The Effect of Competition between Islamic and Conventional Banks on Credit Risk and Liquidity Risk: Cross Countries Analysis

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Purpose – This research aims to analyze whether competition between Islamic and conventional bank exist through credit and liquidity risk analysis. This study examines bank size and competition have a role to play. However, apart from bank size, other exogenous variables affect credit and liquidity risk, such as profitability, efficiency, diversification, and loan to asset ratio within big and small bank categories.

Furthermore, a study about liquidity risk is attractive to find significant variables to provide bank liquidity. Macroeconomic variables are used to control the country's market differences among countries.

Design/methodology/approach – Using the system Panel Data technique on 229 banks, which 159 conventional banks and 70 Islamic banks between 2013 and 2020, this paper explores the critical impact of bank size, profitability, inefficiency, and innovation on competition in the dual banking system and the effect to the credit and liquidity risk in 16 countries covers developed and developing countries.

Findings – On the total sample basis, we found that efficiency, profitability, and loan to asset ratio affect the banks' credit risk in the dual banking system. On the other hand, profitability and efficiency seem to decrease credit risk. Thus loan to asset ratio is reducing as well. The influence of profitability and efficiency seem to be similar in both large and small bank samples. We found that only in the big bank sample can distinguish behavior between Islamic and conventional banks. Islamic big banks are found to be less risky as compared to their traditional counterparts. The results are robust for different panel data estimation models and sub-samples of varying size groups. The findings of this paper provide essential insights into the competition-credit risk and liquidity risk relation in the dual banking system.

Originality/value – The paper is focused on credit risk and liquidity risk in the dual banking environment and fill the gap in the literature by studying (1) does the competition between the conventional bank and Islamic bank exist, does the competition is in the matter of a niche market or the asset size, (2) is there any effect to credit risk and liquidity risk (3) do profitability, efficiency, size, innovation affects to credit risk and liquidity risk for conventional and Islamic bank (4) do the big, and small banks exhibit similar behaviors on credit and liquidity risk. (5) do Gross Domestic Product (GDP), Inflation, and Crisis affect credit and liquidity risk?

Keywords: credit risk, liquidity risk, competition, the dual banking system.

I. Introduction

Bank competition always becomes an exciting discussion related to economic growth and financial stability. Competition between conventional and Islamic banks in the world can be a balanced competition in the sense that both compete in the same market and fight for the same market share. However, the competition between the two types of banks can also mean that both compete for different market shares. A group of people who can only serve by Islamic banks could be a market niche for Islamic banks, where this market difference is a form of unbalanced competition.

Essentially, there are differences between conventional and Islamic banks, including in Islamic banks, the principles adopted are equity, participation, and ownership. Those activities have to be free from riba, gharar, and maysir. Riba is above the principal amount of loans, deposits, and other financial transactions. Gharar means 'uncertainty' or ownership is unclear, or the characteristics of the commodity are not specific. Maysir means speculation and gambling.

In the middle time of a crisis, it is essential to study bank behavior and its impact on the banking risk. The performance of Islamic banking from the previous studies yield different conclusions. Islamic banks have better performance than conventional banks, especially during a crisis (Beck et al., 2013). Islamic banks have better asset quality. Thus, Islamic banks have better capitalization and are resistant to crisis; However, Albaity et al. (2019) had contradictory results Islamic banks are very vulnerable to competition and not competitive compared to the conventional rivals. Competition erodes Islamic banks' Return on Assets (ROA) and Return on Equity (ROE), reducing financial performance.

Since Islamic banking has become a significant component in many developing countries (Ibrahim and Alam, 2017; Akhtar et al., 2017; Azmi et al., 2019), it is essential to explore the extent of credit and liquidity risk in these dual banking economies. Credit risk, which is the potential loss of principal due to borrowers' failure, is one of the most critical risks banks encounter and has been accepted as the main reason for many banking crisis in developing economies (Demirguç-Kunt and Detragiache, 2005). Liquidity risk is the inability of the banks to fund assets and pay their obligations as they due dated (Ghenimi *et al*, 2020). Adalsteionsson (2014) stated that this risk could perhaps be much more important than other types of banking risks as it can may cause insolvency issue or "bank rush".

This paper attempts to fill the gap in the empirical literature on Islamic banking. To our knowledge, it is the first paper to provide a cross-country empirical analysis of the effect of competition between conventional and Islamic banks on credit and liquidity risk in developed and developing countries. Examining the issue in a cross-country context, moreover in developed and developing countries, is vital because the data on Islamic banks in a single country is insufficient to distinguish the impact of Islamic banks from other factors that affect financial stability. The use of cross-country data requires adjustment for country-specific factors, but this is possible because the number of observations is sufficient for the analysis.

II. Literature Review
2.1 Credit Risk

Study about competition between conventional and Islamic banks analyzing a competitor because both compete in the same or different playing field. Islamic banks, with their specialization, can create niche market with the majority Muslim population in some countries, there is exist an unequal competitive market.

Differences between conventional and Islamic banks basically in "the principal amount." Islamic bank based on equity, participation, and ownership allows all transactions free from Riba, Gharar, Maysir. These Islamic ethics in that transactions prohibit above the principal amount of loans, deposits, and other financial transactions. In addition, it may not contain 'uncertainty' or ownership is unclear or suspicious or characteristics of the commodity are not sure. Moreover, speculation and gambling transactions are also prohibited in the Islamic principle.

Fakhrunnas, *et.al* 2018, found that the banks' risk-taking behavior in Indonesia during 2010-2017 has a long-term relationship with macroeconomic factors. Mansor H. Ibrahim (2016) studied bank lending behavior over the business cycle in a dual banking system using 21 conventional banks and 16 Islamic banks in Malaysia from 2001–2013. The study found that the aggregate loans by banks to be pro-cyclical in conformity with existing studies. When we segregate the conventional and Islamic banks, the cyclicality of bank lending seems true only for conventional banks. The Islamic banks can even be counter-cyclical in their financing decisions. Islamic banks can stabilize credit. To investigate whether Islamic banks take excessive risk-taking actions during a crisis is essential. From a panel sample of 25 Islamic banks and 114 conventional banks from 10 dual-banking countries, Islamic banks show sustainable financing while conventional banks decline credit during the crisis period. Furthermore, the credit growth of Islamic banks was higher than that of conventional banks during the crisis period (Ibrahim and Rizvi2017).

Hakim and Chkir, 2018, investigate the market structure and the degree of concentration of the Islamic banking industry in the Gulf Cooperation Council (GCC) during 2005–2010. The result shows that the conventional banking industry is more concentrated than the Islamic banking industry. Further, the measure of the market structure of Islamic and conventional banking is almost similar regarding total deposits and total loans. In general, conventional banking in the region operates under perfect competition. However, the market structure in the Islamic banking industry is mostly a monopoly study. Muhamad *et al.* (2018) evaluated the degree of competition whether Islamic banks can cope with competition from conventional rivals with the period of 1997-2016 in Malaysia present the results that the level of competition in Islamic banking is more intense than the level of competition in conventional Islamic banking. It means that Islamic banks can compete with conventional counterparts.

According to Kabir et.al (2015), total assets impact to credit risk in a positive significant relationship when credit risk was measured by both Distance to Default and Z-score methods and in a negative relationship when credit risk was measured by NPL, this indicates that an increase in asset could reduce the credit risk. Further, Islamic banks have significantly lower credit risk than conventional banks when measured by the distance-to-default method. Ahmed, Naveed; Akhtar, Muhammad Farhan; et al. (2011) stated that the association between the size and credit risk of Islamic bank have statistically positive significant. The study covered Islamic bank in Pakistan from periode of 2006-2009. Faaza Fakhrunnas *et al.* , 2018 found that risk-taking behavior of the bank risk mitigation related to bank size from Indonesia data banks during 2010-2017. The empirical evidence covering 18 banking systems found that small Islamic banks tend to be financially more robust than conventional banks regarding bank size. Large conventional banks tend to be financially stronger than Islamic banks (Martin Čihák and

Heiko Hesse, 2008). Furthermore, Capital Adequacy Ratio (CAR) is crucial in undertaking unexpected losses that might occur (Athanasoglou et al., 2008). In this regard, Hassan et al. (2011), Hassan and Chowdhury (2010), and Grais and Kulathunga (2007) argue that the capital adequacy ratio serves as an essential buffer against insolvency.

Gonzalez et al. (2017) analyzed the relationship between competition and banks' risk-taking behavior in the MENA region during 2005–2012. The study found that a U-shaped relationship between competition and risk-taking for the banks in the MENA region. Banks with higher ROA are associated with higher growth and are resilient to adverse shocks. Further, it could be negatively related to credit risk (Gulati *et al.*, 2019). The Return on Asset (ROA) have positive association with credit risk when it was measured by both Z-score and distance-to-default as the proxy and statistically has highly negative relationship with Non Performing Loan (NPL), indicating that profitable banks have lower credit risk, and better skill of risk management at the same time.. Moreover, the cost to income ratio has a negative correlation with credit risk when it was measured by both distance-to-default and the Z-score method and a positive correlation with both distance-to-default and NPL (Kabir *et al.*, 2015). Positive significant association also found between the size of Islamic bank in Pakistan and credit risk during 2006-2009. Regarding to the growth of assets and loan to asset ratios, they added that these variables have negative correlation with credit risk when it measured by Z-score and NPL, and have positive correlation when credit risk measured by Distance to Default method.

2.2 Liquidity Risk

Sahyouni and Wang (2018) used a panel data set of 4995 banks across 11 developed and emerging countries (2011-2015). The results show evidence of increased creation of liquidity over the period. By applying the panel data fixed effect technique, banks that create more liquidity are set up to have lower profitability. According to a study by Naveed, *et al.* (2011), there is a statistically significant positive association between the size of Islamic banks in Pakistan from 2006-2009 and financial risks such as liquidity risks. Still, the management of assets establishes a significant positive association with liquidity and operational risks. Capital adequacy has a negative and significant association with credit and operational risks, whereas it is positive and with liquidity risk.

Based on study by Akhtar, *et al.* (2011) conventional banks have preferable profitability management, return on assets, and lower liquidity risk than Islamic banks. Association between NPL, bank size, asset management, Capital Adequacy Ratio (CAR) is significant positive, but has significant negative association with liquidity risk. Furthermore, there is significant positive relationship between liquidity risk, and bank size, CAR, ROA, ROE, in both banking system whilst, NPL is found negative significant relationship in both banking system in Pakistan samples (Iqbal, 2012). Furthermore, Megeid (2017) found that conventional banks have a positive relation with loan quality, asset quality, funding and liquidity variables. For the Islamic banks, the loan and funding quality have positive relationship with loan quality, while, they have negative relation to asset and liquidity quality.

Regarding competition between conventional and Islamic in dual banking system, Bitar & Walker (2018) stated that the rapid growth of banking product development through private banking sectors improvement, foreign competition openness, and latest financial reforms adoption, put pressure on Islamic banks. It leads more spending on Islamic bank's research and development, as well as on employee training. This have to be considered regarding inefficiency issue. The development of this new Islamic banking products tends to be time taking, due to products required approval from the Shari'a board, not only have to comply with international standard but also Islamic boards which will escalate the costs of their compliance in the expense of Islamic banks efficiency scores. In addition, Islamic banks are smaller and less experienced, less proficient of taking benefit from economies of scale than their

conventional counterparts. Because of that reason Islamic banks become more deficient in efficiency than conventional banks. Due to this condition, they are motivated to keep higher liquidity ratios, which can assist them counter liquidity shortage and dissociate them from the externalities of the financial crisis. At the same time, inefficiency in resources management could be another reason for maintaining higher liquidity reserves.

2.3 Competition

Theoretically, the relationship between bank competition and risk is determined by bank ability to mitigate risk (Beck et al., 2013). If bank competition is rise, banks expected to mitigate risk in order to compete in the market. Demsetz (1973) defined that competition will increase efficiency and reduce risk. Banks will perform better by applying efficiency so that they able to adapt and mitigate risk in the face of competition. Banks will be more prepared in competitive market.

However, there are several empirical arguments which state that the above premise results in ambiguous research. For example, the theory of Anginer and Demirguc-Kunt (2014) stated that competition increases bank risk. Competition without strong regulations will lead to unfair competition due to experience liquidity problems and information shocks. In crisis conditions, the risk of banks will suddenly increase. Moreover, if in the systemic crisis, the banking risk will be higher than that of a non-systemic crisis. This systemic crisis is indicated by the decline in bank equity. If the bank's equity continues to decline, it is indicated that bank which have not sufficient portfolio to finance its activities (Battiston et al., 2012). For that reason, within the crisis, competition will increase bank risks.

Referring to previous empirical results on the same topic as Ali et al., (2021) showed that competition will reduce credit risk. In the context of bank size, Islamic banks with large assets have less risk than conventional banks with the same asset category. Meanwhile, Islamic banks with small asset categories have a greater risk than conventional banks in the same category. This research strengthens the results of research from Beck et al., (2013) that Islamic banks have a smaller risk than conventional banks. In the context of the crisis, Ali et al., (2021) also stated that Islamic banks are more resilient in times of crisis than conventional banks. Credit risk proxied by non-performing loans of Islamic banks is better than that of conventional banks. This indicates that during the crisis Islamic banks are relatively more resilient than conventional banks.

2.4 Lerner Index

The Lerner index determines the level to which the index price charged by a corporate in a market deviation from the price that occurs in perfect competition. This explains that the calculation as the difference between actual price and marginal cost, divided by price. Lerner index converges to zero as competition increases, meanwhile will goes up one as the corporates' market power becomes greater. In the term of banking, the Lerner index captures the mark-up of banks charge by calculating the difference between credit and marginal interest rates cost and express it as a proportion of the former. Thus, it is a direct measure of competition.

Learner index is a measurement value to assess the ability and competitiveness of banks in keeping the price of their products within the margin of safety. The marginal cost itself can be obtained from the observation of three cost factors, namely, the cost of human resources, the cost of physical capital, and the cost of funds (Boone, 2008). Shows the learner index at the country level with consistency in producing above the level of competition because it affects how aggressively the company behaves then bank margin costs are also sensitive to macroeconomic conditions (Carbo et al., 2009)

Despite the Lerner Index's theoretical advantages, relatives discuss the competition between conventional and Islamic and banks. The first objective of our studies is to investigate whether banking sector development or country banking sector stability influence the association between bank stability and competition. We took banks sample from developed countries such as Europe and emerging economies such as the Middle East, North Africa, and East Asia. The second objective is to investigate whether Ali *et al*. (2020) model supports the latest data by applying broader data coverage and additional variables such as liquidity risk.

2.5. Crisis

During the pandemic covid-19 crisis, the context of crisis becomes even more crucial due to economic performance is affected from two sides, namely production and consumption. Guerrierri *et al*., (2020) stated that the current pandemic crisis has an impact on two sides, namely a decrease in purchasing power due to a decrease in productivity cause of physical distancing. For that reason, the community experienced a significant decrease in consumption which caused the supply side to be affected suddenly. This is known as Negative Supply Shocks Cause Demand Shortages. Naturally, this productivity lowering due to a decrease in demand side. Bank debtors who experiencing revenue problems thereby rise credit risk. For exception, if there are any bailout regulations in the form of interest subsidies or credit restructuring policy which reduce credit risk with the assumption that debtors have a good momentum after the policy of contra-cyclical end. If this assumption is not fulfilled, the bank's credit risk will increase significantly. From the previous empirical evidence, Islamic banks would more resistant to crises than conventional banks. However, at the covid-19 crisis, empirical evidence from previous studies such as Ali *et al*., (2021), Albaity *et al*., (2019), Beck *et al*., (2013) might generate different result.

III. Data and Methodology

3.1. Data

The research uses data from 229 banks that represent a sample of banking in three different world regions, namely the group of developed countries, the group of countries of the Middle East and North Africa (MENA), and the group of countries of the Association of Southeast Asian Nations (ASEAN). Sample from a group of developed countries, namely Germany and the United Kingdom, a group of Gulf Cooperation Council (GCC) member countries in the Middle East and North Africa (MENA) region represented by nine countries namely: Bahrain, United Arab Emirates, Qatar, Saudi Arabia, Oman, Jordan, Kuwait, Lebanon and Turkey; and the group of ASEAN countries is represented by five countries namely Indonesia, Malaysia, Singapore, Thailand, and Philippine.

Period data are from 2013-2020 yearly. Based on the type of bank, 229 banks will be analyzed, consisting of 159 conventional banks and 70 Islamic banks. This study uses Bank focus data, and Indonesia Financial Service Authority (OJK)'s data. Macroeconomic data is processed from the World Development Indicator from the World Bank.

3.2. Variables

Following Ali *et.al* (2020) a proxy for credit risk used the ratio of non-performing loan to gross loan (NPLs). NPL is a bank loan with subject to late repayment, the higher NPL means higher unpaid bank loan and shows the higher bank credit risk. This study considers two different groups of variables to address credit risk in dual banking. The first group includes bank-specific variables. For credit risk are Cost inefficiency (INEFF), Diversification (NONIT), Profitability (ROA), Bank Size (LnTA), and loan ratio (GLTA). Cost inefficiency generated by dividing the operating expense to total assets. Cost inefficiency is important to determine bank risk. According to Chaibi and Ftiti (2015) the cost-efficiency ratio reflect to the cost of inefficiency is measured by the ratio of operating expenses (i.e. non-interest expenses) to total assets. Income diversification (NONIT) derived from non-interest income divided by total income (Gulati et. al, 2019). Return on Assets (ROA) as provided Net Income divided by Total Asset supposed to have negative relationship to credit risk (Kabir et al, 2015) and positive relationship to liquidity risk (Iqbal, 2012). Based on Cihak and Hesse (2018) 's calculation to control the bank size, using the log of total asset. To control the degree of bank lending we use gross loans to total assets (GLTA) (Rashid *el al*., 2017).

Bank specific variables for liquidity risk are Equity to Total Asset Ratio (Eqtas), Loan Loss Provision (LLP), Off Balance Sheet (OBS), Bank Size (LnTA), Loan ratio (GLTA) and Capital Adequacy Ratio (CAR). Equity to Total Asset Ratio derived from the ratio of total equity to total Asset. LLP is approximated by dividing loan loss provision to average loans outstanding (Pool, 2015) . Off Balance Asset (OBS) is defined by assets or liabilities that do not appear on a bank's balance sheet. It is argued that the larger OBS owned by the bank, they relatively have high level of liquidity risk (Megeid, 2017). Capital Adequacy Ratio as a measurement of bank's available capital to support bank's operationalization supposed to have significant negative relationship with liquidity risk (Akhtar el al., 2011).

Table 1. Definition and Source of The Variables

Variables	Definition	Source
Dependent Variables		
Non-Performing Loans	The ratio of non-performing loan or financing to total loan or financing on a yearly basis	Bank Focus and OJK's database
Loan to Deposit Ratio	The ratio of loan to total deposit	Bank Focus and OJK's database

Bank Specific Variables		
Cost (in)efficiency (INEFF)	Operating Expense/Total Assets	Author's calculation
Diversification (NONIT)	Non-interest income/Total income	Author's calculation
Profitability (ROA)	Net Income/Total Assets	Bank Focus and OJK's database
Bank Size (LnTA)	Natural log of Total Assets	Bank Focus and OJK's database
Loan ratio (GLTA)	Gross loans/Total Assets	Bank Focus and OJK's database
Equity to Total Asset Ratio (Eqtas)	The ratio of total equity to Total Asset	Author's calculation
Loan Loss Provision (LLP)	loan loss provision/average loans outstanding	Bank Focus and OJK's database
Off Balance Sheet (OBS	assets or liabilities that do not appear on a company's balance sheet	Bank Focus and OJK's database
Capital Adequacy Ratio	measurement of a bank's available capital	Bank Focus and OJK's database
Lerner Index	An estimate of banking competition	Author's calculation
Islamic	Dummy variable, equal to 1 for the Islamic bank and 0 for the conventional bank	Author's calculation
Crisis	Dummy variable, equal to 1 for year 2020 and 0 for other wise	Author's calculation
Macroeconomic Variables		
GDP real growth rate (GDPgs)	Annual GDP real growth rate	Bank Focus and World Development Indicator (WDI)
Inflation (INFs)	Annual inflation rate	Bank Focus and WDI

As the proxy of market competition, Lerner Index has been used in this study. This variable supposed to have significant and positive impact on banking stability (Louati, 2016). The estimation for Lerner Index is approximated as:

$$L_{it} = \frac{P_{it} - MC_{it}}{P_{it}}$$

The result of Lerner Index data for some sample bank in developed countries, MENA and ASEAN as shown in table 16 until table 18.

3.3. Methodology

This study uses the panel data estimator to measure what variables drive the credit and liquidity risk in dual banking system countries. The panel of Credit Risk equation based on Ali *et al.* (2020), the differences from previous that Ali *et al.* (2020) used the generalized method of moment estimator, but this research used panel data method, then this paper used latest data beside the wider coverage of research areas including developed and developing countries and covering liquidity risk model despite of credit risk which the liquidity model used the writer own model.

The following equation model is used to answer the research question:

Panel Equation for Credit Risk:

$$Y_{it} = \alpha_0 + \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 x_{3it} + \beta_4 x_{4it} + \beta_5 x_{5it} + \beta_6 x_{6it} + \beta_7 Dummy + \beta_8 Macro_{jt} + e_{it}$$

In the equation for credit risk above i indicates bank, t indicates the year and j indicates the country. Y represents NPL, X_1 represents INEFF, X_2 represents NONIT, X_3 represents ROA, X_4 represents lnTA, X_5 represents GLTA, and X_6 represents Lerner Index. Dummy represent dummy variable, Islamic and crisis. Macro represents Macroeconomics variable, GDP growth and Inflation rate and finally e_{it} represents error term.

Panel Equation for Liquidity Risk:

$$Y_{it} = \alpha_0 + \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 x_{3it} + \beta_4 x_{4it} + \beta_5 x_{5it} + \beta_6 x_{6it} + \beta_7 x_{7it} + \beta_8 Dummy + \beta_9 Macro_{jt} + e_{it}$$

In the equation for liquidity risk above i indicates bank, t indicates the year and j indicates the country. Y represents LDR, X_1 represents Equity to Total Asset (EqTas), X_2 represents LLP, X_3 represents OBS, X_4 represents lnTA, X_5 represents CAR, X_6 represents GLTA and X_7 represents Lerner Index. Dummy represents dummy variable, Islamic and crisis. Macro represents Macroeconomics variable, GDP growth and Inflation rate and finally, e represents error term.

IV. Result and Analysis

4.1 Descriptive statistics

Descriptive Statistics shows in the table below:

Table 2. Descriptive Statistics

	Mean	Std. dev.
NPLs	4.6875	8.1324
LDRs	0.9509	0.4729
eqTas	0.1369	0.1106
LLPs	-5.1819	366.702
OBS	10.4317	120.641
INEFFs	0.0226	0.0207
ROAs	0.8475	1.9645
lnTAs	15.3407	2.784
NONITs	0.0968	0.1723
Lis	0.4692	0.4239
GLTAs	0.5834	0.1791
GDPgs	2.2043	4.3654
INFs	3.2343	8.234

Table 3. Results NPL from Panel Data (Full Bank)

VARIABLES	(1) NPLs	(2) NPLs
INEFFs	64.1205***	64.1597***
	(27.2216)	(27.1834)
NONITs	-0.8600	-0.8586
	(1.8371)	(1.8370)
ROAs	-0.8091***	-0.8076***
	(0.2815)	(0.2820)
lnTAs	-0.2180	-0.2164
	(0.1842)	(0.1836)
GLTAs	-10.9986*	-11.0103*
	(6.2479)	(6.2341)
GDPgs	-0.0879*	-0.0679
	(0.0525)	(0.0733)
INFs	0.0729***	0.0739***
	(0.0410)	(0.0265)
LIs	1.8253*	1.8076*
	(1.0097)	(1.0184)
D_Islamic	-0.1225	-0.1243
	(1.2835)	(1.2849)
D_Crisis		0.3023
		(0.6035)
Constant	13.2851***	13.2864***
	(5.3634)	5.4153
Observations	1761	1761

	Number of gid	224	224

Table 4. Results NPL from Panel Data (Big Bank)

VARIABLES	(1) NPLs	(2) NPLs
INEFFs	48.6463**	48.6051**
	(21.1194)	(21.1538)
NONITs	-0.1939	-0.1958
	(1.3999)	(1.4265)
ROAs	-1.8426***	-1.8433***
	(0.4983)	(0.4957)
lnTAs	-0.5561***	-0.5562***
	(0.1818)	(0.1819)
GLTAs	-1.8923	-1.8935
	(4.4317)	(4.4289)
GDPgs	-0.0458	-0.0463
	(0.0432)	(0.0585)
INFs	0.0789***	0.0788***
	(0.0291)	(0.0287)
LIs	3.2637*	3.2686*
	(1.8179)	(1.8723)
D_Islamic	-1.9946**	-1.9940**
	(0.9585)	(0.9649)
D_Crisis		-0.0085
		(0.4027)
Constant	14.1381***	14.1412***
	(2.7796)	(2.7834)
Observations	1379	1379
Number of gid	183	183

Standard errors in parentheses

Table 5. Results NPL from Panel Data (Small Bank)

VARIABLES	(1) NPLs	(2) NPLs
INEFFs	80.2832**	80.7534**
	(40.0608)	(40.3825)
NONITs	-2.9277	-2.8492
	(5.4080)	(5.3915)
ROAs	-0.6608**	-0.6564**
	(0.3282)	(0.3253)
lnTAs	0.1109	0.1234
	(0.6210)	(0.6224)
GLTAs	-26.3961**	-26.2162**
	(11.6152)	(6.1968)
GDPgs	-0.0336	-0.1166

	(0.1637)	(0.3574)
INFs	0.0666	0.0609
	(0.0565)	(0.0700)
LIs	2.9256***	2.9662**
	(1.1154)	(1.1599)
D_Islamic	3.5352	3.4589
	(4.0948)	(4.1296)
D_Crisis		-1.1028
		(3.1571)
Constant	15.9187	16.1191
	(10.9295)	(11.0930)
Observations	382	382
Number of gid	59	59

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Credit Risk

This study uses two regression estimates on credit risk. The results of both estimations exhibit no significant difference. The model is estimated based on panel data with stable coefficient values between variables. The Sargan test shows that it has no correlation and is valid for the model. The model is free from over-identification and correctly defined. In addition, the AR test demonstrates the consistency of the estimators.

The test results and literature show that cost efficiency (INEFF) positively correlates with credit risk. These results are in line with the previous research by Ali *et al*. (2020). Based on this result, banks with higher efficiency levels can reduce operational costs, saving resources set aside for the screening and monitoring process of lending. Profitability (ROA) is significant in decreasing credit risk. This argument follows the research results of Ali *et al*. (2020) and Alam Nafis et al. (2018). Good profitability enables banks to deal with sound risk management and improves human resources' system and quality. Banks that experience losses tend to have high credit risk because they cannot improve their systems to prevent credit risk.

Gross Loan to Total Asset (GLTA) is a proxy to indicate bankability in converting an asset to a loan. Credit risk is affected by GLTA as well. The empirical study found that the increase in GLTA has a significant adverse effect on NPL in whole and separated sample banks. Meanwhile, in big banks, the rise in GLTA does not affect the increase in credit risk because big banks tend to maximize the financing system and human resources to reduce credit risk. The more loans disbursed by full and small banks be able to decrease credit risk. In small banks decreasing credit risk significantly through improving loan asset ratio. However, increasing lending is necessarily accompanied by enhancing the supervisory and trouble management system in loans. At a point of the increasing loan, the asset ratio will be insufficient to decrease credit risk. This phenomenon exhibits an insignificant bank sample.

We used the Lerner index to investigate whether competition and market concentration of the bank sample could distinguish dual system banks due to credit risk. Even though market competition in a single country is different, the market competition can increase teach bank market power. This study found that the Lerner index has a significant positive effect on increasing credit risk, strengthening the results of the previous research by Ali et al. (2020). The Lerner coefficient, which is -1 < 0 < 1, means that the lower the level of competition in the banking system, the higher the bank's credit risk and vice versa. As a competitive stability indicator proposed by Boyd and De Nicolo (2005), we can indicate the Lerner Index has a good

indicator in the dual banking economy. This view shows that competition between banks can reduce interest rates. When a monopoly occurs, banks can increase interest rate loans in the market as desired. Therefore, the opportunity for increased risk is even more incredible. When market competition is high, banks will tend to adjust interest, leading banks to reduce credit risk.

Liquidity Risk

This research uses three estimations to examine liquidity risk with the dependent variable Loan to Deposit Ratio (LDR). The model is estimated based on panel data with stable coefficient values between variables. The Sargan test shows that it has no correlation and is valid in the formulation of the model. The p-value indicates that all models are free from over-identification and correctly defined. In addition, the AR test demonstrates the consistency of the estimators used in the specification.

Table 6. Results LDR from Panel Data (Full Bank)

VARIABLES	(1) LDRs	(2) LDRs	(3) LDRs
eqTas	2.0813***	2.1733***	2.1583***
	(0.5816)	(0.6018)	(0.6044)
LLPs	-1.25e-06	-1.17e-06	-1.99e-06
	(1.59e-06)	(1.69e-06)	(1.67e-06)
OBS	-0.00008***	-0.00009***	-0.00009***
	(0.00002)	(0.00002)	(0.00002)
lnTAs	0.0196***	0.0199***	0.0204***
	(0.0064)	(0.0062)	(0.0062)
CARs	-0.0046**	-0.0046*	-0.0045*
	(0.0023)	(0.0024)	(0.0024)
GLTAs	0.9792***	0.9667***	0.9649***
	(0.1513)	(0.1573)	(0.1577)
GDPgs	0.0021	0.0024	0.0003
	(0.0021)	(0.0021)	(0.0035)
INFs	0.0003	0.0003	0.0002
	(0.0005)	(0.0005)	(0.0006)
LIs		-0.0371*	-0.0355*
		(0.0197)	(0.0197)
D_Islamic	-0.0734	-0.0615	-0.0603
	(0.0518)	(0.0525)	(0.0523)
D_Crisis			-0.0286
			(0.0270)
Constant	-0.0826	-0.0760	-0.0753*
	(0.1496)	(0.1631)	(0.1639)
Observations	1679	1718	1718
Number of gid	215	216	216

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The study results show that the size of the bank (LNTA) has a significant positive effect on all sample banks covering full, big, and small banks, especially in the small sample banks, size

bank only affects the nor expected condition. In contrast, with additional crisis variables, the bank size does not affect the small banks. The size of bank assets no longer determines the liquidity risk. Capital is a reserve fund to prevent banks in experiences financial constraints. The more excellent capital adequacy ratio should exhibit, the smaller the liquidity risk. In this research, liquidity risk in the full sample of banks, either in normal or crisis conditions, is strongly influenced by capital. The results support the theory that the capital adequacy ratio (CAR) has a significant negative effect on increasing liquidity risk (LDR).

Table 7. Results LDR from Panel Data (Big Bank)

VARIABLES	(4) LDRs	(5) LDRs	(6) LDRs)
equal	0.9749	1.0659	1.0526
	(0.7513)	(0.7474)	(0.7510)
LLPs	2.66e-07	7.31e-07	2.81e-07
	(1.71e-06)	(1.62e-06)	(1.72e-06)
OBS	0.0868	0.0901	0.0886
	(0.0583)	(0.0578)	(0.0581)
lnTAs	0.0277**	0.0330**	0.0338***
	(0.0134)	(0.0132)	(0.0131)
CARs	-0.0013	-0.0009	-0.0008
	(0.0031)	(0.0032)	(0.0032)
GLTAs	0.9144***	0.9182***	0.9177***
	(0.2083)	(0.2086)	(0.2086)
GDPgs	0.0030	0.0040*	0.0031
	(0.0019)	(0.0020)	(0.0024)
INFs	0.0005	0.0006	0.0006
	(0.0004)	(0.0004)	(0.0004)
LIs		-0.1867**	-0.1823**
		(0.0912)	(0.0914)
D_Islamic	0.0083	0.0122	0.0131
	(0.0619)	(0.0613)	(0.0612)
D_Crisis			-0.0126
			(0.0114)
Constant	-0.1811	-0.2004	-0.2125
	(0.2544)	(0.2565)	(0.2557)
Observations	1340	1340	1340
Number of gid	176	176	176

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Financing to asset ratio (GLTA) has a significant positive effect on increasing liquidity risk (LDR). The higher the financing ratio, the greater the bank's liquidity risk. Lerner index shows a substantial adverse impact on increasing liquidity risk, especially for the total sample and big bank category. Market competition causes banks to increase market power. In big banks and full sample banks, competition is tighter than that in small banks. When banks cannot compete, it can increase bank liquidity risk. However, when market competition is low, banks will be able to reduce liquidity risk because banks can raise interest rates as desired so that the profit generated is more significant. This study found that the Off-Balance Sheet (OBS) in the liabilities side showed a significant adverse effect on liquidity risk in the full sample and small banks. OBS be able to reduce liquidity risk. However, the significant bank sample is not

significantly influenced by OBS because the operational market for big banks is much sophisticated, so the liquidity risk is higher. The macroeconomic control variables, both GDP and inflation, show that only GDP affects liquidity risk in big and small categories. In contrast, the inflation variable affects only small banks positively.

Table 8. Results LDR from Panel Data (Small Bank)

VARIABLES	(7) LDRs	(8) LDRs	(9) LDRs
eqTas	2.6252***	2.9595***	2.9786***
	(0.8563)	(0.9157)	(0.8978)
LLPs	0.00005	0.00007	0.00007
	(0.00003)	(0.00005)	(0.00005)
OBS	-0.0001***	-0.0001***	-0.0001***
	(0.00003)	(0.00003)	(0.00003)
lnTAs	0.0635**	0.0516	0.0510
	(0.0322)	(0.0342)	(0.0332)
CARs	-0.0046	-0.0023	-0.0023
	(0.0033)	(0.0026)	(0.0027)
GLTAs	1.2904***	1.3533***	1.3441***
	(0.2162)	(0.2376)	(0.2411)
GDPgs	0.0064	0.0087*	0.0103
	(0.0055)	(0.0054)	(0.0095)
INFs	0.0021	0.0028*	0.0030*
	(0.0013)	(0.0014)	(0.0017)
LIs		0.1590	0.0017
		(0.4779)	(0.0121)
D_Islamic	-0.3547***	-0.3346***	-0.3326***
	(0.1131)	(0.1212)	(0.1211)
D_Crisis			0.0150
			(0.0826)
Constant	-0.6936**	-0.7351**	-0.7347**
	(0.3041)	(0.3281)	(0.3295)
Observations	317	317	317
Number of gid	52	52	52

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Conclusion

This study aims to study the credit risk of Islamic and conventional banks in the dual banking system. According to that, we have to analyze whether bank size and competition have a role to play. On the total sample basis, we find that efficiency, profitability, and loan to asset ratio affect the credit risk of the banks in the dual banking system. On the other hand, profitability and efficiency seem to decrease credit risk. Thus, loan to asset ratio is also reducing as well. The influence of profitability and efficiency seem to be similar in both large and small bank samples. We test that the dummy of Islamic bank whether matter or not to distinguish the behavior of both banking system, we found that only in the significant bank sample, which able to determine behavior between Islamic and conventional banks. Islamic big banks are found to be less risky as compared to their conventional counterparts. Meanwhile, small bank samples exhibit no significant evidence.

On the other hand, when we study liquidity analysis, the finding is attractive, especially for the size of the bank. The coefficient has a significant and positive effect on small sample banks. In addition, in crisis conditions, the bank size no longer determines liquidity risk. It implies that small banks were more vulnerable in terms of liquidity in the crisis condition.

We find that macro-economic variables to control the country market differ significantly from the influence of total full sample and significant bank sample. However, gross to product influences to full bank sample both Islamic and conventional bank is necessary. However, in terms of liquidity risk, only GDP affects liquidity risk for big and small bank categories, while the inflation variable affects only small banks positively.

Our results have several policy implications. First, they suggest regulating competition in countries with dual banking systems and how smaller banks need from the factors that impact credit risk. This paper may propose regulatory implications as the current regulatory framework found to be more significant in increasing credit risk for small Islamic banks than their conventional counterparts. A possible reason for that could be the regulatory framework for this type of bank. A regulatory approach to enlarge the bank size could be fit for this.

Further, small banks should be protected by a regulation that prevents them from vulnerability in terms of liquidity risk. In supporting the competition-stability view, we find that the dual banking system market tends to be monopolistic in the full sample, thus exhibiting increasing credit risk. On the other hand, big and small samples tend to perfect market competition and decrease credit risk.

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Appendix

Table 9. Number of Samples

Country	Number of Sample
UK	17
Germany	9
Saudi Arabia	12
Bahrain	17
Kuwait	10
Qatar	9
Oman	6
Turkey	18
Uni Emirat Arab	13
Jordan	14
Lebanon	16
Thailand	15
Philippine	16
Indonesia	30
Singapore	8
Malaysia	22

Table 10. Matrix Multicollinearity NPLs

	NPLs	INEFFs	NONITs	ROAs	lnTAs	GLTAs	GDPgs	LIs	inf	d_crisis	d_isla~c
NPLs	1.0000										
INEFFs	0.1986	1.0000									
NONITs	0.0438	0.2354	1.0000								
ROAs	-0.2692	-0.0375	-0.1437	1.0000							
lnTAs	-0.1304	-0.3572	-0.1427	0.0134	1.0000						
GLTAs	-0.3314	-0.0206	0.0773	0.1182	0.0307	1.0000					
GDPgs	-0.0950	0.1374	0.1476	0.1743	-0.1893	0.1833	1.0000				
LIs	-0.0903	-0.1999	-0.0731	0.4267	0.1193	0.1111	0.0348	1.0000			
inf	0.1250	0.0460	0.0170	0.0249	-0.1313	-0.1284	-0.1565	-0.0221	1.0000		
d_crisis	0.0600	-0.0157	-0.0336	-0.0778	0.0295	-0.0156	-0.4825	0.0245	0.1597	1.0000	
d_islamic	-0.0233	0.0857	0.4702	-0.1541	-0.1012	0.1942	0.0265	-0.0553	-0.0907	0.0026	1.0000

Table 11. Matrix Multicollinearity LDRs

	LDRs	eqTas	LLPs	OBS	lnTAs	car	GLTAs	GDPgs	LIs	inf	d_crisis	d_isla~c
LDRs	1.0000											
eqTas	0.3052	1.0000										
LLPs	0.0271	0.0135	1.0000									
OBS	0.0188	0.0298	0.0080	1.0000								
lnTAs	0.0159	-0.2420	-0.0136	-0.2013	1.0000							
car	0.1444	0.5005	0.0039	0.0579	-0.1622	1.0000						
GLTAs	0.3157	-0.1551	0.0422	0.0560	-0.0043	-0.2059	1.0000					
GDPgs	0.2000	0.0522	0.0271	0.0534	-0.1711	0.0290	0.1994	1.0000				
LIs	-0.0249	0.0290	0.0313	0.0950	0.0816	-0.0414	0.0629	0.0097	1.0000			
inf	-0.0537	-0.0439	0.0044	0.0179	-0.1309	-0.0435	-0.1452	-0.1908	-0.0509	1.0000		
d_crisis	-0.0331	-0.0191	-0.0618	-0.0255	0.0288	0.0321	-0.0177	-0.5070	0.0208	0.1565	1.0000	
d_islamic	0.0264	-0.0350	0.0293	-0.0142	-0.0838	0.0126	0.2362	0.0505	0.0033	-0.0781	0.0050	1.0000

Table 12. Dynamic Panel Data Estimation Without Crisis

```
Dynamic panel-data estimation, two-step system GMM
```

Group variable: gid				Number of obs	=	1192
Time variable : year				Number of groups	=	190
Number of instruments = 34				Obs per group: min =		1
Wald chi2(9) = 989.15				avg =		6.27
Prob > chi2 = 0.000				max =		7

NPLs	Coefficient	Corrected std. err.	z	P>|z|	[95% conf. interval]	
NPLs						
L1.	.8292571	.1291195	6.42	0.000	.5761876	1.082327
INEFFs	3.51201	17.90197	0.20	0.844	-31.57521	38.59923
NONITs	2.552763	9.985895	0.26	0.798	-17.01923	22.12476
ROAs	-.7414596	.3895204	-1.90	0.057	-1.504905	.0219863
lnTAs	-.088199	.1092386	-0.81	0.419	-.3023027	.1259046
GLTAs	-3.414242	2.368429	-1.44	0.149	-8.056277	1.227793
GDPgs	-.003423	.060999	-0.06	0.955	-.1229788	.1161328
INFs	-.18217	.0842909	-2.16	0.031	-.3473771	-.0169629
LIs	4.001599	1.410552	2.84	0.005	1.236969	6.76623
_cons	2.770569	2.799453	0.99	0.322	-2.716258	8.257396

Table 13. Sargan and Hansen Test Without Crisis

```
Instruments for first differences equation
  Standard
    D.(INEFFs L.ROAs L.lnTAs L.GLTAs GDPgs L.LIs)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L(1/7).L.NPLs
Instruments for levels equation
  Standard
    INEFFs L.ROAs L.lnTAs L.GLTAs GDPgs L.LIs
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.L.NPLs
```

```
Arellano-Bond test for AR(1) in first differences: z = -2.33  Pr > z = 0.020
Arellano-Bond test for AR(2) in first differences: z =  1.19  Pr > z = 0.235

Sargan test of overid. restrictions: chi2(24)  = 188.44  Prob > chi2 = 0.000
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(24)  = 30.24  Prob > chi2 = 0.177
  (Robust, but weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:    chi2(18)  = 26.74  Prob > chi2 = 0.084
    Difference (null H = exogenous): chi2(6)   =  3.50  Prob > chi2 = 0.744
  iv(INEFFs L.ROAs L.lnTAs L.GLTAs GDPgs L.LIs)
    Hansen test excluding group:    chi2(18)  = 21.96  Prob > chi2 = 0.234
    Difference (null H = exogenous): chi2(6)   =  8.28  Prob > chi2 = 0.218
```

Table **14. Dynamic Panel Data Estimation With Crisis**

```
Dynamic panel-data estimation, two-step system GMM
```

Group variable: gid				Number of obs	=	995
Time variable : year				Number of groups	=	185
Number of instruments = 34				Obs per group: min =		0
Wald chi2(10) = 865.53					avg =	5.38
Prob > chi2 = 0.000					max =	6

NPLs	Coefficient	Corrected std. err.	z	P>|z|	[95% conf. interval]	
NPLs						
L1.	.8608013	.140099	6.14	0.000	.5862123	1.13539
INEFFs	-1.913751	28.00351	-0.07	0.946	-56.79961	52.97211
NONITs	2.812359	11.80452	0.24	0.812	-20.32407	25.94878
ROAs	-.7357197	.3523918	-2.09	0.037	-1.426395	-.0450445
lnTAs	-.070915	.1626893	-0.44	0.663	-.3897802	.2479502
GLTAs	-2.571423	2.476628	-1.04	0.299	-7.425524	2.282679
GDPgs	.0279393	.0873385	0.32	0.749	-.143241	.1991195
INFs	-.197834	.1065285	-1.86	0.063	-.4066261	.010958
LIs	3.674153	1.749029	2.10	0.036	.2461181	7.102187
CRISIS	.3469226	.4653081	0.75	0.456	-.5650645	1.25891
_cons	1.985626	3.728485	0.53	0.594	-5.322069	9.293322

Table 15. Sargan and Hansen Test With Crisis

```
Instruments for first differences equation
  Standard
    D.(INEFFs L.ROAs L.lnTAs L.GLTAs GDPgs L.LIs L2.CRISIS)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L(1/7).(L.NPLs CRISIS)
Instruments for levels equation
  Standard
    INEFFs L.ROAs L.lnTAs L.GLTAs GDPgs L.LIs L2.CRISIS
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.(L.NPLs CRISIS)
```

```
Arellano-Bond test for AR(1) in first differences: z =  -1.92  Pr > z =  0.054
Arellano-Bond test for AR(2) in first differences: z =   1.11  Pr > z =  0.266
```

```
Sargan test of overid. restrictions: chi2(23)  = 176.69  Prob > chi2 =  0.000
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(23)  =  30.53  Prob > chi2 =  0.135
  (Robust, but weakened by many instruments.)
```

```
Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:      chi2(16)  =  22.12  Prob > chi2 =  0.139
    Difference (null H = exogenous): chi2(7)   =   8.41  Prob > chi2 =  0.298
  iv(INEFFs L.ROAs L.lnTAs L.GLTAs GDPgs L.LIs L2.CRISIS)
    Hansen test excluding group:      chi2(17)  =  22.44  Prob > chi2 =  0.168
    Difference (null H = exogenous): chi2(6)   =   8.09  Prob > chi2 =  0.232
```

Table 16. Bank Lerner Index's in Saudi Arabia

Country	Bank Name	Year	MC	P	LIs
ARAB SAUDI	AL RAJHI BANK	2013	0.023557	0.108191	0.7823
		2014	0.023256	0.096568	0.7592
		2015	0.023460	0.095448	0.7542
		2016	0.024097	0.098253	0.7547
		2017	0.024255	0.099443	0.7561
		2018	0.023940	0.101186	0.7634
		2019	0.024597	0.107585	0.7714
		2020	0.021059	0.092700	0.7728
	ALAWWAL BANK	2013	0.030296	0.092222	0.6715
		2014	0.027623	0.090066	0.6933
		2015	0.026170	0.088207	0.7033
		2016	0.033614	0.090266	0.6276
		2017	0.027278	0.080269	0.6602
		2018	0.028518	0.080828	0.6472
		2019	0.035074	0.081540	0.5699
		2020	0.039005	0.089605	0.5647
	ALINMA BANK	2013	0.025942	0.078631	0.6701
		2014	0.024556	0.070107	0.6497
		2015	0.024593	0.075558	0.6745
		2016	0.029254	0.074390	0.6068
		2017	0.029135	0.086168	0.6619
		2018	0.031753	0.101793	0.6881
		2019	0.032347	0.099503	0.6749
		2020	0.026060	0.083794	0.6890
	ARAB NATIONAL BANK	2013	0.026554	0.082983	0.6800
		2014	0.022514	0.074628	0.6983
		2015	0.024065	0.078638	0.6940
		2016	0.029885	0.086012	0.6526
		2017	0.027828	0.090158	0.6913
		2018	0.028796	0.090084	0.6803
		2019	0.030082	0.090636	0.6681
		2020	0.023819	0.076952	0.6905
	BANK ALBILAD	2013	0.042520	0.117130	0.6370
		2014	0.042866	0.103736	0.5868
		2015	0.043684	0.100651	0.5660
		2016	0.050836	0.112926	0.5498
		2017	0.045869	0.106830	0.5706
		2018	0.045491	0.109709	0.5854
		2019	0.043243	0.107522	0.5978
		2020	0.036817	0.101316	0.6366
	BANK ALJAZIRA	2013	0.034349	0.072220	0.5244
		2014	0.036959	0.078530	0.5294
		2015	0.046873	0.113245	0.5861
		2016	0.052338	0.098793	0.4702
		2017	0.047130	0.095294	0.5054
		2018	0.045375	0.092329	0.5086
		2019	0.044044	0.089856	0.5098
		2020	0.037022	0.087735	0.5780

		2013	0.020460	0.065005	0.6853
		2014	0.019328	0.065600	0.7054
		2015	0.022193	0.075470	0.7059
	BANQUE SAUDI FRANSI	2016	0.024766	0.073569	0.6634
		2017	0.029128	0.080505	0.6382
		2018	0.029126	0.084894	0.6569
		2019	0.032198	0.092570	0.6522
		2020	0.024419	0.081605	0.7008
		2013	0.415360	1.073895	0.6132
		2014	0.418104	1.027694	0.5932
		2015	0.412690	1.117327	0.6306
	HSBC SAUDI ARABIA	2016	0.423901	0.925851	0.5422
		2017	0.333406	0.773966	0.5692
		2018	0.324238	0.691196	0.5309
		2019	0.318090	0.878519	0.6379
		2020	0.411084	1.033091	0.6021
		2013	0.022573	0.076702	0.7057
		2014	0.023287	0.082743	0.7186
		2015	0.022924	0.080052	0.7136
	RIYAD BANK	2016	0.030141	0.085645	0.6481
		2017	0.027579	0.086511	0.6812
		2018	0.029293	0.089931	0.6743
		2019	0.030210	0.094708	0.6810
		2020	0.022796	0.081703	0.7210
		2013	0.018213	0.073321	0.7516
		2014	0.017648	0.073155	0.7588
		2015	0.017648	0.071960	0.7548
	SAMBA FINANCIAL GROUP	2016	0.022222	0.075848	0.7070
		2017	0.022095	0.076701	0.7119
		2018	0.021910	0.079144	0.7232
		2019	0.024551	0.076202	0.6778
		2020	0.021508	0.071282	0.6983
		2013	0.019176	0.072943	0.7371
		2014	0.018779	0.075961	0.7528
		2015	0.019826	0.077648	0.7447
	SAUDI ARABIA BRITISH BANK	2016	0.024552	0.085618	0.7132
		2017	0.022931	0.085503	0.7318
		2018	0.025404	0.095168	0.7331
		2019	0.026050	0.079610	0.6728
		2020	0.024986	0.072595	0.6558
		2013	0.027501	0.086348	0.6815
		2014	0.027046	0.083543	0.6763
		2015	0.029221	0.089105	0.6721
	SAUDI NATIONAL BANK (SNB)	2016	0.033377	0.099037	0.6630
		2017	0.030323	0.096079	0.6844
		2018	0.031276	0.098440	0.6823
		2019	0.028893	0.095217	0.6966
		2020	0.021841	0.081385	0.7316

Table 17. Bank Lerner Index's in United Kingdom

Country	Bank Name	Year	MC	P	LIs
United Kingdom	AHLI UNITED BANK (UK)	2013	0.023990	0.048493	0.5053
		2014	0.023770	0.059849	0.6028
		2015	0.022587	0.059725	0.6218
		2016	0.022828	0.061052	0.6261
		2017	0.021250	0.057004	0.6272
		2018	0.028551	0.065539	0.5644
		2019	0.023516	0.060938	0.6141
		2020	0.022256	0.053817	0.5864
	AIB GROUP (UK)	2013	0.029114	0.041309	0.2952
		2014	0.027251	0.042418	0.3576
		2015	0.022690	0.049558	0.5421
		2016	0.018456	0.049145	0.6245
		2017	0.023830	0.051458	0.5369
		2018	0.023292	0.055260	0.5785
		2019	0.025382	0.064358	0.6056
		2020	0.024972	0.045951	0.4565
	Al Rayan Bank - UK	2013	0.051476	0.043159	-0.1927
		2014	0.033954	0.047882	0.2909
		2015	0.029353	0.052008	0.4356
		2016	0.030255	0.049856	0.3931
		2017	0.030443	0.048580	0.3733
		2018	0.037653	0.052401	0.2814
		2019	0.038824	0.052037	0.2539
		2020	0.034302	0.047168	0.2728
	BANK SEPAH INTERNATIONAL	2013	0.012840	0.011794	-0.0886
		2014	0.011055	0.010313	-0.0719
		2015	0.011401	0.013780	0.1727
		2016	0.015065	0.017531	0.1406
		2017	0.020404	0.016812	-0.2137
		2018	0.022220	0.027190	0.1828
		2019	0.023789	0.033284	0.2853
		2020	0.024900	0.031974	0.2213
	BARCLAYS BANK PLC - UK	2013	0.029653	0.048207	0.3849
		2014	0.026336	0.042477	0.3800
		2015	0.026475	0.044547	0.4057
		2016	0.022799	0.041039	0.4445
		2017	0.015849	0.028883	0.4513
		2018	0.025672	0.042139	0.3908
		2019	0.021124	0.039565	0.4661
		2020	0.015410	0.034229	0.5498
	Bank of London and the Middle East (BLME) - UK	2013	0.066870	0.133270	0.4982
		2014	0.064855	0.130739	0.5039
		2015	0.067150	0.132022	0.4914
		2016	0.081161	0.119143	0.3188

		2017	0.063188	0.092446	0.3165
		2018	0.051752	0.088701	0.4166
		2019	0.047035	0.085936	0.4527
		2020	0.038837	0.065183	0.4042
	CLYDESDALE BANK	2013	0.042450	0.064067	0.3374
		2014	0.046357	0.061996	0.2523
		2015	0.046443	0.061471	0.2445
		2016	0.047741	0.057904	0.1755
		2017	0.039077	0.053678	0.2720
		2018	0.040339	0.053438	0.2451
		2019	0.034020	0.049209	0.3087
		2020	0.026276	0.042123	0.3762
	FBN BANK (UK) LIMITED - UK	2013	0.031984	0.075861	0.5784
		2014	0.031165	0.076723	0.5938
		2015	0.028451	0.086204	0.6700
		2016	0.029920	0.063514	0.5289
		2017	0.029667	0.050146	0.4084
		2018	0.031056	0.051372	0.3955
		2019	0.028934	0.065694	0.5596
		2020	0.028334	0.061376	0.5383
	HSBC BANK PLC - UK	2013	0.018809	0.037295	0.4957
		2014	0.020338	0.035180	0.4219
		2015	0.021799	0.040925	0.4673
		2016	0.022280	0.037375	0.4039
		2017	0.019775	0.038015	0.4798
		2018	0.022609	0.040765	0.4454
		2019	0.018681	0.028084	0.3348
		2020	0.016429	0.023040	0.2869
	JORDAN INTERNATIONAL BANK	2013	0.040849	0.089842	0.5453
		2014	0.033647	0.078224	0.5699
		2015	0.039474	0.079779	0.5052
		2016	0.043765	0.082944	0.4724
		2017	0.052152	0.079528	0.3442
		2018	0.049468	0.080632	0.3865
		2019	0.053252	0.081008	0.3426
		2020	0.052173	0.077924	0.3305
	KINGDOM BANK LIMITED	2013	0.055035	0.071240	0.2275
		2014	0.058588	0.083330	0.2969
		2015	0.059919	0.118593	0.4947
		2016	0.058682	0.079613	0.2629
		2017	0.052451	0.076356	0.3131
		2018	0.063360	0.088675	0.2855
		2019	0.058857	0.086191	0.3171
		2020	0.058548	0.074189	0.2108
	LLOYDS BANK PLC - UK	2013	0.041579	0.065437	0.3646
		2014	0.032621	0.053416	0.3893
		2015	0.031639	0.050940	0.3789
		2016	0.028749	0.049713	0.4217
		2017	0.023559	0.050110	0.5298
		2018	0.031940	0.068911	0.5365

	2019	0.033707	0.069865	0.5175
	2020	0.026306	0.058473	0.5501
METRO BANK PLC - UK	2013	0.067448	0.041240	-0.6355
	2014	0.052976	0.048178	-0.0996
	2015	0.044908	0.046513	0.0345
	2016	0.035308	0.046011	0.2326
	2017	0.027042	0.040833	0.3377
	2018	0.028529	0.043803	0.3487
	2019	0.041845	0.050028	0.1636
	2020	0.043873	0.048395	0.0934
NATIONAL WESTMINSTER BANK	2013	0.040222	0.054131	0.2570
	2014	0.031296	0.056898	0.4500
	2015	0.034815	0.046338	0.2487
	2016	0.019838	0.041668	0.5239
	2017	0.017680	0.051018	0.6534
	2018	0.028435	0.064284	0.5577
	2019	0.036243	0.068325	0.4696
	2020	0.025147	0.053651	0.5313
NORTHERN BANK LIMITED - UK	2013	0.043438	0.097180	0.5530
	2014	0.030235	0.077597	0.6104
	2015	0.026705	0.077696	0.6563
	2016	0.025784	0.077244	0.6662
	2017	0.017821	0.074382	0.7604
	2018	0.023834	0.067762	0.6483
	2019	0.022623	0.063626	0.6444
	2020	0.017373	0.043101	0.5969
PARAGON BANK PLC - UK	2013	0.188620	1.487232	0.8732
	2014	0.055200	0.504812	0.8907
	2015	0.024149	0.076315	0.6836
	2016	0.029085	0.104232	0.7210
	2017	0.019137	0.033224	0.4240
	2018	0.022529	0.052859	0.5738
	2019	0.025604	0.048644	0.4736
	2020	0.021726	0.041969	0.4823
STANDARD CHARTERED BANK - UK	2013	0.033936	0.067106	0.4943
	2014	0.032107	0.060289	0.4674
	2015	0.035680	0.056590	0.3695
	2016	0.032534	0.053744	0.3947
	2017	0.034281	0.054849	0.3750
	2018	0.025886	0.034092	0.2407
	2019	0.037456	0.053242	0.2965
	2020	0.028969	0.045424	0.3623

Table 18. Bank Lerner Index's in Malaysia

Country	Bank Name	Year	MC	P	LIs
MALAYSIA	AFFIN BANK BERHAD	2013	0.039188	0.072492	0.4594
		2014	0.040069	0.072175	0.4448
		2015	0.041613	0.071083	0.4146
		2016	0.034316	0.073541	0.5334
		2017	0.032514	0.072264	0.5501
		2018	0.033706	0.079528	0.5762
		2019	0.036603	0.087168	0.5801
		2020	0.032417	0.093127	0.6519
	AFFIN ISLAMIC BANK BERHAD	2013	0.035415	0.063024	0.4381
		2014	0.038241	0.066523	0.4251
		2015	0.040605	0.071420	0.4315
		2016	0.042939	0.079759	0.4616
		2017	0.041076	0.066134	0.3789
		2018	0.044444	0.071419	0.3777
		2019	0.058194	0.082487	0.2945
		2020	0.043991	0.063803	0.3105
	AL RAJHI BANKING & INVESTMENT CORPORATION (MALAYSIA) BERHAD	2013	0.057221	0.077903	0.2655
		2014	0.055385	0.073027	0.2416
		2015	0.059276	0.082704	0.2833
		2016	0.057230	0.073417	0.2205
		2017	0.064356	0.079337	0.1888
		2018	0.065851	0.081488	0.1919
		2019	0.066881	0.092740	0.2788
		2020	0.064096	0.054955	-0.1663
	ALLIANCE ISLAMIC BANK BERHAD	2013	0.043342	0.073448	0.4099
		2014	0.036088	0.066855	0.4602
		2015	0.038301	0.064281	0.4042
		2016	0.045640	0.070429	0.3520
		2017	0.033439	0.064261	0.4796
		2018	0.038135	0.077801	0.5098
		2019	0.040075	0.058260	0.3121
		2020	0.039417	0.035312	-0.1163
	BANK ISLAM MALAYSIA BERHAD	2013	0.047147	0.098462	0.5212
		2014	0.046358	0.093530	0.5043
		2015	0.047418	0.091809	0.4835
		2016	0.045939	0.088742	0.4823
		2017	0.048829	0.098829	0.5059
		2018	0.047450	0.092853	0.4890
		2019	0.049759	0.095166	0.4771
		2020	0.042830	0.081805	0.4764
	BANK OF AMERICA MALAYSIA BERHAD	2013	0.035242	0.054093	0.3485
		2014	0.040639	0.064465	0.3696
		2015	0.039813	0.091302	0.5639
		2016	0.034637	0.077006	0.5502
		2017	0.032468	0.080661	0.5975
		2018	0.031299	0.072976	0.5711

		2019	0.038741	0.089001	0.5647
		2020	0.028157	0.085178	0.6694
	CIMB ISLAMIC BANK BERHAD	2013	0.037073	0.069096	0.4635
		2014	0.037862	0.074250	0.4901
		2015	0.040124	0.074793	0.4635
		2016	0.035907	0.073738	0.5131
		2017	0.033934	0.066999	0.4935
		2018	0.038108	0.074053	0.4854
		2019	0.041465	0.076349	0.4569
		2020	0.033333	0.053551	0.3776
	HONG LEONG ISLAMIC BANK BERHAD	2013	0.033847	0.078597	0.5694
		2014	0.033651	0.075794	0.5560
		2015	0.035558	0.070261	0.4939
		2016	0.035663	0.067604	0.4725
		2017	0.034320	0.063464	0.4592
		2018	0.034125	0.066011	0.4830
		2019	0.035382	0.067923	0.4791
		2020	0.031983	0.061373	0.4789
	HSBC AMANAH MALAYSIA BERHAD	2013	0.036217	0.083231	0.5649
		2014	0.036184	0.078706	0.5403
		2015	0.035852	0.068693	0.4781
		2016	0.040079	0.069168	0.4206
		2017	0.036814	0.060218	0.3887
		2018	0.037825	0.074776	0.4942
		2019	0.035925	0.074278	0.5163
		2020	0.032364	0.059469	0.4558
	INDUSTRIAL AND COMMERCIAL BANK OF CHINA (MALAYSIA) BERHAD	2013	0.029676	0.039328	0.2454
		2014	0.041157	0.060778	0.3228
		2015	0.037433	0.065296	0.4267
		2016	0.038191	0.065241	0.4146
		2017	0.037332	0.091044	0.5900
		2018	0.044604	0.091644	0.5133
		2019	0.040886	0.074730	0.4529
		2020	0.040926	0.076964	0.4682
	MALAYAN BANKING BERHAD - MAYBANK	2013	0.036381	0.083637	0.5650
		2014	0.034519	0.076071	0.5462
		2015	0.034740	0.078268	0.5561
		2016	0.034563	0.079684	0.5663
		2017	0.035453	0.080903	0.5618
		2018	0.035417	0.079909	0.5568
		2019	0.035923	0.081979	0.5618
		2020	0.030043	0.075237	0.6007
	MAYBANK ISLAMIC BERHAD	2013	0.038945	0.071261	0.4535
		2014	0.038778	0.078998	0.5091
		2015	0.041692	0.075784	0.4499
		2016	0.038550	0.076863	0.4985
		2017	0.034157	0.067313	0.4926
		2018	0.034103	0.064704	0.4729
		2019	0.033854	0.068252	0.5040
		2020	0.025673	0.050033	0.4869

	OCBC AL-AMIN BANK BERHAD	2013	0.036967	0.077134	0.5207
		2014	0.039129	0.058652	0.3329
		2015	0.044197	0.078180	0.4347
		2016	0.044293	0.088104	0.4973
		2017	0.040900	0.100771	0.5941
		2018	0.040724	0.080675	0.4952
		2019	0.039990	0.083536	0.5213
		2020	0.034920	0.055849	0.3747
	PUBLIC BANK (L) LTD	2013	0.008234	0.079305	-1.1038
		2014	0.010326	0.004925	-3.0969
		2015	0.006466	0.142322	-1.0454
		2016	0.008743	0.005661	-0.5445
		2017	0.011816	0.120092	0.9016
		2018	0.016619	0.035179	0.5276
		2019	0.018575	0.061254	0.6967
		2020	0.014401	0.003312	-5.3477
	PUBLIC ISLAMIC BANK	2013	0.031232	0.068203	0.5421
		2014	0.032806	0.065669	0.5004
		2015	0.035162	0.061308	0.4265
		2016	0.038070	0.066600	0.4284
		2017	0.036581	0.061537	0.4056
		2018	0.038287	0.064908	0.4101
		2019	0.036567	0.061306	0.4035
		2020	0.029716	0.047711	0.3772
	RHB Islamic Bank	2013	0.036654	0.061504	0.4040
		2014	0.034196	0.060149	0.4315
		2015	0.036235	0.064841	0.4412
		2016	0.040054	0.076577	0.4769
		2017	0.039394	0.075500	0.4782
		2018	0.039074	0.073754	0.4702
		2019	0.038948	0.071525	0.4555
		2020	0.034507	0.053709	0.3575
	Ambank Islamic Berhad	2013	0.040712	0.067194	0.3941
		2014	0.039762	0.064714	0.3856
		2015	0.050306	0.083633	0.3985
		2016	0.047169	0.083225	0.4332
		2017	0.047270	0.081373	0.4191
		2018	0.041144	0.072809	0.4349
		2019	0.035359	0.062328	0.4327
		2020	0.024975	0.029251	0.1462
	Bank Muamalat Malaysia Berhad	2013	0.052964	0.092294	0.4261
		2014	0.050244	0.070355	0.2858
		2015	0.051725	0.078075	0.3375
		2016	0.049721	0.073151	0.3203
		2017	0.052522	0.086179	0.3906

		2018	0.057506	0.095540	0.3981
		2019	0.042816	0.064670	0.3379
		2020	0.044519	0.066643	0.3320
	Kuwait Finance House Berhad	2013	0.057115	0.129778	0.5599
		2014	0.048085	0.104363	0.5393
		2015	0.047380	0.051514	0.0803
		2016	0.048854	0.057582	0.1516
		2017	0.064347	0.094899	0.3219
		2018	0.062515	0.090963	0.3127
		2019	0.057433	0.086483	0.3359
		2020	0.044821	0.056733	0.2100
	Standard Chartered Saadiq Berhad	2013	0.039549	0.086764	0.5442
		2014	0.037105	0.061522	0.3969
		2015	0.038347	0.065319	0.4129
		2016	0.048451	0.082325	0.4115
		2017	0.049978	0.082014	0.3906
		2018	0.045185	0.101773	0.5560
		2019	0.045431	0.098765	0.5400
		2020	0.034380	0.059226	0.4195