



## The influence of internal factors on loan risk management - Case study commercial banks of Kosovo

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### Abstract

The main purpose of this study is to empirically analyse key internal factors influencing loan risk management of Kosovo's commercial banks. This research adopts parametric statistics and employs a multilinear regression model. The data used for the analysis covers 7 banks for the 12 years from 2008 to 2019. The dependent variable is credit risk measured by dividing total debt by total assets. The independent variables are the size of the bank, the ratio of non-performing loans, the capital adequacy ratio, the debt-to-capital ratio, and asset management. The hypotheses raised in this research were tested through the SPSS software package using quantitative methodology. The results obtained through multiple linear regressions have shown that credit risk is positively correlated and statistically significant with non-performing loans and debt-to-equity ratio and statistically significant and negatively correlated with bank size, capital adequacy, and asset management. Considering our results, it can be considered that Kosovo's commercial banks have performed very well so far by assessing internal factors that impact credit risk. The findings of this research have direct practical implications for the banking sector in Kosovo regarding the credit risk management approach because it can be used further to enhance the effectiveness of using proper mechanisms and regulations to minimize credit risk exposure.

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## 1. Introduction

Credit risk management has evolved over the years and to date has become the most relevant activity for banks and the entire financial industry (Fatemi & Fooladi, 2006). In an uncertain and unpredictable international environment, proper credit risk management is considered to be decisive for banks' survival and a key competitive advantage. The bankruptcy of a significant number of banks, the loss of customer deposits, as well as the merger of many other banks from the crisis of 2008 onwards, has shown the necessity of building capacities and increasing internal efficiency to credit risk (Affes & Hentati-Kaffel, 2019). Banks that fail to put in place the protection mechanism for credit risk are prone to not being able to survive in the markets where they operate (Chiesa, 2008).

Non-performing loans, as well as loans classified as written off directly, affect the profit of commercial banks. High levels of bad loans affect the performance of banks negatively and then lead the banking sector into inefficiency (Sahiti, Sahiti, & Aliu, 2017). Concerning credit risk management, numerous research advances are being made to reach an agreement on the methodology and depth of credit assessment. Bank officials must value and chalk up projects, get to know clients, and estimate the situation with quantitative and

qualitative information. [Ozurumba \(2016\)](#) outlined three fundamentals foremost for credit rating: security, suitability, and profitability.

"In the first place, the protection of any down payment or lend is of great significance" ([Aremu, Suberu, & Oke, 2010](#)). Credit risk management is connected to the assessment of the personal qualities and financial position of customers. The bank must ensure that its customers have strong character, honesty, integrity, and trustworthiness, and ensure that they can pay back the loan through the cash flows generated by company operations. Furthermore, [Aremu et al. \(2010\)](#) state that the money owed will be able to ensure admissible safety to the bank even if the assumed provenance of the reward loses out.

Second, "the bank must be satisfied with the appropriateness of the loan or advance". Based on the regulatory aspect, the purpose of the loan should be legitimate, and follow the trend of the country's economy and the monetary policy of the government. The Central Bank of Kosovo, in its instructions for banks and financial institutions, states that credit risk has been amended to standardize the repayment period of bad loans by banks, as well as to clarify the definitions of loan reprogramming with arrears and differentiation of these cases from cases of additional refinancing in cases when there are no financial difficulties on the part of the borrower. Also, profitability is a guiding force for any bank operation, including credit ([Ozurumba, 2016](#)). Third, as a profit-oriented institution, banks necessarily expect their goals to deliver a certain level of profits with which they can issue dividends to make shareholders happy ([Ozurumba, 2016](#)).

For a proper credit risk assessment, analysis of research on the economic and financial situation of the borrower should be done, and the credit risk portfolio should be concisely analysed because it has a very large impact on bank liquidity. Rodina and co-authors stressed that "banks, for having facilitation in credit risk analysis and a secure future, must prevent negative impacts by systematically assessing and analysing the factors which affect lending" ([Konovalova, Kristovska, & Kudinska, 2016](#)).

In general, in recent years, credit risk management has received increased attention. This has undoubtedly been driven by the changes in the legal framework of the financial system by harmonizing the legislation with the advanced approaches based on the internal assessment of Basel II and Basel III ([Gatzert & Wesker, 2012](#)).

Kosovo's banking sector is relatively new and till today it has been a success story. Since its establishment has undergone rapid growth and development ([Sahiti, Alshiqi, Neskrodieva, Sahiti, & Bekteshi, 2022](#)). Risk management practices among the banks operating in Kosovo are not designed exclusively based on the Kosovo market but are mainly adapted from the countries where the banks originate with the local approach of Kosovo's banking market. Till today, the credit risk models that are used in the banking sector of Kosovo are based on the regulatory capital standards using advanced techniques that are served the banks so accurately and fairly for assessing the credit risk standards. As a result, enormous benefits have been realized by the banks for exploiting the use of these modelling techniques.

Scientific researchers worldwide have conducted in-depth studies regarding the influence of internal factors on loan risk management. Scholars have come up with opposing results from the empirical studies that have been examined so far. However, no such studies have been undertaken till this date for Kosovo's banking sector. This research is of paramount importance to fill the research gap for this phenomenon. The novelty that will be derived from the research findings of this study will provide insights in regards to the aggregate credit risk of Kosovo's banking sector, the identification of the key internal factors influencing loan risk management, analysing and the evaluation of the importance of these internal factors pertaining loan risk management. Moreover, this study of Kosovo's young banking sector will be expected to shed more light on the improvement of risk management practices to avoid risk concentration for minimizing risk, and boost return.

## **2. Literature Review**

No economic activity nowadays can function without credit therefore credit risk is highly dependent on business success. By means of banking expansion from investments or the addition of new agreements between the contracting parties, greater exposure to credit may arise. Credit risk is highly dependent on internal and variable factors. [Serwadda \(2018\)](#) came to the conclusion that credit risk factors have a major role in the bank's benefits and therefore banks should pay more attention to these factors. One of the most fundamental elements that affect credit risk is the creditworthiness of borrowers ([Goel & Rastogi, 2021](#)) while [Campbell-Verduyn, Goguen, and Porter \(2017\)](#) have emphasized that the best credit assessment is then based on the financial history of the borrower. Well according to [Dietrich and Wanzenried \(2011\)](#), banks with high capital have a negative relationship with the profitability of the banks because they include a lot of expenses including administrative expenses as well as other expenses that are set by the management.

According to the Bis working paper report by the author [Stever \(2007\)](#) small banks compared to large banks have more potential to be exposed to credit risk given the reason that these credit risks cannot be expanded further. Non-payment of instalments causes credit risk, which negatively affects banks' profitability [Dietrich and Wanzenried \(2011\)](#). The increase in non-payments causes loss to the banks, and in this case, they are obliged to increase the provisions, which affect the bank's income.

However, from many studies conducted in relation to credit risk, they have concluded that the size of banks has a positive impact on profitability of banks (Pasiouras & Kosmidou, 2007). Banks operating in Kosovo respond to these findings because the more capital the banks have the more, they have the opportunity to expand with their products and with the distribution of their loans. In order to have stability in relation to credit risk, banks must stabilize the income from the interest rate for a longer period of time and create a budget to protect the banks' profitability (Drager, Heckmann-Draisbach, & Memmel, 2020). The products of the commercial banks of Kosovo in recent years have had a rapid development where today the commercial banks are in competition with the banks of developed countries. To supervise the loans of the commercial banks, the Central Bank of Kosovo has created a regulation that strictly supervises credit management and in this way it has created good management which brought high profits to banks (Sahiti & Sahiti, 2021).

### 3. Methodology

Credit risk is one of the main factors in the banking system that has been studied by many organizations around the world such as European Union, the US, Japan, and other countries. But in Kosovo, research of this kind is scarce. Therefore, one of the main motives to research the management of credit risk of commercial banks in Kosovo for the period 2008-2019 and 84 observations is to contribute to this topic through our analysis, evaluation, and empirical findings on the internal factors influencing credit risk. This study includes these banks RBKO (Raiffeisen Bank), PCB (ProCredit Bank), NLB (NLB Bank), TEB (TEB Bank), BKT (National Commercial Bank), BPB (Private business bank), BE (Economic Bank). There are 11 banks in Kosovo, but we have studied only 7 banks. In the study we have excluded 3 other banks because they entered the market during 2019.

The study is based on data from the annual reports of Kosovo's commercial Bank, published on the official website of the Central Bank of Kosovo, which shares data regarding indicators (size of the banks, nonperforming loans, capital adequacy, debt to capital ratio and asset management) that are related to credit risk management and banking profitability. Based on these indicators we have treated the zero and alternative hypotheses related to credit risk, as follows:

- 1a. Hypothesis 0: Credit risk management is dependent on the size of the bank.
- 1b. Hypothesis 1: Credit risk management is not dependent on the size of the bank.
- 2a. Hypothesis 0: Credit risk management is dependent on non-performing loans.
- 2b. Hypothesis 1: Credit risk management is not dependent on non-performing loans.
- 3a. Hypothesis 0: Credit risk management is dependent on the capital adequacy ratio.
- 3b. Hypothesis 1: Credit risk management is not dependent on the capital adequacy ratio.
- 4a. Hypothesis 0: Credit risk management is debt dependent.
- 4b. Hypothesis 1: Credit risk management is not dependent on debt.
- 5a. Hypothesis 0: Credit risk management is dependent on asset management.
- 5b. Hypothesis 1: Credit risk management is not dependent on asset management.

To prove the five hypotheses mentioned above, we used the econometric model: "Multiple linear regression", as follows:

$$CR = \alpha + SB_1X_1 + NPL_2X_2 + CA_3X_3 + D/E_4X_4 + AMX_5 + \epsilon \quad (1)$$

Credit risk is a dependent variable, while the size of banks, non-performing loans, capital adequacy ratio, debt-to-equity ratio, and asset management are independent variables. The following table explains each variable:

**Table 1. Description of variables.**

Dependent variable	Description
Credit risk (CR)	Total debt / Total assets
Independent variable	
Size of the bank (SB)	The logarithm of total assests
Ratio of non-performing loans (NPL)	Non-performing loans / Total assets
Capital adequacy ratio (CA)	Total capital / Total assets
Debt to capital ratio (D/E ratio)	Total liabilities / Total capital
Asset management (AM)	Assets turnover = Operational revenue (Sale) / Total assets

Table 1 as shown above presents the description of the study's variables and acronyms for each variable. The dependent variable is credit risk, whereas independent variables are the size of the bank, the ratio of non-performing loans, capital adequacy ratio, debt to capital ratio, and asset management.

The Pearson correlation that we have adopted in this study is used to measure both the strength and relationship between the variables as depicted by Stewart (2016). Correlation results can emerge depending on the strength of the variables included for study purposes. A positive correlation means that variables are directly correlated with each other, meaning that an increase in one variable will increase in the other one. A scenario with a negative correlation implies that an increase in one variable will decrease the other one and vice versa. On the other hand, there are cases when there is non-correlation amongst the variables.

The reason why we have used the multiple linear regression econometric model is that it is very suitable for testing hypotheses about the influence of independent variables on the dependent variable as shown by [Studenmund \(2006\)](#). Most similar studies conducted in other countries have adopted a similar model. In our model, we also use the significance level of 0.05 percent to test the influence of independent variables on credit risk. Furthermore, to ensure that all the parameters statistically are in line with the model we have adopted, in our study, we also have estimated other coefficients including the ANOVA and collinearity tests. ANOVA otherwise is known as the analysis of variance which is used to effectively measure the significance level between the means. Its significance level is calculated by dividing the value of the statistic by the two degrees of freedom values ([Blaikie, 2003](#)).

As far as collinearity statistics, to check and ensure the data used are valid and worthy for the model, as an indicator our concern is the variance inflation factor (VIF). We have collinearity among variables when an independent variable impacts the other independent variable ([Wooldridge, 2015](#)). Normally, it is impossible to have no collinearity at all, but accepted VIF values of the independent variables should be less than ten (10).

#### 4. Descriptive Analysis on Factors that Impact Credit Risk

The description of statistical data regarding the effect of inner factors in credit risk management is of particular importance because it provides a meaningful summary of the interpretation of data related to credit risk management. Statistical data on factors that impact credit risk, respectively in profitability and in net income, are presented and commented in this stage. The results are presented in [Table 2](#) which show the minimum, maximum, mean, and standard deviation values. The key factor is credit risk, which presents the greatest banking risk because the value of each bank is measured by the value of lending. Based on descriptive statistics, we see that credit risk has a mean worth of 0.890 (standard deviation of 0.041), a minimum value of 0.652, and a maximum value of 0.9387. We notice from the results a low variability from the average, and we can conclude that Kosovo commercial banks have a high degree of lending.

**Table 2.** The statistical description of the factors impacting credit risk

Variables	N	Minimum	Maximum	Mean	Std. deviation
CR	84	0.653	0.939	0.891	0.042
SB	84	11.022	19.608	13.606	2.237
NPL	84	0.013	0.079	0.033	0.019
CA	84	0.065	0.347	0.109	0.041
D/E ratio	84	1.095	14.438	8.473	3.201
AM	84	0.003	0.622	0.109	0.134
Valid N (Listwise)	84				

Bank size (SB) as the independent variable has the following values: an average of 13.6056, a minimum of 11.0216, a maximum of 19.6077, and a standard deviation of 2.2372. This deviation occurred because two banks were established in 2008 and their size changed during the research period. The non-performing credit variable, on the other hand, has the following values: an average of 0.0326 a minimum value of 0.128 and a maximum of 0.785, and a standard deviation of 0.018, which means that this factor has a very small change during this period.

Another indicator capital adequacy (CA) has these values in the statistical analysis: an average of 0.1093, minimum of 0.0648, a maximum of 0.3473, and a standard deviation of 0.0414 indicating that there was no major capital change during the study period.

The average ratio of debt to equity (D/E Ratio) during this period is 8.4733, the minimum ratio is 1.0948 and its maximum ratio is 14.437, with a standard deviation of 3.2009. This large change in the ratio occurred because the liabilities of commercial banks increased in relation to capital during the study period due to the non-imposition of strict credit criteria.

Asset Management (AM) as an independent variable has an average ratio of 0.1094, a minimum ratio of 0.0026, a maximum ratio of 0.2607, and a standard deviation of 0.1341, representing a small degree of variability.

#### 5. Testing Credit Risk Variables by Correlation

For regression analysis, the basic variables of the Correlation analysis must be tested. The analysis of the basic correlation of the person coefficient shows us whether the variables have a relationship. For the analysis made in the study, we get the first information from the correlation analysis is to see if the variables have reported to each other. When the values of the correlation ratio are above 0.8, in this case the variables are reported to each other. Initially, credit risk (CR) was tested as a dependent variable in relation to the size of the bank, NPL, CA, D/E RATIO, and AM as defined in the model.

**Table 3.** The ratio between the size of banks and the credit risk.

		CR	SB
CR	Pearson correlation	1	-0.029
	Sig. (2-tailed)		0.819
	N	84	84
SB	Pearson correlation	-0.029	1
	Sig. (2-tailed)	0.819	
	N	84	84

Based on the results shown in [Table 3](#), we say that the significance coefficient  $P = 0.819$ , which is greater than  $P > 0.05$ , shows that these two variables have no correlation with each other. Also, the Pearson coefficient shows us that these two variables are not correlated (the table shows  $r = -0.029$ ), which means that loan risk is contradictious reported to the size of banks. According to the correlation test, we can conclude that  $H1A$  is not accepted, and, thus, the alternative hypothesis is accepted: credit risk management is not dependent on the size of the bank.

**Table 4.** Ratio between NPL and credit risk.

		CR	NPL
CR	Pearson correlation	1	0.382**
	Sig. (2-tailed)		0.002
	N	84	84
NPL	Pearson correlation	0.382**	1
	Sig. (2-tailed)	0.002	
	N	84	84

**Note:** \*\* Correlation is significant at the 0.01 level (2-tailed).

In [Table 4](#), based on the analysis, we see that there is a connection between problem loans and credit risk. The coefficient is significant,  $p = 0.002$ , which means that  $P < 0.01$ . This result confirms that there is an interrelationship among the variables. Also, the Pearson coefficient,  $r = 0.382$ , confirms that these two variables are averaged with each other. According to this coefficient, we say that as NPL increases, credit risk also increases. Considering that the result is significant, hypothesis  $H2a$  is approved, which means that credit risk management is dependent on non-performing loans. This relationship is also confirmed in the literature since the increase in non-performing loans automatically affects the increase in credit risk management as described by [Wolke \(2018\)](#) & [Gorrod \(2004\)](#).

**Table 5.** Ratio between capital adequacy and credit risk.

		CR	CA
CR	Pearson correlation	1	-0.649**
	Sig. (2-tailed)		0.000
	N	84	84
CA	Pearson correlation	-0.649**	1
	Sig. (2-tailed)	0.000	
	N	84	84

**Note:** \*\* Correlation is significant at the 0.01 level (2-tailed).

[Table 5](#) shows the impact of capital adequacy and credit risk. The value of  $P = 0.000$  is lower than  $P < 0.01$ , therefore capital adequacy impacts the credit risk, and is negatively correlated and significant. From the results obtained, we conclude that as capital adequacy increases credit risk also decreases, confirming hypothesis  $H3a$ . A similar relationship between those two variables has also been confirmed by [Dionne \(2013\)](#) & [Jivaasha \(2019\)](#).

**Table 6.** Ratio between debt/equity and credit risk.

		CR	D/E ratio
CR	Pearson correlation	1	0.840**
	Sig. (2-tailed)		0.000
	N	84	84
D/E ration	Pearson correlation	0.840**	1
	Sig. (2-tailed)	0.000	
	N	84	84

**Note:** \*\* Correlation is significant at the 0.01 level (2-tailed).

An important and significant interrelationship between debt and credit risk is seen in [Table 6](#) since the value  $p = 0,000$  is lower than  $P < 0.01$ . A correlation exists between these two variables based on the Pearson

coefficient,  $r = 0.840$ . Since the Pearson coefficient is positive, we can conclude that as debt to capital increases, credit risk also increases. These values confirm hypothesis H4A – that management of credit risk is dependent on debt (RD / CR). This relation is based on the literature of credit risk management because an increase in debt to capital automatically exposes banks in to a higher degree of credit risk.

Table 7, presents the accord between asset management and loan risk, showing that there is an accord between asset management and loan risk,  $p = 0.041$  and  $r = -0.258$ , with a negative relationship showing that reducing asset management increases credit risk. This result supports the confirmation of hypothesis H5a, which states that the management of credit risk is dependent on the management of assets. Such results are grounded on a theory because proper techniques, practices, and models of asset management lead to a more cost-effective manner and thus automatically pave the way to orient assets in proper channels where they have the potential to grow and create additional value.

Table 7. Ratio between asset management and credit risk.

		CR	AM
CR	Pearson correlation	1	-0.258*
	Sig. (2-tailed)		0.041
	N	84	84
AM	Pearson correlation	-0.258*	1
	Sig. (2-tailed)	0.041	
	N	84	84

Note: \* Correlation is significant at the 0.05 level (2-tailed).

## 6. Analysis and Discussion of Multiple Regression Collinearities in Relation to the Internal Factors of the Credit Risk Management

Through the collinearity, we have shown the relationship between credit risk as the conditional variable and the bank's size, NPL, capital adequacy, debt/capital, and asset management as independent variables. Since we used multiple regression, the multicollinearity or collinearity explains the correlatives and tolerances between independent variables.

Table 8. Collinearity statistics for independent variables.

Independent variables	Collinearity statistics	
	Tolerance	VIF
(Constant)		
SB	0.885	1.130
NPL	0.770	1.299
CA	0.719	1.391
D/E ratio	0.801	1.249
AM	0.660	1.515

Note: Dependent variable: Credit risk.

From the results presented in Table 8, we see that the humble worth of forbearance is 0.660, which does not exceed the value of 0.90 of VIF, and the highest value of VIF is 1.515, which does not exceed the value of 10. As a result, these values do not exceed the allowed parameters and we can conclude that the independent variables (bank size, NPL, capital adequacy, debt/capital ratio, and asset management) are not related to each other and the model is adequate.

After multiple regression analysis, we can present the impact of these factors on credit risk. The regression model is determined by the values of R, R-squared, and adjusted R-squared.

The correlation coefficient is represented by R in the regression model. On the other hand, R<sup>2</sup> (squared) shows the multiple determination coefficients or the sum of the variance of all the independent variables that can be explained by the model fit data. Adjusted R-squared also serves the same purpose and considered to have a more accurate value. In regression, the standard error determines the measure of variance along the regression line and calculated as the standard deviation (Studenmund, 2006).

Table 9 presents the model summary of the multilinear regression used in this study. The results show that parameters of credit risk provide an R of 0.901, which means that the model has a good fit. R-squared is 0.812 and the value of the adjusted R-squared is 0.796, meaning that 79.6% of the credit risk variance can be explained through independent variables of the model with a low standard deviation of 1.9%.

Table 9. Model summary of multilinear regression<sup>b</sup>.

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.901 <sup>a</sup>	0.812	0.796	0.019

Note: <sup>b</sup> Dependent variable – Credit risk.

<sup>a</sup> Independent variables or predictors (constant) SB, NPL, CA, D/E RATIO, AM.

The "F" in the ANOVA regression results indicates the significance of the model and the P value of the null hypothesis. According to the F value and P, we can understand the importance of the regression analysis and the level of trust in the set hypothesis, which supports the approval or rejection of the hypothesis. The value of P indicates the probability of the value obtained in F if the hypothesis is approved or rejected. The value of reliability in finance is considered to be significant if the confidence level is 95%. To consider the relationship between two variables statistically significant, the P value should not be greater than 0.05. From the regression result in [Table 10](#) we see that the value of F is 49.269, which corresponds to the value of P = 0.000 (P < 0.005), and we can say that all explanatory variables are different from zero. Based on the results available to us, the model is accepted.

Based on the regression result, we notice that the size of the bank is a significant factor and is negatively correlated with credit risk. [Ahmed, Akhtar, and Usman \(2011\)](#) in their study of Pakistani banks" found a negative significant correlation for the above variable. [Köhler \(2015\)](#) and [Adusei \(2015\)](#) found positive correlations and pointed out that the larger the size of the bank results in the greater credit risk. The opposite result, where the size of the banks has no significance and is negatively related to the credit risk, was found by [Mehmood, Sheraz, Mehmood, and Mujtaba \(2017\)](#) in their study of Pakistani banks.

**Table 10.** ANOVA regression results<sup>a</sup>.

Model	Sum of squares	Df	Mean square	F	Sig.
Regression	0.087	5	0.017	49.269	0.000 <sup>b</sup>
Residual	0.020	57	0.000		
Total	0.107	62			

Note: a. Dependent variable – Credit risk.

b. Independent variables or predictors (constant) SB, NPL, CA, D/E RATIO, AM.

**Table 11.** Estimation of variables according to the regression equation.

Model	Unstandardized coefficients		Standardized coefficients	T	Sig.	T-test
	B	Std. error	Beta			Sig. (2-tailed)
(Constant)	0.944	0.018		51.829	0.000	0.000
SB	-0.003	0.001	-0.157	-2.569	0.013	0.000
NPL	0.036	0.015	0.16	2.443	0.018	0.000
CA	-0.607	0.066	-0.618	-9.133	0.000	0.000
D/E ratio	0.005	0.001	0.414	6.452	0.000	0.000
AM	-0.101	0.022	-0.325	-4.599	0.000	0.000

Note: Dependent variable – Credit risk.

Independent variables: MB, NPL, CA, D/E RATIO, MA.

NPL - like other independent variables based on the results of the regression equation (see [Table 11](#) - shows that there is a positive relationship with credit risk positive correlation between non-performing loans and credit risk has also been found by [Busch and Kick \(2009\)](#); [Afriyie \(2013\)](#) and [Alizadeh Janvisloo and Muhammad \(2013\)](#). These studies have concluded that credit risk increases with the growth of non-performing loans. [Ahmed et al. \(2011\)](#); [Mehmood et al. \(2017\)](#) also found negative links, which are counterintuitive and contrary to our findings, and have concluded that non-performing loans do not affect credit risk.

The result of regression analysis shows that capital adequacy is statistically significant and negatively correlated with credit risk. Similarly, a study by [Gizaw et al. \(2015\)](#) when analysing the credit risk and profitability performance in the Ethiopian banking sector found that credit risk is negatively related to capital adequacy. On the other hand, [Mehmood et al. \(2017\)](#) in their study found a positive relationship between credit risk and capital adequacy for commercial banks in Pakistan.

We see from [Table 11](#) that we have statistical significance, p = 0.000, and a positive relationship between the ratio of total debt and credit risk. Therefore, this variable is very important because it is one of the main determinants of bank profitability. When total debt is higher than capital, the credit risk becomes higher as well. It is affecting managerial behaviour at the same time because if the financing through capital is very low, it means lower benefits for the enterprise. This positive correlation was found by [Fernández de Lis, Martínez Pagés, and Saurina Salas \(2000\)](#) and co-authors in their study of risk credits in Spanish banks, and they suggested that this increases portfolio coverage of credit risk for banks is used to cover losses. ([Fernández de Lis et al., 2000](#)). [Berrios \(2013\)](#) in his study of the relationship between credit risk, profitability, and liquidity during the period 2005-2009, took as a sample of 200 observations and pointed out that the loan loss coverage led banks to be a more risk tolerant toward borrowers, thus increasing the ratio of total debt to equity.

Asset management is one of the main factors in risk management by commercial banks. Through asset management, banks can use and distribute assets rationally. Based on the result in [Table 11](#) we note that asset management with credit risk has statistical significance (p = 0.000) but there is a negative relationship between these variables. The same result was found by [Ahmed et al. \(2011\)](#) in their study of Pakistani banks for the

period 2006-2009. [Salah and Fedhila \(2012\)](#) and [Imbierowicz and Rauch \(2014\)](#) also found the same result in their empirical study of US banks from 2001-2008 and 1988-2010.

Finally, T-tests show what impact the independent variables have on the dependent variable. As can be seen in [Table 11](#) all independent variables have an impact on credit risk.

## 7. Conclusion

As a result of our descriptive analysis, we have identified and seen the performance of factors that affect credit risk. The use of correlation tests and regression analysis has shown the connection between the dependent variable and the non-dependent variables. Results of descriptive statistics have shown that the relationship between variables included in the study is grounded on theory and is in line with other scholars' findings. Based on this, we can easily conclude that collinearity in our study is moderate within tolerance levels and it does not cause a problem in the fitting of the regression model we have adapted to interpret the influence of independent variables on the loan credit risk management of banks operating in Kosovo. Moreover, the results of the model summary both R which has indicated the correlation coefficient in the multiple linear regressions between independent variables on the outcome of the dependent variable, and R<sup>2</sup> (which shows total variance) have shown that the model used in the regression fits in the data extremely well.

Based on the econometric model, our findings have shown that the following internal factors influence loan risk management of Kosovo's commercial banks including asset management, capital adequacy, non-performing loans, bank size, and debt-to-equity ratio.

Referring to the regression results as shown above, we can conclude that bank size is an important factor that impacts credit risk given the positive and statistical relationship between variables. The biggest banks that currently operate in Kosovo's banking sector are foreign-owned and are part of the larger groups from their country of origin. As such, these banks manage to perform way better as opposed to locally owned banks in terms of profit and other performance parameters. Big banks in Kosovo tend to generally make safer loans in comparison with smaller banks that are locally owned. They can diversify in a more efficient way and therefore are less exposed, unlike small banks. Similar results of a negative relationship between bank size and credit risk have been confirmed by [Alzoubi and Obeidat's \(2020\)](#) study that involved 48 banks in 16 different countries. In addition, our findings are in line with the results of other researchers such as [Wahyudi, Pambudi, and Adha \(2019\)](#) & [Waemustafa and Sukri \(2015\)](#).

In terms of non-performing loans, the result of our econometric analysis is consistent with the theory, which indeed shows that the increase in the NPL leads to higher credit risk. Similar findings were confirmed by [Ekrami and Eski \(2009\)](#); [Michael \(2006\)](#) and [Fofack \(2005\)](#). Among future challenges for bankers in Kosovo is to sustain current levels of NPL which are lower compared to other countries in the Balkans and lower compared to the average rate of countries that are part of the Euro Zone. NPL levels in Kosovo have not been affected throughout the years by the global financial crisis of the year 2007-2008, the European crisis of 2009-2010, and the recent pandemic situation. This is mainly due to rigid credit risk management practices implemented throughout the banking sector.

Capital adequacy in our study has been confirmed to be statistically significant and negatively correlated with credit risk. Our results are in line with other studies including [Gizaw, Kebede, and Selvaraj \(2015\)](#) and [Mehmood et al. \(2017\)](#). Historically banks in Kosovo have operated with a sufficient level of capital and constantly have met their obligations. Throughout the years, there has been an influx of capital in Kosovo's banking sector from its diaspora which lives mainly in western Europe, the UK, and the USA. Given the higher deposit interest rates compare to other countries, Kosovo's banking system has been always attractive to allocate foreign capital.

Debt to equity ratio has been shown influencing factor and is positively related to credit risk in Kosovo's banking sector. This implies that an increase in the debt-to-equity ratio will lead to an increased level of credit risk. The positive and significant relationships between these variables were shown also by [Fernández de Lis et al. \(2000\)](#) & [Berríos \(2013\)](#). The characteristics of Kosovo's banks that are included in our study tend to finance through debt rather than equity. The capital they lend to their customer base is mostly sourced from the borrowing side. Kosovo's financial market is poorly developed, banks and other major corporations are not publicly traded and thus it is uncommon to raise capital through equity by issuing shares.

Finally, asset management for Kosovo's commercial banks included in our study shows the statistical significance is negatively correlated with credit risk. The enhancement of asset management techniques, procedures, and processes implies a lower credit risk. The same results are found in other studies by various scholars including [Salah and Fedhila \(2012\)](#) & [Imbierowicz and Rauch \(2014\)](#). What makes unique the issue of asset management in Kosovo's banking industry is the conservatively manned adopted risk-averse strategy which in turn has contributed less exposure to the international financial market. Thus, this has contributed to being more immune and protective towards global crisis and unforeseen events.

Based on this, we can conclude that our results can guide us in understanding what metrics we can use to grow the effectiveness of loan risk administration in commercial banks in Kosovo. Considering our findings and comparing them with relatively low levels of non-performing loans in Kosovo and constantly increasing profit levels, we firmly believe that the banking sector has performed exceptionally well while making proper



assessments and evaluations of internal factors influencing credit risk. No matter the financial and banking crises that have occurred in different regions of the world, banks in Kosovo have managed to capitalize on their return on investments. Therefore, we believe that throughout the banking sector in Kosovo, proper mechanisms and bank regulations have been pursued and all banking activities have been backed up by sound credit risk analysis given the success level to date.

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