

## Financial Inclusion and Laku Pandai Program on Individual Bank Profitability: Case Study in Indonesia

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### ABSTRACT

This study attempts to investigate the effect of the level of financial inclusion and the *Laku Pandai* program on individual bank profitability. Because from the bank's point of view, profitability is needed for business continuity. This study uses a financial inclusion index with a macro approach where there are three dimensions considered, namely penetration, availability, and usage, which will be processed using two-stage PCA. There are 31 banks that joined *Laku Pandai*, and all of them will be included in the sample using the Fixed Effect model. The period used in the research is from the initial implementation year of the *Laku Pandai* program (2015) to 2021. The results of the research show that the effect of financial inclusion on individual bank profitability has yet to be proven. Apart from that, the difference in the implementation of the *Laku Pandai* program in the control and treatment groups did not produce a significant difference in ROA in this dataset but resulted in a significant negative difference in ROE. Therefore, the authorities need to review the financial inclusion program through banks (bank-based). The behavior of underbanked and unbanked populations' financial transactions may not be in accordance with the banking business model.

**KEYWORDS** *financial inclusion, Laku Pandai, bank profitability*



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### INTRODUCTION

Financial inclusion, defined as the proportion of a population that has access to and utilizes formal financial services (Demirguc-Kunt et al., 2020), has become a key policy objective for many developing nations, including Indonesia. The availability of financial services such as savings, credit, and insurance is proven to play a crucial role in fostering economic growth and maintaining financial system stability (Mehrotra & Yetman, 2015). Indonesia has set an ambitious target to increase its financial inclusion level to 90 percent by 2024, underscoring the government's commitment to integrating its entire population into the formal financial ecosystem (Kalinin et al., 2024; Kharde et al., 2025; Ramesh, 2025; Wihardja et al., 2025).

Efforts to increase financial inclusion cannot be separated from the role of financial service providers (Bourreau & Valletti, 2015; Kandpal & Mehrotra, 2019; Mader, 2018). Bank-based model is one approach to increase financial inclusion, in which a bank is an official provider of financial services (both bank account and electronic money account), cooperates with agents, is fully managed or assisted by third parties under licenses and bank trademark.

Since 2014, Indonesia Financial Service Authority (OJK) has launched the *Laku Pandai* program, which is aimed at providing banking services or other financial services through collaboration with third parties (bank agents), and is supported by the use of information technology facilities to serve the needs of people who have not yet been reached by financial services.

There are several studies on the impact of financial industry on financial inclusion. The result of research by Shihadeh & Liu (2019) shows that increasing financial inclusion through branch banks can improve bank performance and reduce risk. This is in line with research in China which shows that financial inclusion has a negative impact on non-performing loan (Chen et al., 2018).

In addition, the presence of bank branch offices also affects the regional economy, especially in low-income communities, environments that have historically had minimal access to credit (Allen et al., 2020; Toussaint-Comeau et al., 2020). This is because the closure of bank branch offices has reduced the number of loans disbursed to the area (Gila-Gourgoura & Nikolaidou, 2017; Naili & Lahrichi, 2020). Meanwhile for the bank itself, enough numbers of branch offices contribute to reduce inefficiency (Harimaya & Kondo, 2016). So that the expansion of branch offices is expected to increase bank profitability efficiently and have a positive impact on regional economic growth. On the other hand, research by Liu et al., (2020) states that banks with high lending are more vulnerable to credit risk. High credit risk is usually reflected in bad loans which erode bank profits.

Until now, studies on the impact of financial inclusion on the financial industry are still limited (Mehrotra & Yetman, 2015). Whereas the presence of banks as providers of access to financial services allows more people to transact easily, frequently and openly.

Bank has various performance measurements based on what it wants to achieve. As a business entity, profit is the ultimate goal of its business activities (Horoshkova & Antoniuk..., 2023). This does not mean that banks cannot have other goals for the economy and society (Kumhof & Jakab, 2016; Верников, 2024). However, profit is needed for the continuity of the bank's business so that it can continue to play a role in development, providing benefits to society.

The urgency of this research is underscored by Indonesia's aggressive financial inclusion targets. If the programs designed to meet these targets inadvertently weaken the financial institutions tasked with implementing them, the long-term sustainability of both the banks and the inclusion agenda could be jeopardized. Therefore, understanding the business implications for banks is not merely an academic exercise but a critical input for sound policy design. The novelty of this study lies in its dual focus: it constructs a multidimensional financial inclusion index for Indonesia and simultaneously evaluates the direct impact of the Laku Pandai program, measured by agent numbers, on the profitability of individual banks.

Profitability is a performance measurement that shows a bank's ability to generate profits over a certain period (Riyanto, 1995). Profitability can be measured by Return on Assets (ROA) and Return on Equity (ROE). ROA is a ratio that shows how efficient a company is in utilizing its resources. While ROE is a measure of profitability seen from an investor's perspective because it shows the company's success in creating profits for the amount of money invested.

Bank income source can be divided into two types, interest income and non-interest income. Interest income is generated through the difference between credit interest and public fund interest. Income other than interest, such as fee-based income is generated from banking services other than lending.

Through transactions and economic activities of the local community, bank profitability can increase. But on the other hand, efforts to increase financial inclusion require costs for banks to be able to provide adequate facilities and infrastructure for transaction services. These issues arise a research gap on the effect of financial inclusion on bank profitability.

This research was conducted to see the impact of the level of financial inclusion in Indonesia through the Laku Pandai program for banks from a business perspective which can be used as a consideration for policy makers in an effort to create financial inclusion.

## RESEARCH METHOD

This study used a financial inclusion index with a macroeconomic approach which included three dimensions, namely penetration, availability, and usage. The macroeconomic approach was used because it was in line with the scope and objectives of the study, in this case bank profitability. The formation of the index was adopted from research by Sarma & Pais (2011). The index formation data was taken and processed from the Payment System and Financial Market Infrastructure Statistics (*Statistik Sistem Pembayaran dan Infrastruktur Pasar Keuangan*, SPIP) and Indonesian Financial System Statistics (*Statistik Sistem Keuangan Indonesia*, SSKI) reports.

In addition, the Laku Pandai program in this study was represented by the natural logarithm of the number of agents. Data on the number of agents were obtained from the OJK report. Bank profitability indicators, Return on Assets (ROA) and Return on Equity (ROE), were collected from the annual reports of each bank. The control variables used were internal and external factors that also determined bank profitability. Internal factors were represented through bank characteristic variables, namely Operating Income to Operating Costs (BOPO), Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), bank size, and Loan to Deposit Ratio (LDR). External factors were variables outside bank management but that also influenced profitability, namely macroeconomic variables such as inflation, interest rates, and Gross Domestic Product (GDP) growth rates. The data were collected from Bank Indonesia (BI), OJK, the Indonesia Central Agency on Statistics (BPS), and bank annual reports.

The period used in this study was from when the Laku Pandai program was implemented in 2015 to 2020. During this period, the number of administering banks continued to increase (Table 1). However, there was no information regarding the addition of Laku Pandai organizing banks in 2020. Therefore, for 2020, the organizing banks were assumed to be the same as in 2019. Consequently, the data used were unbalanced panel data.

**Table 1. List of Sampel Banks based on The Year They First Held Laku Pandai (31 banks)**

<b>2015 (7 banks)</b>
Bank Mandiri, BRI, BNI, BTN, BTPN, BCA, BPD Kaltim
<b>2016 (13 banks)</b>
Bank Sinarmas, Bank Bukopin, Bank Sahabat Sampoerna, BJB, Bank Jateng, BRI Syariah, Bank Danamon, Bank Riau Kepri, BTPN Syariah, Bank Artha Graha, BPD Jatim, BPD NTB, BPD NTT
<b>2017 (7 banks)</b>
BPD Lampung, BPD Sumsel Babel, Bank Nobu, BPD Jambi, BPD Bali, BPD Bengkulu, BPD Kalbar
<b>2018 (3 banks)</b>
CIMB Niaga, BPD DIY, Bank Syariah Mandiri
<b>2019 (1 bank)</b>
Bank DKI

Source: OJK

The formation of the financial inclusion index was carried out using the two-stage PCA method which was adopted from previous studies (Camara & Tuesta, 2014; Sarma, 2012). Furthermore, the results of the index calculation are entered into the regression model. This study uses the two-way fixed effect model with the control variable in the form of a vector of individual bank characteristics and macroeconomic conditions. The TWFE method tries to compare between the control and treatment groups. The control group is the bank group that has not implemented the Laku Pandai program and the treatment group is the bank group after implementing the Laku Pandai program. In this study, the implementation of Laku Pandai at each bank was carried out in different years. In other words, the treatment is applied in a

different year for each bank. Because of the difference in the year Laku Pandai was implemented, the two-way fixed effect was used to see changes in the impact between before and after the implementation of the program at the bank that was the treatment group against the control group. The modeling is stated as follows:

$$Y_{it} = X\delta_i + \alpha FI_t + \beta \ln A_{gen_t} + \gamma_k \sum Z_{it} + \theta_j \sum W_t + e_i \quad (1)$$

Where i is bank cross-section, t represents time.  $\delta$  is a treatment group specific effect. Y is dependent variable. FI is financial inclusion index and  $\ln A_{gen}$  is natural logarithm of the number of Laku Pandai agents, which are variables of interest. Z and W are control variables. Where Z is individual bank characteristics with k is the number of the banks. W is macroeconomic factors with j is the number of the factors. e is error.

**Table 2. List of Sampel Banks based on The Year They First Held Laku Pandai (31 banks)**

Variable	Definition	Measurement
Dependent Variables		
ROA	Return on Assets	Profit before tax / total assets (%)
ROE	Return on Equity	Profit before tax / total equity (%)
Independent Variables		
Variables of Interest		
FI	Financial inclusion index	Composite index of financial inclusion variables
$\ln A_{gen}$	Laku Pandai	Natural logarithm of total Laku Pandai agents
Control Variables (Bank Characteristic)		
BOPO	Operational Income Operating Costs	Operating costs / operational income (%)
CAR	Capital adequacy ratio	(Tier 1 + tier 2) capital / Risk Weighted Assets (%)
NPL	Non-performing loan ratio	Non-performing loan / Total loans (%)
$\ln Asset$	Natural logarithm of total assets	Natural logarithm of total assets
LDR	Loan-to-deposit ratio	Total loans / total deposits (%)
Control Variables (Macroeconomic condition)		
INF	Inflation rate	Change in consumer price index annually (%)
BIRATE	Bank of Indonesia rate	Bank of Indonesia rate
PDBG	GDP growth rate series 2010 quarter IV	GDP growth rate annually (%)

Because this study uses ROA and ROE in measuring profitability, there will be two equations. If the equations are written along with the description of the control variables, they become:

$$ROA_{it} = X_1 \delta_{i1} + \alpha_1 FI_t + \beta_1 \ln A_{gen_t} + \gamma_{11} BOPO_{it} + \gamma_{21} CAR_{it} + \gamma_{31} NPL_{it} + \gamma_{41} \ln Asset_{it} + \gamma_{51} LDR_{it} + \theta_{11} INF_t + \theta_{21} BIRATE_t + \theta_{31} PDBG_t + e_{it} \quad (2)$$

and

$$ROE_{it} = X_2 \delta_{i2} + \alpha_2 FI_t + \beta_2 \ln A_{gen_t} + \gamma_{12} BOPO_{it} + \gamma_{22} CAR_{it} + \gamma_{32} NPL_{it} + \gamma_{42} \ln Asset_{it} + \gamma_{52} LDR_{it} + \theta_{12} INF_t + \theta_{22} BIRATE_t + \theta_{32} PDBG_t + e_{it} \quad (3)$$

## RESULT AND DISCUSSION

### Financial Inclusion Index

Financial inclusion in this study was measured using a multidimensional index (Camara & Tuesta, 2014; Sarma, 2012) for the period 2015 to 2020. The following table provides a list of variables along with descriptive statistics which are input indicators for each dimension and reduced to a variable using two stages of PCA. Before using PCA, the indicators of each dimension are normalized. The author compares the final index results using the normalized z-score, min-max and softmax. The resulting index value is almost the same. So the author uses normalization with the min max method to produce a linear transformation with the actual value which then produces values that are in the range of zero and one. Zero indicates financial exclusion and one indicates financial inclusion.

Table 3 presents a list of component variable names (column 1) written based on dimensions (penetration, availability, usage) and their definitions (column 2). All data is taken from SPIP and SSKI by Bank of Indonesia. Column 3, 4, 5 and 6 are descriptive statistics for each variable, namely the minimum value (min.), maximum value (max.), average (mean) and standard deviation (SD).

**Table 3. Details of financial inclusion index component variables**

Variable	Definition	Min.	Max.	Mean	SD
Penetration Dimension					
FP1_DPK	Number of DPK Banking Accounts per 1,000 adults	952	1909	1450,67	368,46
FP2_KDebit	Number of ATM and ATM+Debit cards per 1,000 adults	648	1081	844,33	152,93
FP3_KKredit	Number of credit cards per 1,000 adults	86	92	89,33	2,16
FP4_Emoney	Number of electronic money accounts per 1,000 adults	185	2187	908,83	785,27
Availability Dimension					
FS1_Kantor	Number of bank service offices per 100,000 adult population	16	18	16,33	0,82
FS2_ATM	Number of ATM machines per 100,000 adult population	53	56	54,33	1,21
Usage Dimension					
FG1_PDB	Banking credit to current price GDP	35,19	36,11	35,7	0,34
FG2_TXNDB	Number of transactions per debit card	31,17	39,72	36,67	3,18
FG3_TXNCR	Number of transactions per credit card	16,21	19,97	18,16	1,57

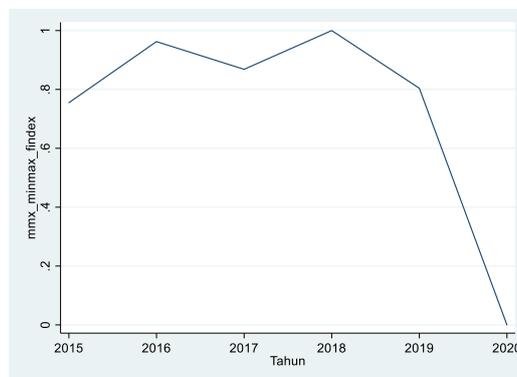
Source: Author's calculation

Then, first-stage PCA was carried out at the dimension stage, the results of which are presented in the following table. The component weights for each dimension are generated from the information for each PC and the eigenvalue. On the Penetration dimension, the weight of each component is almost balanced, namely 0.4986 (FP1\_DPK), 0.5027 (FP2\_KDebit), -0.4614 (FP3\_KKredit) and 0.4601 (FP4\_Emoney). The negative sign on the weight indicates the direction. This means that having a credit card does not represent financial inclusion, because it is easier for most people to have a basic financial product (for example, a debit card or savings account) than a credit card, so credit cards are less able to measure penetration dimensions.

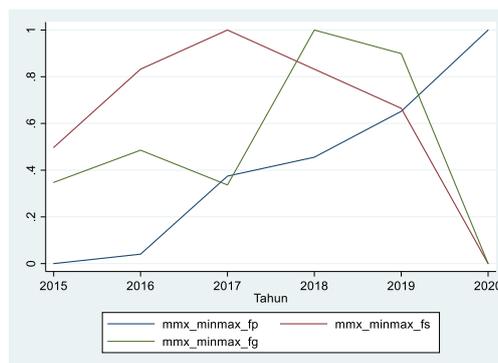
On the Availability dimension, the weight of the two indicators is quite large, namely -2.8418 (FS1\_Office) and 3.8418 (FS2\_ATM). The estimation results show that bank service offices do not represent financial inclusion, because bank service offices are only available in developing areas, considering that the capital costs for establishing and operating an office are also relatively more expensive. Meanwhile, ATMs are more representative of the availability dimension in financial inclusion.

On the Usage dimension, the weight of each indicator is -0.4591 (FG1\_PDB), 1.5229 (FG2\_TXNDB), -0.0638 (FG3\_TXNCR). The number of debit card usage variables best represents the level of financial inclusion compared to the other two variables, because it can be said that all people can have a debit card. While the other two variables indicate the use of credit, in which not all people can have credit facilities.

The financial inclusion index (normalized) and its components can be seen in Figure 1. From Figure 1, it can be seen that financial inclusion has started to decline from 2019 to 2020 which corresponds to its components on the dimensions of availability and use. This is likely due to the Covid-19 pandemic that has hit since the beginning of 2020 which has hampered economic activity. On the other hand, there was an increase in the penetration rate throughout the observation period. This can be explained by the fundamental nature of the penetration dimension which measures the number of accounts, debit cards, credit cards and electronic money cards in circulation without considering their use. The Pre-Employment Card program, which has been rolling out since 2020, requires participants to have a bank account for the purpose of receiving aid funds. This can also be a factor affecting the penetration rate. Thus, the dimension of penetration can continue to increase even though a pandemic occurs. However, the overall impact of the three dimensions on financial inclusion is dominated by the availability and usage dimensions.



**Figure 1. Chart of financial inclusion index**



**Figure 2. Chart of financial inclusion variable components**

## Descriptive Analysis

According to Bank Classification based on its Core Capital (KBMI), 14 sample banks are included in the KBMI 1, 7 banks are classified as KBMI 2, 6 banks are KBMI 3, and 4 banks are KBMI 4. KBMI 1 is a group of banks that have core capital below 6 trillion rupiah, KBMI 2 has a capital of 6 to 14 trillion rupiah, KBMI 3 has a capital of 14 to 70 trillion rupiah and KBMI 4 has capital above 70 trillion rupiah.

Table 4 below presents the results of descriptive statistics for each variable (column 1) used in the regression equation and their definitions (column 2). Independent variable data and bank characteristic control variables were taken from the annual financial reports of each sample bank, macroeconomic conditions control variable data were obtained from BPS, Agent variable data were taken from OJK statistical data and index variable data were the results of calculations in this study. Column 3, 4, 5 and 6 are descriptive statistics for each variable, namely the minimum value (min.), maximum value (max.), average (mean) and standard deviation (SD).

## Fixed Effect Result

Table 5 shows the results of the regression analysis using the Fixed Effect method. The estimation results show that the bank's involvement in the Laku Pandai program (treatment) was found to have no effect on ROA and ROE. However, the number of Laku Pandai agents is estimated to have a significant negative effect on ROE, with a significance level of 5%. This can be interpreted that bank profitability decreases when the number of agents increases. This indicates that public transactions served through Laku Pandai are simple and low-cost transactions that are not profitable for banks.

**Table 4. Details of Regression Variables**

Variable	Definition	Min.	Max.	Mean	SD
<b>Dependent Variable</b>					
ROA	<i>Return on Assets</i>	-4,61	13,58	2,32	2,02
ROE	<i>Return on Equity</i>	-48,67	36,5	12,91	8,93
<b>Independent Variable</b>					
<b>Variable of Interest</b>					
FI	Financial Inclusion Index	-2,82	1,01	-0,15	1,43
lnAgen	Natural logarithm of Laku Pandai agents total per December	11,02	14	13,52	0,74
<b>Control Variable (Bank's Characteristics)</b>					
BOPO	Operational Income Operating Costs	58,07	168,1	80,92	13,03
CAR	Capital/Risk Weighted Assets (ATMR)	10,52	49,44	21,85	5,10
NPL	Non Performing Loan	0,05	10,35	3,01	1,95
lnAsset	Natural logarithm of total assets	13,3	21,2	17,62	1,74
LDR	Loan-to-deposit ratio	48,79	163	88,97	14,25
<b>Control Variable (Macroeconomic Condition)</b>					
INF	Inflation rate	1,68	3,61	2,82	0,66
BIRATE	Bank of Indonesia rate	3,75	7,5	4,89	0,97
PDBG	GDP growth rate series 2010 quarter IV	-2,17	5,19	3,54	2,98

Source: Author's calculation

For several types of transactions, Laku Pandai customers are charged a fee which then becomes the income of the agent and the bank. However, this type of BSA (Basic Saving Account) savings is not subject to fees such as monthly administration and account opening fees. Meanwhile for ROA, the number of Laku Pandai agents is estimated to have a non-significant negative effect.

In accounting, the equation ROA, ROE and the relationship between assets, liabilities and equity is as follows:

$$\text{ROA} = \frac{\text{Return}}{\text{Total Assets}} \quad (4)$$

$$\text{Total Assets} = \text{Total Liability} \quad (5)$$

$$\text{ROE} = \frac{\text{Return}}{\text{Total Equity}} \quad (6)$$

The difference between ROA and ROE lies in the denominator. ROA has a greater denominator value than ROE. The number of Laku Pandai agents is not significant to ROA but significant to ROE, it is estimated due to the larger ROA denominator. The difference in the ROA and ROE denominator is the amount of liability that is calculated in the total asset value in the ROA divisor. One of the liability components is public savings funds or commonly called Third Party Funds (*Dana Pihak Ketiga*, DPK). So that with the same number of returns, the magnitude of the ROE ratio is greater than ROA because the value of equity in the ROE denominator is smaller than the total assets in the ROA divisor. Likewise, when there is a decrease in the same number of unit returns, the magnitude of the decrease in ROE will be greater than ROA. In other words, ROE is more sensitive than ROA.

The negative relationship between the Laku Pandai variables represented by the number of agents with ROA and ROE could be because the income generated is less than the costs incurred, resulting in a negative return and lowering the ROA and ROE. This finding indicates that agents in the Laku Pandai program tend to be cost centers for banks.

Meanwhile, changes in the financial inclusion variable did not produce a significant effect on changes in bank profitability, both ROA and ROE. Thus, the effect of financial inclusion on bank profitability has yet to be proven. ROA and ROE have the same quantifier, namely Return. Broadly speaking, returns are generated from two types of income, namely interest income and non-interest income. Interest income is generated from public savings funds channeled in the form of credit. Income other than interest is generated from fees, commissions, fees for financial services such as for money transfers and others. That is, banks need to channel funds or provide financial services to generate returns. Financial inclusion variables that do not show a significant effect on ROA or ROE are possible because the financial activities carried out by the people involved have not provided sufficient benefits. Because the level of profit generated from each bank activity is different. For example, recruiting one debtor will be more profitable for the bank than recruiting one new depositor. However, the recruitment of new customers is still needed to open opportunities for other banking service needs or simply to increase third-party fund (TPF) so that they can be channeled into loans for other customers.

The difference in positive and negative signs in the results of estimating the impact of financial inclusion on ROA and ROE is possible due to changes in liabilities, one of the TPF component. This means that even though the impact on the return component (quantifier) of the two ratios has the same nominal value, an increase in TPF can increase liabilities and indirectly increase total assets (denominator). The increase in total assets makes the ROA ratio

decreased. Meanwhile, the increase in liabilities has no effect on total equity or ROE. However, because the estimates do not show significant results, the effect of financial inclusion on bank profitability cannot be proven.

**Table 5. Fixed-Effect Estimation Results**

Variable	Fixed-effect	
	ROA	ROE
0.join_laku	0	0
	(.)	(.)
1.join_laku	0,0440	1,149
	(0,480)	(0,926)
Inklusi_keuangan	-0,0248	11,37
	(0,723)	(0,303)
Agen	-0,0905	-15,23*
	(0,092)	(0,023)
Control Variables	Yes	Yes
Number of Observations	186	186

Note: Standard errors in parentheses. \*  $p < 0,05$ , \*\*  $p < 0,01$ , \*\*\*  $p < 0,001$ .

Source: Author's calculation

## CONCLUSION

This study examined the impact of financial inclusion levels and the Laku Pandai program—an agent-based initiative designed to expand public access to the financial system—on bank profitability in Indonesia. Financial inclusion, defined as the availability of access to financial services for the entire community, was measured using a macro-level index encompassing three dimensions: penetration, availability, and usage. From the bank's perspective, profitability is essential for business continuity and depends not only on the number of people with access but also on how customers utilize the financial services offered, as banks generate income primarily through interest from lending and fee-based services. Given that banks incur capital costs to provide access, it is crucial to assess whether customers are actively using available services and whether banks are operating efficiently. Future research should explore the behavioral patterns of underbanked and unbanked populations to better align financial inclusion programs with banking business models, and investigate alternative delivery channels or partnership models that may prove more sustainable for both banks and underserved communities.

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