

ANALYSIS OF CREDIT RISK ON ISLAMIC AND COMMERCIAL BANKS IN MALAYSIA

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Abstract

The financial market plays a major role to facilitate risk-sharing and efficient allocation of assets between investors. Credit-risk management is one of the essential activities banks must undertake to survive the ever-growing competition in the banking sector. Accordingly, credit-risk management is one of the most severe challenges or problems faced by the financial sector, mainly influenced by multiple factors that should not be overlooked. However, do credit risks have an impact on banks in Malaysia? The rationale of this study is to conduct an empirical analysis on the determinants of credit risk among the Islamic and conventional banks in Malaysia. There are six (6) determinants identified as independent variables in this study, namely return on assets (ROA), return on equities (ROE), banks' inefficiency (IE), loan-to-deposit ratio (LDR), inflation rate (IR), and exchange rate (ER), while credit risk (CR) as a dependent variable. Secondary data have been collected from the 16 Islamic banks and 26 commercial banks in Malaysia from 2009 until 2019 (11 years) by using Thomson Reuters Eikon. Using the regression analysis and Random Effect Model, findings reveal that all the independent variables have a positive, significant relationship towards credit-risk measurement, except for return on equities that has a significant, negative relationship with the dependent variable. It is finally concluded that future researchers should fill the gaps by investigating these variables in other countries to compare and give some suggestions on policymakers on credit-risk situations for such countries.

Keywords: Credit risk, Islamic banks, commercial banks, performance, Malaysia.

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Introduction

The financial market plays a crucial role in promoting risk-sharing and effective utilization of assets among stockholders. In Malaysia, the financial sector is overseen by Bank Negara Malaysia (BNM), which is a statutory body governed by Malaysia's Central Bank Act 2009 to promote monetary and financial stability. The aims are to provide a conducive environment for the Malaysian economy's sustainable development and manage credit risks, particularly during economic downturns. The BNM currently plays a significant role in introducing policies to expand and improve financial markets, particularly the foreign-exchange market.

Credit-risk management (CRM) is one of the essential activities banks must undertake to survive the ever-growing competition in the banking sector. Commercial-bank credit-giving operations continue to constitute banking institutions' key sources (Shkodra & Ismajli, 2017). In rising the complexity of banking operations and the emergence of new risk factors and continuing changes in the economic environment, financial-risk expertise is needed to conduct risk assessments at system-wide and individual-institutional levels. The specialization of risk-management units on credit, business, operational, insurance, and technological risks has therefore been formed in supervisory departments to serve both the regulatory and supervisory sectors by tracking and reviewing developments and risk patterns in the financial system. These units provide feedback and support for policy growth,

supervisory, and macro-prudent surveillance functions on risk-management practices. In detail, Shkodra and Ismajli (2017) have noted that risk is a mechanism that must be constantly, dynamically, and accurately defined and controlled in each financial institution, including all risk spectrums, such as credit risks, market risks, liquidity risks, and risk transfer. According to Akram and Rahman (2018), credit risks are linked to the primary business operations of banks that include lending and deposit transactions. Accordingly, credit-risk management is one of the most severe challenges or problems faced by the financial sector, mainly influenced by the multiple factors that should not be overlooked.

The study aims to address the key question: Does credit risk impact banks in Malaysia? Accordingly, some papers have attempted to answer this question but have used cross-country data and only looked at conventional banks. To fill in the gap, this study attempts to analyze credit-risk determination among the 26 commercial banks and 16 Islamic banks in Malaysia for the period between 2009 and 2019.

Problem Statement

When a financial crisis occurred a few years back in Malaysia, the country's financial-risk exposure was being the most affected part. Many previous studies have calculated credit risks in various financial structures that either help or restrict the functioning of Islamic banks, making it challenging for them to compare country-specific data (Lassoued, 2018). As mentioned by Klieštík and Cúg (2015), the modelling of credit-risk problems occurs when the default of a corporation, which is not a common occurrence, is quantified beforehand. Based on a statement unveiled by Akram and Rahman (2018), it is clear that measuring the loan and asset quality on credit-risk management is also an impact. Ping Han (2015) has supported that the lending practices of commercial banks are affected not only by the macroeconomic situation but also the changes to the market and other external factors and internal operations. Hence, the threats are certain future occurrences that may or may not be expected from loans that can result in the losses of the credit assets of the commercial banks. Therefore, this study seeks to determine the relationship between profitability, inefficiency, loan-to-deposit rate, inflations, and exchange rate towards credit risk. At the same time, the investigation also intends to identify some factors that may influence credit risk among the Islamic and commercial banks in Malaysia.

Literature Review

Credit risk is a possibility that some of the assets of a financial institution, especially its loans, will decrease in value and may become worthless (Rose & Hudgins, 2008). According to Klieštík and Cúg (2015), credit risk reflects the possibility of losses in the case of a failure of a business partner. This situation can be considered a failure to fulfil obligations under the terms of a contract, which results in creditors' businesses. Focusing on managing risks, small Islamic banks tend to be more financially stable than small conventional banks. In contrast, large conventional banks are better than large Islamic banks and unexpectedly, the small Islamic banks are financially stronger than the large Islamic ones (Čihák & Hesse, 2010). In the meantime, Čihák and Hesse (2010) have also argued that this situation may change because of credit-risk-management systems are getting increasingly complicated in Islamic banks when working on a larger scale. In general, the Islamic banks have a different capital structure compared to the conventional banks.

Return on assets is a ratio that illustrates a business's capacity to generate net income by examining the business's operational activities that describe the assets in getting company profits (Rahayu et al., 2020). The econometric results show that a higher ROA ratio has a consistently positive link with the z-scores in all banks' specifications at a level of five per cent (Lassoued, 2018). In the other specifications for the Islamic banks, it has been found that, when using the random effects regressions and OLS techniques, there is a significant, positive impact on the Z-scores at the one-per-cent level respectively. Such econometric findings indicate that the requirements for the conventional banks display the significant, positive ties to the z-scores. The impact of profitability has explained a lot of the variation in the z-scores, hence, the researchers can clearly conclude a link between profitability and stability.

Based on Shkodra and Ismajli (2017), the t-test results of inefficiency (IE), equity return (ROE), asset return (ROA), credit risk (CR) and loan-to-deposit ratio (LDR) are significantly correlated at the level

of analytical importance of less than 5 per cent. The linear combination of the predictor variables has formed the regression equation in the model that provides the 31.27 per-cent R-squared, which explains the credit-risk variance. In the meantime, they have also found that the ROE-and-CR correlation is optimistic and meaningful but not for the ROA.

Meanwhile, findings by Ferreira (2020) have supported the presence of banks' inefficiency, which is primarily caused by the ineffective managerial performance and poor combinations of bank inputs and outputs. Banks' inefficiency is vital during this time since the European Union nations have faced financial imbalances and fiscal imbalances. Certain governments have even been compelled to seek foreign financial help to overcome severe financial and sovereign crises. Findings from Lahuddin and Viverita (2017) have also found that banks' inefficiency adds to the increase in credit risk, except in low- and middle-income nations. This situation is consistent with the flawed-management theory, which states that a bank's failure to decrease inefficiency increases credit risk. Loan-loss provision and exchange rate have a substantial impact on a credit-risk increase.

In the meantime, a loan-to-deposit ratio is a frequently used metric for evaluating a bank's liquidity. It is calculated by dividing the bank's total loans by its total deposits. The bank's insufficient liquidity to satisfy any unforeseen fund requirements is referred to as a high ratio (Islam & Rana, 2017). If the ratio is excessively low, it could suggest a lack of lending opportunities or unwillingness to accept the risks that are offered. Technically, a study done by Le et al. (2021) has found that lagged credit risk, profitability, and inflation have positive effects on credit risk, while bank capital, bank size, economic growth, and loan-to-deposit ratio have negative ones.

Inflation is one of the factors known to be a macroeconomic variable. According to Espinoza and Prasad (2010), the recent financial crisis has acknowledged the importance of macroeconomic engagement with the stability of banking systems. The macroeconomic shocks will make those banks with a higher level of non-performing loans more vulnerable. Based on some studies, it has been found that inflation and non-performing loans have a strong, positive relation. The results have shown that, as high inflation, falling exchange rates, and unemployment increase, the amount of non-performing loans tends to increase (Klein, 2013).

In an investigation of changes in the exchange rate, the results have led to the mixed implications of non-performing loans (Chaibi & Ftiti, 2015; Nkusu, 2011). As an improvement in the value of a home currency, the situation would diminish the competitive advantage of companies conducting foreign-trade activities. For example, an increase in the market interest rate will directly raise bank returns and result in a substantial increase in credit risk. High-interest rates would deter borrowers from repaying their loans, thereby, lead to the borrowers' risk composition to move to bad risks (Bohachova, 2008). According to Castro (2013), it is also favorably influenced by a rise in the real exchange rate. Furthermore, there has been evidence of a significant increase in credit risk during the current financial crisis. A study conducted by Chaibi and Ftiti (2015) has shown that a relationship between interest rate and non-performing loans is positive due to the increase in the debt burden of borrowers as interest rates rise, thereby, weakens the debt-service ability of the borrowers, resulting in a higher rate of the non-performing loans and an increase in credit danger.

Methods

Research Design

A set of 453-observation sample size from 2009 until 2019 (monthly-basis) has been derived from the Thomson Reuters Eikon database, which has involved the independent variables, namely profitability (return on asset and return on equities), banks' inefficiency, loan-to-deposit ratio, and credit rates (inflation rate and exchange rate), while the dependent variable is credit risk as a robust measurement for credit performance. This study has been conducted at the 16 Islamic banks and 26 commercial banks in Malaysia by using a multivariate panel regression model. All the data had been collected and analysed by using STATA, and the correlation analysis and Breusch-Pagan Test were then carried out. Since the p-value is significant, the researchers have proceeded to analyzing by using the Random Effect (RE)

panel data. The Random Effects Model (REM) is a statistical model in which some of the parameters (effects) that define the systematic components of the model exhibit some forms of random variation. This model has been used in the panel analysis of the hierarchical or panel data to assume that there are no fixed effects from all the parameters used. In other words, it allows individual effects to happen. Besides, it has also been used to identify individual characteristics for each observation in the sample.

The variables descriptions are as follows:

- CR : Credit risk (percentage)
- ROA : Return on asset (percentage)
- ROE : Return on equities (percentage)
- IE : Banks' inefficiency (percentage)
- LDR : Loan-to-deposit ratio (percentage)
- INF : Inflation rate (percentage)
- ER : Exchange rate (percentage)

Research Framework

The discussion of this paper focuses on the determination of credit risk towards return on assets, return on equities, banks' inefficiency, loan-to-deposit ratio, inflation rate, and exchange rate towards credit risk. Figure 1 below shows the research framework of this study.

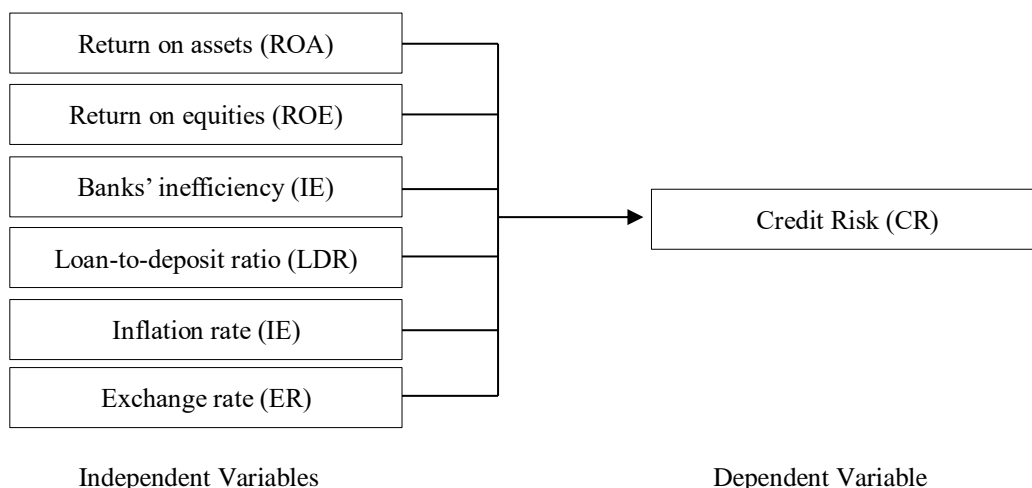


Figure 1: Research Framework

Result and Discussion

This section illustrates the results and interpretation of the relationship between credit risk and the six (6) indicators employed in this study and discusses the output of the results.

Table 1 shows the summary of the data used in the present study, which refers to the dependent and independent variables and their analyses. The average value of credit risk in the Malaysian Islamic and commercial banks is 0.7737 units or 0.77 per cent of credit risk for the past eleven (11) years. At the same time, it should be noted that the return in equity records the highest standard deviation, which is 43.3282 times, indicating that return on equity has the highest variability of data. In contrast, the least variability is recorded by credit risk, which proves to be the most stable one. Most of the variables examined show positive mean values, therefore, the data have minor variability because the standard deviation of the dependent variable is higher than its mean value.

In addition, Table 1 also demonstrates that the maximum value of credit risk is 3.3766, while the minimum value is 0. The maximum values for the independent variables, abbreviated as ROA, ROE, IE, LDR, INF, and ER, are 94.8019, 458.2218, 100, 3.871, 4.3, and 4.3 respectively. However, the minimum values for ROA and ROE are -5.2977 and -38.2651, and 0 values for IE, LDR, IF, and ER

respectively. Meanwhile, skewness is an analysis used to measure the symmetry of the variables. The positive value of the data shown is skewed to the right and vice versa. Based on the analysis, it is observed that ROA, ROE, IE, and LDR are skewed to the right due to their positive values, while CR, INF, and ER are skewed to the left as resulted by their negative values.

Table 1. Statistical Description of the Study Variables

	CR	ROA	ROE	IE	LDR	INF	ER
Mean	0.7737	2.3336	18.1218	28.6410	0.6344	1.9969	3.2456
Medium	0.9037	1.0940	11.7864	37.8000	0.7100	2.0910	3.2730
Maximum	3.3766	94.8091	458.2218	100.000	3.8710	4.3000	4.3000
Minimum	0.0000	-5.2977	-38.2651	0.0000	0.0000	0.0000	0.0000
Std. Deviation	0.3503	8.6789	43.3282	25.8154	0.5642	1.1500	1.1170
Skewness	-0.1513	7.7606	6.4313	0.0479	2.2229	-0.0230	-2.0654
Kurtosis	11.2428	68.1885	50.2633	1.4639	11.9541	2.1365	6.6686

Obs = 453

Groups = 42

Note: Credit Risk (CR), Return on Asset (ROA), Return on Equity (ROE), Inefficiency (IE), Loan-to-Deposit Ratio (LDR), Inflation, (INF), and Exchange Rate (ER)

The results shown in Table 2 reveal an association between the variables analyzed by using the correlation matrix. The correlation matrix has been applied to assess the correlation among the variables, either in a positive or negative direction. It indicates that those variables have a parallel relationship, where if one variable either increases or decreases, the other variables will increase or decrease in parallel. In addition, the correlation analysis among the variables can also be used to detect the existence of the problem of multicollinearity. However, the results in Table 2 show that the multicollinearity problem does not exist because the correlation coefficients for all the variables are less than 0.5. Looking at the final results, it is evident that credit risk is positively correlated with all the variables as they move in the same direction (Bohachova, 2008; Castro, 2013; Espinoza & Prasad, 2010; Ferreira, 2020; Klein, 2013; Lahuddin & Viverita, 2017; Lassoued, 2018; Nkusu, 2011). The results also show that IE and ER have a high correlation with CR.

Table 2. Pearson's Correlation of the Study Variables

	CR	ROA	ROE	IE	LDR	INF	ER
CR	1.0000						
ROA	0.0820	1.0000					
ROE	0.1084	0.8379	1.0000				
IE	0.4297	0.2186	0.3356	1.0000			
LDR	0.3748	0.0974	0.1311	0.1094	1.0000		
INF	0.3806	0.0504	0.0986	0.0959	0.3806	1.0000	
ER	0.4951	0.0819	0.0898	0.2373	0.3279	0.5164	1.0000

In the interim, the variance inflation factor (VIF) has also been used to identify multicollinearity in the model as the issue has not been detected formally. According to Table 3, all the values of VIF recorded do not exceed 5. Therefore, it denotes that there is no multicollinearity problem existing in this study.

Table 3. Variation Inflation Factor (VIF)

Variable	VIF	1/VIF
ROA	3.44	0.2910
ROE	3.71	0.2691
IE	1.21	0.8267
LDR	1.21	0.8238
INF	1.48	0.6760
ER	1.48	0.6761
Mean VIF	2.09	

Based on the results displayed in Table 4, the interpretation of the relationship is explained further. $_Cons$ shows that if other variables remain constant, credit risk (CR) will increase by 0.202009. Likewise, return on asset (ROA) also shows that if credit risk increases, it will also increase ROA by 0.0024. However, if return on equity (ROE) decreases, it will decrease credit risk by 0.004768. In contrast, inefficiency (IE) shows that if credit risk increases, it will increase the inefficiency by 0.0024. Meanwhile, if loan-to-deposit ratio (LDR) increases, it will also increase credit risk by 0.123428. The same pattern goes to inflations (INF) as if credit risk increases, it will increase INF by 0.040293. The last coefficient, which is for exchange rate, is also on the same page as for every one per cent of increase in interest rate (IR), it will increase credit risk by 0.089937.

Based on the table above, it is obvious that there are insignificant readings on the t-statistic of ROA and ROE towards credit risk, which are 0.92 and -1.84 respectively. Meanwhile, IE, LDR, INF, and EF are significant towards credit risk as the t-statistic readings are more than 2. The overall readings of t-statistic show that IE is the most significant variable towards credit risk.

Table 4. Pooled Ordinary Least Square (OLS)

Variable	Coefficient	Std. error	t	P> t	95% Conf.	Interval
ROA	0.0024	0.0027	0.92	0.358	-0.0028	0.0077
ROE	-0.0010	0.0006	-1.84	0.067*	-0.0021	0.0001
IE	0.0048	0.0005	8.94	0.0000***	0.0037	0.0058
LDR	0.1234	0.0243	5.08	0.0000***	0.0757	0.1711
INF	0.0403	0.0134	3.01	0.0030***	0.0622	0.0666
ER	0.0899	0.0141	6.36	0.0000***	0.1223	0.1177
$_Cons$	0.2020	0.0406	4.98	0.0000	0.1223	0.2818
No of obs	453					
Prob (F-stats)	0.0000					
R-squared	0.4110					

Note: *, **, and *** denote significance at the 10-per-cent, 5-per-cent, and 1-per-cent significant levels respectively.

Table 5 shows the results generated by the Random Effects analysis. In light of this result, it is clear that ROE has a negative relationship with CR. By holding other variables constant, the result shows that, with a one-per-cent increase in ROA, CR would increase by 0.0074 per cent, and, in contrast, while there is a one-per-cent increase in ROE, CR would decrease by 0.0021 per cent. The effect of LDR on CR is higher than the effect on ER. Therefore, it could be assumed that LDR could be considered as

one of the crucial factors affecting the increment of credit risk in the Islamic and commercial banks in Malaysia. These results have further corroborated the findings of the studies conducted by Shkodra and Ismajli (2017), indicating that an increase in the loan-to-deposit ratio could increase the credit risk of those banks. Therefore, the Islamic and commercial banks in Malaysia should monitor their credit risks in managing the overall total assets to reduce uncertainties.

Table 5. Random Effects Results

Variable	Coefficient	Std. error	t	P> t	95% Conf.	Interval
ROA	0.0074	0.0025	2.98	0.0030***	0.0025	0.0122
ROE	-0.0021	0.0006	-3.70	0.0000***	-0.0033	-0.0010
IE	0.0049	0.0007	7.15	0.0000***	0.0036	0.0062
LDR	0.1234	0.0271	5.61	0.0000***	0.0989	0.2050
INF	0.0379	0.0134	3.01	0.0030***	0.0147	0.0611
ER	0.0853	0.0129	6.60	0.0000***	0.0600	0.1106
_Cons	0.2102	0.0405	5.20	0.0000	0.1309	0.2894
No of obs	453					
Prob (F-stats)	0.0000					
R-squared	0.4004					

Note: *, **, and *** denote significance at the 10-per-cent, 5-per-cent, and 1-per-cent significant levels respectively

Meanwhile, the other variables, such as IE, INF, and ER, are positively correlated with CR. By holding other variables constant, the coefficient of the stated variables shows that a one-per-cent increase in IE, INF, and ER would increase CR by 0.0049 per cent, 0.0379 per cent, and 0.0853 per cent respectively. These results are in line with some of the latest studies which have found a positive relationship between credit risk and those variables in both the Malaysian Islamic and commercial banks (Bohachova, 2008; Castro, 2013; Chaibi & Ftiti, 2015; Espinoza & Prasad, 2010; Ferreira, 2020; Klein, 2013; Nkusu, 2011).

In terms of the coefficient determination, the present study shows the 40.44 per cent of variation in CR, which has been simultaneously explained by the variation in all the independent variables. The low value of the R2 has to be expected because this study has used the panel data analysis, involving a different unit of analysis in the estimation. The estimated model is acceptable because the probability of F-stat = 0.000 is less than $\alpha = 0.05$. This result indicates that all the variables would jointly affect CR.

The Breusch-Pagan Test has then been carried out. The result reveals that the p-value is 0.0000 and Chi squared is 126.49. Since it is significant, the researchers have proceeded to carrying out the Random Effect (RE) panel data analysis. Table 6 below summarizes the findings of the analysis carried out in the present study.

Table 6. Summary of Analysis

Variable	Finding	Author(s)
Return on assets (ROA)	Positive and significant	Lassoued (2018)
Return on equities (ROE)	Negative and significant	Muhamad Yusuf et al. (2021), Shkodra & Ismajli (2017)
Bank's inefficiency (IE)	Positive and significant	Ferreira (2020), Lahuddin & Viverita (2017)
Loan-to-deposit ratio (LDR)	Positive and significant	Shkodra & Ismajli (2017)

Inflation rate (INF)	Positive and significant	Espinoza & Prasad (2010), Klein (2013), Le et al. (2021)
Exchange rate (ER)	Positive and significant	Bohachova (2008), Castro (2013), Chaibi & Ftiti (2015), Nkusu (2011)

Based on the analysis, the researchers have concluded that all the listed variables are statistically significant towards credit risk, except for return on equity, which has a significant, negative relationship. The most significant factor influencing the credit risks of the Islamic and conventional banks in Malaysia is the banks' inefficiency ratio (IE). It is due to the probability that the significant level of 1 per cent and z-statistic is 7.15. This finding has been proven by Shkodra and Ismajli (2017) and Lassoued (2018) who have stated that inefficiency has a positive relationship with credit risk. This means that a one-per-cent rise in banks' inefficiency collaborates with a one-per-cent increment in credit risk.

Conclusion

This study has been conducted based on examining the significant relationship between credit risks among the Islamic banks and conventional banks in Malaysia. Besides, the researchers could also answer that credit risk has an impact on the banks in Malaysia. There are many previous studies conducted in their own countries. Hence, this study has been undertaken to provide a deeper understanding on determining credit risks among the Islamic and conventional banks in Malaysia. In summary, the present study's findings have indicated that return on assets, banks' inefficiency, loan-to-deposit ratio, inflation rate, and exchange rate positively and significantly influence credit risk, while return on equity negatively and significantly influences the banks' credit risk.

A few recommendations are to be suggested as there are several gaps of knowledge in these findings that would benefit future research. Since this study has only been conducted on the Malaysian banks, future researchers with better resources and can obtain more data and they are highly advisable to conduct their studies in other countries with more independent variables incorporated to improve the effectiveness of the credit-risk determination. Hence, it is more favorable if the analysis individually tests more banks to indicate individual improvements on the banks' performances. On top of that, the researchers can also obtain different perspectives from the different countries when they find out more about the banks' credit risks in those countries. Besides, the future researchers can also add more periods of years to get better results. These suggestions are some of ways for obtaining better outcomes as analyzing the companies in the different countries would be much more interesting. Moreover, the data findings could also be contrasting with this study as the number of years are increased.

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