

RISK MANAGEMENT AND LEVEL OF PERFORMANCE OF UNSECURED LOANS IN COMMERCIAL BANKS IN NANYUKI TOWN, KENYA

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ABSTRACT

Banks have to manage more types of risks in order to maximize the shareholders' wealth. Kenyan banks have witnessed increasing non-performing loans. The liberalization of interest rate controls, the privatization of publicly owned banks, and the expansion on the variety of financial instruments, provided new business opportunities for banks but they also increased the need for proper risk management systems to be put in place in order to control the risks and uncertainties deriving from these changes. The gross non-performing loans (NPLs) increased by 6.6 percent in the first quarter of 2017. The study focused on the effect of risks management on performance of unsecured loans in banks. The objective of the study was to establish the effect of information technology on performance of unsecured loans. The study was anchored in the information asymmetry and technological determinism theories. The study used a descriptive cross sectional research design. Commercial banks in Nanyuki town were targeted. Branch managers and departmental heads were the respondents in the study. The study used purposive sampling where all 12 banks and 60 respondents were involved in the study. A self-administered questionnaire was used to collect data. Descriptive statistics such as frequencies, percentages, mean and standard deviation were used to organize findings. Regression analysis was conducted to determine the statistical significance of the

attempted prediction between risk management and performance of loans among commercial banks. The tests were performed the help of SPSS software at 95% confidence level. Findings were presented in form of tables and figures. The study found that that information technology was used in risk management to a large extent. Regression analysis showed that there was a strong positive correlation ($r=0.837$) between risk management and performance whereby 68.4% of performance of unsecured loans in commercial banks in Nanyuki town, Kenya could be attributed to risk management. There was statistically significant relationship ($F(4,7) = 4.394, P=0.004$) between risk management and performance of unsecured loans in commercial banks in Nanyuki town, Kenya. Information technology ($p=0.044$), was statistically significant. The study concluded that risk management is vital to performance of unsecured loans in commercial banks. This relationship is driven by utilization of information technology which enable the bank assesses and predict risk and therefore employ corrective and mitigation strategies to avoid default. The researcher recommended that commercial banks should make greater investments in information technology in risk management especially in the area of data mining.

Key Words: *information technology, performance of loans, unsecured loan, risk management*

INTRODUCTION

Gallati (2003) characterizes risk as a condition in which there exists a presentation to hardship, or a condition in which there exists a probability of deviation from a coveted result that is normal or sought after. Ghosh (2012) characterizes risk in banks as a potential misfortune that may

happen because of some hostile occasions, for example, monetary downturns, unclear changes in financial and exchange strategy, negative developments in loan costs or remote trade rates, or declining value costs.

Risk management can be viewed as a dynamic, vital, and incorporated process that envelops both the estimation and the relief of risk, with a definitive objective of boosting the estimation of a bank, while limiting the risk of insolvency (Schroeck, 2002). Rejda (2008) characterizes risk management as the procedure through which an association distinguishes hardships exposures confronting it and chooses the most proper strategies for treating such exposures. Bessis (2002) describes risk management as the entire arrangement of risk management procedures and models allowing saving money establishments to set up various risk-based methods and practices.

The procedure of risk management includes the key steps of identifying risk, risk examination and appraisal, risk review checking, and risk treatment or control (Bikker & Metzmakers, 2005; Buttmer, 2001). Though a risk in straightforward terms can be estimated utilizing standard deviation, a few risks might be hard to quantify requiring more unpredictable strategies for risk estimation. Great risk management isn't just a guarded component, yet additionally a hostile weapon for commercial banks and this is deeply determined by the nature of governance and management.

A challenge in risk management is how to treat the risk because of various types of risk treatment option which include accept risks, avoid, outsource, share, or transfer (Schanfield & Helming 2008). One technique for managing risk is to keep away from the risk by not continuing with the movement prone to create the risk. Risk evasion should just happen when control measures don't exist or don't lessen the risk to an adequate level. Part or a large portion of a risk might be exchanged to another gathering with the goal that they share duty. Components for risk exchange incorporate contracts, protection, associations and business co-operations. After risks have been declined or exchanged, remaining risk might be held on the off chance that it is at an acceptable level.

STATEMENT OF THE PROBLEM

The advancement of the banking sector in Kenya in 1992 signified the start of exceptional competitiveness among the business banks, before then competition in the banking industry was not felt most in east and central Africa thus most Banks did not extend huge amounts of unsecured credit (Makena, Ngare, Mulindwa & Wairia, 2017). A portion of the advances were "political loans" conceded with practically zero credit appraisal; different loans were advanced to internal staff, all of which in this way moved toward becoming non-performing (Wanyama, Yegon & Kemboi, 2014). As per Aduda, Magutu and Wangu (2012), the low quality credits prompted abnormal amounts of non-performing advances and in this way disintegrated profits of banks through advance provisioning some of which appeared out rightly political. Numerous banks that fall in the late 1990's were as a result of the poor management of credit risks which

was depicted in the elevated amounts of nonperforming advances (Central Bank Supervision Report, 2005). More recently, Kenyan banks have seen expanding non-performing advances. The gross non-performing credits (NPLs) expanded by 6.6 percent from KSh 212.6 billion as at the end of the fourth quarter of 2016 to KSh 226.6 billion at the end of the first quarter of 2017; the increase in non-performing loans signaled an increase in risks (CBK, 2017). Available studies such as Afande (2015), Geitangi (2015), Soi (2015) and Wachira (2017) have failed to address issues on information technology, risk analysis, monitoring and reporting. Thus the study sought to determine the effects of risk management on performance of unsecured loans in commercial banks in Nanyuki town, Kenya

GENERAL OBJECTIVE

To establish the effect of use of information technology on performance of unsecured loans in commercial banks in Nanyuki town, Kenya.

RESEARCH HYPOTHESES

H₀₁: There is no significant effect of information technology on performance of unsecured loans in commercial banks in Nanyuki town, Kenya.

LITERATURE REVIEW

Information Asymmetry Theory

The theory of asymmetric data was created in the 1980s as a conceivable clarification for regular marvels that standard general equilibrium financial matters couldn't clarify. Izquierdo and Izquierdo (2007) explain asymmetric information portrays a circumstance where one gathering in an exchange has progressively or better data analyzed than another. This regularly occurs in exchanges where the dealer knows more than the purchaser, despite the fact that the turn around can occur also. Possibly, this could be a hurtful circumstance since one gathering can exploit the other party's absence of information.

The data asymmetry issue happens ex post when just borrowers, however not banks, can watch real returns after task fruition (Brown, Hillegeist & Lo, 2004). This prompts an ethical danger issue. Moral peril emerges when a borrower takes part in exercises that lessen the probability of a credit being reimbursed. A case of good peril is the point at which firms' proprietors "redirect" stores (lawfully or illicitly) to themselves or to partners, for instance, through misfortune making contracts marked with related firms.

Unbalanced data is an issue in money related markets, for example, acquiring and loaning. In these business sectors the borrower has much better data about his money related state than the loan specialist. The loan specialist experiences issues knowing whether it is likely the borrower will default (Izquierdo & Izquierdo, 2007). To some degree the moneylender will attempt to

defeat this by taking a gander at past record and confirmation of compensation. Be that as it may, this lone gives a constrained data. The outcome is that moneylenders will charge higher rates to make up for the hazard. In the event that there was immaculate data, banks wouldn't have to charge this hazard premium.

The information asymmetry problem is relevant to this study because performance of loans in commercial banks is the dependent variable in the study. The lower the data asymmetry, the lower is the spread charged by the loan specialist. Furthermore, a lower data asymmetry can likewise guarantee the characteristic risks of the agreement are all the more precisely replicated in its spread.

Technological Determinism Theory

Technological Determinism theory states that media innovation decides how people think, feel, act, and how a general public works, it moves starting with one mechanical age then onto the next (Tribal-Literate-Print-Electronic) (Murphie & Potts, 2003). Innovation is the sole or prime precursor reason for changes in the public eye, while human components and social elements are viewed as auxiliary. Numerous investigations center around the evening out of access to ICTs as far as physical access, utilizing innovative determinism hypothesis in their theories and conclusions (Croteau & Hoynes, 2003).. The hole in access could likewise be comprehended as a wonder with three particular angles, including a worldwide partition (alluding to ICT incongruities between nations), a social separation (alluding to the hole in access to ICT between various areas of a country's general public) and a vote based gap (alluding to the distinction between the individuals who do and the individuals who don't utilize the assortment of computerized intends to take part openly life) (Norris, 2001).

As per innovative determinism, advancement and the opening up of business sectors are introduced as being required by the innovation change that goes with shutting the computerized separate. As indicated by Rodrigues, Gald, Rodrigues and Galdi (2017), this infers everybody has a similar potential to utilize innovation and to profit by ICTs, gave that everybody approaches these. In spite of the fact that the previously mentioned creators used mechanical determinism in their exploration, they likewise upheld the hypothesis of social determinism by incorporating financial factors in their examination. The technological determinism theory recognizes technology such as Information Technology as the main mover of performance and development. Technological determinism (TD), basically, is the possibility that innovation affects our lives. This thought figures conspicuously in the prevalent creative ability and political talk, for instance in the Internet is revolutionizing the economy and society. This theory is therefore relevant in this study which seeks to establish how the use of information technology relates to the performance of loans in commercial banks in Nanyuki town, Kenya.

EMPIRICAL REVIEW

Results of a study by Madume (2010) showed that bank output such as loans and other assets increase significantly to changes in expenditure on information and communication technologies. The examination demonstrated that expanded profitability in numerous cases prompts enhanced operational proficiency and productivity which are the commendable objectives of any saving money foundation. Another examination by Romdane (2012) explored the execution of data innovation (IT) interests in an example of 15 Tunisian banks over the period 1998– 2009. The observational discoveries propose that the effect of IT speculations on Tunisian banks' execution is certain. The investigation of the inside determinants of banks' effectiveness levels demonstrates that size and administrative limit emphatically and fundamentally influence the Tunisian banks' cost proficiency, while the offer of non-performing credits speaks to a wellspring of wastefulness.

Tasmin (2012) built up that the utilization of ICT can prompt lower costs, yet the impact on productivity stays uncertain, attributable to the likelihood of ICT impacts that emerge because of consistence popularity of gifted work compel, issues of expanding interest to meet client's desire for client benefit conveyance, dependability of the data framework and rivalry in money related administrations. Barret (2016) inspected the connection between IT chance administration, organization measure, and the money related execution of credit associations in Jamaica. Consequences of the numerous relapse tests affirmed a factually noteworthy connection between IT hazard administration, foundation estimate, and the money related execution of Jamaican credit associations, $F(2, 99) = 46.861$, $p = 0.000$, $R^2 = .486$. Be that as it may, IT hazard administration activities did not give any critical variety ($\beta = .139$, $p = .074$) in budgetary execution.

Dangolani (2011) examined the impact of data innovation in the saving money arrangement of Bank Keshavarzi Iran. The discoveries demonstrated that Information innovation adds to the keeping money framework in three distinctive routes as tails: IT spares the season of the clients and the workers prominently, IT chops down the costs and IT encourages the system exchanges. Monyoncho (2015) contemplate looked to decide the connection between E-Banking advances and money related execution of business banks in Kenya. The investigation uncovered that current ATM developments offer monetary foundations the chance to change the ATM from a money allocator to a client relationship administration device, improving unwaveringness among all clients. Charge cards are being received by the banks to expand wage, and to lessen credit and liquidity dangers. Versatile managing an account is probably going to affect the gainfulness of business banks as business activities get smoothen and that web saving money offers the accommodation of directing a large portion of the keeping money exchanges during an era that suits the client.

RESEARCH METHODOLOGY

Research Design

Polit, Beck and Hungler (2001) describe the research plan as the specialist's general technique for noting the exploration question or testing the examination speculation. The current study used a descriptive cross sectional research design. Cross-sectional studies are carried out at one time point or over a short period. Descriptive studies are usually the best methods for collecting information that will demonstrate relationships and describe the world as it exists (Creswell, 2005). This design was therefore appropriate as it enabled the researcher describe the relationships between the variables using minimum resources and time.

Target Population

Target population refers to the entire group of individuals or objects to which researchers are interested in generalizing the conclusions (Saunders, Lewis & Thornhill, 2007). In this study, commercial banks in Nanyuki town were targeted. Nanyuki Town was targeted as it is one of the fastest growing urban areas in Kenya. The entry of major banks and supermarkets to Nanyuki town as opposed to nearby towns such as Nyeri is evidence to this fact. The town is multi-cultural and is the market centre for farms, ranches, game parks and wildlife conservancies in the region (County government of Laikipia, 2017). There were 12 commercial banks in the town (CBK, 2018). Respondents included branch managers and departmental heads. Departmental heads included heads of operations, credit, customer service and SME sections. These persons were assigned duties of loaning and are therefore resourceful persons on matters concerning the study. There were 12 managers and 48 heads of department in the 12 banks in Nanyuki which gives a total of 60 respondents.

Sampling Strategy

The study used purposive sampling. According to Creswell (2009), purposive sampling is a sort of sampling in which specific settings, people, or occasions are intentionally chosen for the imperative data they can give that can't be gotten also from different decisions. It is generally utilized as a part of research for identifying and determination of data rich cases identified with the wonder of interest. Using this technique, all 12 banks and 60 respondents were involved in the study. This is to ensure that the study had a large enough sample for generalisation of findings. In addition, all the banks were located in one area and are close to one another so it was easy for the researcher to collect data without any major cost implications.

Data Collection Instruments

The study used primary data. Primary data was collected by way of a self-administered questionnaire which was filled by branch managers and departmental heads of the participating banks. Questionnaires were preferred as they are able to collect a large amount of information

from a large population in relatively short amount of time. In addition, data collected through questionnaires eases analysis (Burns, 2010). The researcher developed the questionnaires. Majority of the questions were in five-point likert-scale format. Likert scale was preferred because such questions are quick and economical to administer and score and they lend themselves well to item analysis procedures (Dawson, 2009).

Data Collection Procedures

The researcher got an authorization letter from the school of business, Kenyatta University identifying him as a bona fide student of the institution. This letter was used to apply for a research permit from the National Council of Science and Technology. The researcher contacted the management of the various commercial banks to inform them of the impending study. On an agreed date, the researcher delivered the questionnaires to the individual banks. The researcher gave the respondents a week to fill the questionnaires. This gave the respondents ample time to answer the questions thereby ensuring a high response rate. The researcher left his contacts for any respondent who may need clarification. After 7 working days, the researcher collected the questionnaires. Financial statements of the participating banks were reviewed to collect data on performance of loans.

Data Analysis

Data was cleaned, scored and coded before being fed into the computer using SPSS software. Descriptive statistics such as frequencies, percentages, mean and standard deviation were used to organize findings. Regression analysis was also be conducted. Regression analysis was conducted to determine the statistical significance of the attempted prediction between risk management and performance of loans among commercial banks, determine the strength of association between performance of loans among commercial banks and the multiple independent variables (information technology, risk analysis, risk monitoring and risk reporting), identify the relative importance of each of the multiple independent variables in predicting the performance of loans among commercial banks and predict the values of the dependent variable from the values of the multiple independent variables. The model to be used is as stipulated by Ugirase, (2013) as shown below.

$$Y = C + \beta_1 IT + \beta_2 RA + \beta_3 RM + \beta_4 RR + e$$

Where: Y = Loan portfolio performance; C = Constant; β = Beta values; IT = Information Technology; RA = Risk Analysis; RM = Risk Monitoring; RR = Risk Reporting; e = Error term

The tests were performed the help of SPSS software at 95% confidence level. Findings were presented in form of tables and figures.

RESEARCH FINDINGS AND DISCUSSION

Socio-Demographic Characteristics of Respondents

Socio-Demographic characteristics assessed in the study included gender, age, level of education and working experience. Results indicated that majority (65%) of the respondents in the study were male. This shows that there is a gender disparity among the branch managers and departmental heads of commercial banks in Nanyuki town whereby women are underrepresented. The findings also show that 44% of the respondents were aged above 35 years while those aged between 32 and 35 years accounted for 31% of respondents. The mean age was 34 years. This signifies that branch managers and departmental heads of commercial banks in Nanyuki town are relatively young as majority of them were below the age of 40 years.

Findings also showed that majority (80%) of the respondents had acquired a bachelor's degree while 20% had acquired a post graduate degree. This is an indication that branch managers and departmental heads of commercial banks in Nanyuki town were highly educated and therefore in a position to comprehend and respond appropriately to the questions in the study. The findings also show that slightly above half of the respondents had a working experience of between 1 and 10 years while those with a working experience of between 11 and 20 years accounted for 49%. The mean working experience was 9 years. This shows that majority of respondents had acquired adequate experience to enable them respond resourcefully to the study questions.

Use of Information Technology in Risk Management

The study sought to establish how banks in the study used information technology in risk management. The findings would enable establish the effect of use of information technology on performance of unsecured loans in commercial banks in Nanyuki town, Kenya. Results showed that the average mean ($M=1.76$, $SD=0.730$) indicates that a high agreement and convergence of views among the respondents in the items. Majority of respondents indicated that credit scoring models ($M=1.51$, $SD=0.505$), data mining techniques ($M=2.04$, $SD=1.037$) and early warning systems ($M=1.96$, $SD=0.769$) were employed in risk management in their banks. The findings therefore suggested that information technology was used in risk management to a large extent in commercial banks in Nanyuki town, Kenya. This is consistent with Benson (2017) who indicated that IT is not only useful to look at historical data in a source and uses of funds statement, but it is also extremely important to estimate the business borrower's future sources and uses of funds and its statement of financial position. The findings are also consistent with Chornous and Ursulenko (2013) argument that latest technology, which combines the achievements of artificial intelligence, numerical mathematics, statistics, has enabled to suggest new promising approaches to risk assessment and information support.

Performance of Loans

Performance of loans was assessed by checking on non-performing loans, portfolio at risks, number of loan accounts, gross loans and loan growth.

Non-Performing Loans: The average non-performing loans (%) were noted over the study period. The findings showed that slightly above half (58%) of the participating banks had an average non-performing loan percentage of between 1% and 5%. The mean NPL average was 5.8%.

Portfolio at Risk: The average portfolio at risk (PAR) was also assessed over the study period and findings showed that 42% of the banks had an average portfolio at risk of less than 10% while those who had a PAR score between 11% and 20%. The mean PAR was 12.8%.

Number of Loan Accounts: To measure loan performance, the number of loan accounts was also assessed. Results indicated that majority (67%) of the banks in the study had between 100, 001 and 500, 000 loan accounts over the study period. The man number of loan accounts was 133, 088.

Respondents' Opinion on Most Affecting Factor

Respondents in the study were asked to indicate which of the four variables in the study had the most effect on performance of unsecured loans in commercial banks. Findings in Figure 3 show that slightly above half (56%) selected risk analysis while 20% picked information technology as the factor with the most influence on performance of unsecured loans in commercial banks.

Respondents Suggestions on Enhancing Performance of Loans

Respondents in the study were also asked to suggest ways to enhance loan portfolio performance. Findings indicated that 47% recommended enhancement of risk analysis methods, 38% recommended greater adoption of technology in risk management while 21% suggested borrower training.

INFERENTIAL ANALYSIS

To determine the effects of risk management on performance of unsecured loans in commercial banks in Nanyuki town, Kenya, regression analysis was done. Regression analysis was done with the help of SPSS at 95% confidence level. The findings would also enable testing of hypotheses.

Table 1: Model Summary

R	R Square	Adjusted R Square	Std. Error of the estimate
0.837	0.7	0.684	0.224

The results in Table 1 indicate that there was a strong positive correlation ($r=0.837$) between risk management on performance of unsecured loans in commercial banks in Nanyuki town, Kenya. The findings show that 68.4% of performance of unsecured loans in commercial banks in Nanyuki town, Kenya can be attributed to risk management. This therefore shows that risk management is vital for loan portfolio performance. This is in agreement with Soi (2015) who established that credit risk management practices in banks with application of modern approaches to risk measurement, particularly for credit and overall risks is important for commercial banks. The finding is also in agreement with Mutuku (2016) finding that risk management practices under study significantly affected the financial performance of commercial banks. The finding is however in disagreement with Ghani and Mahmood (2015) who established that there is no relationship between risk management understanding and risk assessment and analysis and performance of financial institutions.

Table 2: ANOVA Output

	Sum of squares	df	Mean square	F	Sig
Regression	2.146	4	0.536	4.394	0.0043
Residual	0.854	7	0.122		
Total	3.000	11			

The results in Table 2 indicate that there is statistically significant relationship ($F(4,7) = 4.394$, $P=0.004$) between risk management on performance of unsecured loans in commercial banks in Nanyuki town, Kenya. This lends support to the importance of risk management in loan portfolio performance. This finding is in support of findings from similar studies by Wahome (2010); Madume (2010); Tasmin (2012); Lipunga (2014); Soi (2015); Mutua (2015); Mutuku (2016) and Rao and Jirra (2017) who also found a significant relationship between risk management and performance of loans.

Table 3: Regression Coefficients

Variable	B	Std. Error	t	sig
Constant	0.233	0.341	0.683	0.517
Information technology	0.429	0.186	2.309	0.044
Risk analysis	0.920	0.248	3.707	0.006
Risk monitoring	0.488	0.155	3.156	0.016
Risk reporting	0.156	0.125	1.248	0.252

The beta coefficients can be substituted into the model as shown below.

$$Y = 0.233 + 0.429 IT + 0.920 RA + 0.488 RM + e$$

The new model shows that without risk management, loan portfolio performance would be 0.233. The model also shows that all the beta coefficients have positive signs indicating that they all contribute to an increase in performance of unsecured loans. Looking at the beta coefficients,

risk analysis ($\beta=0.920$) has the largest beta value indicating that it is the most affecting while risk reporting has the least beta value ($\beta=0.156$) indicating that it is the least affecting of the four variables on performance of unsecured loans in commercial banks in Nanyuki town, Kenya. The significance values in Table 3 can be used to test the hypothesis.

Information Technology and Performance of Unsecured Loans

The study's hypothesis (H_{01}) stated that there is no significant effect of information technology on performance of unsecured loans in commercial banks in Nanyuki town, Kenya. Findings in Table 3 show that information technology ($p=0.043$) was statistically significant. The hypothesis is therefore rejected and the study concludes that there is a significant effect of information technology on performance of unsecured loans in commercial banks in Nanyuki town, Kenya. This is consistent to findings of Madume (2010) who showed that bank output such as loans and other assets increase significantly to changes in expenditure on information and communication technologies. It is also consistent to Barret (2016) findings of a statistically significant relationship between IT risk management, institution size, and the financial performance of Jamaican credit unions. The findings are however in contrast to Tasmin (2012) who established that the usage of ICT can lead to lower costs, but the effect on profitability remains inconclusive,

CONCLUSIONS

The study concludes that information technology affects performance of unsecured loans in commercial banks in Nanyuki town, Kenya. Specifically, commercial banks which utilized information technology to a large extent in risk management were found to have better loan portfolio performance than those who utilized IT moderately or to a low extent. This can be attributed to the application of credit scoring models, data mining techniques, early warning systems which enable the banks assess the credit risk of a borrower and predict the deterioration of credit positions as early as possible using minimum effort and cost.

Risk analysis affects performance of unsecured loans in commercial banks in Nanyuki town, Kenya. Risk analysis was the most important of the four factors under investigation. The more comprehensive a bank carried out risk analysis the greater its loan portfolio performance. Risk analysis contributes positively to greater loan portfolio performance because risk evaluation risk estimation and risk reduction strategies involved in risk analysis enable the bank predict client's probability of default and therefore limit the uncertainty preventing the bank from suffering unacceptable losses.

Risk monitoring is also vital to performance of unsecured loans in commercial banks in Nanyuki town, Kenya. Although risk monitoring was not well conducted by majority of banks, those banks that observed risk monitoring to a great extent saw enhanced loan portfolio performance as opposed to those which didn't. Risk monitoring is important because activities such as risk audits, reserve analysis, setting reserve levels and risk reassessment enable the bank assess

compliance with extant sanction and post-sanction processes laid down by the bank from time to time. Risk monitoring also enables the bank find out any mistakes in risk analysis and identify new risks and reassessing current ones and take corrective action.

Risk reporting was not found to be an important predictor of performance of unsecured loans in commercial banks in Nanyuki town, Kenya. This may be attributed to the fact that risk reporting is subject to the effectiveness of activities such as risk analysis, risk monitoring and use of information technology. If such activities are done well, the bank well have good performance of unsecured loans whether reporting is done well or not.

In summary the study concludes that risk management is vital to performance of unsecured loans in commercial banks. This relationship is driven by utilization of information technology, risk analysis and risk monitoring which enable the bank assess and predict risk and therefore employ corrective and mitigation strategies to avoid default. The study concludes that risk management works well when all the activities involved all conducted well since they complement each other.

RECOMMENDATIONS

In light of the findings of the study, the researcher recommends that commercial banks should make greater investments in information technology in risk management especially in the area of data mining. Commercial banks should seek to utilize scenario analysis more in risk analysis as it is a good credit risk assessment tool. Reserve analysis should be employed more as a risk monitoring tool. Commercial banks should also invest more in risk management techniques to get the most of reduced loan default.

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