

3	The Board of Directors has clearly outlined accountability for risk management practices and is understood by the authorities.	1	2	3	4	5
4	The internal stakeholders understood that managing risk is crucial to the performance and success of the bank.	1	2	3	4	5
5	The risk management group understands that the application of the most sophisticated techniques is crucial for the success of the quality portfolio.	1	2	3	4	5
6	The risk management group continually reviews and evaluates risk management techniques and applies them while deciding on a loan.	1	2	3	4	5
7	The risk management group effectively monitors the use of risk management practices and amends the policies accordingly.	1	2	3	4	5
8	The board of directors regularly reviews and updates the Bank's Credit risk strategies, policies, and procedures and these policies ate available across the Bank.	1	2	3	4	5
9	The senior management plays a role in implementing credit risk strategy approved by the board of directors and ensures the implementation and execution of credit policies and procedures.	1	2	3	4	5
10	The boards of directors and senior management thoroughly monitor the major credit risk exposure of the Bank and guide internal stakeholder accordingly.	1	2	3	4	5
11	The bank has credit manuals and the policies related to CRM are consistently updated in the manuals.	1	2	3	4	5
12	The bank has a special asset department that continuously monitors the stuck/bad portfolio and takes appropriate primitive measures against default risk.	1	2	3	4	5
13	The CRM system and practice have been integrated with appropriate Management Information Systems (MIS) and Software based programs.	1	2	3	4	5
14	The bank has developed its own internal credit risk rating system and apply effectively while practicing CRM practices.	1	2	3	4	5
15	The bank has an early identification of the credit default system and puts the loan on the watch list for taking immediate corrective action.	1	2	3	4	5
16	I am involved in the process of updating my bank's credit risk models.	1	2	3	4	5
17	I understand the different types of credit risk models and how they are used to assess credit risk.	1	2	3	4	5
18	I believe that my bank's credit risk models are accurate and reliable.	1	2	3	4	5
19	I am confident that my bank's credit risk models are used to make fair and responsible lending decisions.	1	2	3	4	5
20	My bank regularly updates its credit risk models.	1	2	3	4	5
21	I believe that my bank's credit risk models are effective in managing credit risk.	1	2	3	4	5
22	I would recommend my bank's credit risk models to other banks.	1	2	3	4	5
23	My bank regularly offer training and refresher courses.	1	2	3	4	5