THE EFFECTS OF FINANCIAL SYSTEM STABILITY INDICATORS ON FINANCIAL INSTITUTIONS

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Abstract

Indonesia has increasingly developed in the past few years, both in the bank and non-bank industries. The non-bank financial industry is an essential financing source in any country. The number of development programs in Indonesia requires tons of money. Alternative financing that can be employed is the financing obtained from the Financial Institutions However, the crisis monitoring and prevention framework do not yet cover the Non-Bank Financial Industry. Therefore, this study aims to determine the effect of financial system stability on the financial institutions in the long-term and short-term utilizing index calculation analysis usingthe min-max method and Error Correction Model or ECM Error Correction Model.In addition, the study employs thesecondary data with monthly time series from January 2015 to April 2020. This study examines whetherfinancial system stability significantly affects Indonesia's financial institutions in the long-term.

Keyword: financial system stability, financial institution, ECM

1.INTRODUCTION

The development of a country is determined by the economic entities' development and growth of the financial system, i.e., banking and non-banking. Indonesia has shown an increasing development in the past few years, both in the bank industries and non-bank industries. The non-bank financial industry is an essential financing source in any country [1].

Alternative financing sources obtained from investment or business capital support are urgently required to undertake the national development vision and mission. The number of development programs in Indonesia requires a lot of money. The alternative financing that can be employed is the financing obtained from the Financial Industry .[2] Non-bank financial institutions, known as NBFI, are the non-bank financial industry consisting of insurance institutions, pension funds, specialized NBFI supporting industries, and Microfinance Institutions (MFI). is an institution with a strategic role as a non-bank institution that is capable of collecting and channelling community funds effectively. The increasein the assets of Banking sector and NBFI can play an essentialrole in implementing the development programs. [2] financial institutions has large assets; one of the advantages of these non-bank financial institutions is that they have a relatively maintained Non-Performing Financing (NPF) at the level of 3.7 whereas theReturn on Assets (ROA) is still in a positive condition and is at the level of 4.09 percent.However, the potential of non-bank financial institutions in Indonesia remains untapped. IN 2018, PT Asuransi Jiwasraya (Persero), as one of the Non Bank Financial Industries in Indonesia, carried out window dressing, and in the research results of the Audit Board of the Republic of Indonesia has been conducted since 2006.This is a violation of the prudential principle. On another occasion, the Minister of Finance of the Republic of Indonesia Sri Mulyani stated that the Financial System Stability Committee (KSSK) employed Law Number 9 of 2016 concerning Financial System Crisis Prevention and Management (UUPPKSK) as well as the dominant Laws for each financial institution to mitigate the risk of domestic banks [3]. From the statement, the framework for crisis monitoring and prevention does not yet include the Non-Bank Financial Industries. According to Crocket (1977), the stability and health of the banking sector are part of financial stability which is closely related to the health of an economy[4]. The function of banking as an intermediary institution is related to

financial system stability. If there is a disruption in the intermediation function, it will hamper the allocation of funds and financing for productive sectors. Macroprudential policy is defined as a policy that aims to limit the risks and costs of a systemic crisis. Based on the definition of the Regulation of Bank Indonesia (PBI) No. 16/11/PBI/2014 about the regulation and macroprudential supervision, systemic risk is defined as the potential instability due to the occurrence of contagious interference, bothpartially or in the entire financial system due to the interaction of the size of the factors, the effort complexity, the interconnectedness between institutions or financial markets, as well as the tendency of excessive behaviour on participants or financial institutions to follow the economic cycle of procyclicality. To avoid or reduce the risk of the possibility of financial system instability, it is necessary to identify an indicator of financial system stability for non-bank financial institutions in Indonesia.

2. LITERATURE REVIEW

2.1. Financial Intermediation

McKinon (1973) stated there quirement for economic growth. The theoretical approach is based on several aspects,according to [5], which are:

1. The co-existence of economic development is supported by old and modern technology with very different levels of efficiency in physical and human resources.
2. The fact becoming the concern in the production process is the need for a relatively large investment. Physical capital becomes an essential element that is taken into account in the development process.
3. The importance of investing is in the financial intermediation because the financing sector can determine the rate of return.

The development of the Financial intermediation theory is motivated by the level of inequality in return on assets. Schumpeter (1911) in [6] describes the disparity in the increase of the return on assets due to the technological advances. However,this can trigger the entrepreneurial dynamism that characterizes the economic growth. The disparity, according to McKinon and Shaw (1973) in [7], is the difference in intermediation, which is traditionally based on transaction costs and asymmetric information, and intermediation function which has increased with the role of technology into the financial markets the role of intermediaries in the financing institutions, which,according to [6], can produce dramatical acceleration in the overall growth of the economy. Therefore, the improvement in the process of financial intermediation is a prerequisite for economic growth. Shaw (1973) further suggests that the real growth in financial institutions can provide more access to the debtors who can provide the incentives of the equity loan.

[8] divides the financial system into two components, namely the financial market and the financial intermediaries. Financial Intermediation is an important economic development activityasit can lead to a flow of funds from the unproductive parties to the productive parties in managing the fund. Financial Intermediation is mainline in transferring fund from one lenderto another. The media certainly focuses more on the stock market, while,in fact, financial intermediaries are more important sources of financing for companies than the stock market. In the financial institutions, [9] uses the stability trinity of the financial system to describe the conditions that allow the financial system to work effectively and efficiently and be capable of withstanding internal and external shocks so that the allocation of funding or financing can contribute to the growth and stability of the national economy. Pressure, intermediation, and efficiency are the main objectives in the selection of indicators.

2.2. Financial System Stability

Financial stability consists of various institutions in theeconomy that becomes the intermediary betweenthe one's savings andothers' investments [10]. It becomes an important part of supporting the real sector in development [11]. Financial stability is associated with development stages; according to Andrew (2014), the development results in the financial sector are the development of the economy. However, financial system stability will follow the state of the real sector. The direct link between the financial stability and the prices, according to [12], is the financial system stability with the price stability, which is the reference for monetary stability and financial sector stability, in which there are financial institutions, both banks, and non-bank financial

institutions. [13] has several important points to understand financial stability, namely:

(a) Financial stability is a comprehensive concept and includes various aspects of systems, infrastructure, institutions, and also markets;

(b) The concept of financial stability not only discusses how the financial sector can fulfil its role in allocating risk and resources, mobilizing savings, and facilitating the accumulation of wealth, its development and growth but also how the payment system in the economy can operate properly without hindrance;

(c) The concept of financial stability discusses not only the absence of financial business but also the ability of the financial system to limit and deal with the emergence of imbalances before it becomes a severe threat;

(d) Financial system stability is written and understood in terms of its potential consequences on the real economy. Disruptions in the financial markets or individual disruptions in the financial institutions should not be considered a threat to financial stability if it does not have a significant impact on the economy;

(e) It is a renewed concept and occurs in a continuum. The implication is that to achieve financial stability is not necessary for all parts of the economy to operate at peak performance, but should be consistent over time (spare tire).

[14] Financial system stability is a financial system entering an unstable stage where the system has endangered and hampered economic activity. [9] The financial system has a significant role in the economy. This system helps the resource reallocation, primarily funds so that the deficit units can utilize the excess funds in the surplus units.

[1], with aresearch entitled "The Determinants of Profitability of Non-Bank Financial Institutions in Bangladesh", aims to find the influence of income and the cost ratio from non-bank financial institution towards the financial system performance that can give sources of financing on the country and can turn on the performance of non-bank financial industry by using variable panel data Firm Size, Capital Adequacy Ratio, Loan Ratio, Non-Performing Loan Ratio, Deposit Ratio, and Profitability, Nit Interest Margin, Non-interest margin, and Cost to Income Ratio.The study concludes that, along with the increase in the total profitability of the non-bank industry, the non-bank financial industry can increase profits from the non-bank financial industry and can increase the stability of the financial system in Bangladesh.

3. RESEARCH METHOD

This research was quantitative research, which sought the long-term and the short-term effects between the financial system stability and the Financial Industry. The indicator variable on the financial system stability used wasthe secondary data with monthly time series from January 2015 to August 2020 sourced from the Financial Services Authority and Bank Indonesia. The basic period between 2015-2020 was selected because it had several conditions ranging from normal era to the Covid-19 pandemic condition, and the new normal era in Indonesia.

This study used the dependent variables from the Assets of Bank and Non-Bank Financial Industry including insurance assets, pension funds, financing institutions, and specialized financial institutions, whereas the independent variables consisted of indicators forming variables of financial system stability.

After conducting the min-max calculation method, the variables from the assets of non-bank financial institutions became the dependent variable, and the nine forming indicators of financial system stability became the independent variables.The model equation is as follows:

$$Asset\ FI = \beta_0 + \beta_1 BOPO + \beta_2 CAR + \beta_3 LDR + \beta_4 NIM + \beta_5 NPL + \beta_6 ROA + \varepsilon$$

Description:

$Aset\ FI$: The Assets of Bank and Non-Bank FI

$\beta_1 BOPO$: Operational Payment and Operating Income Index

$\beta_2 CAR$: Capital Performing Loan Index

$\beta_3 LDR$: Loan to Deposit Ratio Index

$\beta_4 NIM$: Net Interest Margin Index

$\beta_5 NPL$: Non-Performing Loan Index

$\beta_6 ROA$: Return on Assets Index

The first step in this research was to create the financial system stability index using the Financial Stress Index, which was generally constructed by one or more stress variables from different financial sectors. By using the composite index in two stages. The first stage was to calculate each index for each variable with the following formula:

$$I(i) = \frac{\mathrm{X(i)} - \mathrm{X(i)min}}{\mathrm{X(i)maks} - \mathrm{X(i)min}}$$

Information:

I(I) : Variable index i
X(i) : variable value i
X(i) min : the smallest value of variable i
X(i) max: the largest value of variable i

The use of the statistical normalization approach aimed to simplify and sharpen the analysis in this study. The min-max method employed the minimum and maximum values for the variable data and indicators used in this study.

The Unit Root Test was carried out to prove the stability (normality) of the correlationpattern in each variable so that the resulting regression was not false to produce a correct interpretation. For this stationarity test, generally, the most frequently used was the Augmented Dickey-Fuller or ADF Test. By comparing the ADF test value with the Critical Value, the ADF test value becamesmaller than the Critical value and had a probability of less than 5%.Therefore, the data was stationary.

The CointegrationTest was carried out to prove the stability (normality) of the correlation pattern in each variable so that the resulting regression was not false to produce a correct interpretation. For this stationarity test, generally, the most frequently used was the Augmented Dickey-Fulleror ADF Test. By comparing the ADF test value with the Critical Value, the ADF test value becamesmaller than the Critical value and had a probability of less than 5%. Therefore,the data was stationary.

Error Correction Model (ECM) was introduced by Sargan and popularized by Engle-Granger. In general, this model was the concept of a time series econometric model that aimed to balance the condition for short-run equilibrium with the condition for long-run equilibrium through an adjustment. Engle and Granger (1987) suggested that if there was cointegration between some variables, a condition called error correction representation was obtained, indicating that the changes that occurred in the dependent variable were not only influenced by the independent variable but were also influenced by the balance of the cointegrationcorrelation.

The classical assumption test was carried out to determine whether there were deviations from the classical assumptions. According to [15], several classical assumptions should be complied for an estimation result to be excellentand efficient.

4. RESULT AND DISCUSSION

The results of the unit root test of the Augmented Deckey-Fuller test can be explained in Table 1 as follows Table 1. The Results of Augmented Dickey-Fuller Test at the Level and first difference

Variable	Augmented Dickey-Fuller Prob.	Augmented Dickey-Fuller Prob.
The Assets of Financial Institutions	0.7550	0.0000
BOPO	0.0590	0.0000
CAR	0.1409	0.0000
LDR	0.3242	0.0000
NIM	0.1525	0.0000
NPL	0.3790	0.0000
ROA	0.0320	0.0000

Source: The processing results using Eviews 9

Table 1 shows the results of the unit root test of the Augmented Dickey-Fuller Test at the level with the ADF method. In the table, none the independent variable is stationary at the level. In contrast, for other variables that are not stationary, the unit root test is re-tested the Augmented Dickey-Fuller Test at the first difference level. Testing at the first difference level produced all statsionary variables with a significant probability level at the first difference level.

Using the cointegration test of Augmented Engle-Granger from the residuals, and using the cointegration test of Johansen Cointegration, the analysis process could use the Error Correction Model (ECM) testing in Table 2. The Results of Cointegration Test of Johansen Cointegration

Rank Trace	Statistic	Critical Value (0.05)
Trace	327.0324	239.2354
Maximum eigenvalue	82.20406	64.50472

Source: The processing results using Eviews 9

The Johansen Cointegration test used trace statistic analysis and a critical value of 5% with trace statistic and Max-Eigen values. The statistic value for both Trace Statistic by 327.0324 was greater than the Critical Value by 239.2354, and Max-Eigen Statistic by 82.20406 was greater than the Critical Value 64,50472. It could conclude that the variable in this study had cointegration, which meant that there was a long-term correlationon each variable.

The Error Correction Model (ECM) is an econometric analysis used to find regression equations for short-run and long-run equilibrium. The results of long-term estimation can be observed in Table 3 as follows:

Table 3. The Results of Long-term Estimation

Variable	*Coefficient*	*std.error*	*t-Statistic*	*Prob.*
BOPO	0.000275	0.015266	0.017995	0.9857
CAR	1.035097	0.174180	5.942683	0.0000
LDR	0.072054	0.016733	4.306088	0.0001
NIM	0.007584	0.019323	0.392465	0.6962
NPL	-0.037131	0.013945	-2.662688	0.0101
ROA	-0.034587	0.016644	-2.078064	0.0422
C	6.905307	0.025111	27.49881	0.0000
R^2	0.823864	*Durbin-Watson stat*		0.788197
Ajt. R^2	0.805323	*Prob (F-statistic)*		0.000000

Source: The processing results using Eviews 9

In this equation, the P-Value coefficient of 0.0000 is significant at the 5% level, meaning that if the financial system stability indicator is 0, then the assets of the financial institution are 6,905307. The coefficient of the independent variable of OEOI is 0.000275, which means that every increase in financial system stability (BOPO) of 1% will increase the assets of financial institutions by 0.000275% and do not have a significant effect on the assets of financial institutions with a p-value of 0.9857 at the 5% level. The coefficient of the independent variable CAR is 1.035097, which means that each increase in financial system stability (CAR) of 1% will increase the assets of financial institutions by 1.035097% and have a significant effect on the assets of financial institutions with a p-value of 0.0000 at the 5% level. The coefficient of the LDR independent variable is 0.072054, meaning that each increase in financial system stability (LDR) of 1% will increase the assets of financial institutions by 0.072054% and have a significant effect on the assets of financial institutions with a p-value of 0.0001 at the 5% level. The coefficient of the NIM independent variable is 0.007584, which means that each increase in financial system stability (NIM) of 1% will increase the assets of financial institutions by 0.007584% and has no significant effect on financial institution assets with a p-value of 0.6962 at the 5% level. The coefficient of the NPL variable is -0.037131, which means that each increase in financial system stability (NPL) of 1% will reduce the assets of financial institutions by 0.025044% and have a significant effect on financial institution assets with a p-value of 0.0101 at the 5% level. The coefficient of the ROA independent variable is -0.034587, which means that each increase in financial system stability (ROA) of 1% will reduce the assets of financial institutions by 0.034587% and have a significant effect on the assets of financial institutions with a p-value of 0.0422 at the 5% level. The long-term equation model in table 4.4 has a probability F-statistic of 0.00000 which means it is significant at the α level of 5%. This illustrates that the independent variables in each model of the financial system stability variables simultaneously affect the assets of non-bank financial institutions. The R2 value of 0.823864 indicates that 82% of the changes in the indicator variable for financial system stability can be explained by the independent variables in this long-term equation. The remaining 18% is explained by other factors outside the model. Meanwhile, the Adjusted R2 value of 0.805323 shows that taking into account the degree of freedom, all independent variables included in the model are able to explain the dependent variable by 80%, while the remaining 20% is explained by factors outside the model.

Table 4. The Results of Short-term Estimation

Variable	*Coefficient*	*std.error*	*t-Statistic*	*Prob.*
BOPO	-0.007898	0.010381	-0.760830	0.0401
CAR	-0.086178	0.135838	-0.634422	0.4500
LDR	-0.008582	0.012267	-0.699576	0.5284
NIM	0.016808	0.011773	1.427662	0.4871
NPL	-0.005956	0.008246	-0.722238	0.1589
ROA	-0.002671	0.010092	-0.264677	0.4732
C	0.002989	0.001422	2101820	0.7922
R^2	0.119332	*Durbin-Watson stat*		2.554476
Ajt. R^2	0.024975	*Prob (Fstatistic)*		0.288429

Source: The processing results using Eviews 9

In this equation, it shows that the P-Value coefficient constants of 0.7922 are not significant at the 5% level, meaning that if the indicator of financial system stability is 0, then the assets of financial institutions are 0.002989.The coefficient of the independent variable BOPO is -0.007898, which means that every increase in financial system stability (BOPO) of 1% will reduce the assets of financial institutions by 0.007898% and have a significant effect on the assets of financial institutions with a p-value of 0.0401 at the 5% level.The coefficient of the independent variable CAR is -0.086178, which means that every 1% increase in financial system stability (CAR) will reduce the assets of financial institutions by 0.086178% and has no significant effect on financial institution assets with a p-value of 0.4500 at the level of 5%.The coefficient of the LDR independent variable is -0.008582, which means that every 1% increase in financial system stability (LDR) will reduce the assets of financial institutions by 0.008582% and have no significant effect on the assets of financial institutions with a p-value of 0.5284 at the 5% level. The coefficient of the NIM independent variable is 0.016808, which means that each increase in financial system stability (NIM) of 1% will increase the assets of financial institutions by 0.016808% and has no significant effect on the assets of financial institutions with a p-value of 0.4871 at the 5% level. The coefficient of the NPL variable is -0.005956, which means that every 1% increase in financial system stability (NPL) will reduce the assets of financial institutions by 0.005956% and have a significant effect on the assets of financial institutions with a p-value of 0.1589 at the 5% level. The coefficient of the ROA independent variable is -0.002671, which means that each increase in financial system stability (ROA) of 1% will reduce the assets of financial institutions by-0.002671% and does not have a significant effect on the assets of financial institutions with a p-value of 0.4732 at the 5% level. The short-term equation model in table 4.5 has a probability F-statistic of 0.288429 which means it is not significant at the α level of 5%. This illustrates that the independent variables in each model of the financial system stability variable simultaneously have no effect on institutional assets. The R2 value of 0.119332 indicates that the 11% change in the indicator variable for financial system stability can be explained by the independent variables in this long-term equation. The remaining 89% is explained by other factors outside the model. Meanwhile, the Adjusted R2 value of 0.024975 shows that taking into account the degree of freedom, all independent variables included in the model are able to explain the dependent variable by 2%, while the remaining 98% is explained by factors outside the model.

The classical assumption test is carried out to determine whether there are deviations from the classical assumptions. According to Gujarati (2006)[17], several classical assumptions must be met for an estimation result to be good and efficient. Multicollinearity test using Variance Inflation Factors in the model there is no multicollinearity with the Centered VIF value on all variables less than 10. The heteroscedasticity test in this model uses the Glejser test, there is no heteroscedasticity with the Pro value. Chi-Square with a value of 0.4255 is greater than α 0.05, it can be concluded that there are no symptoms of heteroscedasticity. Autocorrelation test using the Breush-Grodfrey LM Test, there are no autocorrelation symptoms with the Prob value. Chi-Square 0.0861 is greater than α 0.05. Normality test using the Jerque-Bera test (JB-Test) the data used in this study are normally distributed with a probability value of 0.735153 greater than α 0.05

5.CONCLUSION

The results of the model analysis in this study indicate that simultaneously the indicator variables of financial system stability significantly affect financial institutions'

assets in the long-term. The result in this study corresponds to a study of Imtiaz (2013) entitled "The Determinants of Profitability of Non-bank Financial Institutions in Bangladesh," whose result indicates the increase in the number of profitability from the non-bank financial industry.Therefore,the non-bank financial industry can increase the profit from the non-bank financial industry. In the long-term, it can improve the stability of the financial system in Bangladesh. Another study from Islam (2007) entitled "Non-Bank Financial Intermediaries (Nbfis) and Economic Growth In Malaysia: An Application of the Ardl Bounds Testing Approach to Cointegration" finds the variable between per-capita income and the economic growth in Malaysia Market Capitalization. Value of trade, total assets from non-bank financial institutions, and private credit indicate that non-bank financial institutions' development has a positive and significant long-term impact affectingthe financial system stability in Malaysia. This research is also in line with Dhiba (2019) in his research entitled "The effect of BOPO, GDP, NPF, and SBIS on the growth of banking assets in Indonesia" which explains that the indicator variables used have a long-term effect on banking assets.

Based on the description above, the stability system for long-term financial givesan effect to the non-bank financial institution where the systemic risk is defined as the presence of potential instability.The potential instability, therefore,means that it will give a negative effect from the systemic risk on the economy. This situation can be seen from the increased number of distraction on the payment system, credit flow, and decreasing on asset value, as well as the community trust on a non-bank financial institution which are the empirical evidence that community trust is the factor that can affect to the stability of the financial industry. Therefore, it can be a great effort on forming to vast community trust in the non-bank financial industry as one of alternative financing in Indonesia [16].The low level of the community trust to the non-bank financial institution can be a great challenge for the government. On the other hand, non-bank financial institutions can be an alternative to financing development programs in Indonesia. So the researchers suggest that there should be financing for non-bank financial institutions to be able to suppress LDR (Loan to Deposit Ratio). From the perspective of the Financial Services Authority, which has the task of maintaining financial system stability, it faces challenges in the financing segment for non-bank financial institutions which separates non-bank financial institutions from the banking sector and creates a more competitive financial sector. If there is a financing segment for non-bank financial institutions, the utilization of financing sources originating from banks can be done optimally.

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