

The Impact of Financial Inclusion on Financial Stability in Indonesia

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Abstract: The financial system has a strategic role in an economy. In the last 22 years, Indonesia has experienced two economic crises. This event reminds of the importance of maintaining financial system stability. The data used in this study is quarterly data for the period 2008-2019 from Indonesia Financial System Statistics and Financial Stability Review of Bank Indonesia as well as the Annual Report of the Deposit Insurance Corporation. Data analysis method used a t-test and f-test. The result of this investigation showed that financial inclusion that was proxied using the number of savings accounts and the number of bank service offices had no influence on financial stability. Meanwhile, financial inclusion that is proxied using the number of ATMs, third-party funds-to-GDP ratio and SMEs credit account ratio to bank credit accounts has a positive and significant effect on financial stability. This research also shows that financial inclusion jointly has a positive and significant effect on financial stability. Based on this research, the government is expected to create a policy that attracts the public to use financial services that are fully available.

1 INTRODUCTION

Indonesia has experienced two economic crises over a span of 22 years. In mid-1997 until its peak in 1998 Indonesia experienced an Asian Financial Crisis. At the beginning of 1998, the rupiah exchange rate on the US dollar reached Rp 10.700,00, - and significantly weakened during the first half of 1998 (Harvie & Hoa, 2016). Not just the Asian Financial crisis, during the global economic crisis from 2008 to 2009, the rupiah depreciated again at a point of Rp 12,100 per US dollar. This then became a lesson for Indonesia on the importance of maintaining the stability of the country's financial system. Bank Indonesia reported in April 2020 that Indonesia experienced a devaluation of the exchange rate with a middle value of Rp 16,413 per US dollar caused by the influx of the COVID-19 pandemic in Indonesia.

Several times the economic crisis proved that financial system stability in Indonesia is still not good enough to ward off all pressures both internally and externally. Currently, increasing financial inclusion is a priority for many countries after global financial crisis in 2008. The high level of financial inclusion contributes to the increasing stability of banks as financial service providers (Ahamed & Mallick, 2017). Financial inclusion itself is one of the strategies used by many countries to increase the

inclusive growth of the country (Dienillah, Anggraeni, & Sahara, 2018). Financial inclusion is also likely to negatively affect the stability of the country's financial system. According to Dienilla, Anggraeni and Sahara (2018), the possibility of instability in a financial system is caused by a decline in credit standards, increased risk to the bank's reputation, and the absence of action on microeconomic regulations. Bank Indonesia stated that financial inclusion itself is a factor that can substantially boost financial system stability and economic growth of a country (Bank Indonesia, 2014). This is based on the role and distribution of financing sources to national economic growth that can only occur if the financial system can survive all kinds of vulnerabilities both internally and externally (Bank Indonesia, 2014).

Camara and Tuesta (2014) stated that Indonesia is ranked 61st out of 82 countries that serve as the object of research on the ease of people in accessing financial services, as well as the 71st rank regarding the absence of barriers for people in access to financial services. This is far from the vision and mission of inclusive finance that has been formulated, namely creating a financial system that can be accessed by all people easily in order to improve the economy, prevent squalor, align income and realize a good financial system stability in Indonesia (Bank Indonesia, 2014).

Research conducted by Dienillah, Anggraeni and Sahara (2018) found that countries with high income levels have inclusive financial levels and financial stability is better than countries with middle and low incomes. The study also mentioned that financial inclusion has no influence on low and middle income countries as well as in high income countries that have a positive effect on financial system stability, and that the country needs to increase the availability of financial services and improve financial development to achieve financial inclusion and good financial stability.

Researchers previously used the ratio of the number of savings accounts, the ratio of the number of bank services offices, the ratio of Third Party Funds to Gross Domestic Product (GDP), as well as the total credit accounts of SMEs and Banks as independent variables that become proxies of financial inclusion. In this study, researcher added independent variables in the form of the number of Automated Teller Machines (ATM) ratios as a proxy of financial inclusion. Rusdianasari (2018) in her research mentioned that ATM as a form of financial technology has a role to play in the creation of good financial inclusion in terms of the availability of financial services. Quoted from www.worldbank.org, Indonesia is classified as a middle income country, which then encourages researcher to examine the impact of financial inclusion on financial system stability in Indonesia.

This study aims to find out whether financial inclusion affects financial system stability in Indonesia during the period 2008 to 2019 quarteredly, as well as to find the empirical evidence related to the impact of financial inclusion on financial system stability in Indonesia during the period 2008-2019.

2 LITERATURE REVIEW

2.1 Classical Theory

According to Adam Smith (1776), all economic resources can be used with maximum (full employment) if there is a perfect competitive economy, this is believed by classical economists. They also argue that full employment can only be achieved if the country's economy is not mixed by the government but rather the market mechanism has full control over the state economy (Smith, 1776). The accumulation of capital is also seen as the key to progressed by the classical. This resulted in the

storage of large amounts of money tends to be done by the classics.

2.2 Banking

The definition of banking has been first regulated by Law Number 10 of 1998 about Banking. Banking is an institution, business activity, and process in a business activity related to the bank. The law also explains that the entire community fund covered by a business entity intended to improve the standard of living of the community is referred to as a bank. Banking is an activity carried out with the intention to raise funds (funding) and channel them back (lending), as well as a financial institution that receives deposits from the public in the form of savings, current accounts, and deposits and provide credit to the community as its main (Kasmir, 2013). Bank is also a place for exchange, transfer of money and receipt of all forms of payments and deposits. The bank itself is defined as a financial business entity that serves as a storage of money from the community that will be channelled again to the community in the form of credit intended to improve people's living standard (Darmawi, 2012).

2.3 Bank Penetration

Inclusive finance must have a large number of financial service users, so an inclusive financial system requires bank penetration to reach all levels of society (Sarma, 2012). Bank penetration is one of the driving factors in the creation of financial inclusion is what a state needs to do to encourage the creation of a good inclusive financial system, as evidenced by the increasing number of users of financial services (Sarma, 2012). The number of savings accounts owned by the public as an indicator of bank penetration measurement has a positive and significant effect on financial system stability (Dienillah, Anggraeni, & Sahara, 2018). Based on research conducted by Ahamed and Mallick (2017) found that the number of savings accounts held per 100,000 adult population has no significant effect on financial system stability. Therefore, the penetration of banks as a proxy of financial inclusion measured using the number of savings accounts is estimated to affect the stability of the financial system in Indonesia, so the hypothesis that will be tested in this study as follows:

H1: Financial inclusion proxied by the ratio of the number of savings accounts affects financial system stability in Indonesia in the period 2008-2019.

2.4 Availability of Access to Financial Services

The availability of financial services and the ease of access to financial services by all levels of society must exist in an inclusive financial (Sarma, 2012). The availability of access to financial services is indicated by the number of ATM and financial services offices available in a region. The availability of financial services in an area both in urban and rural areas will result in easy public access to these financial services, so that the involvement of the community supports the creation of a stable financial system.

According to Camara and Tuesta (2014) in their research, the availability of access and the absence of barriers in access to financial services are the main factors in the growth of good financial inclusion in a country, which can then also positively affect the stability of the financial system. Rusdianasari (2018) found that the number of bank services offices that are indicators of financial inclusion measurement in terms of availability of access to financial services has a significant effect on financial system stability in Indonesia, but this does not apply to the number of ATM available that do not have a significant effect on financial system stability in Indonesia. Dienillah, Anggraeni, and Sahara (2018) in their research, showed that the availability of financial access proxied using the ratio of the number of bank service offices has a significant positive effect on financial system stability in countries with high income levels. Contrary, Irmayasari and Adry (2020) found that the number of bank branch offices had no effect on financial system stability. The of the number of bank service offices and ATM in circulation is expected to affect the stability of the financial system in Indonesia, so the next hypothesis to be tested as follows:

H2: Financial inclusion proxied by the ratio of the number of Automate Teller Machines (ATM) affects the stability of the financial system in Indonesia in the period 2008-2019.

H3: Financial inclusion proxied by the ratio of the number of bank service offices has an effect on financial system stability in Indonesia in the period 2008-2019.

2.5 the Usefulness of Financial Services

According to Sarma (2012), bank account owners should make adequate use of these financial services, because ownership of bank accounts alone

is not enough to encourage financial inclusion of a country. Therefore, the deposit-to-GDP ratio as well as the ratio of SMEs credit accounts to the number of banking credit accounts are measuring the extent to which people use financial services to promote financial system stability.

The number of users of financial services is not enough to encourage the creation of good financial inclusion, but it must be followed by the utilization of financial services itself (Sarma, 2012). Han and Melecky (2013) mentioned that increased access to bank savings can increase the resilience of the funding base of savings collected in the form third-party funds, the study also found that third-party funds negatively and significantly affect the stability of the financial system. Dienillah and Anggraeni (2016) in their research found that the ratio of deposit to third-party funds is positively related to financial stability in Asian countries. This is in line with research conducted by Laksamana and Suryahana (2018), showing that the increase in third-party funds also has a positive impact directly on financial stability in Indonesia. The increase in the number of SMEs accounts alone has an effect on improving financial stability related to decreasing the credit risk of SMEs (Laksamana & Suryadana, 2018). Similarly, Siddik and Kabiraj (2018) found that financial inclusion measured using SME credit amounts to banking credit had a positive and significant contribution to financial system stability. From this explanation, the use of financial services as a proxy of financial inclusion as measured using the ratio of deposit to third-party funds as well as the ratio of the number of SMEs credit accounts to the number of banking credit accounts is estimated to affect the stability of the financial system in Indonesia, do the next hypothesis that will be tested in this study as follows:

H4: Financial inclusion proxied by deposit-to-third-party funds ratio affects financial system stability in Indonesia in the period 2008-2019.

H5: Financial inclusion proxied by the ratio of SME credit accounts to banking credit accounts has an effect on financial system stability in Indonesia in the period 2008-2019.

2.6 Financial Inclusion

Financial inclusion is defined as an overall effort aimed at eliminating all material and non-material obstacles to the ease of public access in utilizing financial services (Bank Indonesia, 2014). It is still far in fact of the world achieved, evidenced by the number of people who have difficulty in accessing

financial services that result in financial inclusion in Indonesia is no better than financial inclusion from other countries (Camara & Tuesta, 2014). This is far from the criteria for creating a good economic system, based on community involvement in the economic system is an important factor in the creation of a good economic system, marked by the ease of access to financial services by all levels of society as a form of community involvement in the country's economic system (Bank Indonesia, 2014). It is also based on research conducted by Dienillah and Anggraeni (2016), mentioning that financial system stability in Asia is significantly affected by financial inclusion. Financial inclusion has several factors that affected whether or not financial inclusion, namely bank penetration, availability of access to financial services, as well as the usefulness of financial services (Sarma, 2012).

The three driving factors of financial inclusion, especially the availability of financial services, are believed to encourage the growth of financial inclusion that has positive impact on financial system stability (Camara & Tuesta, 2014). Financial inclusion is explained to have both positive and negative effects on financial system stability (Khan, 2011). Research conducted by Dienillah, Anggaraeni and Sahara (2018), shows that financial inclusion only has a significant effect on countries with high income levels and has no effect on middle-income countries. Based on this, financial inclusion is expected to simultaneously affect the stability of the financial system in Indonesia so, the next hypothesis to be tested as follows:

H6: Financial inclusion significantly affects financial system stability in Indonesia in the period 2008-2019.

Based on the hypotheses that have been presented, the research model is obtained as follows:

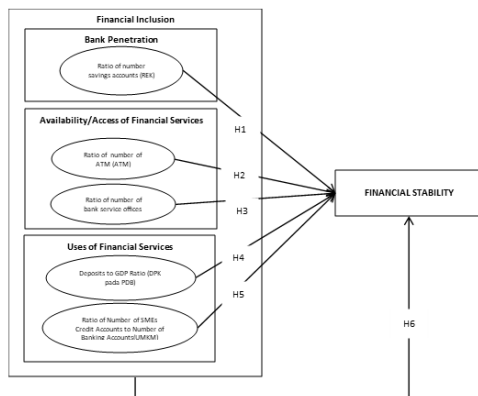


Figure 1: Research Model.

3 RESEARCH METHOD

The method approach used in this study is the hypothesis test, where there are data analysed in the form of numbers and this study there is an influence test that requires quantitative approach in processing the data.

This type of research is descriptive using quantitative data. The object of this research is banks in Indonesia. The sampling technique in this study is to use census sampling.

4 RESEARCH RESULT AND DISCUSSION

4.1 Characteristic of Sample

The characteristics of the sample on this study divided in two characteristics, based on the amount of core capital of bank, and based on operational bank. This study has 110 banks in Indonesia which is become the sample of this study. Based on the amount of core capital of banks in Indonesia, banks in Indonesia are classified in four category which is called General Banks Business Activity (GBBA). Bank which classified in GBBA I have a core capital of less than 1 trillion, GBBA II with a core capital above 1 trillion to 5 trillion, GBBA III with a core capital above 5 trillion to 30 trillion, while for the category of GBBA IV is a bank that has a core capital above 30 trillion. Based on 110 banks in Indonesia, most of the sample classified in the category of GBBA II with total 61 banks (55%). GBBA, I have 14 banks (13%), GBBA III has 28 banks (25%), and GBBA IV only has 7 banks (6%). It can be explained that the amount of core capital of banks Indonesia is above 1 trillion to 5 trillion.

Based on the operational bank, banks in Indonesia classified in two, conventional banks and sharia banks. Conventional bank itself is a bank that in providing services and financial traffic as a business activity is carried out in accordance with the provisions previously stipulated. On the other hand, sharia banks are banking whose business activities are in accordance with Islamic law and Law Number 21 of 2008 about Sharia banking. From 110 banks in Indonesia, most of them is classified into conventional banks with has 96 banks on total (87%) and sharia banks has 14 banks (13%). It can be explained that the operational banks Indonesia is conventional bank.

4.2 Descriptive Statistics

Descriptive statistics are statistics that describe the characteristics of the data to be examined. Descriptive statistics also have frequency, dispersion, measurement of central tendencies, and measurement of shapes. A frequency that indicates the number of times a phenomenon occurs. Measurement of central tendency is used to measure the central value of data distribution in the form of average, median, mode (Ghozali, 2011). The purpose of this analysis is to determine the state of the variables used during the study period. The result of the descriptive statistical analysis can be seen as follows:

Table 1: Descriptive Statistics.

	N	Min	Max	Mean	Std. Dev
Y	48	0.74	2.43	1.2844	0.48687
X1	48	46.57	148.34	81.692	30.6966
X2	48	20.00	56.00	37.646	11.75
X3	48	10.00	20.00	14.563	3.10734
X4	48	31.64	39.17	37.354	1.71376
X5	48	18.93	28.37	20.035	1.80764

Source: The data is processed using SPSS software

Based on the descriptive statistical test result in table 1, N shows the amount of data that is 48 obtained secondary and the processed. Minimum shows the lowest value of each variable data. On the Y variable, namely financial system stability index, the minimum value of 0,74, this figure is the financial system stability index of Indonesia in third quarter of 2017. On variable X1, ratio of the number of savings accounts per 100,000 adults shows a value of 46,57 which is the value of ratio of the number of saving accounts in Indonesia in first quarter on 2008, while in the variable X2 shows the minimum value of 20,00 is the value of ratio of ATM number per 1,000 km² in Indonesia in fourth quarter of 2008. In X3 variable the ratio of the number of bank service offices per 1,000 km² shows the minimum value of 10,00 is the value of Indonesia's ratio of the number of bank service offices per 1,000 km². Variable X4 shows the minimum value of 31,64 is the value of ratio of third-party funds to GDP in Indonesia in fourth quarter of 2008, and variable X5, namely the ratio SMEs credit accounts to banking credit accounts showed a value of 18,93 in first quarter of 2008 in Indonesia.

Maximum shows the highest value of each variable data. In variable Y, the maximum financial system stability index value is 2,43, which is the financial system stability index of Indonesia in fourth quarter of 2008. In variable X1, the ratio of the number of saving accounts per 100,000 adults shows a maximum value of 148,34, which is the value of ratio of the number of saving accounts per 100,000 adults in Indonesia in fourth quarter of 2019, while on the ratio of number of ATM per 1,000 km², X2 shows the maximum value of 56,00 is the value of Indonesia's ratio of the number of ATM per 1,000 km² in fourth quarter of 2017. On the value of the ratio of the number of bank service offices per 1,000 km², X3 shows the maximum value of 20,00 in fourth quarter of 2018. Variable X4 shows the maximum value of 39,17 is the value of ratio of third-party funds to GDP in Indonesia in third quarter of 2017, and variable X5, namely the ratio SMEs credit accounts to banking credit accounts showed a value of 28,37 in fourth quarter of 2015 in Indonesia.

Means showing the average value of each data variable. In variable Y, the financial system stability index average value is 1,2844. In variable X1, the ratio of the number of saving accounts per 100,000 adults shows an average value of 81,692, while on the ratio of number of ATM per 1,000 km², X2 shows the average value of 37,646. On the value of the ratio of the number of bank service offices per 1,000 km², X3 shows the average value of 14,563. Variable X4 shows the average value of 37,354, and variable X5, namely the ratio SMEs credit accounts to banking credit accounts showed an average value of 20,035.

Standard deviations indicate the heterogeneity contained in the tested data or the average amount of variability of the data examined. In variable Y, the financial system stability index, the standard deviation is 0,48687. In variable X1, the ratio of the number of saving accounts per 100,000 adults shows a standard deviation of 30,6966, while on the ratio of number of ATM per 1,000 km², X2 shows the standard deviation of 11,75. On the ratio of the number of bank service offices per 1,000 km², X3 shows the standard deviation of 3,10734. Variable X4 shows the standard deviation of 1,71376, and variable X5, namely the ratio SMEs credit accounts to banking credit accounts showed a standard deviation of 1,80764.

4.3 Classical Assumption Testing Results

The result of testing the classic assumptions of the regression model is usually referred to as good models if they meet the test requirements, the results of the test that have been carried out consist of normality test, heteroscedasticity test and multicollinearity test.

4.3.1 Normality Test

Normality tests are performed to determine the value of group deployments and data variables whether they are distributed normally or not. A data variable is said to be distributed normally if the significant value is greater than 0.05 or 5% (Santoso, 2012). The normality test results are follows:

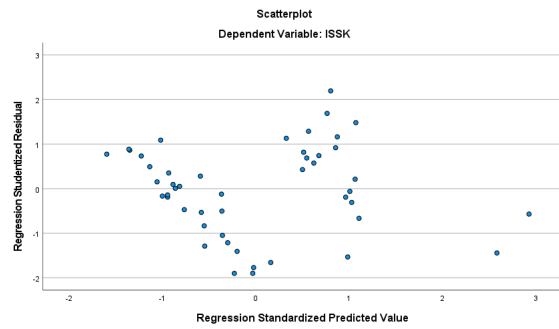
Table 2: Normality Test.

Variable	Kolmogorov-Smirnov ^a	Shapiro-Wilk
	Sig.	Sig.
Y	0.117	0.197
X1	0.119	0.158
X2	0.2	0.096
X3	0.188	0.051
X4	0.2	0.516
X5	0.2	0.708

Source: The data is processed using SPSS software

4.3.2 Heteroscedasticity Test

Heteroscedasticity testing is conducted to determine whether there are similarities of a research regression model used, which if the research variable does not experience heteroscedasticity, then indicates the research regression model used well (Sunyoto, 2016). Scatterplot charts are used as heteroscedasticity testing, taking into account scatterplot points at standardized value (ZPRED) and studentized residual (SRESID). A regression model is said not to experience heteroscedasticity when the points in ZPRED and SRESID do not form a particular pattern. The heteroscedasticity test results are follows:



Source: The data is processed using SPSS software

Figure 2: Heteroscedasticity Test.

4.3.3 Multicollinearity Test

Multicollinearity test is the existence of a definite linear relationship between the free changes. To find out if there is a problem with data related to multicollinearity test can be seen from the value of Tolerance and VIF (Value Inflation Factor). If the value of tolerance is more than 0,10 and the value of VIF is less than 10 then the variable has no problem related to the multicollinearity test with other independent variables (Ghozali, 2011). The multicollinearity test results are follows:

Table 3: Multicollinearity Test.

Variable	Tolerance	VIF
X1	0.247	4.048
ATM	0.252	3.973
X3	0.804	1.244
X4	0.693	1.444
X5	0.764	1.309

Source: The data is processed using SPSS software

4.4 Hypothesis Testing Results

Table 4: Multiple Linear Regression Analysis Results.

Variables	B	T	Sig
(Constant)	-2.871	-3.21	0.003
X1	-0.001	-0.571	0.571
X2	-0.017	-3.302	0.002
X3	-0.016	-1.475	0.148
X4	0.101	4.704	0.000
X5	0.067	3.451	0.001

Source: The data is processed using SPSS software

From table 4, obtained the multiple linear regression equation is as follows:

$$Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 \tag{1}$$

The multiple regression explained that a constant value of -2,871 which means that if ratio of the number of saving accounts per 100,000 adults (X1), ratio of number of ATM per 1,000 km² (X2), ratio of number of bank service offices per 1,000 km² (X3), ratio of third-party funds to GDP (X4), and ratio of SMEs credit accounts to banking credit accounts (X5) have a zero value, then the level of financial system stability index (Y) is the value -2,871. The regression coefficient for the ratio of the number of saving accounts per 100,000 adults (X1) is -0,001, the ratio of number of ATM per 1,000 km² (X2) is -0,017, the ratio of number of bank service offices per 1,000 km² (X3) is -0,016, the ratio of third-party funds to GDP (X4) is 0,101, and ratio of SMEs credit accounts to banking credit accounts (X5) is 0,067.

Based on the equation model above, it can be explained that if ratio of the number of saving accounts per 100,000 adults increase by 1 value, then the financial system stability index will be decreased by 0,001. Based on the table above, it can be explained that the significance of the ratio of the number of saving accounts per 100,000 adults variable is 0,571, which means that there is no significant effect because the value is greater than 0,05, it can be conclude that **H1 not supported**.

Based on table 4, it can be explained that if ratio of number of ATM per 1,000 km² increase by 1 value, then the financial system stability index will be decreased by 0,017. Based on the table above, it can be explained that the significance of the ratio of number of ATM per 1,000 km² variable is 0,002, which means that there is has significant effect because the value is lesser than 0,05, it can be conclude that **H2 is supported**.

Based on table 4, it can be explained that if ratio of number of bank service offices per 1,000 km² increase by 1 value, then the financial system stability index will be decreased by 0,016. Based on the table above, it can be explained that the significance of the ratio of number of ATM per 1,000 km² variable is 0,148, which means that there is no significant effect because the value is greater than 0,05, it can be conclude that **H3 not supported**.

Based on table 4, it can be explained that if ratio of third-party funds to GDP increase by 1 value, then the financial system stability index will be

increased by 0,101. Based on the table above, it can be explained that the significance of the ratio of third-party funds to GDP variable is 0,000, which means that there is has significant effect because the value is lesser than 0,05, it can be conclude that **H4 is supported**.

Based on table 4, it can be explained that if ratio of SMEs credit accounts to banking credit accounts increase by 1 value, then the financial system stability index will be increased by 0,067. Based on the table above, it can be explained that the significance of the ratio of SMEs credit accounts to banking credit accounts variable is 0,001, which means that there is has significant effect because the value is lesser than 0,05, it can be conclude that **H5 is supported**.

Table 5: Simultan Test Result (F-Test)

	F	Sig.
Regression	41.718	.000 ^b

Source: The data is processed using SPSS software

Based on table 4, it can be explained that all independent variables are ratio of the number of saving accounts per 100,000 adults, ratio of number of ATM per 1,000 km², ratio of number of bank service offices per 1,000 km², ratio of third-party funds to GDP, and ratio of SMEs credit accounts to banking credit accounts significantly affect simultaneously to financial system stability index in Indonesia. Therefore, it can be concluded that **H6 is supported**.

5 CONCLUSIONS

This study aims to find out and provide empirical evidence of the influence of financial inclusion on financial system stability, which is financial inclusion is projected with a ratio of the number of savings accounts per 100,000 adults, the ratio of the number of bank service offices per 1,000 km², the ratio of ATM numbers per 1,000 km², the ratio of third-party funds to GDP, and the ratio SMEs credit accounts to banking credit accounts and FSSI as a proxy of financial system stability. After conducting research, the conclusion can be taken as follows:

1. Financial inclusion measured using the ratio of the number of savings accounts per 100,000 adults and the ratio of the number of bank service offices per 1,000 km² had no effect on

- the stability of the financial system measured using Y.
2. Financial inclusion measured using the ratio number of ATM per 1,000 km², third-party funds to GDP ratio and the ratio of SMEs credit accounts to banking credit accounts had a positive and significant effect on financial system stability, which was indicated by a significant value of the variable which is smaller than 0,05.
 3. Financial inclusion measured using the ratio of the number of savings accounts per 100,000 adults, the ratio of the number of bank service offices per 1,000 km², the ratio number of ATM per 1,000 km², third-party funds to GDP ratio and the ratio of SMEs credit accounts to banking credit accounts together have a positive and significant influence on stability of the financial system in Indonesia.
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