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Financial Risk & Financial Performance: A Critical Analysis of Commercial Banks Listed in Rwanda Stock Exchange

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ABSTRACT

Regardless developed or developing, banking sector serves as the spine of the economy of a country. Financial risks played a major role in the global banking crisis which occurred in the past decades. After which financial risks remained a major topic of interest globally. This in turn threatens their financial viability. The country's banking sector is vulnerable to risks whether it is financial or non-financial. This made it essential to include operational risk as area of study along with other financial risks as the risk cannot be ignored. This study therefore, investigated the effect of financial risk on financial performance of commercial banks listed in Rwanda Stock Exchange. The study used financial distress theory, interest rate parity theory, shift ability theory and stewardship theory Descriptive research design is used in the study. Target population of the study constituted all the banks listed in Rwanda Stock Exchange. The study used random panel technique for panelling data for the period of 2008 to 2019. Data was analysed through the use of descriptive statistics and multiple linear regression analysis. From table 4.12 of coefficients, solvency risk amongst the sub variables was highly influenced by financial performance which reported a t-value of 3.188 hence the most significant.

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Background of the study

Whether a country is developing or developed, banking industry is included among the core sectors in a country's economy and it plays a vital role in the countries' economy. Banking operations carried out by commercial banks together with the services offered are diverse and well spread out. The main operations undertaken by them are divided into two, namely; primary and secondary operations. Their primary functions include accepting deposits, advancing loans, creating credit. General utility services, clearance of cheques etc are termed as the secondary functions. However, banks carry forward the practice of lending as the vital principal operation. This is due to the reason that they make profit based on this function of theirs'. Lending practices are central to the realization of critical banking objectives with financial performance being the baseline yardstick for the sector. All banks understand clearly the sensitivity of lending practices and how they can influence banking services. They are at the top of the priority list for the banking operations. Any shortcoming in practice can significantly hurt the overall financial performance of the bank (Kumar B. 2011).When a bank lends it's funds to their counterparties in the name of loans or advances, the borrowers are supposed to give a coupon amount (as per interest rate provided by bank) and the actual amount (which was lent). The rate at which interest is ascertained would be ascertained annually, quarterly or semi-quarterly depending on the agreement among the parties' i.e. the bank and the individual or firm who borrows. At the instance of the deal among the parties regarding lending, the bank ascertains the probability of default by the client so as to calculate the expected loss. But due to any reason, if the client reaches a situation where the fund borrowed couldn't be given back (for example bankruptcy),such funds are termed as non-performing assets.

However, as a result of their daily activities and the environment of operation, this makes commercial banks as one of the most prone institutions to risks among financial institutions. In such a situation, returns from investments will vary unexpectedly. These have lead to extinction of many banking institutions where they were not addressed properly at the right instance. Over the past few decades, researchers have mentioned about many financial risks that commercial banks faces in their day to day activities, namely; equity risk, liquidity risk, interest rate risk, currency risk, asset-backed risk, foreign exchange risk, credit risk among others. These risks contribute negatively in terms of how an organization will perform financially (Kumar B. 2019). Kumar B. (2018) in his study argued that the goal of risk management is to measure risks in order to monitor and control them, and also enable it to serve other important functions in a bank in addition to its direct financial function. Financial institutions will not be able to thrive well in the absence of risk management practices that are effective without which they won't be able to safeguard themselves from collapsing. This makes it the need to identify and understand the risks run by banks so as to rightly confront, control and sustainability in manage them so as to ensure the functionality of banks over time. The sustainability part is ignored by many.

According to Dr. Kumar Bhupendra (2018) the crisis experienced worldwide during the period 2017 to 2009 affected the financial steadiness and their economic performance, but it sharpened banks on the importance to hedge against risk by implementing the necessary methods. Risk management and risk-detection can never be fully be complete since there are always unforeseen and unintended aspects of risk environment (BNR, 2011

Objective of the Study

1. To establish effect of solvency risk on financial performance of commercial banks listed in Rwanda Stock Exchange.
2. To establish effect of liquidity risk on financial performance of commercial banks listed in Rwanda Stock Exchange.
3. To establish effect of operational risk financial performance of commercial banks listed in Rwanda Stock Exchange.

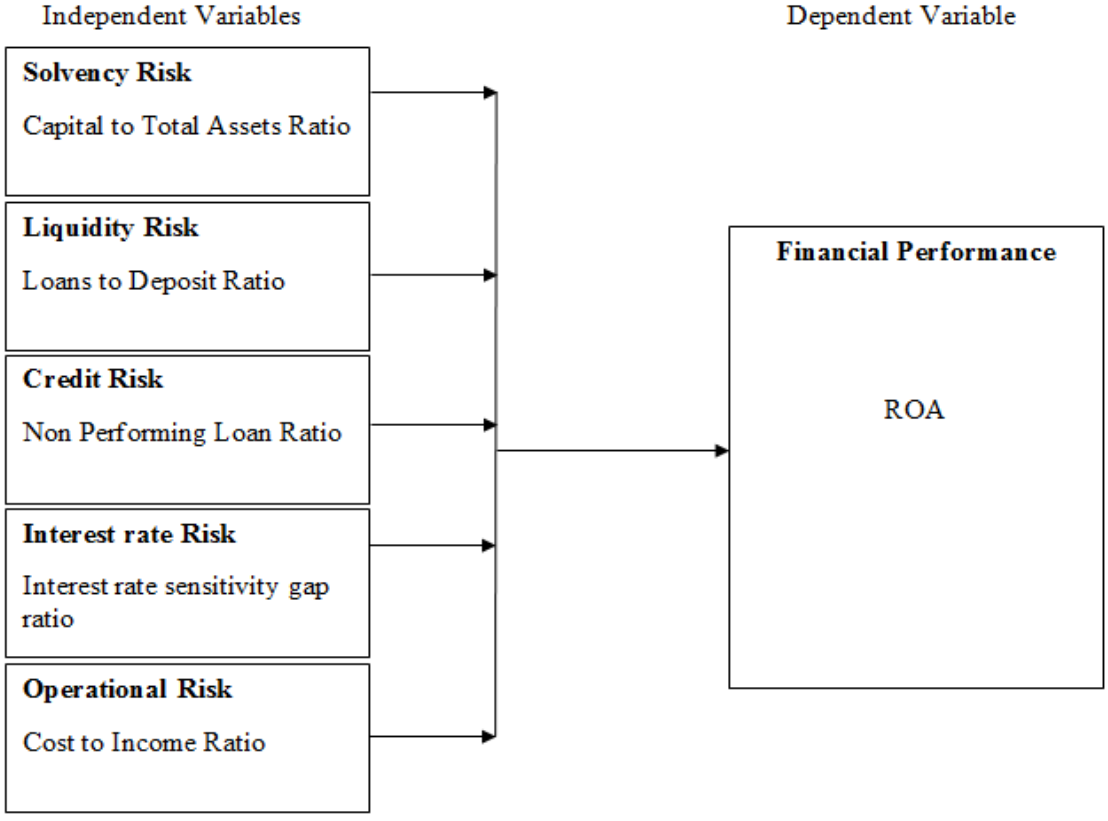
Hypotheses

H01 Solvency risk has no significant effect on financial performance of commercial banks listed in Rwanda Stock Exchange.

H02 Liquidity risk has no significant effect on financial performance of commercial banks listed in Rwanda Stock Exchange.

H03 Credit risk has no significant effect on financial performance of commercial banks listed in Rwanda Stock Exchange

Conceptual Framework



Panel Data Technique Analysis

According to Gujarati (2004), if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model/FEM and random effect model/REM. This was further tested using Hausmann test. The results are as shown as below in Table 4.1.

Table 4.1: Panel Data Technique Analysis

Correlated Random Effects - Hausman Test
Equation: Untitled
Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	6.252273	5	0.2824

** WARNING: estimated period random effects variance is zero.

Period random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CTA	0.054242	0.080367	0.000259	0.1047
LDR	-0.007822	-0.013242	0.000053	0.4547
NPLR	-0.214566	-0.156326	0.001602	0.1456
INTR	0.007096	0.006460	0.000004	0.7542
CIR	-0.020720	-0.016515	0.000023	0.3755

Source: Research findings Secondary data eviews output, 2021

According to the understandings of Zulfikar(2018), for a p>0.05 from hausman test, random effects is selected. Results denote that p-value is 0.2824(ie p>0.05).Hence the null hypothesis that fixed model is not best fit since was therefore accepted, thus the random effect model was adopted to analyse the effect of financial risk on financial performance of commercial banks.Tassew and Hailu (2019), Odhiambo(2016) inferred p values of 0.4615 and 0.9957 respectively and selected random effect model.

Factor Statistics

According to the understandings of Johnson and Wichern, (2000), the reduction of variables by the factor analysis (FA) method can be used to reduce variables and create factors or variables deriving from linear combinations. However, the mere suggestion of a method cannot be accepted when it comes to analyzing quantitative data; two tests must be considered so that whether to use of the method above mentioned can be decided (Chair Junior et al., 2009). These authors recommend performing the index analysis of KMO and Bartlett´s test of sphericity (BTS)

The following section inferred the scale and reliability statistics of the data sample.The results were tested using SPSS.According to the understandings of Andy(2013), the KMO statistics greater than 0.5 is acceptable and infer that the analysis is useful for the data collected.

KMO and Bartlett's Test

Table 4.2 below shows the result of Kaiser-Meyer-Olkin Measure of Sampling Adequacy test.The value of Kaiser-Meyer-Olkin was 0.571 whereas significance of Bartlett's test was 0.000. Study done by Mtebe and Roope (2014), investigated the use of mobile learning system, in their study, the KMO was found to be 0.832 confirmed the sampling adequacy of the data. Moreover, Bartlett's test of sphericity p <. 001 indicated that correlations between items were sufficiently large for performing the Principal Component Analysis. The extraction by principal components, principal axis factoring, and alpha factoring were tested; the method of principal components showed the best results.

Table 4.2: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.571
Bartlett's Test of Sphericity	Approx. Chi-Square	72.766
	df	15
	Sig.	.000

Source: Research findings, 2021

Result indicated the proportion with which variables suffer variance due to underlying factors. Since the value is 0.591(i.e>0.5)it is implied that factor analysis is useful. Since the diagonal elements should be >. 0.5 if at all the sample is adequate for a given set of variables (Field, 2009: p.651).Bartlett's test for sphericity is used to test whether or not the correlation matrix which is created an identity matrix.Since the significance level which we got as the result for Bartlett's test for sphericity is 0.000(i.e <0.05) indicate that the factor analysis is useful with the data being collected.

Table 4.3:Communalities

Table 4.3 shows the results of communalities check.Communalities is checked inorder to check the amount of variance in each variable which is being analysed.

Communalities		
	Initial	Extraction
CTA	1.000	.530
LDR	1.000	.664
NPLR	1.000	.762
INTR	1.000	.693
CIR	1.000	.680
ROA	1.000	.836
Extraction Method: Principal Component Analysis.		

Source: Research findings SPSS output, 2021

Here the extraction method used is principal component, due to wich the initial communalities is 1 for correlation analysis. Extraction communalities are estimates of the variance (i.e the spread between the values in the set of data) in each variable accounted for by the components. In the above table it is measured that the extraction communalities values are high, which in turn denotes that the extracted components represent the considered variables well. Hence there is no need to extract another component. From the table, it is measured that all the factors are having extraction value (using varimax) greater than 0.5.According to the study conducted by Michael(2019) regarding IFMIS, it was noted that all the twelve (factors extracted using varimax) were having extraction values greater than 0.5.

Table 4.4: Total Variance Explained

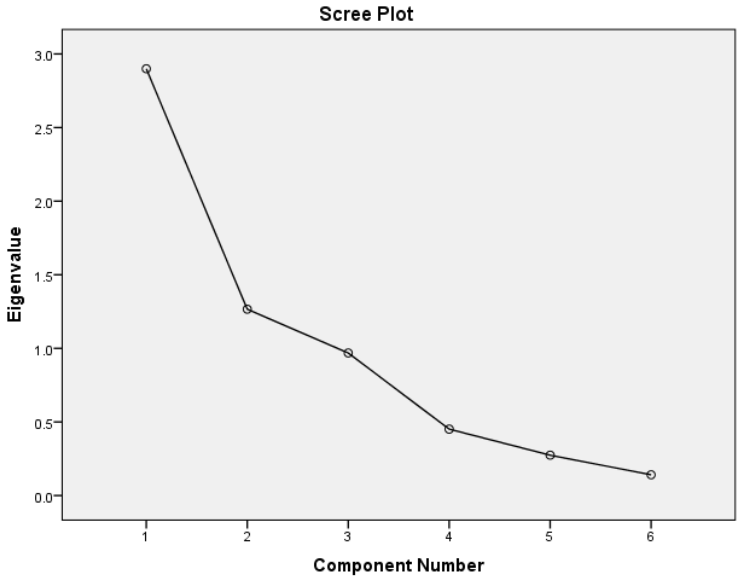
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.899	48.322	48.322	2.899	48.322	48.322	2.095	34.917	34.917
2	1.266	21.100	69.422	1.266	21.100	69.422	2.070	34.506	69.422
3	.968	16.141	85.563						
4	.451	7.519	93.082						
5	.274	4.568	97.649						
6	.141	2.351	100.000						
Extraction Method: Principal Component Analysis.									

Source: Research findings SPSS output, 2021

Table 4.4 explains the total variance. Here eigen values greater than 1 is been extracted. Eigen values provide the amount of variance explained by each factor. From the table, it is measured that the first three components had eigen values more than one and explained 69.42% of results. According to the study conducted by Michael (2019), regarding IFMIS using factor analysis and explaining total variance, it was measured that the first five components were have eigen values more than one and explained 81% of the results. But in this study, it is regarding effect of financial risks on financial performance of commercial banks, it was measured that 69.42% of results is explained by the factors having eigen values more than one.

Scree Plot

Diagram 4.1: Scree Plot



Source: Research findings SPSS output, 2021

The steep slope indicates that the components can be considered. There are five steep slopes according to the figure. Hence it is inferred that all the components can be considered.

Descriptive Statistics

Table 4.5 below presents results of the descriptive statistics of the overview of return on assets by the sample size during the period 2009 to 2018.ROA is having minimum, maximum, mean and standard deviation of 2.10, 5.26, 3.66 and 0.737 respectively. LDR had a minimum, maximum, mean and standard deviation of 64.94,130.21,88.89 and 16.94 respectively. NPLR had a minimum, maximum, mean and standard deviation of 2.80,11.19,6.49 and 1.94 respectively. INTR had a minimum, maximum, mean and standard deviation of -67.47,49.06,-24.00 and 30.29 respectively. Whereas CIR had a minimum, maximum, mean and standard deviation of 19.04,71.1248.88 and 12.14 respectively.

Table 4.5: Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
CTA	30	16.381897352000000	9.118043128000000	25.499940480000000	15.812824512599999	3.706487469268750	.482	.427	.049	.833
LDR	30	65.2687478000000	64.9458152000000	130.2145630000000	88.897618913333320	16.941396636813373	.772	.427	.177	.833
NPLR	30	8.378961419	2.809222141	11.188183560	6.490336394000	1.940612664953	.096	.427	-.013	.833
INTR	30	116.53682212000000	-67.46734873000000	49.06947339000000	-24.002560969600005	30.291913349369228	.650	.427	.332	.833
CIR	30	52.08300000	19.04000000	71.12300000	48.8801861770	12.14774214392	-.704	.427	.072	.833
ROA	30	3.163285606	2.096681586	5.259967192	3.65564224670	.737144013341	.606	.427	.293	.833
Valid N (listwise)	30									

Source: Research findings SPSS output, 2021

Minimum ROA during the study period was 2.10 while the maximum was 5.26. The range for ROA was 3.16 with a mean of 3.66 and standard deviation of 0.737.This in turn means that the banks are making profit and from the standard deviation it is inferred that there is low difference in profits among them.

For solvency risk (measured by CTA), the minimum value was 9.12 and maximum of 25.49. The range was 16.38 with a mean of 15.81 and standard deviation of 3.70.The standard deviation indicates that the banks are suffering from varying levels of solvency risk. The liquidity risk (measured by LDR), had a minimum value of 64.95 and maximum of 130.214 with a range of 65.26. The mean was 88.89 and standard deviation of 16.95.However,the great standard deviation implies that banks are having varying liquidity ratios compared to each other while the mean indicates that the liquidity ratio of banks are high. For credit risk (measured by NPLR), the minimum value was 2.809 while the maximum value was 11.19. The range was 8.38 with the mean of 6.49 and standard deviation of 1.941.Which in turn depicts a moderate amount of credit risk tackled by the banks and the standard deviation depicted that there is no much difference of credit risk faced in between the banks. For interest rate risk (measured by INTR), the minimum value was -67.47 while the maximum value was 49.06. The range was 116.53 with the mean of -24.00 and standard deviation of 30.29. The high standard deviation indicates that the banks are having varying interest rate risk. The operational risk (measured by CIR), had a minimum value of 19.04 and maximum of 71.12 with a range of 52.08. The mean was 48.88and standard deviation of 12.15.The mean indicates that the banks are maintaining high cost to income ratio and the standard deviation indicates that the banks are tackling varying levels of operational risk.

The kurtosis test results fall in the range of -3 to +3.This indicates that the distribution is normal. Similarly skewness value for all variables lies in the range of -0.8 to +0.8 indicating normal distribution. Hair et al. (2010) and Bryne (2010) argued that data is considered to be normal if skewness is between -2 to +2 and Kurtosis is between -7 to +7.According to the understandings of Schmider et al., (2010), the recommended values of skewness and kurtosis for normal distribution is less than 2 and 9 respectively. Acceptable values of skewness fall between – 3 and + 3, and kurtosis is appropriate from a range of – 10 to + 10 when utilizing SEM (Brown, 2006).

Diagnostic Tests

Normality Test

From the descriptive statistics table, the data is in the normal range of skewness and kurtosis. The panel data needs to be tested for normality of residuals. Jarque-bera test is employed for the same. Table 4.8 below shows the results of Jarque-bera test. The test considered null hypothesis that the sample normally distributed whereas the alternative hypothesis is that the data is not normally distributed. The null hypothesis is accepted for p>0.05.Similarly normal distribution of residuals is checked using Jarque-Bera test. Diagram 4.2 indicated results of the same. The test considered null hypothesis that the residuals are normally distributed whereas the alternative hypothesis is that the residuals are not normally distributed. The null hypothesis is accepted for p>0.05.

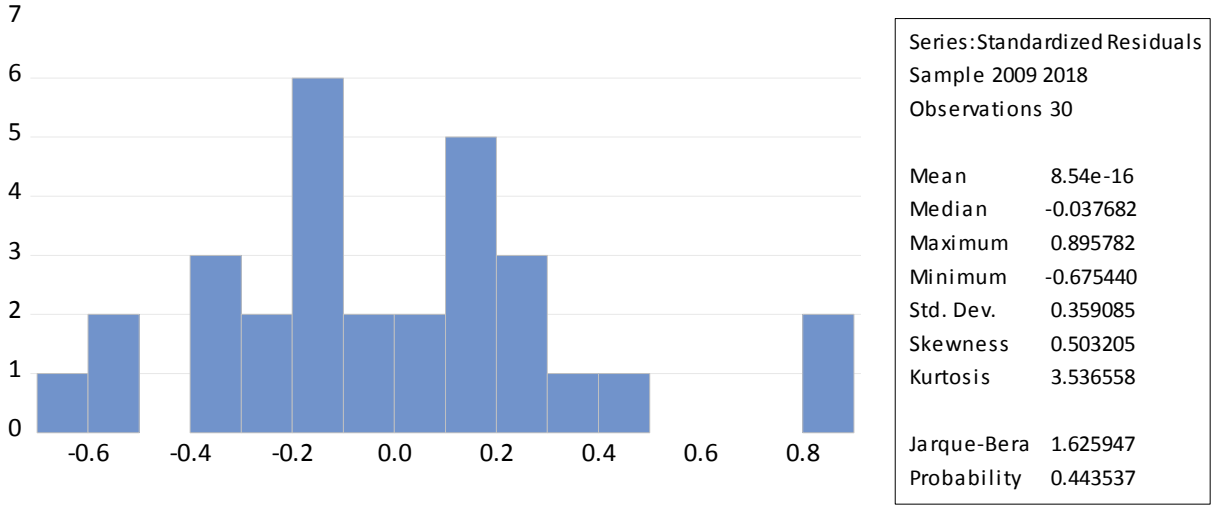
Table 4.6: Normality Test

	ROA	CTA	LDR	NPLR	INTR	CIR
Mean	3.655642	15.81282	88.89762	6.490336	-24.00256	48.88019
Median	3.508071	15.52992	87.08746	6.598943	-19.45805	52.92000
Maximum	5.259967	25.49994	130.2146	11.18818	49.06947	71.12300
Minimum	2.096682	9.118043	64.94582	2.809222	-67.46735	19.04000
Std. Dev.	0.737144	3.706487	16.94140	1.940613	30.29191	12.14774
Skewness	0.574977	0.457340	0.732849	0.091313	0.616686	-0.668638
Kurtosis	3.052933	2.847488	2.954982	2.795858	3.085519	2.867240
Jarque-Bera	1.656494	1.074873	2.687871	0.093783	1.910647	2.257415
Probability	0.436814	0.584244	0.260817	0.954191	0.384688	0.323451
Sum	109.6693	474.3847	2666.929	194.7101	-720.0768	1466.406
Sum Sq. Dev.	15.75806	398.4034	8323.317	109.2133	26610.40	4279.462
Observations	30	30	30	30	30	30

Source: Research findings eviews output, 2021

The p statistic of Jarque-Bera is greater than 0.05. Hence the null hypothesis is accepted that the data is normally distributed.

Diagram 4.2: Normality test for residuals



Source: Research findings eviews output, 2021

From the results, the F-statistic of Jarque Bera is 1.625 whereas the p statistic is 0.443.Hence,the null hypothesis is accepted since p>0.05.Which means that the residuals are normally distributed.

Autocorrelation Test

Autocorrelation test is used to find the degree with which the values of the same variable are similar with successive time intervals. Autocorrelation is tested so as to confirm that the data does not violate the assumption of instant independence. Which is required when doing multiple linear regression.

Autocorrelation Test for data sample

Table 4.7.1: Autocorrelation Test

Table 4.7.1 below represents the Durbin Watson test for autocorrelation.The value of Durbin Watson statistic for data sample is 1.851. According to the study done by Kioko et al., (2019) the reading was 1.9 and inferred that there is no autocorrelation since the value is close to 2.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.873[a]	.763	.713	.394720931407	1.851
a. Predictors: (Constant), CIR, LDR, CTA, INTR, NPLR					
b. Dependent Variable: ROA					

Source: Research findings SPSS output, 2021

The value is 1.851 (ie close to 2) which indicates that there is no serial correlation in the data sample of the model. Coming to ANOVA tble for serial correlation, the F statistic is 15.428 whereas p value is 0.0000007(ie <0.05).

Autocorrelation Test for residuals

Table 4.7.2: Autocorrelation Test for Residuals

Table 4.7.2 below represents the Durbin Watson test for autocorrelation. The value of Durbin Watson statistic for residuals is 2.018.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.423[a]	.179	.008	.20106	2.018
a. Predictors: (Constant), CIR, LDR, CTA, INTR, NPLR					
b. Dependent Variable: sqres					

Source: Research findings SPSS output, 2021

The value is 2.018 (ie close to 2)which indicates that there is no serial correlation in the residuals of the model.

Multicollinearity Test

Mutlicollinearity is observed when there is very high correlations between two or more variables. This overrides the assumption for multiple linear regression that the data sample doent suffer from multicollinearity. Multicollinearity test is done so as to check this.VIF is used so as to quantify the extent of collinearity.

Table 4.8: Multicollinearity Test

Table 4.8 below represents the results of multicollinearity test.The (Tolerance,VIF) for independent variables are (0.615,1.625), (0.622,1.608), (0.513,1.951), (0.549,1.822), (0.666,1.501) respectively.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	5.539	.796		6.955	.000	3.895	7.183		
	CTA	.080	.025	.404	3.188	.004	.028	.132	.615	1.625
	LDR	-.013	.005	-.304	-2.413	.024	-.025	-.002	.622	1.608
	NPLR	-.156	.053	-.412	-2.963	.007	-.265	-.047	.513	1.951
	INTR	.006	.003	.265	1.978	.060	.000	.013	.549	1.822
	CIR	-.017	.007	-.272	-2.234	.035	-.032	-.001	.666	1.501
a. Dependent Variable: ROA										

Source: Research findings SPSS output, 2021

The test utilized VIF value along with tolerance value(ie 1/VIF).All the variables had acceptable tolerance value (ie 0.2<p<1).Similarly the VIF values of the variable lies under 10.The mean value of VIF is 1.7014 (ie<5) while the mean value for tolerance is 0.593(ie <1)..Hence there is no multicollinearity.

Heteroskedasticity Test

In the multiple linear regression model, it is assumed that data is not heteroskedastic. Hence it is required to test for any heteroskedasticity in the data sample before continuing with multiple linear regression in this study. Heteroskedasticity test is used for this. Using this test, the square of residuals is being checked against the independent variables.

Table 4.9: Heteroskedasticity Test

Table 4.9 below represents the results of BreuschPagan-Godfrey test for testing heteroskedasticity. For significance value greater than 0.05, the null hypothesis is accepted that there is no heteroskedasticity. The value of significance is 0.413.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.212	5	.042	1.049	.413[b]
	Residual	.970	24	.040		
	Total	1.182	29			
a. Dependent Variable: sqres						
b. Predictors: (Constant), CIR, LDR, CTA, INTR, NPLR						

Source: Research findings SPSS output, 2021

In this test the square of residual value is tested with independent variable. If the p value is greater than 0.05 then the null hypothesis is accepted (i.e there is no heteroskedasticity). From the results, p is 0.413 (ie >0.05),thus the null hypothesis is accepted and it is inferred that there is no heteroskedasticity in the residuals of the model.

Inferential Statistics

Inferential statistics is one among the main branches of statistics. It uses random sample data from the target population and based on it, makes inferences about the population. The study uses inferential statistics so as to measure effect of financial risks on financial performance of commercial banks listed in Rwanda Stock Exchange. The study also conducted an inferential analysis for the variables and the results are as explained in the subsequent sections.

Regression Analysis

Regression analysis is used to measure changes in the dependent variable due to the change in independent variable. This analysis is done so as to measure the effect of independent variable on the dependent variable. The study uses regression analysis so as to evaluate the effect of financial risks on financial performance of commercial banks listed in Rwanda Stock Exchange. Since more than one variables are used as independent variables, the study employs multiple linear regression analysis.

Table 4.10 below shows a model summary of regression analysis among the five independent variables (Capital to Total assets Ratio, Loan to Deposit Ratio, Non-Performing Loan Ratio, Interest rate sensitivity gap ratio and Cost to Income Ratio) and a dependent variable ROA(Return on Assets).In the model summary R is represents quality of prediction of dependent variable and the value is 0.873.Or in other words, R gives the correlation between the independent variables and ROA.R square value is 0.763 and adjusted R square is 0.713.The coefficient of determination (i.e R square) indicates the proportion of variance explained by regression model here R square is 0.763,this means that the five independent variables considered namely CTA, LDR, NPLR, INTR, and CIR explains 76.3% of the variability of Return on Assets (ROA) ie the dependent variable. Therefore there are other factors that affect the profitability of equity bank which constitute for 23.7 %. This therefore means that future studies may be conducted to discover what these factors are and the magnitude with which they affect the financial performance of commercial banks. The Standard error value is 0.3947; it represents the standard deviation of the residues.

Table 4.10: Regression Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.873[a]	.763	.713	.394720931407	1.851
a. Predictors: (Constant), CIR, LDR, CTA, INTR, NPLR					
b. Dependent Variable: ROA					

Source: Research findings SPSS output, 2021

In the study findings by Kioko et al., (2019), the R square value was 0.536 and adjusted R value was 0.499 with standard error of estimate. 561422 and Durbin Watson value of 1.924 for the regression model employing four independent variables of financial risks against ROA as dependent variable. Implying that the study explained 53.6% of deviation in commercial banks' financial performance by the independent variables whereas 46.4% deviation was due to other variables which were not included by the above researcher. The study findings of this study is showing high value of R square and adjusted R, however the standard error is lower compared to the findings of the above researcher. This study managed to explain 76.3% of deviation in commercial banks' financial performance by the independent variables of financial risks.

Results of ANOVA

According to Mugenda and Mugenda (2003), ANOVA is a data analysis procedure that is used to determine whether there are significant differences between two or more groups or samples at a selected probability level. `An independent variable is said to be a significant predictor of the dependent variable if the absolute t-value of the regression coefficient associated with that independent variable is greater than the absolute critical t-value.

Table 4.11 below shows the results of ANOVA. F-critical value at 5% level of significance was calculated from the tables. In value of F is 15.428 with p=0.000002.

Table 4.11: Results of ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.019	5	2.404	15.428	.000[b]
	Residual	3.739	24	.156		
	Total	15.758	29			
a. Dependent Variable: ROA						
b. Predictors: (Constant), CIR, LDR, CTA, INTR, NPLR						

Source: Research findings SPSS output, 2021

F- critical value is a point in the test distribution with which the obtained F-statistic from the test is being compared. The regression analysis yields an F-statistic where if the calculated F-value is greater than the critical or tabled F-value, the prediction will be rejected. F critical value is calculated and the value for F-critical is 2.55.F value is 15.428 which is greater than the F critical value (2.55) where the degrees of freedom of regression and residuals are 5 and 24 respectively. The significance value is 0.0000007 which is very much lower than 0.05 showing that the model is statistically significant in predicting the effect of independent variables on financial performance. Hence it is found that the overall model was significant and best fit.

Table 4.12: Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	5.539	.796		6.955	.000	3.895	7.183		
	CTA	.080	.025	.404	3.188	.004	.028	.132	.615	1.625
	LDR	-.013	.005	-.304	-2.413	.024	-.025	-.002	.622	1.608
	NPLR	-.156	.053	-.412	-2.963	.007	-.265	-.047	.513	1.951
	INTR	.006	.003	.265	1.978	.060	.000	.013	.549	1.822
	CIR	-.017	.007	-.272	-2.234	.035	-.032	-.001	.666	1.501
a. Dependent Variable: ROA										

Source: Research findings SPSS output, 2021

Thus, the equation $Y = \beta o + \beta 1\ X1 + \beta 2\ X2 + \beta 3\ X3 + \beta 4\ X4 + \beta 5\ X5 + \varepsilon$, becomes:

$Y = 5.539 + 0.080\ CTA - 0.013\ LDR - 0.156\ NPLR + 0.006\ INTR - 0.017\ CIR + \varepsilon$

Where,
ROA=Return On Assets
CTA=Capital to Total assets Ratio
LDR=Loans to Deposits Ratio
NPLR=Non Performing Loans Ratio
INTR=Interest rate sensitivity gap Ratio
CIR=Cost to income Ratio

From the above table;
The constant coefficient hold the value as 5.539.This means that holding all the four independent variables used in the study at zero, the value of financial performance would be 5.539.

The results shows that solvency risk (measured by CTA), liquidity risk (measured by LDR), credit risk (measured by NPLR), interest rate risk (measured by INTR) and operational risk (measured by CIR) had p values of 0.004,0.024,0.007,0.060, and 0.035 respectively. According to the findings of Odhiambo(2016) on the impact of financial risks on financial performance of commercial banks, the constant value was 12.51 whereas the coefficients of credit risk, interest rate risk, and liquidity risks where 0.130,0.246,0.002.Whereas in the study done by Kioko et al., (2019),the constant was -3.397 and coefficients of credit risk, liquidity risk and operational risks where 0.041,0.066 and 0.646 respectively.

Summary of Demographics findings

On the movement in the value of ROA over the duration of the study, results of the descriptive statistics of the overview of return on assets by the commercial banks listed in Rwanda Stock Exchange during the period 2009 to 2018. Minimum ROA during the study period was 2.10while the maximum was 5.26. The range for ROA was 3.16 with a mean of 3.66 and standard deviation of 0.737. For solvency risk, the minimum value was 9.11 while the maximum value was 25.49. The range was 16.38 with standard deviation of 15.81.Liquidity risk had the minimum value of 64.95 while the maximum value was 130.21. The range was 65.26 with standard deviation of 88.89. For credit risk, the minimum value was 2.81 while the maximum value was 11.19. The range was 8.37 with standard deviation of 6.49. For interest rate risk, the minimum value was -67.47 while the maximum value was 49.06. The range was 116.53 with standard deviation of 24.02. For operational risk, the minimum value was 19.04 while the maximum value was 71.123. The range was 52.08 with standard deviation of 48.89.

Summary of Objective findings

The first objective was to establish the relationship between solvency risk and financial performance of commercial banks listed in Rwanda Stock Exchange. The results of first objective showed that taking all other independent variables at zero, a unit increase in solvency risk will lead to a 0.080 increase in financial performance (measured by ROA). This shows that solvency risk had a positive effect on return on assets. The result of this study indicated a positive relationship solvency risk and financial performance.

The second objective was to establish the relationship between liquidity risk and financial performance of commercial banks listed in Rwanda Stock Exchange. The results of second objective showed that taking all other independent variables at zero, a unit increase in liquidity risk will lead to a 0.013 decrease in financial performance (measured by ROA). This shows that liquidity risk had a negative effect on return on assets. The result of this study indicated a negative relationship liquidity risk and financial performance.

The third objective was to establish the relationship between credit risk and financial performance of commercial banks listed in Rwanda Stock Exchange. The results of third objective showed that taking all other independent variables at zero, a unit increase in credit risk will lead to a 0.156 decrease in financial performance (measured by ROA). This shows that credit risk had a negative effect on return on assets. The result of this study indicated a negative relationship credit risk and financial performance.

Conclusion

The variable that generates the highest t-value is the most significant and that which generates the lowest t-value is the least significant. From table 4.12 of coefficients, solvency risk amongst the sub variables was highly influenced by financial performance which reported a t-value of -3.188 hence the most significant. This was followed by credit risk, operational risk and liquidity risk with t values of -2.963, -2.413 and -2.234 respectively. Whereas interest rate risk was the least significant with a t-value of 1.978. The results showed that all financial risks affect the financial performance of commercial banks significantly.

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