The Effect of Liquidity Risk and Credit Risk on Bank Stability in ASEAN Countries Experiencing Recession Due to the Covid-19 Pandemic

Andreas Krisvian, Rofikoh Rokhim

Department of Management, Faculty of Economics and Business, University of Indonesia,
Depok City, 16424, Indonesia

E-mail: andreas.krisvian@ui.ac.id , rofikoh.rokhim@ui.ac.id

Abstract

This study was conducted to determine various elements that may affect the stability of the bank. This influence mainly comes from banking risk in the form of liquidity risk and credit risk. In this study, the sample used was 41 open conventional banks from 5 ASEAN countries that experienced a recession due to the Covid-19 pandemic in 2020. The analysis in this study used the GMM and VECM methods with quarterly data in the period of Q4 2015 to Q3 2020 so that it covered the period before and during the crisis. The results of this study found that there is a reciprocal effect between the two banking risks in the long term and both simultaneously significantly affect bank stability. The results of this study can provide a deeper understanding of banking risk management with the aim to increase bank stability that supports the country's sustainable economy.

Keywords: Risk Management, Bank Stability, Recession, ASEAN, Covid-19, Sustainable Economy

1. Introduction

Various negative impacts on the economy have been felt by many countries as a result of the pandemic caused by the Covid-19 virus. The pandemic, which has been more than 1 year since its inception in 2020, has caused the economy of countries to slow down, and many of them have even announced a recession. A country that is being hit by an economic crisis, marked by a recession, has to face a dilemma where the country's economy must continue to run without causing the spread of the Covid-19 virus to expand. This condition will be a challenge for banks as financial service providers, as well as intermediaries for economic activities in each country. Banks must be able to continue to operate and meet the needs of public financial services, especially in dealing with situations that are new and different from normal conditions before the pandemic. Banks must also adapt by having good stability during this new "normal" situation, given their very significant role in creating a conducive environment for the country's economy.

One way for banks to have good stability is to carry out good financial risk management as well. That way, the bank can cope with a loss due to financial risk well and be prepared to face similar risks in the future or in other words, it is a way to adapt sustainably. Four financial risks are generally faced by banks, namely liquidity risk that can occur when there is a rapid and massive withdrawal of funds by the public or commonly known as bank runs, credit risk which means borrowers of loan funds who do not pay off payments according to the agreed time previously agreed, interest rate risk occurs when interest rate changes occur, and operational risk when a bank has to experience a disaster such as a damaged computer system or a building fire for example. However, according to Ghenimi, Chaibi, and Omri (2017), liquidity risk and credit risk are the two most essential risks because they are directly related to bank business activities and are the main causes if a bank fails or goes bankrupt.

Financial experts believe that liquidity risk and credit risk are two interrelated risks and have an influence on bank stability. Dermine (1986) argues that liquidity risk is a cost that can reduce profits so that failure in terms of loan repayment will cause a decrease in cash inflows and reduce the level of liquidity. Then Ghenimi, Chaibi, and Omri (2017), through their research on the effect of liquidity risk and credit risk on bank stability in the MENA region, stated that liquidity risk and credit risk simultaneously could significantly affect bank stability. In addition, another similar study was also conducted by Imbierowicz and Rauch (2014) who took the subject of research in the form of commercial banks in America, proving that liquidity risk and credit risk simultaneously affect bank stability or the possibility of banks going bankrupt.

This study took samples in the Southeast Asia region or the ASEAN Region and specifically focused on countries that experienced a recession in 2020 due to the worsening economic effects of the Covid-19 pandemic. There are at least five ASEAN countries that are experiencing a recession, including the Philippines, Indonesia, Malaysia, Singapore, and Thailand (Aida, 2020; Prayoga, 2020). The ASEAN region was chosen to be the research sample because apart from being a research limitation, the ASEAN region is a collection of countries with high state financial prospects and can compete with other world regions, and are one of the most affected countries by this crisis. For example, based on statistical data from ASEANStatsDataPortal (2021), the main income of ASEAN countries that mostly come from the tourism sector, has experienced a significant decrease in the number of tourists, which was as much as 143.5 million in 2019 and to only 26.1 million tourists in 2020.

This research is a relatively new study because there has been no similar research which takes samples in the form of ASEAN countries experiencing a recession due to the Covid-19 pandemic. This study takes reference from the previous research by Ghenimi, Chaibi, and Omri (2017), which discusses similar topics and research objectives, namely the influence of liquidity risk and credit risk on bank stability. However, this study has differences in terms of sample selection, data periods, crisis periods, and additional discussion in terms of analysis of the long-term effect of risk variables and both of internal and external variables that may also affect liquidity risk, credit risk, and bank stability. In this way, different research results may also be obtained. The researchers hopes that this research can contribute to provide benefits in the form of more knowledge about banking risk management to increase bank stability as a form of responding to the challenges of the economic crisis in a sustainable manner. In addition, researchers also hope that this research can be a reference for parties who need it, such as academics, banking researchers, and the government as a regulator.

2. Literature Review
2.1 Influence between Liquidity Risk and Credit Risk

The influence between liquidity risk and credit risk is believed by experts to be two interconnected risks. This effect is when a change in one of these two risks will affect the other. Several previous studies by financial experts had also examined and proven the relationship between these two risks. These studies were first conducted by Diamond and Rajan (2005), explaining theoretically that liquidity risk and credit risk in banks are two risks that are simultaneously interconnected. In addition, the research by Ejoh, Okpa, and Inyang (2014) examined the relationship between liquidity risk and credit risk at banks in Nigeria through experimental research on 80 respondents. Later, research by Djebali and Zaghdoudi (2020) examined the threshold effect of the two risks by taking research samples in the MENA region and got the results in the form of a negative effect caused by one risk will result in a similar effect on other risks.

In this study, the investigated effect is whether there is a reciprocal and significant relationship between liquidity risk and credit risk to support the previous research. Thus, the hypotheses of this research can be formulated as follows:

H_1: There is a reciprocal effect between liquidity risk and credit risk significantly

H_2: Liquidity risk significantly affects credit risk

H$_3$: Liquidity risk significantly affects credit risk

2.2 Effect of Liquidity Risk and Credit Risk on Bank Stability

Apart from the influence of liquidity risk on credit risk and vice versa, these two risks have been widely studied by financial experts as two risks that also play a major role in determining the level of probability for a bank going bankrupt or in determining the stability of the bank. There are at least 6 previous studies that had succeeded in proving the significant influence between liquidity risk and credit risk variables on the stability or level of probability of bank bankruptcy, including:

1. Ejoh, Okpa, and Inyang (2014) examined the effect of liquidity risk and credit risk on bank bankruptcy risk in Nigeria;
2. Imbierowicz and Rauch (2014) examined the effect of liquidity risk and credit risk on the probability of a bank experiencing bankruptcy or the probability of default (PD) by taking a sample of banks in the United States;
3. Ghenimi, Chaibi, and Omri (2017) examine the effect of liquidity risk and credit risk on bank stability in the MENA region;
4. Setiawan, Sudarto, and Widiastuti (2019) examined the effect of credit risk and liquidity risk individually or simultaneously on bank stability in Indonesia;
5. Zaghdoudi (2019) examined the effect of credit risk, liquidity risk, and operational risk on bank stability in Tunisia;
6. Djebali and Zaghdoudi (2020) examined the effect of the threshold effect of liquidity risk and credit risk on bank stability in the MENA region.

Based on several studies above, it has been proven that liquidity risk and credit risk are either individually or simultaneously in the form of a combination of the two risks have a significant influence on bank stability. Therefore, in this study, several hypotheses can be formulated which refer to the previous studies, as follows:

H$_4$: Liquidity risk significantly affects bank stability

H$_5$: Credit risk significantly affects bank stability

H$_6$: The combination of liquidity risk and credit risk significantly affects bank stability

2.3 Bank's Internal and External Factors Affecting Liquidity Risk, Credit Risk, and Bank Stability

Research from several economists and one of them, namely Ghenimi, Chaibi, and Omri (2017), states that each of the liquidity risk, credit risk, and bank stability can be influenced by other factors apart from the risk factor itself. These factors are divided into 2 types, namely risk factors originating from financial statements or internal bank conditions and external risk factors derived from a country's macroeconomic conditions. Internal factors in this study include the stability ratio itself in the previous period or lagged bank stability, bank size, profitability (ROE and ROA), loan asset ratio, income diversification, efficiency, net interest margin, net interest margin, liquidity gap, and loan growth rates. Meanwhile, external factors consist of the ASEAN economic crisis in the form of a recession due to the pandemic, Real Gross Domestic Product (GDP), and inflation.

2.3.1 Lagged Stability Bank (Z-Score(-1))

Based on the results of the research conducted by Ghenimi, Chaibi, and Omri (2017), results are obtained which state that bank stability in a certain period can affect bank stability in the next period. The stability of the bank is measured by using the Z-Score calculation using the formula for the average return on assets (ROA) plus the equity to asset ratio (EAR) and the results are divided by the standard deviation of the ROA during the period studied. For this reason, the following hypotheses were formulated in this study:

H_7: Lagged bank stability significantly affects bank stability

2.3.2 Bank Size

The size of the bank based on previous research by experts is said to have a significant influence on liquidity risk, credit risk, and bank stability. Iqbal (2012), in his research, obtained the results that the size of the bank affects liquidity risk positively and significantly. Then, further research by Ghenimi, Chaibi, and Omri (2017) proved that bank size has a positive and significant effect on credit risk. In addition, according to Zaghdoudi (2019) and Ghenimi, Chaibi, and Omri (2017), bank size also had a negative and significant effect on bank stability. By referring to some of these previous studies, the following hypotheses can be formulated:

H_8: Bank size significantly affects liquidity risk

H_9: Bank size significantly affects credit risk

H_{10}: Bank size significantly affects bank stability

2.3.3 Return on Assets (ROA)

ROA has a significant influence on liquidity risk, credit risk, and bank stability, according to previous research by several experts. The effect of ROA on liquidity risk was obtained through research and has been proven to have a positive and significant correlation by Akhtar, Ali, and Sadaqat (2011) and Iqbal (2012). Then, the effect on credit risk was proven by Kabir, Worthington, and Rakes (2015) and Ghenimi, Chaibi, and Omri (2017) in a negative and significant way. In addition, according to research by Ghenimi, Chaibi, and Omri (2017) and Setiawan, Sudarto, and Widiastuti (2019), ROA also had a positive and significant effect on bank stability. Therefore, referring to some of these previous studies, the following hypotheses can be formulated:

H11: ROA significantly affects liquidity risk

H_{12}: ROA significantly affects credit risk

H_{13}: ROA significantly affects bank stability

2.3.4 Return on Equity (ROE)

ROE, based on several previous studies, is said to have a significant influence on liquidity risk. This is evidenced through research by Iqbal (2012) and Muharam and Kurnia (2015), which both successively produced two significant results, but in the opposite direction to liquidity risk. Iqbal (2012) found that ROE had a positive effect, while research by Muharam and Kurnia (2015) gave a negative effect. By referring to the results of these previous studies, the following hypotheses can be formulated:

H_{14}: ROE significantly affects liquidity risk

2.3.5 Loan to Asset Ratio (LAR)

Based on a previous study, it has been proven that LAR has a significant effect on credit risk. The study by Kabir, Worthington, and Rakes (2015) succeeded in proving a negative and significant effect on the LAR ratio to credit risk. In addition, another study that also examined the effect of LAR on credit risk was carried out by Ghenimi, Chaibi, and Omri (2017), but their study did not have a significant effect on credit risk. Therefore, referring to previous research, a hypothesis can be formulated, namely:

H_{15}: LAR significantly affects credit risk

2.3.6 Loan Growth

According to Ghenimi, Chaibi, and Omri (2017) this loan growth ratio is proven to have a negative and significant effect on bank stability so that in this study a hypothesis can be formulated referring to these results, as follows:

H_{16}: Loan growth significantly affects bank stability

2.3.7 Income Diversification

Kabir, Worthington, and Rakes (2015) provided results where income diversification had a negative and significant effect on bank stability. This is different from Srairi (2013) and Ghenimi, Chaibi, and Omri (2017), both of which provde that there was a positive and significant effect of income diversification on bank stability. Referring to some of these previous studies, the following hypotheses can be formulated:

H_{17}: Income diversification significantly affects credit risk

H_{18}: Income diversification significantly affects bank stability

2.3.8 Efficiency

Efficiency is one of the factors of credit risk and is thought to influence bank stability based on previous studies. Ghenimi, Chaibi, and Omri (2017), through their research, resulted in the form of a negative and significant effect of efficiency on credit risk. However, its effect on bank stability based on previous studies was still questionable, and further research is needed. For example, research by Kabir, Worthington, and Rakes (2015) and Ghenimi, Chaibi, and Omri (2017) has not proven that efficiency can significantly affect bank stability. However, the results of both had the same direction of influence, namely negatively. Therefore, in this study, the following hypotheses will be formulated:

H_{19}: Efficiency significantly affects credit risk

H_{20}: Efficiency significantly affects bank stability

2.3.9 Net Interest Margin (NIM)

The bank's net interest income margin (NIM) is thought to be a factor of liquidity risk based on several previous studies. However, the significance of the NIM is still unclear, and further research is needed that might prove its significant effect on liquidity risk. For example, the previous research by Muharam and Kurnia (2015), which confirmed the effectiveness of NIM on the liquidity risk of conventional banks, was negative and insignificant. However, this study

also examined the same thing in Islamic banks, and it turned out to be successful in providing positive and significant results. In addition, similar results were also obtained by Ghenimi, Chaibi, and Omri (2017), which proved the insignificant effect of NIM on liquidity risk, but in the opposite direction, namely positively. Thus, in this study, the hypothesis was formulated, namely:

H_{21}: NIM significantly affects liquidity risk

2.3.10 Liquidity Gap

The liquidity gap in its role as a factor of bank risk has been proven only to affect bank liquidity risk. This is supported by research by Muharam and Kurnia (2015), which proved that the liquidity gap could negatively and significantly affect liquidity risk. Also, another study that also examined the same thing, one of which was Ghenimi, Chaibi, and Omri (2017), although in their research it was not successful in proving the significant effect of a liquidity gap on liquidity risk. Based on the previous research, a hypothesis can be formulated, as follows:

H_{22}: Liquidity gap affects liquidity risk significantly

2.3.11 Capital Adequacy Ratio (CAR)

Based on several previous studies, CAR is proven to have a significant effect on liquidity risk and bank stability. Research by Iqbal (2012) confirmed that CAR had a positive and significant effect on bank stability. In addition, there are at least 2 studies that have succeeded in proving the significant effect of CAR on bank stability. These studies were conducted by Ghenimi, Chaibi, and Omri (2017) and Setiawan, Sudarto, and Widiastuti (2019), both of which succeeded in proving a positive and significant influence on CAR on bank stability. Based on these previous studies, some hypotheses can be formulated, namely:

H_{23}: CAR significantly affects liquidity risk

H_{24}: CAR significantly affects bank stability

2.3.12 Economic Crisis 2020 (Recession)

External factors in the form of the economic crisis in previous research by Ghenimi, Chaibi, and Omri (2017), have an influence on liquidity risk, credit risk, and bank stability, respectively, which are positively and significantly (liquidity risk as an inverse measure of liquidity), negative insignificant, and negative significant. Furthermore, with the reason that there are

allegations of the same or different effects between these variables based on previous research, in this study, several hypotheses can be formulated:

H_{25}: The economic crisis significantly affects liquidity risk

H_{26}: The economic crisis significantly affects credit risk

H_{27}: The economic crisis significantly affects bank stability

2.3.13 Inflation Rate

Previous research by Ghenimi, Chaibi, and Omri (2017) proved that external factors in the form of inflation rates influenced liquidity risk, credit risk, and bank stability, respectively, negatively and significantly (liquidity risk as an inverse measure of liquidity), positive and significant, and significant positive. Furthermore, because there is an allegation of the same effect and the possibility of finding a different result between these variables, this study can formulate the following hypotheses:

H_{28}: Inflation rate significantly affects liquidity risk

H_{29}: Inflation rate significantly affects credit risk

H_{30}: Inflation rate affects banks significantly

2.3.14 Real Gross Domestic Product Growth

Previous research by Ghenimi, Chaibi, and Omri (2017) proved that external factors in the form of real GDP growth influence liquidity risk, credit risk, and bank stability, which are positively and insignificantly positive (liquidity risk as an inverse measure of liquidity), negative significant, and negative insignificant. Furthermore, because there is an allegation of the same effect and the possibility of finding a different result between these variables, in this study, several hypotheses can be formulated as follows:

H_{31}: Real GDP growth affects liquidity risk significantly

H_{32}: Real GDP growth affects credit risk significantly

H_{33}: Real GDP growth significantly affects bank stability

3. Methodology
3.1 Econometric Methods

This study used 2 methods. The first method used is the System-Generalized Method of Moments or SYS – GMM by Blundell and Bond (1998) in one stage or one step regression carried out simultaneously and non-simultaneously. This method is used because it is assumed that there is a problem of endogeneity in this study or there is a correlation between the variables and the error term or other factors that are not included in a research equation. This endogeneity problem generally occurs in simultaneous equations or research that analyzes the influence between variables reciprocally, such as this study, or it is assumed that there is an endogeneity problem. The GMM method is an estimate of the effect in the short term, seen through its characteristics where the sample size N must be greater than the research period T to avoid the potential for autocorrelation problems in the research residuals (Asteriou, Pilbeam, and Pratiwi, 2021). For this reason, additional estimates are needed using other methods to measure the relationship between variables in the long term.

The second method, Vector Error Correction Model (VECM), serves to assess whether there is a short-term and long-term causal or reciprocal relationship between research variables, both with variables in the same period or with variables in the same period lagged risk variables in the previous period. In addition, VECM method can also be used as an additional complement to the GMM method to assess the robustness or consistency of research results related to the reciprocal effect of variables as well as to examine the long-term effect on the relationship between research variables.

3.2 Sample Data

The sample data of this study included two different types of data, namely data on banking companies and macroeconomic data for a country. The data of banking companies must meet several special criteria, while macroeconomic data in the form of inflation data and Real GDP growth of the countries studied are only a complement to the banking companies' data and do not have any particular criteria. The criteria for the banking companies' data include:

1. Open conventional banks from 5 countries in ASEAN, consist of Philippines, Indonesia, Malaysia, Singapore, and Thailand that experienced a recession in 2020.
2. Has made an Initial Public Offering or IPO at least before the fourth quarter of 2015 until the third quarter of 2020.

Based on these criteria, 41 conventional banks were obtained from the Philippines, Indonesia, Malaysia, Singapore, and Thailand.

3.3 Research Variables

Table 1. List of Research Variables

Variables	Equation	Source
Credit Risk	Non – Performing Loans & Impaired Loans / Gross Loans	(Ghenimi, Chaibi, dan Omri, 2017)
Liquidity *	Liquid Assets / Total Assets	(Ghenimi, Chaibi, dan Omri, 2017)
Bank Size	Logarithm of Total Assets	(Ghenimi, Chaibi, dan Omri, 2017)
ROE	Net Income / Total Equity	(Ghenimi, Chaibi, dan Omri, 2017)
ROA	Net Income / Total Assets	(Ghenimi, Chaibi, dan Omri, 2017)
LAR	Net Loans / Total Assets	(Ghenimi, Chaibi, dan Omri, 2017)
Income Diversification	Non – Interest Income / Total Operating Income	(Ghenimi, Chaibi, dan Omri, 2017; Srairi, 2013)
Efficiency	Non – Interest Expense / (Revenue – Provision for Loan Losses	(Ghenimi, Chaibi, dan Omri, 2017)
NIM	Net Interest Income / Earning Assets	(Ghenimi, Chaibi, dan Omri, 2017)
Liquidity Gap	Logarithm of (Total Assets – Total Liabilities)	(Ghenimi, Chaibi, dan Omri, 2017)
CAR	Capital Adequacy (Value) / Risk Weighted Assets or Capital Adequacy (Percentage)	(Ghenimi, Chaibi, dan Omri, 2017)
Economic Crisis	Value 1 for the period 1st quarter to 3rd quarter of 2020	(Ghenimi, Chaibi, dan Omri, 2017)
Inflation Rate	Quarterly Consumer Price Index through interpolation	(Ghenimi, Chaibi, dan Omri, 2017)
Real GDP Growth	Real GDP growth per quarter through interpolation	(Ghenimi, Chaibi, dan Omri, 2017)
Loan Growth	(Loan (t) – Loan (t-1)) / Loan (t-1)	(Ghenimi, Chaibi, dan Omri, 2017)

Stability (Z – Score) **	(Mean of ROA + (Total Equity / Total Assets)) / Standard Deviation of ROA	(Ghenimi, Chaibi, dan Omri, 2017)
Credit Risk x Liquidity Risk	(Non – Performing Loans & Impaired Loans / Gross Loans) x 1 / (Liquid Assets / Total Assets)	(Ghenimi, Chaibi, dan Omri, 2017)
Z – Score (-1)	Formulated via the STATA app	(Ghenimi, Chaibi, dan Omri, 2017)
Credit Risk (-1)	Formulated via the STATA app	(Ghenimi, Chaibi, dan Omri, 2017)
Liquidity (-1)	Formulated via the STATA app	(Ghenimi, Chaibi, dan Omri, 2017)

* Liquidity risk is measured inversely from the liquidity ratio. So, for example, if other variables affect liquidity negatively, then those variables affect liquidity risk positively

** The measure of bank stability (Z-score) in this study is transformed in the form of a logarithm (log) for the reason of data symmetry the same as the previous study by Ghenimi, Chaibi, and Omri (2017).

3.4 Research Equation Models

Simultaneous Equation Model 1 (Simultaneous GMM Method):

Equation 1:

$$\text{Credit Risk}_{(i,\ t)} = C + \beta_1 \text{Credit Risk}_{(i,\ t-1)} + \beta_2 \text{Liquidity}_{(i,\ t)} + \sum_{j=1}^{J} \beta_{\ j} \text{Bank}_{(i,\ t)}^{j} + \sum_{l=1}^{L} \beta_{\ l} \text{Macroeconomics}_{(i,\ t)}^{l} + \varepsilon_{(i,t)}$$

Equation 2:

$$\text{Liquidity}_{(i,\ t)} = C + \beta_1 \text{Liquidity}_{(i,\ t-1)} + \beta_2 \text{Risk Liquidity}_{(i,\ t)} + \sum_{p=1}^{P} \beta_{\ p} \text{Bank}_{(i,\ t)}^{P} + \sum_{q=1}^{Q} \beta_{\ q} \text{Macroeconomics}_{(i,\ t)}^{q} + \varepsilon_{(i,t)}$$

*$\text{Bank}_{(i,\ t)}^{j}$ and $\text{Bank}_{(i,\ t)}^{P}$ represent the bank-specific control variables

Equation Model 2 (VECM Method):

Equation 1:

$$\text{Credit Risk}_{(i,t)} = \partial_0 + \sum_{i=1}^{m} \text{Credit Risk}_{(i,\ t-1)} + \sum_{j=1}^{m} \text{Liquidity}_{(i,\ t-1)} + \varepsilon_{(i,\ t)}$$

Equation 2:

$$\text{Liquidity}_{(i,t)} = \partial_0 + \sum_{i=1}^{m} \text{Liquidity}_{(i,\ t-1)} + \sum_{j=1}^{m} \text{Credit Risk}_{(i,\ t-1)} + \varepsilon_{(i,\ t)}$$

Non-Simultaneous Equation Model 3 (Non-Simultaneous GMM Method):

$Stability_{(i,\ t)} = \beta_0 + \beta_1 Stability_{(i,\ t-1)} + \beta_2 Credit\ Risk_{(i,\ t)} + \beta_3 Liquidity_{(i,\ t)} + \beta_4 Credit\ Risk*Liquidity\ Risk_{(i,\ t)} + \beta_5 ROA_{(i,\ t)} + \beta_6 Bank\ Size_{(i,\ t)} + \beta_7 CAR_{(i,\ t)} + \beta_8 Loan\ Growth_{(i,\ t)} + \beta_9 Income\ Diversification_{(i,\ t)} + \beta_{10} Efficiency_{(i,\ t)} + \beta_{11} Economic\ Crisis_{(i,\ t)} + \beta_{12} Inflation\ Rate_{(i,\ t)} + \beta_{13} Real\ GDP\ Growth_{(i,\ t)} + \varepsilon_{(i,\ t)}$

3.5 Descriptive Statistics

Table 2. Descriptive Statistics of Research Variables

Variables	Obs	Mean	Std	Min	Max
Credit Risk	820	.0379945	.0626401	.000606	.9967093
Liquidity	820	.845148	.0826934	.4923324	.9921046
Credit Risk * Liquidity Risk	820	.0466144	.0779942	.0006602	1.104852
Stability	820	2.089102	.3419747	.8397949	2.573408
Loan Growth	820	.0150752	.0537166	-.4816903	1.024868
Bank Size	820	7.749768	1.248267	5.768708	10.16072
ROE	820	.0211025	.0333775	-.5705322	.0693776
ROA	820	.0026397	.0044843	-.0765772	.0096758
LAR	820	.6405335	.0790959	.3938296	.8290935
Income Diversification	820	.2570078	.1328385	-.4881947	.876903
Efficiency	820	.5876001	.7863934	-12.8279	7.505943
NIM	820	.0093303	.0043705	-.0013028	.0223358
Liquidity Gap	820	6.849432	1.291122	4.740507	9.320218
CAR	820	.1875515	.0425884	.1003388	.4585
Economic Crisis	820	.15	.3572893	0	1
Inflation Rate	820	2.262712	1.709805	-.9	6.361
Real GDP Growth	820	4.029634	2.232278	-5.6	7.1

4. Results and Discussion

Table 3. Results of Regression Equation Model 1

Regressors	Credit Risk		Liquidity	
	Coefficient	P-Value	Coefficient	P-Value
Constant	.395113	0.044	.2825527	0.160

Credit Risk	-	-	-.0039533	0.935
Credit Risk (-1)	-.031416	0.871	-	-
Liquidity	-.1079842	0.489	-	-
Liquidity (-1)	-	-	.2105874	0.222
Bank Size	-.0001306	0.983	.4978334	0.037
ROE	-	-	-7.023546	0.146
ROA	-1.418954	0.002	51.55072	0.154
LAR	-.3695847	0.032	-	-
Income Diversification	-.0520581	0.238	-	-
Efficiency	-.0002884	0.899	-	-
NIM	-	-	7.178312	0.041
Liquidity Gap	-	-	-.5229661	0.034
CAR	-	-	.0209607	0.932
Economic Crisis	-.0146928	0.358	.0331348	0.025
Inflation Rate	.0007873	0.778	.0068769	0.263
Real GDP Growth	-.0021592	0.375	.0071369	0.002
AR(2) Test	0.08	0.938	-0.99	0.324
Hansen Test	14.76	0.194	21.96	0.109

Table 4. Hypothesis Testing for Simultaneous Equation Model 1

Regressors (H$_X$)	Credit Risk P-Value	< or > α = 0,05	Alternate Hypothesis (H$_X$)	Liquidity P-Value	< or > α = 0,05	Alternate Hypothesis (H$_X$)
Credit Risk (H$_3$)	-	-	-	0.935	>	Unacceptable
Credit Risk (-1) *	0.871	>	-	-	-	-
Liquidity	0.489	>	Unacceptable	-	-	-

(H2)						
Liquidity (-1) *	-	-	-	0.222	>	-
Bank Size (H9) | (H8)	0.983	>	Unacceptable	0.037	<	Acceptable
ROE (H14)	-	-	-	0.146	>	Unacceptable
ROA (H12) | (H11)	0.002	<	Acceptable	0.154	>	Unacceptable
LAR (H15)	0.032	<	Acceptable	-	-	-
Income Diversification (H17)	0.238	>	Unacceptable	-	-	-
Efficiency (H19)	0.899	>	Unacceptable	-	-	-
NIM (H21)	-	-	-	0.041	<	Acceptable
Liquidity Gap (H22)	-	-	-	0.034	<	Acceptable
CAR (H23)	-	-	-	0.932	>	Unacceptable
Economic Crisis (H26) | (H25)	0.358	>	Unacceptable	0.025	<	Acceptable
Inflation Rate (H29) | (H28)	0.778	>	Unacceptable	0.263	>	Unacceptable
Real GDP Growth (H32) | (H31)	0.375	>	Unacceptable	0.002	<	Acceptable

Table 5. Results of Regression Equation Model 2 (Short-Term)

Dependent Variable: Credit Risk Independent Variable: Liquidity			
Statistics Test	Statistics Value	df	P-Value
Chi-square	2.347656	2	0.3092
Dependent Variable: Liquidity Independent Variable: Credit Risk			
Statistics Test	Statistics Value	df	P-Value
Chi-square	11.15976	2	0.0038

Table 6. Results of Regression Equation Model 2 (Long-Term)

Dependent Variable: Credit Risk Independent Variable: Liquidity	Coefficient	P-Value
C(1)	-0.425641	0.0000
Dependent Variable: Liquidity Independent Variable: Credit Risk	Coefficient	P-Value
C(1)	-0.010486	0.0011

Table 7. Results of Regression Equation Model 3

Variable *Regressor*	Stability (Z-Score)	
	Coefficient	P-Value
Constant	1.039724	0.027
Z-Score(-1)	.49182	0.005
Liquidity	.0307959	0.816
Credit Risk	1.60168	0.043
Credit Risk x Risk Liquidity	-1.485775	0.032
ROA	8.296796	0.031
Bank Size	-.0417272	0.103
CAR	1.592437	0.016
Loan Growth	.0185082	0.775
Income Diversification	.2168817	0.049
Efficiency	.0068571	0.635
Inflation Rate	-.0158928	0.088
Real GDP Growth	-.0030638	0.468
Economic Crisis	-.0258942	0.357
AR(2) Test	1.10	0.273
Hansen Test	5.53	0.237

Table 8. Hypothesis Testing for Non-Simultaneous Equation Model 3

Regressor (H$_X$)	Stability (Z-Score) P-Value	< or > α = 0,05	Alternate Hypothesis (H$_X$)
Z-Score (-1) (H$_7$)	0.005	<	Acceptable
Liquidity (H$_4$)	0.816	>	Unacceptable
Credit Risk (H$_5$)	0.043	<	Acceptable
Credit Risk x Liquidity Risk (H$_6$)	0.032	<	Acceptable
ROA (H$_{13}$)	0.031	<	Acceptable
Bank Size (H$_{10}$)	0.103	>	Unacceptable
CAR (H$_{24}$)	0.016	<	Acceptable
Loan Growth (H$_{16}$)	0.775	>	Unacceptable
Income Diversification (H$_{18}$)	0.049	<	Acceptable
Efficiency (H$_{20}$)	0.635	>	Unacceptable
Inflation Rate (H$_{30}$)	0.088	>	Unacceptable
Real GDP Growth (H$_{33}$)	0.468	>	Unacceptable
Economic Crisis (H$_{27}$)	0.357	>	Unacceptable

4.1 Discussion of Equation Model 1

Based on the regression results in Table 3 above, it is known that the values of the AR(2) Test and Hansen's Test for liquidity and credit risk, respectively, as dependent variables show insignificant values (P-Value > 0,05). This means that the study results do not found any autocorrelation problems or invalid instrumental variables, respectively. Then in Tables 3 and 4, the results of the short-term effects between variables are as follows:

a. There is no reciprocal effect between liquidity risk (inverse of Liquidity) and credit risk by previous research by Imbierowicz and Rauch (2014) and Ghenimi, Chaibi, and Omri (2017). Thus H_1 is unacceptable;

b. Credit risk is significantly influenced by 2 internal bank factors: profitability in the form of return on assets (ROA) and bank loan asset ratio (LAR). The influence between ROA and credit risk in this study is supported by previous research by Kabir, Worthington, and Rakes (2015) and Ghenimi, Chaibi, and Omri (2017). Also, the effect of LAR on credit risk in this study is supported by previous research by Kabir, Worthington, and Rakes (2015);

c. Liquidity as an inverse measure of liquidity risk is influenced by several internal bank factors. Bank liquidity is significantly influenced by 3 internal factors: bank size, NIM, and liquidity gap. The effect of bank size on liquidity in this study is supported by previous research by Iqbal (2012). This study also obtained new findings in the form of the influence of NIM which positively and significantly affects liquidity. The influence between NIM and liquidity is in line with research by Ghenimi, Chaibi, and Omri (2017), which also shows a positive directional effect. Furthermore, the effect of the liquidity gap on liquidity in this study is supported by the results of previous research by Muharam and Kurnia (2015);

d. The external factors of the bank only significantly affect its liquidity, and there is no significant effect economically on the bank's credit risk, these factors are the economic crisis and real GDP growth. The effect of the economic crisis on bank liquidity in this study is different from the results of previous studies by Ghenimi, Chaibi, and Omri (2017). This difference is obtained in terms of direction and significance between the opposite variables. In this study, the economic crisis has a positive and significant effect on bank liquidity, in contrast to research by Ghenimi, Chaibi, and Omri (2017), which resulted in a negative and insignificant effect. This is similar to Real GDP growth in this study which also has a positive and significant

effect on bank liquidity, in contrast to research by Ghenimi, Chaibi, and Omri (2017), which get the opposite result.

The reciprocal effect of liquidity risk and credit risk in Equation 1 Model is an estimate of the effect in the short term. So in the short term, banks do not need to take extra precautions against other risks if the bank is affected by one of the risks of the two banking risks in this study. For example, a bank affected by credit risk only needs to focus entirely on mitigating losses due to credit risk, such as by restructuring or refinancing loans.

Concerning reducing credit risk, banks can seek to increase the value of their income, both through interest and non-interest income, with the aim to increase bank profitability in the form of ROA ratios; so that, bank losses due to loan repayment failures by debtors can be absorbed from increased profits obtained by the bank. In addition, banks can also strive to increase the number and value of lending to their customers, one of which is by promoting credit facilities. The reason is that the percentage value of losses due to the failure of the bank to receive back the loan funds along with the profit on the interest on the loan can be covered with profits from loans given to other debtors.

Concerning reducing liquidity risk or increasing bank liquidity, banks can increase the number and value of their assets to increase the size of the bank. This is because larger size banks will have a competitive advantage compared to smaller size banks through the economics of scale activities, such as the cost of making bank financial facilities that are less because they are carried out massively or in large quantities. Later, the bank can try to increase income on loan interest, namely by increasing the percentage of loan interest charged to debtors. This is done with the aim of increasing the NIM ratio, as evidenced by this research can further prevent banks from being affected by liquidity problems.

In addition, related to the the effect of the liquidity gap and liquidity risk, there are 2 assumptions that can explain the influence between the variables. The first assumption means that the greater the bank's liabilities, the less the level of liquidity gap; so that, it will increase bank liquidity and vice versa. This means that a lower level of liquidity gap will have a good impact on banks by reducing their liquidity risk and vice versa. This follows the theory by Kenton (2020), which explained that banks can increase their liquidity to deal with problems in terms of cash flow availability, for example, when bank runs occur by making loans or debts in large amounts to other institutions. While the second assumption, the difference in the value of total assets and liabilities that are too large for the bank, will be detrimental to the internal bank

and vice versa. This is because if the bank has a proportion of assets that far exceed its liabilities, it can be said that the bank relies too much on funding from the asset side in paying off all its obligations.

Next is the influence of external factors on liquidity risk. Based on the results of this study, the economic crisis in 2020 had a good impact on the liquidity of the banks of 5 ASEAN countries that experienced a recession that year. Public money stored in banks in the form of deposits was not used optimally by the society as in normal conditions before the pandemic. This is because there is a tendency for people to save in times of crisis in anticipation of preparing for all the worst possibilities from the pandemic; so that, bank liquidity conditions increase, which is marked by a decrease in the reference interest rate of each country at that time.

Additionally, the growth of Real GDP on bank liquidity is used to determine how the state's economic conditions through state revenues are known to affect banking conditions. To reduce liquidity risk, the effect of Real GDP on bank liquidity in this study provides an interpretation that the income of the 5 ASEAN countries studied can provide liquidity support to banks in the country concerned. An increase in the country's Real GDP, as measured by state income calculated based on the level of the inflation rate, indicates that the country's economy is running well so that the community can contribute to state revenue.

4.2 Discussion of Equation Model 2

4.2.1 Discussion of Short-Term Regression Equation Model 2

Based on the regression results in Table 5, the results were obtained in no reciprocal influence between credit risk variables and bank liquidity in the short term. This is because the effect between the two variables and their respective dependent variables are not in line or do not show the same significance. In addition, the liquidity variable in this study is an inverse measure of liquidity risk. So it can be said, too, that there is no reciprocal effect between liquidity risk and credit risk. The results of this study are supported by previous research by Imbierowicz and Rauch (2014) and Ghenimi, Chaibi, and Omri (2017). They also did not find a reciprocal relationship between the two variables and were consistent with the regression results in the Equation Model 1.

4.2.2 Discussion of Long-Term Regression Equation Model 2

Based on the regression results in Table 6, new findings are obtained in a reciprocal influence between credit risk variables and bank liquidity risk in the long term. This is because the

influence between the two variables and their respective dependent variables is in line or shows the same direction and significance. So, in the long run, H_1 is acceptable. Plus, these results are also supported by previous research by Diamond and Rajan (2005) and Djebali and Zaghdoudi (2020). To overcome the reciprocal effect of these two banking risks, banks need to overcome liquidity problems and losses on credit risk in an efficient and short time so that they do not impact the emergence of other risks in the long term.

For example, if the bank is affected by credit risk, the bank needs to take various risk management steps to overcome the problem in terms of the number of customers who are unable to pay off the loans that have been given in a short time. Arrangement of loan terms or contracts for refinancing and restructuring actions should also be carried out immediately, especially if the debtor in question has shown some symptoms of difficulty in paying off loan debts. Likewise, the setting of a new loan repayment contract period should also not have a too long period of time, although the short repayment period can also mean that the bank will earn less interest on the loan. This is because the bank's inability to recover its borrowed funds in the long term will make it difficult for banks to have funds that can be used to fulfill their obligations, for example, the obligation to provide funds for depositors to take.

4.3 Discussion of Equation Model 3

Based on the regression results in Table 7 above, it is known that the value of the AR(2) Test and Hansen's Test for stability (Z-Score) as the dependent variable shows an insignificant value (P-Value > 0,05). This means that the results of the study do not show any autocorrelation problems or invalid instrumental variables, respectively. Then the results of the research in Table 7 and Table 8 above show that bank stability is positively and significantly affected by credit risk. This result is different from several previous studies by Ghenimi, Chaibi, and Omri (2017), Setiawan, Sudarto, and Widiastuti (2019), and Zaghdoudi (2019), all of which stated that there was a negative and significant influence of credit risk on bank stability. Nevertheless, the results in this study can still be said to be reasonable and explained logically using the theory of "gambling for resurrection" which is another form of the principle of "high-risk high return" but is carried out when a business is in a risk-affected condition based on research by Imbierowicz and Rauch (2014). Under these conditions, banks that are only affected by credit risk are assumed to provide a response that will instead provide a mitigation effect that can increase its stability.

In other words, banks in the 5 countries sampled in this study do not perceive credit risk as an obstacle but as an opportunity to increase their stability. The response of the bank, which is assumed to be effective according to this, is to seek for debtors to repay the loans that have been given in any way. One of them is by increasing intermediation costs, such as in terms of a stricter supervision of the profile and performance of debtors in terms of loan repayment, renegotiation of loan repayment contracts through refinancing facilities, and issuing loans with entirely new contracts through restructuring for debtors who have the most difficulty in repaying loans.

The combined effect of credit risk and liquidity risk (credit risk x liquidity risk) negatively and significantly affects bank stability in this study. This is supported by several previous studies by Ejoh, Okpa, and Inyang (2014), Ghenimi, Chaibi, and Omri (2017), Zaghdoudi (2019), and Djebali and Zaghdoudi (2020), which also obtained the same results. The combination of credit risk and liquidity risk is a condition where the bank is affected by these 2 risks at once. Concerning bank stability, this means that the problem of losses due to the failure of the debtor to repay the loan and accompanied by the inability of the bank to withdraw funds from its assets can make the bank unstable or increase the likelihood of failure in terms of fulfilling its obligations. Under these circumstances, banks can at least apply 4 response options, namely:

a. Prevent the occurrence of both risks simultaneously by imposing stricter regulations in terms of terms or contracts of loans, ensuring their investments, and deposit funds from depositors;
b. Lower the expected rate of return or the profit expected by the bank;
c. Make large loans to banks and other companies;
d. Carry out risk-sharing, namely through a process of merger or merging of one bank with another bank in cooperation and acquisition relationships or allowing a bank to be taken over by another more stable institution.

Furthermore, based on Table 7 and Table 8 above, bank stability is also influenced by several internal factors, including:

a. The effect of Z-Score (-1) on bank stability obtained in this study is positive and significant. This result is supported by previous research by Ghenimi, Chaibi, and Omri (2017), which also obtained the same result;
b. The effect of ROA on bank stability shows a positive and significant effect on bank stability. These results are consistent with previous studies by Ghenimi, Chaibi, and

Omri (2017) and Setiawan, Sudarto, and Widiastuti (2019), which also obtained the same results;

c. The effect of CAR on bank stability in this study is positive and significant. This result is the same as previous research by Ghenimi, Chaibi, and Omri (2017) and Setiawan, Sudarto, and Widiastuti (2019), which means an increase or decrease in the CAR level can increase or decrease the level of bank stability respectively;

d. Income diversification has a positive and significant effect on bank stability. This result is the same as previous research by Srairi (2013) and Ghenimi, Chaibi, and Omri (2017).

In this study, lagged bank stability functions as an indicator that measures its ability to maintain its stability in a certain period. This means that banks that are successful in increasing their stability in a certain period will potentially obtain even better stability in the future. Calculation of the measure of bank stability using the Z-Score involves the ROA ratio and the amount of capital owned by the bank as an indicator that can increase bank stability if both things increase. This is consistent with the results of this study regarding the effect of ROA and CAR, which positively and significantly affect bank stability.

Increasing the ROA ratio itself can be done by banks by trying to get more revenue on interest and non-interest. Then the bank can also reduce lending to debtors who have a high-risk profile because this can increase the Risk-Weighted Assets ratio, which can reduce the level of the CAR. Furthermore, bank income through income diversification, for example, transaction fees charged to its customers, deposits to other banks, investments in stocks and bonds, and so on based on this research, can encourage banks to obtain higher stability.

5. Conclusion and Managerial Implications

Based on the results of this study, conclusions can be drawn in the form of several points of managerial implications that can be carried out by the management of the 5 ASEAN banks in this study in order to create a safe, productive, and sustainable business environment, including:

1. Banks need to pay special attention to the two banking risks, which are most directly related to the performance of the bank itself, namely liquidity risk and credit risk. Both of these risks can be the main cause of a bank failing or going bankrupt. Therefore, a good risk management process needs to be applied by banks specifically to prevent and overcome the occurrence of these two risks, given the significant influence of these two risks on bank stability;

2. Based on this research, risk mitigation as an effort to improve bank stability consists of 3 stages, namely the stage of preventing the occurrence of the risk, handling when affected by risk, and maintaining a stable bank condition;

3. Prevention of liquidity risk and bank credit risk can be done successively, for example, by ensuring the bank's investment assets and deposit funds of depositors and tightening the risk profile assessment process for debtors before the bank decides to provide loans to its customers;

4. Countermeasures when a bank is affected by liquidity risk and credit risk can be carried out in succession, for example, changing the bank's investment structure to the majority of assets with a short period of time and seeking debtors to repay loans either by refinancing or credit restructuring;

5. Maintaining the bank's stable condition can be done by increasing the size of the bank's stability through increasing ROA and CAR in a certain period. The reason is that based on this research, banks that succeed in improving their stability in a period will have the opportunity to obtain better stability in the future;

6. Liquidity risk and credit risk were found in this study to have a mutually influencing effect in the long term. This means that in order to overcome one of the risks of the two risks, the bank must be able to resolve it in a fast and efficient time to avoid the emergence of other risks in the long term;

7. The application of the theory of "gambling for resurrection" through the principle of "high-risk high return" can be applied by banks especially to deal with one of the risks and, in this case, refers specifically to credit risk. However, applying this principle should only be carried out when the bank is not experiencing liquidity problems because the potential for the bank to fail will be much greater. Several ways to overcome the risks that occur simultaneously can be done using the risk-sharing method through the merger and acquisition process or making large loans to other parties;

8. The role of banks during this crisis can be seen from the impact of the economic crisis due to the Covid-19 pandemic, which directly affects bank liquidity. The economic crisis due to this pandemic has increased bank liquidity because many people do not use their money for transaction activities optimally and save more. Thus, bank liquidity rises in line with the increase in the amount of funds stored in the bank. Banks can take

advantage of this crisis moment with good liquidity conditions to channel more loan facilities in order to increase their income on bank interest.

6. Suggestions for Further Research

For further research, it may be possible to use closed conventional bank data because in this study, the authors can only obtain open conventional bank data. In addition, the time interval of the research period may be extended to include the period in 2021 or the period after the economic crisis conditions due to the pandemic have improved. But this all depends on the availability of financial statement data published by all the banks concerned. This is because in this study, for example, from a total of 75 open conventional banks in 5 ASEAN countries that experienced a recession in 2020 and had published their financial statements at least before the 4th quarter of 2015, only 41 banks that had completely published their financial statements data until the 3rd quarter of 2020 counted since the last data collection for the making of this research in May 2021.

References

Aida, N. R. (2020). *Indonesia Resmi Resesi, Ini yang Perlu Kita Tahu soal Resesi dan Dampaknya*. Kompas. https://www.kompas.com/tren/read/2020/11/05/125200565/indonesia-resmi-resesi-ini-yang-perlu-kita-tahu-soal-resesi-dan-dampaknya?page=all

Akhtar, M. F., Ali, K., & Sadaqat, S. (2011). Liquidity Risk Management: A comparative study between Conventional and Islamic Banks of Pakistan. *Interdisciplinary Journal of Research in Business*, *1*(1), 10.

ASEANStatsDataPortal. (2021). *ASEAN Visitor Arrivals Dashboard*. ASEANStatsDataPortal. https://data.aseanstats.org/dashboard/tourism

Asteriou, D., Pilbeam, K., & Pratiwi, C. E. (2021). Public debt and economic growth: panel data evidence for Asian countries. *Journal of Economics and Finance*, *45*(2), 270–287. https://doi.org/10.1007/s12197-020-09515-7

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*(1), 115–143. https://doi.org/10.1016/S0304-4076(98)00009-8

Dermine, J. (1986). Deposit rates, credit rates and bank capital. The Klein-Monti Model
    Revisited. *Journal of Banking and Finance*, *10*(1), 99–114. https://doi.org/10.1016/0378-
    4266(86)90022-1

Diamond, D. W., & Rajan, R. G. (2005). Liquidity shortages and banking crises. *Journal of
    Finance*, *60*(2), 615–647. https://doi.org/10.1111/j.1540-6261.2005.00741.x

Djebali, N., & Zaghdoudi, K. (2020). Threshold effects of liquidity risk and credit risk on
    bank stability in the MENA region. *Journal of Policy Modeling*, *42*(5), 1049–1063.
    https://doi.org/10.1016/j.jpolmod.2020.01.013

Ejoh, N., Okpa, I., & Inyang, E. (2014). The Relationship and effect of Credit and Liquidity
    Risk on Bank Default Risk among Deposit Money Banks in Nigeria. *Research Journal
    of Finance and Accounting*, *5*(16), 1–10.

Ghenimi, A., Chaibi, H., & Omri, M. A. B. (2017). The effects of liquidity risk and credit risk
    on bank stability: Evidence from the MENA region. *Borsa Istanbul Review*, *17*(4), 238–
    248. https://doi.org/10.1016/j.bir.2017.05.002

Imbierowicz, B., & Rauch, C. (2014). The relationship between liquidity risk and credit risk
    in banks. *Journal of Banking and Finance*, *40*(1), 242–256.
    https://doi.org/10.1016/j.jbankfin.2013.11.030

Iqbal, A. (2012). Liquidity Risk Management : A Comparative. *Global Journal of
    Management and Business Research*, *12*(5), 54–64.

Kenton, W. (2020). *Bank Run*. Investopedia.
    https://www.investopedia.com/terms/b/bankrun.asp

Muharam, H., & Kurnia, H. P. (2015). Liquidity Risk on Banking Industry: Comparative
    Study Between Islamic Bank and Conventional Bank in Indonesia. *Al-Iqtishad: Journal
    of Islamic Economics*, *5*(2). https://doi.org/10.15408/aiq.v5i2.2118

Prayoga, F. (2020). *4 Negara Asean Sudah Resesi, Indonesia Menyusul?* Oke Finance.
    https://economy.okezone.com/read/2020/08/19/20/2264299/4-negara-asean-sudah-
    resesi-indonesia-menyusul

Setiawan, A., Sudarto, & Widiastuti, E. (2019). The Influence of Credit Risk and Liquidity
    Risk on Bank Stability. *International Conference on Rural Development and
    Entrepreneurship 2019: Enhancing Small Business and Rural Development Toward*

Industrial Revolution 4.0, *5*(1), 1–9.

Srairi, S. (2013). Borsa _ Istanbul Review Ownership structure and risk-taking behaviour in conventional and Islamic banks : Evidence for MENA countries. *Borsa Istanbul Review*, 1–13. https://doi.org/10.1016/j.bir.2013.10.010

Zaghdoudi, K. (2019). The effects of risks on the stability of Tunisian conventional banks. *Asian Economic and Financial Review*, *9*(3), 389–401. https://doi.org/10.18488/journal.aefr.2019.93.389.401