



service departments and a research to clearly understanding who is a right customer to be serve a loan.

## **Introduction**

Banking sector play a significant role in the economy in the country regardless Gross domestic product (GDP) level (Kimani& Koori, 2018). Each banking institution operates into two main function that is to match surplus and deficit through receiving money from customers knows as depositors and turn them into loans to borrowers. However, over the years the implementation of such two functions put banks into credit risk (Kimasar & Kwasira, 2014).

Furthermore, in developing countries, one of factors leading to large numbers of unpaid loans is lacking a strong credit culture (Mwangi, 2015). Higher Non-Performing Loans (NPLs) is one of the significant factors contributing to banks failure (Kimasarc & Kwasira, 2014). A report of World Bank Group on banking sector performance for 53 countries (higher middle and lower income counties) covering 896 banks revealed a rapid increase in the amount of credit losses.

One of global strategy to secure bank loans is credit information sharing through Credit Bureau. A credit bureau is agency charged to gather account information from various creditors and lenders (borrowers and banking institution) in order to help them in making a useful lending decision. Every financial system uses different term in naming this bureau (International Finance Corporation, 2006). Initially, Credit bureaus was established in developed counties such as Germany, Sweden, and the United States for nearly a century, afterwards, other high-income countries from Europe like France, Italy, and Spain adopted Credit Bureau during the 1990s (Baer, Carassinu, Del Miglio, Fabiani, & Fabiani, 2009). Credit Reference Bureau therefore enable banking institutions to get accurate information about characteristics and indebtedness of borrowers (Muteti, 2014). Credit Reference Bureaus operate as regulating body established for borrowers to eliminate false information provided by loan' applicant and in turn significantly minimise the probability of non-payment loans by banks (Koros, 2015).

The implementation of Credit Reference Bureau have contributed to the improvement of information about the applicant (borrower) characteristics by financial institutions, the fore, helping them have a more accurate and reliable prediction of the repayment probabilities of borrowers as well as their abilities (Musyoka & Kiage, 2015).

In eastern Europe, (Albania, Belarus, Latvia, Moldova, Montenegro, Slovenia, Ukraine) Credit bureaus effectively reduced wrong in information available to the banks and other lenders. This has been significantly decreased average rates applied and easier access to credit and improving

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completion in banking industry. For instance, in the Eastern Europe Credit Bureau functions dropped percent of financial constraints from 49 to 27 (Baer, *et al.*, 2009).

Beside European, region other developing economies from across the world experienced a remarkable effect of Credit Bureau. In Asian region, for instance in Shanghai statistics revealed a reduction in nonperforming Loans (NPLs) from 6.67 to 4.52 percent in banks at the end 2002 following one year of establishment of Credit Reference Bureau. In Latin American region specifically in Argentina, the Credit Bureau played a key role in expanding business through information sharing related to customer' payment consumer and commercial entities. Like in Europe in Latin America further, Credit Bureau improved access to credit and providing supportive information to banks which reduced credit loss (Baer, *e al.*, 2009).

In African context Kago (2014) seen African financial system particularly credit information to be worst compared to other continents like Europe, Asia and America that introduced Credit Bureau before Africa. Financial industries in many African countries created Credit Bureaus with main purpose of effective management of borrower risk under higher competition in banking sector.

Credit Reference Bureau (CRB) In Rwanda's context was established in 2009 with a purpose of sharing of credit information among financial institutions as way to easy credit assessment with a full and reliable information concerning applicant and borrower so that to improve decision making before granting any loan. Credit Reference Bureau (CRB) Rwanda serve as intermediary that help banks to access credit from other financial institutions.

CRBs Rwanda is mandated to oversee the private credit reference bureau licensed by the National Bank of Rwanda as per the law governing Credit Information System in Rwanda, whereby all financial institutions are mandatory participants. It ensures the accuracy and reliability of the information and holds it in public credit registry database, for supervisory and statistical purposes (NBR, 2020).

NPL ratios is one of key indicators that measure banks performance. Over five years Rwanda's banking sector has shown in NPLs Ratio that is not pleased as it is mostly above benchmark of five percent. As reported by National Bank of Rwanda (BNR, 20219) in 2016 NPLs Ratio was at7.5% where dropped to 6.5% in 2017 and 5.8% in 2018 however in 2019 NPLs has raised to 6.1% with minimum of 4.3% in 2020.

Recent statistics further indicate increasing banks' NPLs. In this regard, Alliance for Financial Inclusion (AFI, 2020) indicated that approximately 64% of Rwandan banks expected credit losses due to the clients not meeting their commitments (AFI, 2020).

Other reports such as Annual stability report released by National Bank of Rwanda (NBR, 2021) indicated a rise in NPLs amount increased by 19 percent to Rwf 158bn from Rwf133bn in 2020. In

2021, banks wrote off loans amounting to Rwf 75bn compared to Rwf 22bn in 2020. On the other hand, the banking sector noted a 34 per cent increase in provisions for bad debt to Rwf189.5 billion in December 2021 from Rwf 141.3 billion in 2020.

However, in 2009 National bank of Rwanda (BNR) licensed Credit Reference Bureau was licensed to play the major role of improving credit assessment through gathering and combing credit information on individuals and companies from different sources and provide such information to banks in order to reduce Non Performing Loan (NPL) (Ashimwe, 2020).

A number of studies were conducted linking either credit risk management or credit information sharing with loan performance. For instance, In Italy, Jappelli and Pagano (2005) revealed that Information sharing improve financial literacy to the loan applicant and increase their repayment probabilities. In Somalia, Abdifatah (2019) found that effective risk identification is necessary for loan performance. In Soudan, Olobo, Karyeija, Protozoan Khoch (2021) their findings revealed a strong positive correlation between risk management practices and bank performance. Sufi and Malik (2015) from Pakistan found a positive and significant effect between credit risk controls on loan performance. In Kenya, Kisengese (2014) found effect of credit information sharing in reducing non-performing loans. In Kenya Further, Njeru (2021) revealed a positive and significant effect of credit reference bureau on loan performance.

Consequently, from these studies it was shown that none of them that looked on Rwanda' context. In addition, other researches tried to analyze only two components of credits reference bureau that is information sharing and credit assessment, therefore, there is a need to incorporate all factors of credit reference bureau. Hence, this study attempt to fill this gap by investigating the effect of Credit Reference Bureau (CRB) on bank' loans performance in Rwanda's banking sector.

### **Literature Review**

This part reviews some of the literature related to credit reference bureau and loan performance including previous studies attempted to link variables under study.

### **Credit Reference Bureau**

Sinare (2017) defines credit reference bureau as an agency charged to gather information on credit consumers from various sources and shares collected information with lenders or creditors to make easy evaluation of right applicants or borrowers who will not put banks into additional credit risk and nonperforming loans. Such credit information should meet some characteristics of quality information as relevance, reliability and complete for easy open application by recipients.

The purpose to establish Credit Reference Bureau is having a regulatory body that is able to collect and document financial histories of individual and organizations applying for bank loans in order to

compute their credit score based on the accurate information in order to determine borrower's desirability to pay back (Njeru, 2015).

Credit reference bureau was incorporated in financial infrastructure and become key part that enable banks to improve risk evaluation, and also help borrowers to receive loans with lower cost importantly at a competent interest rate (FSD Kenya, 2011). According to Kwambai and Wandera (2013) Credit reference bureau is necessary and needed in financial system because information asymmetry existing between borrowers and lenders and more availability of information are benefit of both lenders and borrowers (Lin, Ma & Song, 2012).

Credit Reference Bureau perform four key functions as credit information collection, credit information sharing, risk assessment and collateral information sharing with banks and other lenders and money supplier.

Credit information collection is one of functions of credit bureau where they always gather updated information about individual consumer's credit records to facilitate banks and related lenders to receive a useful information about individual' people and enterprise in need of bank loan (Houston, & Ma, 2010). During information collection, a particular lender requires to provide data about borrowers to private credit bureaus. Such information come from sources mostly public registers, tax authorities and courts, then, data are compiled in file for individual borrower. In case lenders need a credit report of applicant, they send a request to credit bureau in which they receive back a consolidated data of applicant (Jappelli & Pagano, 2005).

Credit information sharing (CIS) is the process that involve banks and related credit providers where they agree to timely submit financial information of their borrower to the respective credit reference bureau and in turn the credit bureau share borrower's information to the lender who made a request. Credit information sharing is an important role of credit bureau to enable credit providers knowing the behaviour of borrowers in terms of repayment of the loans (Koros, 2015).

Traditionally, this risk was understood that lending institution is in situation of losing the whole loan including interest. In the past, most lenders usually did credit risk assessment and lending decisions that are focused on security than other similar important factors notably cash flow projections, viability of the project, character of the borrower, previous loans completion and ability to repay. Subsequently, incomplete applicant information, poor and unprofessional credit risk assessment are the root cause of many loan defaults in the banking sector (Mustafe, *et al.*, 2019).

According to William (2007), collateral is a significant part of loan requirement and key criteria that most banks ask anyone who apply for a loan. Business owner need to meet this criteria in order to receive money needed for running the business. Another role of private credit bureaus is sharing

data about collaterals especially house mortgage (Jappelli & Marco, 2005). During loan application process, banks consider the value of collateral which help to reduce the cost of adverse selection.

In general, most of banks require applicant to bring collaterals in form of movable assets and real estate (Karapetyan, 2014).

Loan performance refers to the level outstanding loans of banks are paying back in time or in default, or whether borrowers are meeting their obligations especially terms defining principal amount an interest payment (Klein, 2013). Loan performance is the financial soundness of a bank that depends on the performance of their disbursed loan to various sectors. It also means how the loans were scheduled to act and how they are actually acting in terms of the scheduled payments compared to the actual payments. It is closely associated with timely and steady repayment of interest and principal of a loan (Rosenberg, 2009). Loan performance is generally indicated by the level of Non-Performing Loans (NPLs) and loan recovery rate. Nonperforming loans are part of loans including principal and interest that are not yet paid for a minimum of 90 days (Badar & Atiya, 2013).

Loan application implies a process that involve bank customer termed borrower and lenders or banking institutions where borrower submit key details about their finances to the lender in order to reach loan agreement decision. The application includes all the steps performed during transaction process so that the customer gets the complete information of the loan i.e, payment mode setup and payment details (Kirthi, Balaji Krishna & Rajani, 2020).

The question of repayment of credit is one of an important question in finance and commercial banks involved in credit transactions (Roslan & Karim, 2009). The factors to consider in set of the repayment period should be discussed and agreed between two parts, however all are determined based on the liquidity position of individual' borrower and the economic life of the of funded project or investment. The flexibility is necessary in payment schedules for future adjustment in borrower's cash flow pattern when it is needed.

Recovery rate, commonly used in credit risk management, refers to the amount recovered as part of loan defaults. In other words, the recovery rate is the amount recovered from a loan when the borrower is unable to pay the full outstanding amount due. In banking system, a higher recovery rate is desirable. Even though this rate is usually used for debt defaults, it can also be used for receivables defaults (Corporate Finance, 2022).

Factors explaining bank loan recovery rates vary depending on the state of the economic cycle, however the most notable factors are poor macroeconomic conditions and business issues (Wang, Forbes, Fenech, & Vaz, 2018).

Aduda and Gitonga (2011) describe non-performing loans as part of loans that was not paid back due to borrowers have failed comply with loan terms singed in contract and exposes lenders to

potential loses. A loan classified a non performing when are unpaid for a period of three months or for more than 90 days, and this is where lenders pretending to not receiving the full payments or not recover it in full. Non-performing loans are overdue loans which is in two parts that is delay payments or no payment in full. When Non-performing loans are higher it negatively affects lenders as they reduce their ability to meet costs, discourage private investors, and limit the extent of loans to other borrowers (Warue, 2013).

### **Empirical Literature Review**

Jappelli and Pagano (2005) from Italy assessed the role and effects of credit information sharing. Their study was conducted by gathering different literature review where findings revealed that information sharing through credit bureau positively affect credit markets activity and improve knowledge about borrowers' characteristics.

Ramanujam and Vidya (2018) analyzed factors affecting credit Repayment Behaviour of Borrowers, evidence from Micro and Small Medium sized Enterprises(MSME) in India. The study found that There is no significant difference between the gender, age, level of education, occupational background, nature of previous experience, years of experience, type of the units, location of the units and credit repayment performance in MSMEs. This implies that there is was no relationship between the demographic characteristics of borrowers and the credit repayment performance.

In Somalia Abdifatah (2019) analyzed effect of credit risk management on loan performance of banks. The study findings showed that effective risk identification is necessary for loan performance and risk assessment proved to be significant on loan performance of banks in operating in Mogadishu. Moreover, study revealed effective management of risks concerning loans as a way to generate the responses in payment for loan, however risk monitoring found to be insignificant to generate high loan performance.

Olobo, Karyeija, Protazio, Sande and Khoch (2021) investigated effect of credit risk management and performance of bank in Soudan. From the study, the major findings indicated that most financial institutions did demonstrate a presence of credit risk management structures. The study revealed a strong positive correlation between risk management practices and bank performance.

Mustafe, *et al.*, (2019) analyze factors affecting loan repayment performance of banks in Somalia. The study found that period of loan andbusiness purpose, education level, domestic purpose, availability of other source of income and social use have positive effects on borrower loan repayment significantly. The variable of business experience was found to be statistically significant although it has a negative sign whereas size variable of the loan has got positive sigh without statistical significance. There is a considerable relationship seen between the performance of loan repayment and the characteristics of the borrowers. There is also significant relationship seen

between the loan characteristics and loan repayment performance as well as significant relationship between the purpose and performance of banks.

Wang, Catherine, Fenech and Vaz (2018) assessed determinants of bank loan recovery rates in good times and bad: new evidence from U.S Banks. The study found that factors explaining bank loan recovery rates vary depending on the state of the economic cycle. The probability of default and certain loan-specific and other variables hold different explanatory power with respect to recovery rates during good and bad times in the credit cycle, meaning that the relationship between recovery rates and certain loan characteristics, firm characteristics and the probability of default differs depending on underlying credit market conditions.

In Kenya Ngondo (2018) investigated effect of lending rate on loan performance of commercial banks in Kenya. The results of the study revealed that a significant effect of lending rate on loan performance for commercial banks in Kenya.

Nehrebecka (2019) analyzed banks loan recovery rate in commercial banks. His research found that credit risk differs across various industries as well as at different phases of economic cycle. In addition, the research results indicate that both from the standpoint of individual banks and prudential authorities the correlation risk is being underestimated.

Sufi and Malik (2015) investigated the influence of credit risk management on loan performance, empirical investigation of Micro Finance Banks of Pakistan. The results of the analysis showed variables under credit risk management like credit terms and client appraisal have positive and significant effect on the loan performance, while the collection policy and credit risk control have positive but insignificant effect on loan performance.

Kirthi, Balaji, Krishna and Rajani (2020) did a study on factors determining bank loan approvals source of financing for Micro, Small, and Medium enterprises (MSMe) in Indonesia. The study found that factors such as, business age since establishment, total assets turnover, owner's education level, collateral amount, and loan repayment criteria have positive and significant effects on bank loan approval. meanwhile, owner's total assets, credit duration, and good relationship with the bank do not affect bank loan approval.

Kisengese (2014) from Kenya analyzed the impact of credit information sharing on the level of nonperforming loans of banks. His study found that Kenyan banks have incorporated utilised credit information sharing which has an effect in reducing non-performing loans. In Kenya further Njeru (2021) analyzed Credit Reference Bureau and its effect on loan performance using a case study of 40 banks from Kenya. Her study was conducted through survey design involving both primary data and secondary data. The research findings revealed that among four variables under credit reference bureau, three of them such as credit information sharing, risk assessment and credit



oring had a positive and significant effect on loan performance while collateral information sharing has proven to be a positive and insignificant effect with loan performance of Kenyan banks.

### Methodology

This study was survey design conducted through mixed method meaning both quantitative and qualitative approach. In quantitative approach, the researcher adopted descriptive design to summarize personal identification of the respondents and assessing variables under study. Exploratory research also was applied by performing inferential statistics which include correlation and linear regression analysis to predict effect of each variable of credit reference bureau of loan performance.

On another hand, qualitative study was conducted through interview to assess credit managers 'views towards credit reference bureau and loan performance.

Mutunga and Gachunga (2013) defines population of the study as a set of individuals' people, object, items and event sharing similar characteristics that the researcher wish to investigate on and make conclusion about data collected from that particular group.

A sample size defined is a group of subject drawn from the entire population in order to be tested or examined in details and make a generalization later. A sample sizes is done to save time, money and other resources (Lewis, 2015). On another hand, William (2015) defines sampling technique as the technique of identifying or selecting a suitable sample or representative part of the population for the purpose of determining parameters or characteristics of the whole population of the study.

Hence, for current study, the target population was consisted of 15 banking institutions licensed by National Bank of Rwanda by 2021 whereby 48 Individuals from credit departments of banks sampled using purposive method. Purposively sampling is a non-probability sampling procedures in which the researcher uses his/her skills and makes judgment to select those respondents that best meet the needs of his/her research study (Pamela, 2013). Credit managers of stated banks and credit officers have been chosen to respond in this survey including others relevant staff serving in credit department.

### Population composition of the Study

Banks	Sample size Selection
1. Access Bank Rwanda PLC	3
2. Bank of Africa Rwanda PLC	3
3. Bank of Kigali PLC	5
4. BPR Rwanda PLC	5
5. Cogebanque PLC	4

6. Ecobank Rwanda PLC	3
7. Equity bank Rwanda PLC	4
8. Guaranty Trust Bank Rwanda PLC	3
9. I&M Bank Rwanda PLC	3
10. NCBA Bank Rwanda PLC	3
11. Development Bank of Rwanda(BRD)	3
12. Zigama CSS	3
13. AB Bank Rwanda PLC	2
14. Unguka Bank PLC	2
15. Urwego Bank PLC	2
<b>Total</b>	<b>48</b>

**Source:** List of Banks (BNR, 2021)

In this study, both primary and secondary data were collected and analyzed in order to obtain an effective statistical information about the study and making a useful decision. Questionnaire and interviews were used to collect primary data within credits department services of banks whereas secondary data collected from NBR reports.

The data collated from the returned copies of the questionnaire were processed by using the Statistical Product for Service Solution (SPSS) version 22. Data collected was analyzed through descriptive statistics using mean and standards deviation. Moreover, Inferential statistics was performed using person correlation coefficient and linear regression to analyze effect of credit reference bureau variables on loan performance.

### **Empirical Model**

An empirical model in this study was used to estimate the effect of independent variables on the dependent variables through primary data. The regression analysis was therefore, based on loan performance of Rwanda's banking sector as a result of credit reference bureau function namely credit information collection, credit information sharing, risk assessment and collateral information sharing.

Therefore, the measurements of the variables under this research are demonstrated below:

X= independent variable: Credit Reference Bureau(CRB)

X= f (x1, x2, x3 and x4)

x<sub>1</sub>= credit information collection (CIC)

x<sub>2</sub>= credit information sharing (CIS)

x<sub>3</sub>= Credit risk assessment (CRA)

x<sub>4</sub>= collateral information sharing (CIS)

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Y= Dependent variable: Loan performance (LP)

$$LP = \beta_0 + \beta_1CIC + \beta_2CIS + \beta_3CRA + \beta_4CIC + \epsilon$$

$\beta_1$ - $\beta_4$  = coefficients of regression model

$\epsilon$ =Unexplained Variations (Error term)

### **Findings, Discussion and Interpretation**

The first objective of the study was to assess the effect of credit information collection on loan performance. Hypothesis test revealed a correlation coefficient of 0.507 with a p value <0.01 between credit information collection and loan performance. This show significant effect of credit information collection on loan performance. Furthermore, regression model established a positive coefficient of 1.621 and a p-value of .000. This implies that credit information collection has a positive and significant effect on loan performance of Rwanda's banking sector.

The second objective of the study was to analyze the effect of credit Information sharing on loan performance. The results indicate a correlation coefficient of 0.524 and p value <0.01 between credit information sharing and loan performance, this shows a significant effect of credit information sharing on loan performance. In addition, regression model indicated a positive coefficient of 1.054 and a p value of .000. This confirmed positive and significant effect of credit information sharing on loan performance in Rwanda's banking sector.

The third objective of the study was to assess the effect of credit risk assessment on loan performance. Correlation coefficient of 0.502 and p value <0.01 between credit risk assessment and loan performance, implies significant effect of credit risk assessment on loans performance. Moreover, regression model indicated a positive coefficient of .379 and a p-value of .000. This implies that credit risk assessment positively and significantly affects loan performance of Rwanda's banking sector.

The fourth objective of the study was to assess effect of collateral information sharing on loan performance. Correlation coefficient of 0.604 and p value <0.01 between collateral information sharing and loan performance, shows a significant effect of collateral information sharing on loans performance. In addition, regression model indicated a positive coefficient of 1.640 and a p-value of .000. This implies that collateral information sharing has a positive and significant effect on loan performance of Rwanda's banking sector.

The adjusted R Square coefficient computed was 0.774, showing that credit reference bureau function (credit information collection, credit information sharing, credit risk assessment and collateral information sharing) account 77.4% in loan performance. This further implies that the remaining 22.6% variation in loan performance is contributed by other variables other than credit reference bureau function assessed in this study. The Adjusted R Square coefficient indicates the

higher amount of influence that Credit Reference Bureau affect loan performance of Rwanda's banking sector.

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Mortgage and trades activities were found to have the highest share, 36.8% and 31.4% respectively in total nonperforming loans of Rwanda's banking sector. While the lowest shares were Water & Energy by 0% and 0.2% for financial services in 2020.

## **Conclusion and Recommendation**

### **Conclusion**

Referring to the findings of this study it is concluded that four functions of credit reference bureau namely credit information collection; credit information sharing; credit risk assessment and collateral information sharing contribute significant change of 77.4% in loan performance of Rwanda's banking sector. Consequently, the study concluded that credit reference bureau Rwanda through credit information collection; credit information sharing; credit risk assessment along with collateral information sharing significantly and positively affect loan performance of Rwanda's banking sector. Hence, all null hypotheses formulated in this study were rejected due to a p value calculated was less than 0.05. However, there is a room of improvement regarding integrated automation system that easy information sharing between CRB Rwanda and banks.

### **Recommendation**

Based on the study findings, the following recommendations were made for Credit Reference Bureau Rwanda and its banks partners to ensure improved CRB functions that impact loan performance in Rwanda's banking sector:

Credit Reference Bureau should work on their different templates and make one which is adapted in the core banking system. Such template should be automated system in order to easy information exchange between Credit Reference Bureau and financial institutions, especially in case of providing updated customer credit history report.

Credit Reference Bureau need to improve their information technology (IT) to be able to provide feedback to the banks to ensure if data are processed and validated effectively.

Credit Reference Bureau need sufficient employees along with strong management team that is able to improve communication channels with financial institutions.

Financial institutions need a smart credit risk assessment that capitalize customers with repayment capacity rather than collaterals. Credit limits also need to be revised.

Before loan lending approval, financial institutions should consider at least two past years of client credit history to allow banks have enough client financial and history background before granting any credit facility. This will help especially for takeover of loan from other banks.

Credit service department need a regular training to improve employee capacity to be able to implement credit policy.

Before loan lending approval, financial institutions need some research to have a clear understanding of business to be financed and determine the right sources of loan payment and ensure post-disbursement monitoring to stop funds diversion.

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