Does Financial Inclusion Improve Financial Literacy? An ASEAN Cross-Country Analysis

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Abstract. The gap between financial literacy and financial inclusion has become one of the reasons why economic development is hardly developed. This study examines the effect of financial inclusion in improving financial literacy in ASEAN Countries – Indonesia, Malaysia, Singapore, Thailand, Philippines, Myanmar, and Cambodia. Bank accounts, as one of the conventional banking products, become a dependent variable (Y). In contrast, the characteristics of bank customers, such as gender, age, education, and economic condition, become independent variables (X). Through a fixed effect approach on panel regression, this study found that financial literacy significantly affects financial inclusion (sig. 0.000) across ASEAN Countries, except Thailand. Singapore became the intercept since it was the only ASEAN Country categorised as high-income based on the Global Findex Database 2021. Customer characteristics simultaneously influence the number of bank accounts in ASEAN Countries, about 95.3%, while 4.7% can be explained by other factors not included in this study. However, this study only limits conventional financial products, while there have been many digital financial products recently.

Keywords: Financial Literacy, Financial Inclusion, Panel Regression, ASEAN Countries.

1 Introduction

Financial literacy is still becoming a problem in many countries, especially South-East Asia Countries (ASEAN). Findex data shows that 1.7 billion adults were unbanked, representing almost 40 percent of adults worldwide in 2017. Thus, based on the S&P global financial literature survey, financial literacy is essential in promoting financial inclusion [1]. Financial inclusion implies access to and use of financial services as a necessary goal of economic development. Financial inclusion can be adopted as a policy tool to achieve the Sustainable Development Goals (SDGs) [2].

Several cross-country studies showed the positive effect of financial literacy on financial inclusion, considering conventional banking services as outcome variables. Grohmann (2018) found that the financial literacy of traditional banking services influ

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unconventional banking and non-banking financial services. The results determine the positive impact of financial literacy on using electronic/mobile payment services. In comparison, Shen (2021) agrees that financial inclusion significantly affects economic growth in a positive manner, although it has spatial spillover effects towards neighbouring countries. Thus, financial literacy and inclusion support each other in developing a solid financial system in one nation. Accelerating inclusion, financial literacy, and protecting financial consumers for Micro, Small, and Medium Enterprises (MSMEs) has become a priority in many countries, especially in ASEAN. One of its concrete manifestations is the Workshop on Promoting Digital Financial Inclusion and Literacy for MSMEs on March 30, 2023. The high-level dialogue and workshop activities are expected to strengthen the understanding of the ASEAN region's policymakers, regulators, academics, and the private sector [5]. It is crucial to increase financial literacy and inclusion to strengthen the economy in the ASEAN region. Therefore, it will be successful if all stakeholders pay attention and work properly in their respective fields.

The MasterCard Index of Financial Literacy Survey 2013 explained that the average level of financial literacy in ASEAN Countries was only 66.7 out of 100. This point was slightly lower than other countries outside ASEAN, such as New Zealand and Australia. The highest point in ASEAN Countries was Singapore, with 72 points. Malaysia was 70, and the other ASEAN countries were under 70. Thailand and the Philippines' financial indexes were 68 points. In comparison, Myanmar and Vietnam's Financial Literacy Indexes were 66 and 63. The lowest financial literacy index was from Indonesia, with 60 points. Based on the survey, it is concluded that Financial Literacy still becomes the central issue in ASEAN Countries to improve the economic condition of a nation. Nonetheless, the survey results might differ from other surveys depending on the methodologies [6].

However, integrating financial literacy and financial inclusion takes much work. The result of the 2022 National Survey of Financial Literacy and Inclusion (SNLIK) in Indonesia shows that the financial literacy index is 49.68%. The result is increasing by 11.65% compared to 2019, which was only 38.03%. On the other hand, the financial inclusion indexes reached 85.10% in 2022, an increase compared to the previous SNLIK period in 2019, which was 76.19%. Thus, The gap between literacy and inclusion levels in Indonesia is decreasing, from 38.16% to 35.42% during 2019–2022 (see Figure 1) [7].

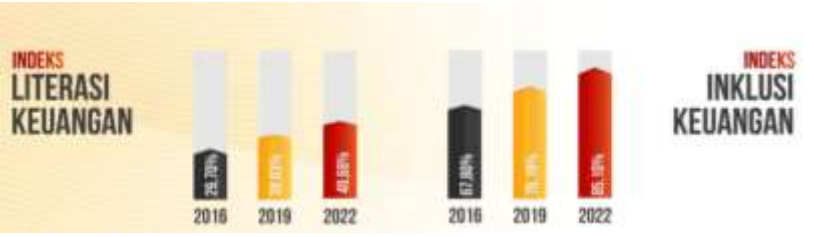

Figure 1. Indonesia National Survey of Financial Literacy and Inclusion (SNLIK) Result in 2022.

Several arguments have arisen regarding the relationship between financial literacy and financial inclusion. The Organization of Economic Cooperation and Development (OECD) and the International Network on Financial Education (INFE) defined financial literacy as a combination of financial management knowledge, skills and behaviours that appear in decision-making to produce economic well-being [8]. The financial literacy concept shows multiple dimensions of aspects, including individuals' skills, attitudes, and behaviours. On the other hand, most empirical studies measure financial literacy by the financial knowledge dimension proposed by Lusardi (2007). Meanwhile, Financial inclusion is defined by the availability of access for the community to utilise financial products and or services in formal institutions to meet the needs and capabilities of the community to achieve prosperity [7]. Financial inclusion arises due to the inability of the public to access/use formal financial institutions/financial services such as banking, insurance, investment, financial technology, and so on due to obstacles, such as conditions, prices, marketing, or the perceptions of individuals or other entities which are commonly referred to as financial exclusion [10][12].

This study investigates how financial literacy could improve financial inclusion or vice versa. Using the standard survey instrument developed by the World Bank, we examine the effect of financial inclusion in improving financial literacy across several ASEAN Countries. Financial literacy is measured by financial knowledge, behaviour, and attitude. In addition, the financial inclusion score is calculated using a bank saving accounts proxy. The previous study barely showed that individuals with higher financial literacy tend to have formal and informal saving accounts than those with lower financial literacy scores [13]. So, this paper hopefully fills the gap because financial literacy and financial inclusion can't be separated and cooperatively enhance economic development in a country.

2 Methodology

We collect the data based on the Global Findex Database survey in 2021. Unfortunately, not all countries in ASEAN have a complete dataset from 2014 to 2021. Hence, we must exclude several countries, such as Brunei Darussalam, Laos, Vietnam, and currently, Timor Leste is also joining the ASEAN Organization but can't be included in this study. Table 1 lists nine variables of this study. Eight indicators are the indicators for financial literacy and one indicator of financial inclusion (bank account holder). Respondent's age are above 15 years old for every variable. Financial literacy indicators measure the characteristics of respondents who save at the bank. In comparison, financial indicator counts the number of respondents with bank accounts.

Table 1. Variables Descriptions

Dimension	Indicator/Variable	Code
Financial Literacy (X)	Female who saved any money (%)	$savedfemale$
	Male who saved any money (%)	$savedmale$

	Young people (ages 15–24) who saved any money (%)	$savedyoung$
	Older people (age 25+) who saved any money (%)	$savedold$
	Respondents who have primary education or less (ages 15+) who saved any money (%)	$savedprimed$
	Respondents with secondary education or more (ages 15+) who saved any money (%)	$savedseced$
	Respondents age 15+ with poor economic conditions (40%) who saved any money (%)	$savedincomepoor$
	Respondents age 15+ with rich economic condition (60%) who saved any money (%)	$savedincomerich$
Financial Inclusion (Y)	Account (% age 15+)	$Account$

To analyse the effect of financial inclusion on financial literacy in Indonesia, Malaysia, Singapore, Thailand, Philippines, Myanmar, and Cambodia from 2014 to 2021, this study uses a panel data regression model. The Panel data regression model combines cross-section data and time series, in which the same unit cross-section data is measured at different times. Panel data is data from some of the same individuals observed in a certain period [14].

There are three types of estimation in the panel data regression model, namely the Common Effect Model (CEM), Fixed Effect Model (FEM) and Random Effect Model (REM). This study uses FEM because it indicates the difference between units of observation. FEM is the estimation of panel regression parameters by adding dummy variables, so this method is often called the Least Square Dummy Variable Model. In the FEM model, the structure of the error components can be ignored so that parameters are also estimated using the OLS method but with the addition of dummy variables in the estimation process [15], [16]. Fixed Effect Model (FEM) can be formulated as follows:

$$Y_{it} = \alpha + \beta X_{it} + \alpha_{it} + \varepsilon_{it}$$

There are four steps in panel data regression. Firstly, estimate the model. Three models can be used in panel data regression. In this research, we use a fixed effect model. The fixed effect model provides a comprehensive analysis that can benefit the study [17]. Secondly, determine the best model with the Chow and Langrage Multiplier Test. Next, run the classical assumption, such as multicollinearity and homoscedasticity, to fulfil the regression test. Lastly, look into the Goodness of fit using the parameter significance test (f-test and partial t-test) and adjusted R-squared [14]. We express the regression model for this study as follows:

$$Account_{it} = \beta_0 + \alpha_1 DumINA + \alpha_2 DumMYS + \alpha_3 DumTHA + \alpha_4 DumPHI + \alpha_5 DumMYR + \alpha_6 DumCAM + \beta_1 savedfemale_{1it} + \beta_2 savedmale_{2it} + \beta_3 savedyoung_{3it} + \beta_4 savedold_{4it} + \beta_5 savedprimed_{5it} + \beta_6 savedseced_{6it} + \beta_7 savedincomepoor_{7it} + \beta_0 savedincomerich_{8it} + \mu_{it}$$

Where $\beta_i$is a vector of control variables and $\mu_{it}$is the error term.

3 Results and Discussion

Table 2 presents the descriptive analysis of every variable in this study. The variables are on the percentage, so the descriptive statistics are provided in decimals. Based on gender, female respondents show higher maximum scores than male respondents. Yet, male respondents show higher mean and lower standard deviation. It can be concluded that men tend to save more money than women.

Furthermore, younger respondents are more committed to saving money than older respondents. Young respondents are categorised as 15 – 24 years old. People with secondary education or more save money than respondents with primary education or less.

Table 2. Descriptive Analysis

	Min	Max	Mean	Std. Deviation
Female who saved any money (%)	.29	.86	.6090	.15293
Male who saved any money (%)	.36	.85	.6271	.14482
Young people (ages 15–24) who saved any money (%)	.31	.86	.6238	.13764
Older people (age 25+) who saved any money (%)	.33	.89	.6124	.15530
Respondents who have primary education or less (ages 15+) who saved any money (%)	.28	.78	.5090	.14103
Respondents with secondary education or more (ages 15+) who saved any money (%)	.42	.89	.6962	.12424
Respondents age 15+ with poor economic condition (40%) who saved any money (%)	.20	.78	.5233	.16707
Respondents age 15+ with rich economic condition (60%) who saved any money (%)	.41	.91	.6814	.14104
Account (% age 15+)	.22	.98	.5852	.28929
Valid N (listwise)				

Table 3 exhibits the Analysis of Variance (ANOVA) to test the hypothesis of whether there is a mean difference between groups. The F-test shows whether all the variables included in the model influence the dependent variable. Using a significance level of 0.05, the independent variables in this study jointly affect the dependent variable (0.000 < 0.05).

Table 3. Analysis of Variance (ANOVA) Test Result

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.650	14	.118	29.980	.000[b]
	Residual	.024	6	.004		
	Total	1.674	20			

a. Dependent Variable: Account (% age 15+) 2014

Table 4 below shows the results of the goodness of fit test. The goodness of fit test explains the dependent variable's variation using the independent variables in the regression model. The goodness of fit test uses the R-squared value or the coefficient of determination. The coefficient of determination measures how far the model can explain the variation in the dependent variable. However, using R-squared is biased towards the number of independent variables in the regression model. To avoid this bias, an adjusted R-squared is used. The adjusted R-squared value in this model is 0.953, which means that the independent variable provides almost all the information needed to predict the variation of the dependent variable.

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. An error in the Estimate	Durbin-Watson
1	.993[a]	.986	.953	.06270	2.545

a. Predictors: (Constant), Saved any money, income, richest 60% (% ages 15+), DumPHI, DumINA, DumMYS, DumCAM, DumTHA, Saved any money, young (% ages 15-24), DumMYR, Saved any money, primary education or less (% ages 15+), Saved any money, secondary education or more (% ages 15+), Saved any cash, income, poorest 40% (% ages 15+), Saved any money, male (% age 15+), Saved any money, older (% age 25+), Saved any money, female (% age 15+)
b. Dependent Variable: Account (% age 15+)

To determine which of the variables has a significant impact on financial inclusion, we run partial test results using a t-test. It is assumed that different results from the ANOVA test. The statistic below (Table 5) shows that only Indonesia, Malaysia, the Philippines, Myanmar, and Cambodia have significant outcomes. Hence, none of the indicators yield effective results against financial literacy.

Table 5. Partial Test Result

	Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.991	.206		4.816	.003
	DumINA	-.539	.117	-.668	-4.586	.004
	DumMAY	-.200	.069	-.248	-2.891	.028
	DumTHA	-.180	.128	-.223	-1.406	.209
	DumPHI	-.717	.082	-.889	-8.723	.000
	DumMYR	-.720	.127	-.893	-5.667	.001

	DumCAM	-.719	.167	-.891	-4.309	.005
	savedfemale	1.154	4.345	.610	.266	.799
	savedmale	2.090	4.401	1.046	.475	.652
	savedyoung	-.289	.728	-.138	-.398	.705
	savedold	-2.791	2.606	-1.498	-1.071	.325
	savedprimed	-.668	.842	-.326	-.794	.457
	savedseced	-.985	.991	-.423	-.994	.359
	savedin-comepoor	-.421	2.853	-.243	-.148	.887
	savedin-comerich	1.697	4.303	.827	.394	.707

a. Dependent Variable: Account (% age 15+) 2014

4 Conclusion

Based on the dataset collected by The World Bank, this study examines the effects of financial literacy on financial inclusion and savings behaviour in the ASEAN Countries. Our analysis yields significant findings that support the previous literature regarding the relationship between financial inclusion and financial literacy. Based on statistical tests, financial inclusion simultaneously influences the level of financial literacy in ASEAN Countries. However, partial tests show slightly different results that none of the variables of financial inclusion affect economic literacy. Yet, only Indonesia, Malaysia, the Philippines, Myanmar, and Cambodia have significant influence.

References

[1] A. Grohmann, T. Klühs, and L. Menkhoff, "Does financial literacy improve financial inclusion? Cross country evidence," *World Dev.*, vol. 111, pp. 84–96, 2018, doi: 10.1016/j.worlddev.2018.06.020.

[2] L. Klapper, M. El-Zoghbi, and J. Hess, "Achieving the Sustainable Development Goals The Role of Financial Inclusion," Washington DC, 2016. [Online]. Available: www.cgap.org.

[3] F. Allen, A. Demirguc-Kunt, L. Klapper, M. Soledad, and P. Martinez, "The foundations of financial inclusion: Understanding ownership and use of formal accounts," *J. Financ. Intermediation*, vol. 27, pp. 1–30, 2016, doi: 10.1016/j.jfi.2015.12.003.

[4] Y. Shen, W. Hu, and C. J. Hueng, "Digital Financial Inclusion and Economic Growth: A Cross-country Study," *Procedia Comput. Sci.*, vol. 187, pp. 218–223, 2021, doi: 10.1016/j.procs.2021.04.054.

[5] P. Yulianto, "Indonesia Terus Mendorong Upaya Pengembangan Inklusi dan Literasi Keuangan UMKM di Kawasan ASEAN," *Kementerian Keuangan Republik Indonesia*, 2023. .

[6] N. Yoshino, P. J. Morgan, and G. Wignaraja, "Financial Education in Asia: Assessment and Recommendations," Tokyo, 2015. doi: 10.1007/978-1-349-67278-3_116.

[7] Otoritas Jasa Keuangan, "Booklet Survei Nasional Literasi dan Inklusi Keuangan Tahun 2022," Jakarta, 2022. [Online]. Available: https://ojk.go.id/id/berita-dan-kegiatan/info-terkini/Pages/Infografis-Survei-Nasional-Literasi-dan-Inklusi-Keuangan-Tahun-2022.aspx#:~:text=Hasil SNLIK 2022 menunjukkan indeks,2019 yaitu 76%2C19 persen.

[8] OECD, "Financial Inclusion and Consumer Empowerment in Southeast Asia," 2018. [Online]. Available: http://www.oecd.org/finance/Financial-inclusion-and-consumer-empowerment-in-Southeast-Asia.pdf.

[9] A. Lusardi and O. S. Mitchell, "Baby Boomer retirement security: The roles of planning, financial literacy, and housing wealth," *J. Monet. Econ.*, vol. 54, no. 1, pp. 205–224, 2007, doi: 10.1016/j.jmoneco.2006.12.001.

[10] V. Y. Putri, R. M. Halim, T. N. Fahira, and S. N. Janice, "Keuangan generasi z: Tingkat literasi dalam rangka peningkatan inklusi keuangan digital," *J. Inov. Has. Pengabdi. Masy.*, vol. 6, no. 2, pp. 188–200, 2023, doi: 10.33474/jipemas.v6i2.19068.

[11] M. A. Dewi, "The Impact of Fintech Towards Financial Inclusion Development in UMKM in East Java," *Accounting*, vol. 3, no. 2, pp. 68–83, 2020.

[12] R. I. Lestari, D. Santoso, and I. Indarto, "Meningkatkan Literasi Keuangan Digital Pada Pelaku UMKM Melalui Sosialisasi Gerakan Nasional Non-tunai," *J. Inov. Has. Pengabdi. Masy.*, vol. 3, no. 1, 2021.

[13] P. J. Morgan and T. Q. Long, "Financial literacy, financial inclusion, and savings behavior in Laos," *J. Asian Econ.*, vol. 68, p. 101197, 2020, doi: 10.1016/j.asieco.2020.101197.

[14] A. C. Putria, T. S. Prakoso, and M. Ohyver, "Modeling the effect of poverty rate, GDRP, and minimum wage, on mean years of schooling in Gorontalo province with panel data regression," *Procedia Comput. Sci.*, vol. 216, no. 2022, pp. 510–516, 2023, doi: 10.1016/j.procs.2022.12.163.

[15] A. M. Astuti, "Fixed Effect Model Pada Regresi Data Panel," *Beta*, vol. 3, no. 2, 2010.

[16] E. N. Amaliah, Darnah, and Sifriyani, "Regresi Data Panel dengan Pendekatan Common Effect Model (CEM), Fixed Effect model (FEM) dan Random Effect Model (REM) (Studi Kasus: Persentase Penduduk Miskin Menurut Kabupaten/Kota di Kalimantan Timur Tahun 2015-2018)," *Estimasi J. Stat. Its Appl.*, vol. 1, no. 2, pp. 106–115, 2020, doi: http://dx.doi.org/10.20956/ejsa.v1i2.10574.

[17] R. Akram, F. Chen, F. Khalid, G. Huang, and M. Irfan, "Heterogeneous effects of energy efficiency and renewable energy on economic growth of BRICS countries: A fixed effect panel quantile regression analysis," *Energy*, vol. 215, p. 119019, 2021, doi: 10.1016/j.energy.2020.119019.