

# HOW TECHNOLOGY, GENDER AND EDUCATION AFFECTED FINANCIAL INCLUSIONS

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Info Artikel	Abstrak
<i>History of Article:</i> Received March 2021 Accepted April 2021 Published May 2021	Makalah ini menyoroti peran faktor teknologi, gender dan pendidikan terhadap inklusi keuangan. Sampel sebanyak 995 orang diambil dari <i>Global Findex Database</i> , Bank Dunia. Dengan menggunakan regresi logistik, penelitian ini menyimpulkan bahwa teknologi dan pendidikan berpengaruh positif terhadap inklusi keuangan. Semakin tinggi tingkat penggunaan teknologi dan pendidikan, semakin besar kemungkinan responden memiliki rekening di lembaga keuangan. Namun, gender tidak
Keywords: financial inclusion	mempengaruhi inklusi keuangan. Pria dan wanita memiliki peluang yang sama dalam inklusi keuangan.
gender education technology	Abstract
	This paper highlights the role of technology, gender and education factors in financial inclusion. A sample of 995 people was taken from the Global Findex Database, World Bank. Using logistic regression, this research concluded that technology and education had a positive effect on financial inclusion. The higher the use of technology and education level, the more likely the respondent has an account at a financial institution. However, gender does not affect financial inclusion. Men and women have the same probability in financial

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inclusion.

#### INTRODUCTION

Financial inclusion is a condition where everyone has access and full services from financial institutions in a timely, convenient, informative and affordable manner. Financial services are available to all segments of society, with particular attention to the poor, productive poor, migrant workers, and residents in remote areas (Bank Indonesia, 2014). The term financial inclusion became a trend after the 2008 crisis, mainly based on the impact of the crisis on the bottom of the pyramid group, which is unbanked and very numerous.

Since 2010, the G-20 and the World Bank have initiated an increase in financial inclusion in developing countries to help reduce poverty levels. Global Findex 2017 notes that globally, around 1.7 billion adults do not have bank accounts. High costs, long distances, incomplete documents, and distrust of the financial system are the main obstacles to opening accounts (World Bank, 2017). Leyshon & Thrift (1995) stated that inclusive finance is the antithesis of financial exclusion. Financial exclusion makes poor people unable to access benefits from the financial sector. Financial inclusion has the main benefits of driving economic growth and development (Demirguc-Kunt, Klapper, & Singer, 2017; Dinabandhu & Debashis, 2018). According to the World Bank, an increase in financial inclusion system facilities by 1% will increase the growth of gross domestic product (GDP) per capita by 0.03 percent. This economic growth subsequently results in new employment growth.

Other benefits of financial inclusion are supporting financial system stability, increasing economic efficiency, reducing shadow banking, supporting financial market expansion, contributing to new market potential for banks, increasing human development index and contributing positively to local and national economic growth continuously (Umar, 2017).

Several models have been tried around the world, such as no-frills accounts, branchless banking, micro-lending, banking without a bank (Bansal, 2012). Some examples of the implementation of the program are no-frills banking (South Africa), branchless banking (Brazil), banks without a bank (Kenya), a superefficient lending mission (Mexico) (Gwalani & Parkhi, 2014).

In Indonesia, inclusive finance is a national strategy to encourage economic growth through equitable distribution of income, poverty reduction, and financial system stability. The Government through Presidential Regulation No. 82 of 2016 officially launched the National Financial Inclusive Strategy (SNKI). Through SNKI, the government formed the National Council for Inclusive Finance. SNKI formulates six pillars namely financial education, public financial facilities, mapping of financial supporting information. regulations, intermediation facilities distribution and channels, as well as consumer protection.

Several attempts have been made to increase financial inclusion and provide positive results. Financial inclusion programs that have been carried out include the Financial Services Without Offices in the Framework of Inclusive Finance (Laku Pandai). Through this program, grocery stalls, pulse shops, and midwives in remote villages can become agents of bank offices.

The Financial Services Authority also developed the KUR Cluster program, which is a channeling of credit from banks to micro businesses, farmers and fishermen. KUR Cluster involves local government to provide training to prospective KUR recipients. The Financial Services Authority also initiated a micro waqf bank that channels financing without collateral.

SNLKI results show there is a development of financial inclusion. It is indicated by the Financial Services Authority survey data in 2013, namely the financial literacy index of 21.84% and the financial inclusion index of 59.74% while in 2016 the financial literacy index was 29.66% and financial inclusion of 67.82%. The report from Global Findex also shows the same thing. Although still lower compared to Singapore, Malaysia and Thailand, financial inclusion in Indonesia has increased from year to year, from 20% (2011), 36% (2014) and 48% (2017).

Many studies have examined the factors that influence financial inclusion. Some of these factors include demographic factors (Febriana & Damayanti, 2017; Kabakova & Plaksenkov, 2018) such as education and gender (Cámara & David, 2015; Demirgüç-Kunt, Klapper, Singer, Ansar, & Hess, 2017). However, to our knowledge, there is little research that discusses the role of technology, especially communication technology, for financial inclusion in Indonesia. Technology is an essential factor and began to be used since 2017 by the World Bank (2017) as one of the factors that influence the level of financial inclusion.

The role of technology, especially communication technology, is vital because technology not only facilitates communication but also in terms of financial management. Moreover, the number of mobile phone users in Indonesia is enormous. The number of smartphone users in Indonesia in 2016 amounted to 65.2 million and experienced an increase in 2019 of 92 million.

The development of financial technology also contributed significantly to the use of finance through cell phones and the internet. According to the Indonesian Internet Service Providers Association, internet penetration in the country has reached 51.8 per cent. Of that amount, the majority are in the productive age, which is 25 years to 34 years. Almost 50 per cent of Indonesian people also already use smartphones to access the internet. Incorrect use of financial technology has risks for its users. For example, many people borrow money from peer to peer lending (Hidajat, 2019b) or cryptocurrency trading without financial knowledge (Hidajat, 2019a).

This research is essential because there are not many studies that discuss the role of technology factors, by asking the question of whether technology, gender and education have a positive effect on financial inclusion.

#### **RESEARCH METHODS**

Nine hundred ninety-five samples came from the Global Findex Database in 2017, which is accessed via microdata.worldbank.org. The Global Findex Database provides data on the results of surveys conducted in several countries, including Indonesia. The number of samples from Indonesia is 1000 people. However, of that number, only 995 were eligible because five people did not fill in questions about cell phone ownership.

Table 1. Research Variables							
Variable	Indicator	Sourc	Scale				
		e					
Financial	Have an	World	Nomina				
Inclusion	account at a	Bank	1				
	financial	(2017)					
	institution						
Technolog	Have a	World	Nomina				
У	mobile /	Bank	1				
	smart phone	(2017)					
Gender	• Male	World	Nomina				
	• Female	Bank	1				
		(2017)					
Education	• Basic	World	Ordinal				
educatio		Bank					
	n	(2017)					
	Middle						
	educatio						
	n						
	• Higher						
	educatio						
	n						

This research used logistic regression. Logistic regression is a data analysis method used to determine the relationship between the dependent variable and the dichotomous or binary independent variables (Hidayat & Istiadah, 2011). The logistic regression models in this paper are:

$$Ln\frac{pi}{1-pi} = \beta 0 + \beta 1x1 + \beta 2x2 + \beta 3x3 + e$$

Where

- $\beta 0 = constanta$
- $\beta 1 = \text{technology coefficient}$
- x1 = technology
- $\beta 2 = \text{gender coefficient}$
- $x^2 = gender$
- $\beta 3 = education coefficient$
- x3 = education
- $\pi j$  = probability where the j<sup>th</sup> factor has a response = 1 (Yes) from a binary logistical response that has a value of 0 (No).

# **RESULTS AND DISCUSSION**

# Model Feasibility Test

a) -2 Log Likelihood

Log-like -2 values are used to assess the overall model, whether independent variables can improve the model (Hidayat & Istiadah, 2011). If the value of -2LogL in the initial condition (Block 0) decreases in the following condition (Block 1), then the regression model is better than before the independent variables are included in the model.

#### Table 2. -2 Log Likelihood Block-0

		Coefficients
Iteration	-2 Log likelihood	Constant
Step 0 1	1368.262	0.211
2	1368.262	0.212

Table 3. -2 Log Likelihood Block-1

Iteration		-2 Log	Coefficients			
		likelihood	Constant	Techn	Gend	Educati
				ology	er	on
Step	1	946.791	-3.690	2.092	0.078	1.269
1						
	2	906.410	-5.445	3.055	0.112	1.773
	3	902.213	-6.158	3.555	0.124	1.900
	4	902.076	-6.293	3.672	0.125	1.910
	5	902.076	-6.300	3.678	0.125	1.910
	6	902.076	-6.300	3.678	0.125	1.910

The results showed a decrease of -2 Log-Likelihood by 466.186 (1368.262 – 902.076). This decrease is statistically significant with a significance of 0.000. It means that the addition of independent variables to the model improves the model.

b) Nagelkerke's R<sup>2</sup>

Nagelkerke's R2 is used to determine the ability of the model to explain the variation of independent variables (technology, gender, and education) to the dependent variable (financial inclusion).

Table 4. Nagelkerke R Square Testing			
Step	-2 Log likelihood	Nagelkerke R Square	
1	902.076	0.501	

The test produces a -2 log-likelihood of 902.076, and the coefficient of determination  $R^2$  is 0.501. That is, the ability of the model in explaining the variation of independent variables on the dependent variable is 50.1%. In comparison, the rest (49.9%) is explained by other variables that are not in this model.

c) Hosmer and Lemeshow's Goodness of Fit Test

An excellent logistic regression model is if there is no difference between the observational data and predictive data. Testing for that purpose is carried out with the Hosmer and Lemeshow test. The results of the Hosmer and Lemeshow test using the SPSS 22 program are as follows.

Table 5. Hosmer	and Lemeshow	Test	
2112	4.0		

Step	Chi-Square	df	Sig.
1	3.493	4	0.479

Hosmer and Lemeshow test are 3.493 with a significance probability value of 0.479 above 0.05, indicating that this binary logistic regression model is acceptable.

d) Classification Table

According to observations of respondents who do not have an account numbered 445 respondents. Of the 445 respondents, it is predicted that 332 respondents do not have an account so that the accuracy of classification is 74.6% (332/445 x 100%). In the prediction, the number of account holders is 461, while the observations numbered 550 respondents, so the accuracy of classification is 83.8% (461/550 x 100%). Overall classification accuracy is 79.7%.

	Tuble of Clussification Tuble				
		Predicted			
		Inclusion (y)			
			Do not		
		Have an	have an	Percentage	
	Observed	account	account	Correct	
Step 1	Inclusion Do not have an	332	113	74.6	
	(y) account				
	Have an account	89	461	83.8	
	Overall Percentage			79.7	

#### Table 6. Classification Table

#### Logistic Regression Test

Multiple logistic regression tests are used to see the effect of technology, gender, and education on financial inclusion. The method used is the enter method with a significance level of 5%.

Table 7. Logistic Regression Test

		В	S.E	Wald	df	Sig
Step	Techn	3.678	0.347	112.64	1	0.000
1	ology			5		
	Gende	0.125	0.170	0.542	1	0.461
	r					
	Educat	1.910	0.169	128.46	1	0.000
	ion			8		
	Consta	-	0.512	151.52	1	0.000
	nt	6.300		2		

The regression equation is:

 $Y = -6,300 + 3,678 X_1 + 0,125 X_2 + 1,910 X_3$ 

Based on the logistic regression equation, it is concluded that:

- Regression coefficient for technology variables is 3.678 (positive), this means that the higher the technology, the higher the likelihood that respondents will have accounts in financial institutions, and vice versa.
- The regression coefficient for the gender variable is 0.125 (positive), this means that if the gender of the respondent is male, the more likely the respondent has an account at a financial institution, and vice versa.
- The regression coefficient for the education variable is 1.910 (positive), this means that the higher the education level of the respondent, the more likely the respondent has an account at a financial institution, and vice versa.

# Effect of Technology, Gender and Education on Financial Inclusion

Regression test results indicate that the technology variable has a value of sig = 0.000 or lower than 0.05, which means the technology has a positive effect on financial inclusion. The higher the technology, the more likely the respondent has

an account at a financial institution. The results of this study are consistent with research conducted by Andrianaivo & Kpodar (2012).

Technology is a product to facilitate human life. Financial Inclusion is a service provider process with various affordable financial products such as savings, credit, insurance, payments and pensions for all low-income or disadvantaged economic actors. Technological advancements in cellular phones make it easy for users to carry out various financial transactions, changing transactions from cash transactions to non-cash transactions. Respondents who have cellular phones tend to have accounts in a financial institution because there are many financial applications. Mobile applications empower not only individual users, but also the economy as a whole. It has the cascade effect stimulates growth, entrepreneurship, and productivity throughout the whole economy (Donovan, 2012).

Regression test results indicate that the gender variable has a value of sig = 0.461 or more than 0.05, which means that gender does not affect financial inclusion. Both men and women have financial inclusion that is no different. The results of this study are consistent with research conducted by Nugroho & Purwanti (2018).

Technology does not differentiate gender so that men and women have the same opportunity to access technology and have a financial account. This condition is a challenge because financial institutions, in general, are more focused on men. Women are largely excluded from financial services, social and economic activities. The exclusion of women's finances means that their potential contribution to economic growth is lost (Fanta & Mutsonziwa, 2016).

Regression test results indicate that education has a value of sig = 0.000 or lower than 0.05, which means that education has a significant positive effect on financial inclusion. The higher the education level of the respondent, the more likely the respondent has an account at a financial institution. The results of this study are consistent with research conducted by Nugroho & Purwanti (2018). Individuals who have low and secondary education have a smaller probability compared to individuals who have higher education to have accounts in formal financial institutions. The higher level of education shows the broader level of one's knowledge, especially formal knowledge in finance. This knowledge will provide insight into how to manage finances well.

#### CONCLUSION

Technology has a positive and significant effect on financial inclusion. The higher the technology, the more likely the respondent has an account at a financial institution. Moreover, vice versa, the smaller the technology, the less likely the respondent has an account at a financial institution. Education also has the same effect. The higher the education level of the respondent, the more likely the respondent has an account at a financial institution. However, gender does not affect financial inclusion. Men and women have the same probability of financial inclusion.

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