Financial Inclusion and It's Impact on Financial Stability: A Case Study of Emerging Market Countries

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Abstract

This study aims to analyze whether financial inclusion can identify leading indicators of financial system stability in five emerging market countries. The research subjects include emerging market countries, namely Malaysia, Singapore, Germany, Mexico, and Indonesia, with data spanning from 2003 to 2021. The Panel ARDL (Autoregressive Distributed Lag) method enables the analysis of both short-term and long-term relationships between variables. The data includes financial inclusion indicators, such as credit ratios, savings, ATMs, Bank Z-scores, and NFDI, as well as indicators of financial system stability, measured using Non-Performing Loans (NPL). We also use GDP per capita as a control variable. The results show that financial inclusion acts as a leading indicator of financial system stability, as evidenced by its significant impact on NPLs in each of the countries studied. These findings offer valuable insights into the importance of expanding financial access to enhance financial system stability, particularly in emerging market countries.

Keywords: Financial Inclusion, Financial System Stability, ARDL Panel

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Introduction

In general, the term "financial system stability" (FSS) is familiar to many economists, especially financial market participants; however, there is no standard, internationally accepted definition. Bank Indonesia defines financial system stability as a condition in which economic mechanisms for pricing, fund allocation, and risk management function well and support economic growth. Over the past two decades, financial system stability has become a significant focus on the international agenda, where financial system stability is measured using the money supply. This is due to several factors, including a stable financial system that facilitates the reallocation of resources, particularly funds, allowing excess funds in surplus units to be utilized by deficit units. Thus, the financial system can increase national economic capacity by increasing the efficiency of fund use in the economy.

Several factors influence financial system stability, one of which, in this study, is financial inclusion, which consists of GDPP, CGDP, LIQ, NFDI, credit, savings, and ATMs. According to [1], "This financial inclusion agenda is expected to encourage inclusive growth in various countries. This is because increasing financial inclusion can increase the savings base and increase financing for the community, thereby facilitating the banking intermediation function and improving performance in the real sector. This will reduce poverty rates, increase income equality, and enhance financial system stability, allowing growth to be felt by all levels of society. However, according to research [2]" financial inclusion in middle- and low-income countries is less good than financial inclusion in high-income countries." Then, based on research conducted by [3] in Kenya, "increased financial inclusion does not lead to an increase in financial system stability in these low-income countries." Therefore, further research is needed to investigate the impact of financial inclusion on financial system stability at each income level across countries.

Financial system stability based on the Bank score (BZS) indicator. Bank Z-score is a score or an index used to predict and assess the probability of a company's future bankruptcy. The problem in this study is the response of financial inclusion variables to financial system stability in emerging market countries during the study period (2003 to 2021), namely Malaysia, Singapore, Germany, Mexico, and Indonesia. The reason for selecting Malaysia, Singapore, Germany, Mexico, and Indonesia is due to their low GDPP and high NPL rates, as illustrated in the figure below.
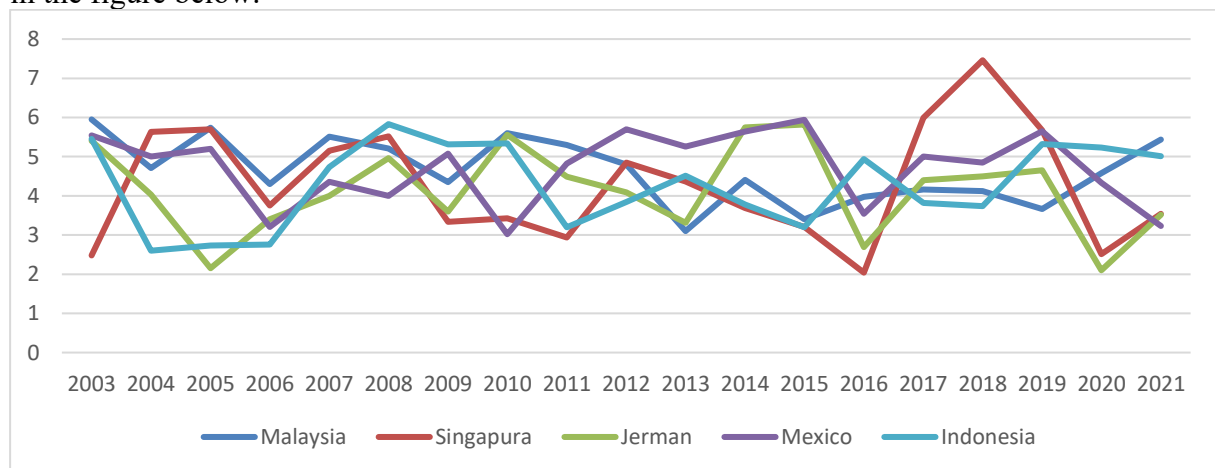
Source: World Bank data
Figure 1. NPL Development, 2003–2021

Literature Review

Financial inclusion policy is a form of financial service deepening aimed at people at the bottom of the pyramid, enabling them to utilize formal financial products and services such as safe deposit, transfers, savings, loans, and insurance. This is done not only by providing appropriate products but also by combining various aspects. A financial inclusion strategy is not an isolated initiative. Therefore, involvement in financial inclusion is not solely the responsibility of Bank Indonesia, but also of regulators, ministries, and institutions. and other institutions in providing financial services to the wider community. Through a national strategy for financial inclusion, it is hoped that collaboration between government institutions and stakeholders will be created in a well-structured manner.

[4] explains that financial inclusion promotes savings and develops a savings culture, increases access to credit, both for entrepreneurship and consumption, and also enables efficient payment mechanisms, thereby strengthening the resource base of financial institutions capable of providing economic benefits through resources and the availability of efficient and allocative payment mechanisms. Empirical evidence shows that countries with large populations do not yet have widespread access to the formal financial sector and also exhibit higher poverty rates and greater inequality. Therefore, financial inclusion today is not an option, but a necessity, and banking is a key driver for its implementation.

According to [4], to determine the extent of the development of financial inclusion activities, a performance measure is needed. Based on several references, indicators that can be used to measure a country's progress in developing financial inclusion are:

1. Availability/access: measures the ability to use formal financial services in terms of physical affordability and price.
2. Usage: measures the actual use of financial products and services (regularity, frequency, and duration of use).
3. Quality: measures whether the attributes of financial products and services meet customer needs.
4. Well-being: measures the impact of financial services on the quality of life of service users.

Bank Indonesia supports the implementation of the National Strategy for Inclusive Finance through the following:

1. Coordinating financial inclusion activities with relevant ministries/agencies. Coordinating with relevant ministries/agencies in the planning and implementation of financial inclusion programs.
2. Mapping regional potential as a basis for determining programs and priorities for financial inclusion activities. Mapping regional potential includes economic sectors, program recipients, and relevant stakeholders.
3. Determining programs and priorities for financial inclusion activities. Determining programs and priorities for financial inclusion activities to be implemented after coordinating with relevant ministries/agencies. Determining programs and priorities for activities is carried out in accordance with the results of regional potential mapping conducted by Bank Indonesia. Furthermore, to facilitate implementation, guidelines for implementing financial inclusion programs are created.
4. Acting as a focal point for specific activities under Bank Indonesia's authority within the framework of implementing the national strategy for financial inclusion. Bank Indonesia serves as the focal point, focusing on education, consumer protection, regulation, and supervision in the payment system; financial planning education; regulation and mapping of information systems for financial inclusion; and developing financial access for MSMEs.

5. Socializing financial inclusion programs. Specifically, to Bank Indonesia's regional representative offices and relevant stakeholders.
6. Building collaboration with relevant stakeholders outside Bank Indonesia. Expanding the development of inclusive finance requires collaboration with various institutions at the national, regional, and international levels.
7. Implementing inclusive finance activities relevant to Bank Indonesia's duties and authorities.
8. Evaluating inclusive finance program activities. Together with relevant ministries/institutions, evaluate the development of inclusive finance to inform improvements and refinements to future activities.

Research Methodology

The data used in this study are secondary data from Bank Indonesia and the World Bank, covering the period from 2003 to 2021. This study uses panel data, a combination of data across time and data across countries. The ARDL panel method is used to obtain estimates of each individual characteristic separately, assuming cointegration in the long-term lag of each variable. Autoregressive Distributed Lag (ARDL) was introduced by [5] [6]. This technique examines each variable's lag at I(1) or I(0). Conversely, the ARDL regression result is a test statistic that can be compared with two asymptotic critical values.

GDPP   : GDP per capita (US$)
CGDP   : Ratio of Private Credit from Bank Deposits and Other Financial Institutions to GDP (%)
LIQ   : Ratio of Current Assets to Deposits and Short-Term Financing (%)
NFDI   : Non-FDI Capital Flow to GDP (%)
KDT   : Credit (%)
TBGN   : Savings (%)
ATM   : ATM (%)
BZS   : Bank Z-score (%)
NPL   : Non-Performing Loan (%)
€   : error term
β   : regression coefficient
α   : constant
I   : number of observations
t   : time period

ARDL Panel Criteria:

The accepted ARDL Panel model is a model with cointegrated lags, where the main assumption is that the coefficient value in the short-run Equation has a negative slope with a significance level of 5%. The ARDL Panel Model Requirements: If the value is negative (-0.597) and significant (0.012 < 0.05), the model is accepted.

Results

This study uses ARDL panel data, which utilizes both time-series and cross-country data. ARDL panel regression is used to obtain separate estimates for each individual characteristic. The following are the processed data for each country:

Table 1.
Analysis of ARDL NPL in Malaysia

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.065794	0.003652	-18.01532	0.0004
D(GDPP)	0.001185	4.97E-05	23.81152	0.0002
D(CGDP)	0.061582	0.000960	64.15487	0.0000
D(LIQ)	-0.227870	0.026812	-8.498966	0.0034
D(NFDI)	-0.080728	0.004040	-19.98382	0.0003
D(KDT)	-0.029682	0.000606	-48.94287	0.0000
D(TBGN)	0.001421	4.48E-06	317.1093	0.0000
D(ATM)	-0.005816	2.10E-05	-277.1633	0.0000
D(BZS)	-0.045265	0.003963	-11.42156	0.0014
C	1.144185	1.126696	1.015522	0.3846

Table 3.
Analysis of ARDL NPL in German

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.318547	0.029991	-10.62140	0.0018
D(GDPP)	-0.019846	0.000451	-44.04760	0.0000
D(CGDP)	0.066682	0.002535	26.30438	0.0001
D(LIQ)	0.105870	0.090678	1.167534	0.3274
D(NFDI)	0.366029	0.007134	51.30601	0.0000
D(KDT)	0.053357	0.000689	77.43912	0.0000
D(TBGN)	-0.006862	9.21E-06	-744.9548	0.0000
D(ATM)	0.020406	6.45E-05	316.4594	0.0000
D(BZS)	0.087971	0.012237	7.189164	0.0055
C	5.096834	9.538267	0.534356	0.6302

Table 2.
Analysis of ARDL NPL in Singapore

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.868758	0.002674	-324.8554	0.0000
D(GDPP)	-0.016172	1.97E-05	-819.5751	0.0000
D(CGDP)	0.232651	0.000359	648.7721	0.0000
D(LIQ)	0.708494	0.003151	224.8625	0.0000
D(NFDI)	0.288029	0.001446	199.2323	0.0000
D(KDT)	-0.038049	9.55E-05	-398.3938	0.0000
D(TBGN)	0.001580	2.28E-05	69.33294	0.0000
D(ATM)	0.030765	4.50E-06	6839.125	0.0000
D(BZS)	-0.060065	2.64E-05	-2275.433	0.0000
C	14.28234	7.665595	1.863174	0.1593

Table 4.
Analysis of ARDL NPL in Mexico

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.000443	0.003761	-0.117919	0.9136
D(GDPP)	0.042671	0.000106	402.5563	0.0000
D(CGDP)	0.054643	0.000527	103.6613	0.0000
D(LIQ)	-0.422067	0.010224	-41.28403	0.0000
D(NFDI)	-0.243259	0.007802	-31.18105	0.0001
D(KDT)	-0.038352	0.000559	-68.62876	0.0000
D(TBGN)	-0.010911	3.83E-05	-284.8751	0.0000
D(ATM)	0.000400	1.34E-05	29.81499	0.0001
D(BZS)	-0.016317	0.000298	-54.83479	0.0000
C	0.006351	1.072093	0.005924	0.9956

Table 5.
Analysis of ARDL NPL in Indonesia

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	0.017128	0.011097	1.543412	0.2204
D(GDPP)	0.064100	0.000378	169.7994	0.0000
D(CGDP)	0.115910	0.002130	54.40977	0.0000
D(LIQ)	0.025274	0.040665	0.621515	0.5783
D(NFDI)	0.263423	0.010347	25.45978	0.0001
D(KDT)	0.040878	0.002311	17.69185	0.0004
D(TBGN)	0.003274	1.37E-05	239.1329	0.0000
D(ATM)	0.000581	5.15E-06	112.9383	0.0000
D(BZS)	-0.211035	0.013213	-15.97235	0.0005
C	-0.219542	3.348508	-0.065564	0.9518

A one percent increase in GDP per capita will increase financial system stability. A one percent increase in GDP per capita will lead to an increase in formal accounts in banking institutions. This increase in formal accounts will lead to an increase in the savings base and improve the intermediation process. The private credit-to-GDP ratio has a positive relationship with financial system stability. A one percent increase in the private credit-to-GDP ratio is expected to lead to a decrease in non-performing loans (NPLs). A one percent increase in GDP per capita will increase financial system stability.

Furthermore, the ratio of current assets to deposits and short-term funding has a positive relationship with financial system stability. A one percent increase in the ratio of current assets to deposits and short-term funding will increase financial system stability. An increase in

current assets will increase customer confidence in formal financial institutions during shocks. The non-capital FDI flow-to-GDP ratio has both positive and negative relationships with financial system stability. A one percent increase in the non-capital FDI flow-to-GDP ratio is expected to lead to a decrease in non-performing loans (NPLs). A one percent increase in non-capital FDI flow-to-GDP will decrease financial system stability. This positive relationship is due to the NFDI's ability to increase bank deposits, thereby increasing credit. Furthermore, NFDI can increase a country's foreign exchange reserves.

Higher credit increases access to the financial sector and can support investment and economic growth. However, this condition can also lead to financial sector vulnerabilities through lower lending standards, excessive leverage, and asset price inflation. Rapid bank credit growth can be driven by several factors: part of the normal phase of the business cycle, liberalization in the financial sector, and high capital inflows. Under normal conditions, in line with domestic economic growth, credit generally grows more rapidly. High credit growth can also be driven by liberalization in the financial sector, which is generally designed to increase the depth of financial system stability.

From the time a person begins working until the end of life, they have income and consumption. Income is lower when someone starts working. This income will continue to increase with the length of time a person works. Therefore, a person should save when their income exceeds their consumption. All public savings are invested. In accordance with the assumption of the propensity to save, a certain proportion of output is left over for savings and then investment. This will result in an increase in the capital stock. An increased capital stock leads to increased economic activity, which in turn improves the stability of the financial system. Regarding the propensity to save, savings are a function of income. A community's income level significantly influences the level of savings. A high income increases the availability of funds not used for consumption, leading to increased savings. The greater the income received by the community, the greater the amount of savings.

The ATM payment system has significant implications for the stability of the financial system and even a nation's economy. A payment system that meets all the required principles—minimizing potential risks, being highly efficient, providing equal access, and protecting consumers—will be a key factor in financial system stability. Conversely, a payment system that fails to minimize risk will become a source of financial instability. Therefore, the payment system can be considered a crucial node in the economy. Movements in transaction volume can be used as early signals to assess economic developments and financial system stability.

Conclusion

The research concludes that financial inclusion can identify leading indicators of financial system stability through NPLs in each emerging market country. Policy recommendations for governments, particularly those in Malaysia, Singapore, Germany, Mexico, and Indonesia, include encouraging increases in GDP per capita, the ratio of private credit from bank deposits and other financial institutions to GDP, the ratio of current assets to deposits and short-term financing, non-FDI capital flow to GDP, credit, savings, and ATMs, as these will enhance financial system stability during this period and in the future. Furthermore, governments, particularly in Malaysia, Singapore, Germany, Mexico, and Indonesia, should encourage portfolio investment to enhance financial system stability during this period and in the future. The banking sector, particularly in Malaysia, Singapore, Germany, Mexico, and Indonesia, should encourage increased financial inclusion and increased current assets to enhance financial system stability during this period and in the future.

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