

# “Analysis of determining the financial inclusion index of composite, conventional and sharia banking in Indonesia”

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# ANALYSIS OF DETERMINING THE FINANCIAL INCLUSION INDEX OF COMPOSITE, CONVENTIONAL AND SHARIA BANKING IN INDONESIA

## Abstract

In Indonesia financial inclusion remains a challenge. This study looked at how the human development index, gross domestic product, and the number of offices of banks affect the financial index in 34 Indonesian provinces for composite, conventional, and sharia banking. This study uses panel data from 2016 to 2019 to address research questions. According to the findings of this study, economic growth, human development index, regional gross domestic product per capita, and bank branches significantly influence the financial inclusion index of the composite banking. Meanwhile, economic growth, human development index, gross domestic product per capita, and the number of bank branches impact the financial inclusion index of conventional banking. However, the financial inclusion index for sharia banking shows that only economic growth variables, regional gross domestic product per capita, and the number of sharia bank branches have a significant influence. The human development index variable does not have a significant influence. Based on these findings, the Financial Service Authority (OJK) and Bank Indonesia must promote a conducive climate for increasing the financial inclusion of banking in Indonesia for both conventional and Islamic banks.

## Keywords

financial inclusion, human development index, economic growth, Islamic banking, panel data regression

## JEL Classification

G20, O15, O40, E44, C23

## INTRODUCTION

The World Bank (Demirguc-Kunt et al., 2017) reported that around 95 million individuals in Indonesia do not have a financial institution account. Indonesia has the world's fourth-largest unbanked population, behind China, India, and Pakistan. However, access to financial services is a problem among individuals and micro, small and medium enterprises (MSMEs) in Indonesia. MSMEs in Indonesia are still experiencing trouble accessing finance (credit), according to Rosengard and Prasetyantoko (2011), Muthia et al. (2019), since the government limits MSMEs in such access and focuses more on consumer finance.

The increased financial inclusion, keeping with the government's goal of making Indonesia the global Sharia economy's hub, will need a rise in sharia finance, which may be achieved by improving the Islamic Financial Inclusion Index. Consequently, there is still a lack of Islamic financial inclusion. According to statistics from the Financial Services Authority (OJK, 2020), the Islamic Financial Inclusion Index decreased in 2019 compared to 2016, falling from 11.1 to 9.10. Each financial sector reveals the extent of financial in-



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clusion. When compared to other financial sectors, such as the capital market (0.01 percent), insurance (1.9 percent), pension funds (0 percent), and pawnshops (0 percent), according to the Financial Services Authority statistics (OJK, 2020), inclusiveness in the banking system is still the greatest (9.6 percent) out of 12,773 respondents (0.7 percent).

These numbers show that participation in the sharia non-bank financial market is still meager at all levels of society. The issue is affecting Indonesia and the rest of the world. According to Beck and Brown (2011), Brekke (2018), out of 29,000 persons in 29 nations, Muslims had fewer bank accounts than non-Muslims, with religious reasons being one of the underlying factors. The primary causes for financial exclusion in Muslim countries, according to Zulkhibri (2016), are cost, distance, belief, and religious reasons. As a result of the aforementioned factors, several Islamic nations have limited financial inclusion. According to Ahamed (2016) in Muthia et al. (2019), high financial inclusion will enhance bank profitability. Because a rise in banking profitability reflects the volume of lending, it will boost real-estate productivity and result in higher production.

This study analyzes the economic growth, the Human Development Index (HDI), gross regional domestic product per capita, and the number of offices that affect the Financial Inclusion Index of composite, conventional, and Sharia banks in 34 Indonesian provinces from 2016 to 2019.

## 1. LITERATURE REVIEW

### 1.1. Financial institutions

According to Pass and Lowes (1988), a financial intermediary is an institution or organization that connects payments from creditors to debtors. According to Sloman et al. (2012), financial intermediation is another name for a financial institution, such as a bank, whose purpose is to broker funds between savers and borrowers. Finally, according to Siamat (1995) in Fahmi (2014), a financial institution is a commercial firm whose primary wealth is financial assets or bills, such as bonds and shares, rather than tangible assets.

Banking plays a significant role in facilitating the smooth transmission of monetary policy as an intermediate institution that provides access to financial services (intermediation) to all sections of society, one example being the minimum reserves kept by commercial banks in central banks. One of the essential purposes of keeping minimum reserves at the central bank, according to Sloman et al. (2012), is to control liquidity risks associated with the time in terms of assets and liabilities to ensure financial system stability. Furthermore, banking has a significant influence on the quantity of money in circulation.

### 1.2. Financial inclusion

According to Ngo (2019), the notion of financial inclusion first appeared in Leyshon and Thrift (1996), but it was not well stated. Therefore, the opposing word of financial exclusion was used instead. The process of a group of people not being able to enter the financial system is referred to as financial exclusion. However, there is also much discussion about the meaning of financial inclusion. According to Bank Indonesia (2014) in Saraswati et al. (2020), financial inclusion is defined as all efforts to promote public access to financial services by removing price and non-price obstacles.

According to Barr et al. (2007), the financial system of inclusion is linked to the development of access to financing facilities for individuals or businesses, as well as the mobilization of savings, credit allocation, and risk management, all of which may deepen and extend the financial system, increasing growth and lowering poverty. Barr et al. (2007) stated that there are two views on an economy's lack of financial inclusion. First, financial inclusion occurs on-demand when potential consumers access financial services but do not utilize them. The second is on the supply side, where credit or financing institutions cannot effectively diversify risks due to their inability to mitigate asymmetric information and, as a result, withhold or deny funding applications for specific debtors.

Financial intermediation is connected to the amount of access to financial services. Financial intermediation done through the creation of banks branch offices or the supply of such facilities will allow access in the collection of various financial products suited for underserved persons or groups or rural groups, according to the most thorough study such as Mishkin (2007) in Bongomin et al. (2017). According to other research, such as Kumar and Mishra (2011) and Bongomin et al. (2017), financial institution structures such as head offices and branch offices can increase financial services, particularly for rural groups. Financial institutions can facilitate the distribution of financial goods more efficiently with several offices, which influences the efficiency of monetary policy. As a result, quick access might be said to boost financial participation. Infrastructure factors such as paving roads, which can increase the number of bank branches in each town, have a favorable and significant influence on the level of financial inclusion, according to Sarma (2012).

The economics in Islam, with religious considerations, is one of the sole financial causes. According to Zulkhibri (2016), financial inclusion in the Islamic economy is linked to income equality based on risk-sharing contracts. Risk-sharing contracts can be used as an alternative to debt financing and Islamic microfinance to help micro-businesses and the needy carry-out redistribution tasks. Shinkafi et al. (2020) found that microcredit and microfinancing instruments, combined with a greater understanding of underserved populations (poor people, rural communities, and low-income persons), effectively increased financial involvement.

According to Jouti (2018), there are several challenges with Islamic financial inclusion that are tied to religious reasons:

- 1) the lack of bank accounts for religious reasons;
- 2) some Muslims who have accounts with conventional financial services are limited to using basic facilities, not financing products, savings, or even insurance;
- 3) Muslims who use conventional financial services will prefer to use shariah-based financial services and products if they are available; and

- 4) if there are financial products available, Muslims will want to use them.

On the other hand, financial inclusion is connected to income inequality and assisting monetary authorities in reaching the ultimate goal of inflation stability. Saraswati et al. (2020) observed that, both in the short and long run, financial inclusion affects the inflation rate, which is a proxy for monetary policy efficacy. According to Mbutor and Uba (2013), the number of bank branch offices has a detrimental impact on monetary policy efficacy.

Sarma (2012) also developed a model for computing the financial inclusion index, which is as follows:

$$X_1 = \frac{\sqrt{d_1^2 + d_2^2 + \dots + d_n^2}}{\sqrt{(w_1^2 + w_2^2 + \dots + w_n^2)}}, \tag{1}$$

$$X_2 = 1 - \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + \dots + (w_n - d_n)^2}}{\sqrt{(w_1^2 + w_2^2 + \dots + w_n^2)}}, \tag{2}$$

$$IFI = \frac{1}{2} [X_1 + X_2], \tag{3}$$

$$IFI = \frac{1}{2} \left[ \frac{\sqrt{d_1^2 + d_2^2 + \dots + d_n^2}}{\sqrt{n}} + \left( 1 - \frac{\sqrt{(1-d_1)^2 + (1-d_2)^2 + \dots + (1-d_n)^2}}{\sqrt{n}} \right) \right], \tag{4}$$

where  $0 \leq w_1 \leq 1$ ;  $IFI$  = index of financial inclusion;  $d_1, d_2, \dots, d_n$  = measurement dimension index;  $w_1, w_2, \dots, w_n$  = weight on dimensions.

The financial inclusion index (IFI) is produced using the average summation of weights and dimensions utilized, as shown in the formula above. As previously stated, Sarma's study (2012) divides the assessment of financial inclusion into three dimensions: banking penetration, financial service availability, and use. Furthermore, if the dimensions employed are regarded equally essential in measuring financial inclusiveness for the sake of simplification, then the dimension weight ( $w$ ) is worth 1. Furthermore, according to Musau et al. (2018),

three characteristics are used to measure financial inclusivity: availability, accessibility, and utilization.

### 1.3. Regional gross domestic product per capita

The distinction between Regional Gross Domestic Product (GDPR) and Gross Domestic Product (GDP) is the measuring scale, which is regional. Gross Domestic Product (GDP) is defined by Pass and Lowes (1988) as the total monetary worth of all products and services generated in an economy over one year. There is a relationship between financial inclusion and income. Ummah et al. (2015) concluded that income (an economic indicator) positively impacted financial inclusion. This study used the data panel technique to examine 33 provinces in Indonesia from 2007 to 2011. GDP per capita has a considerable beneficial influence on financial inclusion rates, according to Sarma and Pais (2011).

Furthermore, income and financial inclusion have a two-way relationship. Again, Adusei (2015) reveals an indirect association between income and financial inclusion. The more significant the income, the higher the savings saved in bank account ownership. Therefore, according to the statement, having a bank account indicates banking penetration, implying a positive relationship between income and financial inclusion (Musau et al., 2018).

### 1.4. Human development index

According to Laha (2015), there is a causal link between financial inclusion and human development, which are positively associated. Therefore, nations with a high level of human evolution will also have a high level of financial inclusiveness. The regional income will, without a doubt, contribute to the HDI level in each region. According to Sarma and Pais (2011), Chithra and Selvam (2013), there is a positive relationship between income and financial inclusion, as stated in Ngo (2019). As a result, these elements must be considered while improving Indonesia's financial inclusivity. A previous study found the financial inclusion index in both conventional and sharia law. Sharia finance has emerged as a critical topic concerning financial inclusion (membership, faith in institutions,

and integration), particularly in Western nations (Brekke, 2018).

According to Sarma and Pais (2011), in the 49 countries plotted, The Human Development Index (HDI) and the Financial Inclusion Index (IIK) had a considerable and significant positive association, meaning that nations with a high Human Development Index also have a high Financial Inclusion Index. Sarma and Pais (2011) did a similar study and discovered that the Human Development Index (HDI) and the Financial Inclusion Index had a significant positive association (IIK). Between 2011 and 2014, Datta and Singh (2019) found various positive associations in each cluster of income categories.

## 2. DATA, METHODS, AND HYPOTHESES

This study uses secondary data financial inclusion, either in composite, conventional, and sharia banking of 34 provinces from 2016 to 2019. Data collected and gathered from the Financial Service Authority (FSA) of Indonesia report, from the website of Bank Indonesia, and macroeconomic data is gathered from the Central Bureau of Statistics of Indonesia.

To address research questions on the effect of economic growth, gross regional product per capita, human development index, and the number of bank offices on financial inclusion index for composite, conventional, and sharia banking, equations (5), (6), and (7) are employed.

$$\begin{aligned} IKK_{Composite} = & \alpha + \text{Log} \beta_1 (EG) + \\ & + \text{Log} \beta_2 (GDPR / Cap) + \\ & + \text{Log} \beta_3 (HDI) + \text{Log} \beta_4 (Office) + \varepsilon, \end{aligned} \quad (5)$$

$$\begin{aligned} IKKK_{Conventional} = & \alpha + \text{Log} \beta_1 (EG) + \\ & + \text{Log} \beta_2 (GDPR / Cap) + \text{Log} \beta_3 (HDI) + \\ & + \text{Log} \beta_4 (Office) + \varepsilon, \end{aligned} \quad (6)$$

$$\begin{aligned} IKK_{Sharia} = & \alpha + \text{Log} \beta_1 (EG) + \\ & + \text{Log} \beta_2 (GDPR / Cap) + \\ & + \text{Log} \beta_3 (HDI) + \text{Log} \beta_4 (Office) + \varepsilon. \end{aligned} \quad (7)$$

The research variables of the analysis can be represented as shown in Table 2.

Based on the aims of this study mentioned before in the previous section, then to solve the analysis, the regression data panel technique (panel data regression model) is used. Moreover, based on the results of model selection tests with chow tests, Breusch-Pagan Lagrange Multiplier (LM) and Hausman tests showed that fixed effect (FE) models are better than random effect (RE) and pooled the least square (PLS). The FE method eliminates the effects of characteristics that do not vary between times (time-invariant) in each company to evaluate the actual effects of independent variables that are suspected to affect variable dependents. Based on the analysis of panel data using the Stata program, the following hypotheses will be proposed:

*H1: Economic Growth positively affects the Financial Inclusion Index.*

*H2: Regional Gross Domestic Product per capita positively affects the Financial Inclusion Index.*

*H3: The Human Development Index positively affects the Financial Inclusion Index.*

*H4: The number of banking offices positively affects the Financial Inclusion Index.*

As mentioned before in the previous section, this study aims to determine the impact of economic growth, HDI, gross regional domestic product per capita, and the number of offices on the Financial Inclusion Index of composite, conventional, and sharia banks in 34 provinces in Indonesia from the data 2016 to 2019. Before execution the empirical estimation, the following stages will be performed on several research variables as an analysis unit for testing successive hypotheses:

- 1) Stage 1: Collect data related to financial inclusion index for conventional and sharia banking in 34 provinces in Indonesia.
- 2) Stage 2: Calculate the composite financial index using an iterative approach based on conventional and sharia financial inclusion indices.

- 3) Stage 3: Perform a test to determine the data panel's regression model.
- 4) Stage 4: Using a fixed effect panel data model to estimate panel regression.
- 5) Stage 5: The empirical model is estimated using a panel regression model. The fixed-effect model was used to analyze the model. In addition, STATA software packages were employed to examine the data.

**Table 1.** Research variables

| Variables                    | Description  | Description  |
|------------------------------|--|--|
| <b>Dependent variables</b>   |  |  |
| IKK <sub>Composite</sub>     | Financial Inclusion Index of Conventional and Sharia banks | As a proxy of financial inclusion that people access to the financial system   |
| IKK <sub>Conventional</sub>  | Financial Inclusion Index of Conventional Banks            | As a proxy of financial inclusion of a conventional bank that people accessed  |
| IKK <sub>Sharia</sub>        | Financial Inclusion Index of Sharia Banks                  | Used as a proxy of financial inclusion of a sharia bank  |
| <b>Independent variables</b> |  |  |
| EG                           | Economic Growth of a Province                              | Used as economic growth in a region or province in a period  |
| GDP/Cap                      | Regional Gross Domestic Product per Capita                 | Total products and services produced in a province in a time divided by the number of people that lived in that province |
| HDI                          | Human Development Index                                    | The high HDI index should increase the financial inclusion index   |
| Office                       | The number of office branches of banks                     | The increased number of bank branches should increase the financial inclusion index                                      |

### 3. RESULTS

A statistical description of this study of each variable should be validated before conducting a quantitative analysis of existing data and models. The examination of the data has been done before quantitatively examining existing data and models. Furthermore, the variable has gone above and above by implementing a screening method to ensure that the data used is not anomalous. The Financial Inclusion Index for the composite is then calculated. Financial inclusion data from conventional banks and sharia banks were collect-

**Table 2.** Descriptive statistic of variables

| Variable                    | Definition   | Mean    | Std. dev | Min   | Max    |
|-----------------------------|--|---------|----------|-------|--------|
| IKK <sub>Composite</sub>    | Financial Inclusion Index of Conventional and Sharia Banks | 67.876  | 5.332    | 58.50 | 78.20  |
| IKK <sub>Conventional</sub> | Financial Inclusion Index of Conventional Banks            | 56.30   | 5.751    | 55.30 | 78.20  |
| IKK <sub>Sharia</sub>       | Financial Inclusion Index of Sharia Banks                  | 10.923  | 8.062    | 2.20  | 41.50  |
| EG                          | Economic Growth of a Province                              | 5.359   | 1.74     | -0.36 | 9.98   |
| GDPR/Cap                    | Regional Gross Domestic Product per Capita                 | 39.246  | 29.890   | 11.47 | 149.83 |
| HDI                         | Human Development Index                                    | 69.159  | 4.150    | 58.05 | 79.60  |
| Office                      | The Number of Office Branches of Banks                     | 108.647 | 128.41   | 16.00 | 545.00 |

ed from 34 provinces in Indonesia and produced the Financial Inclusion Index Composite, as described in the previous section. Table 1 shows the statistical reports for the variables used in regression calculations.

Several tests were undertaken before the regression analysis to identify the regression model of the panel utilized in the study. After the data has been obtained, the following step is to decide the model used by applying the Wald Test to see if the common effect or fixed effect model will be utilized. The Wald Test results for models 1 through 4 are shown in Table 3.

**Table 3.** The Wald test on the panel regression model

| Model    | Cluster I | Cluster II | Cluster III | Cluster IV |
|----------|-----------|------------|-------------|------------|
| Prob (F) | 0.0000    | 0.0000     | 0.0000      | 0.0000     |
| Result   | FEM       | FEM        | FEM         | FEM        |

Note: Wald test: using a critical value of 1%, 5%, and 10%.

According to the Wald test results on the model in four models, the four-model panel model utilized is FEM. However, more testing is required to verify whether the fixed effect or random-effect model is correct. The Hausman method is used to decide the panel regression model. Table 4 shows the Hausman test results.

**Table 4.** The Hausman test on the panel regression model

| Model    | Cluster I | Cluster II | Cluster III | Cluster IV |
|----------|-----------|------------|-------------|------------|
| Prob (F) | 0.0000    | 0.0000     | 0.0000      | 0.0000     |
| Result   | FEM       | FEM        | FEM         | FEM        |

Note: The Hausman test: using a critical value of 1%, 5%, and 10%.

The Hausman test on the four models reveals that they are fixed-effect models. In this study, the next step is to use the FEM model for panel data regression. This study's panel regression model result can be seen in Table 5.

**Table 5.** Effect of EG, HDI, GDPR/Cap and Office on IKK<sub>Composite</sub>

Source: Author estimation (2021).

| Dependent IKK <sub>Composite</sub> | (1) FE1               | (2) FE2              | (3) FE3              | (4) FE4                |
|------------------------------------|-----------------------|----------------------|----------------------|------------------------|
| EG                                 | 0.0234***<br>(0.0016) | 0.494***<br>(0.036)  | 0.260**<br>(0.110)   | 0.279***<br>(0.113)    |
| HDI                                | –                     | 4.438***<br>(0.177)  | 3.258***<br>(0.636)  | 3.436***<br>(0.621)    |
| GDPR/Cap                           | –                     | –                    | 0.006**<br>(0.0034)  | 0.0057***<br>(0.0025)  |
| Office                             | –                     | –                    | –                    | 0.105**<br>(0.0057)    |
| Constanta                          | 72.045***<br>(0.670)  | 92.66***<br>(10.626) | 103.796**<br>(9.509) | 110/665***<br>(11.521) |
| R <sup>2</sup>                     | 0.919                 | 0.975                | 0.964                | 0.977                  |
| Adjusted R <sup>2</sup>            | 0.917                 | 0.949                | 0.923                | 0.950                  |
| F                                  | 0.000                 | 0.000                | 0.000                | 0.000                  |

Note: \* significant at the level of 10%, \*\* significant at the level of 5%, and \*\*\* significant at the level of 1%.

According to Table 5, EG, HDI, GDPR/Cap, and Office positively correlate with IKK<sub>Composite</sub>. This empirical finding has shown that the independent variables positively and significantly affect IKK<sub>Composite</sub>. Therefore, model 1 concludes that each variable will increase by increasing the financial inclusion index composite in 34 provinces in Indonesia.

**Table 6.** Effect of EG, HDI, GDPR/Cap and Office on  $IKK_{Conventional}$ 

Source: Author estimation (2021).

| Dependent $IKK_{Conventional}$ | (1)<br>FE1            | (2)<br>FE2           | (3)<br>FE3           | (4)<br>FE4             |
|--------------------------------|-----------------------|----------------------|----------------------|------------------------|
| EG                             | 0.0349***<br>(0.0017) | 0.532***<br>(0.076)  | 0.332**<br>(0.105)   | 0.381***<br>(0.111)    |
| HDI                            | –                     | 5.277***<br>(0.023)  | 4.225***<br>(0.576)  | 4.678***<br>(0.601)    |
| GDPR/Cap                       | –                     | –                    | 0.004***<br>(0.0002) | 0.004***<br>(0.0002)   |
| Office                         | –                     | –                    | –                    | 0.1567**<br>(0.005)    |
| Constanta                      | 70.801***<br>(0.0124) | 84.940***<br>(1.676) | 95.425**<br>(31.172) | 105.614***<br>(32.253) |
| R <sup>2</sup>                 | 0.993                 | 0.996                | 0.993                | 0.996                  |
| Adjusted R <sup>2</sup>        | 0.986                 | 0.984                | 0.986                | 0.991                  |
| F                              | 0.000                 | 0.000                | 0.000                | 0.000                  |

Note: \* significant at the level of 10%, \*\* significant at the level of 5%, and \*\*\* significant at the level of 1%.

According to Table 6, the panel regression findings reveal that numerous factors influence the financial inclusion index for conventional banking, including economic growth, human development index, gross regional domestic product per capita, and the number of conventional banking offices. The findings demonstrate that increasing these variables is required to improve financial inclusion through conventional banking.

**Table 7.** Effect of EG, HDI, GDPR/Cap and Office on  $IKK_{Sharia}$ 

Source: Author estimation (2021).

| Dependent $IKK_{Sharia}$ | (1)<br>FE1           | (2)<br>FE2            | (3)<br>FE3            | (4)<br>FE4          |
|--------------------------|----------------------|-----------------------|-----------------------|---------------------|
| EG                       | 0.073***<br>(0.0006) | 0.218**<br>(0.105)    | 0.309***<br>(0.105)   | 0.487***<br>(0.119) |
| HDI                      | –                    | 0.218<br>(0.283)      | 2.566<br>(2.913)      | 2.903<br>(3.01)     |
| GDPR/Cap                 | –                    | –                     | 0.0086***<br>(0.006)  | 0.009**<br>(0.003)  |
| Office                   | –                    | –                     | –                     | 0.173***<br>(0.022) |
| Constanta                | 10.633***<br>(0.031) | 70.774***<br>(10.350) | 156.005***<br>(9.388) | 197***<br>(15.538)  |
| R <sup>2</sup>           | 0.997                | 0.984                 | 0.995                 | 0.994               |
| Adjusted R <sup>2</sup>  | 0.994                | 0.968                 | 0.992                 | 0.987               |
| F                        | 0.000                | 0.000                 | 0.000                 | 0.000               |

Note: \* significant at the level of 10%, \*\* significant at the level of 5%, and \*\*\* significant at the level of 1%.

Meanwhile, the financial inclusion index for Sharia banking is influenced by economic growth, regional gross domestic product, and the number of Islamic banking branch offices, according to the results of panel regression research. Meanwhile, the human development index does not significantly affect the sharia banking financial inclusion index ( $IKK_{Sharia}$ ). The panel regression findings are shown in Table 7.

## 4. DISCUSSION

The model of the Financial Inclusion Index for composite, conventional, and sharia banks are on average positively and significantly influenced by economic growth and regional gross domestic product per capita. Based on this study, the first hypothesis (*H1*) indicates that economic growth has a positive and significant impact on the financial inclusion index for conventional, sharia, and composite banks. The result is consistent with Ummah et al. (2015), who found that income has a positive and significant influence on financial inclusion. Kim et al. (2018) stated that from panel data for 55 Organization of Islamic Cooperation (OIC) countries, economic growth has a positive and significant impact on the financial inclusion index.

This study also found that the second hypothesis (*H2*) indicates that Gross Domestic Product Regional per capita (GDPR/capita) positively impacts conventional, sharia, and composite financial inclusion index of banks. The result is in line with a previous study by Umar (2017) that the increase in GDPR/capita imposes the increasing financial inclusion index. Moreover, the increase in GDPR/capita will increase the income, with the increase in income the savings rate in bank accounts will increase, increasing financial inclusion (Adusei, 2015; in Musau, 2018). Government efforts to improve community welfare through social assistance and improved income for the disadvantaged have increased a bank's financial inclusion index. Habibullah research in 2019 discovered that providing community improvement aid through social assistance affects banking financial inclusion.

Based on this study, the third hypothesis (*H3*) indicates that the Human Development Index (HDI)

positively and significantly affects the financial inclusion index of conventional, sharia, and composite banks. The result is in line with a previous study by Sarma and Pais (2011) and Umar (2017) that there is a strong and significant positive correlation between the Human Development Index (HDI) and the level of financial inclusion, especially for composite and conventional banking. This study shows that the human development index has a positive and significant impact on the financial inclusion index both for composite and conventional banks. Nevertheless, the human development index does not significantly impact the financial inclusion index for sharia banking in Indonesia.

Based on this study, the fourth hypothesis (*H4*) indicated that the number of banking offices positively affects the financial inclusion index for conventional, sharia, and composite banks. This study means that the increasing number of banking offices will increase the financial inclusion index. The number of branch offices expands the complexity of banking requirements, and the unequal development of the financial system in each region may limit participation in banking products. Sun and Siagian (2015) stated that the most significant barrier to financial inclusion in Indonesia is the complexity of banking procedures, particularly for microbusiness financing. Based on this study, the increasing number of banks positively and significantly affects Indonesia's financial inclusion index for composite, conventional, and sharia banking.

This study aligns with several policies that need to be achieved to increase the financial inclusion index for sharia banking in Indonesia. Economic growth, regional gross domestic product per capita, and several offices influence the financial inclusion index based on this study. This study is in line with a previous study by Kim et al. (2018). Furthermore, regarding the financial inclusion of

Islamic banking, Kim et al. (2020) found that other factors are needed to drive the financial inclusion index of Islamic banking, including religious and social factors. They were conducted by Kim et al. (2018) specifically related to the financial inclusion of Islamic banking, which found a significant influence between economic growth and financial inclusion of Islamic banking in the Organization of Islamic Cooperation (OIC).

The increasing financial inclusion index of sharia banking in Indonesia needs several policies. Zulkhibri (2016) stated that using instruments such as zakat, waqf, Sadaqah, and Qardh Al-Hasan is related to income redistribution to increase financial inclusion. According to Zulkhibri (2016), tools like zakat, waqf, Sadaqah, and Qardh Al-Hasan are used to redistribute income and improve the financial inclusion of sharia banking in Indonesia. Furthermore, Widarwati et al. (2019), explained that increasing the financial inclusion index of sharia banking requires an increase in financial stability.

Further, the Financial Services Authority (OJK, 2016) issued Financial Services Authority Regulation No. 76/POJK.07/2016 on Improving Financial Literacy and Inclusion in the Financial Services Sector for The Community and Society, affirming a detailed strategy related to improving financial inclusion in society for both conventional banking and sharia banking. Continuously improving people's financial literacy is one effective strategy to enhance financial inclusion in public. The Financial Services Authority (OJK) has established a literacy process for financial education and infrastructure development that supports finance and banking for consumers and the public. This program is projected to enhance the public's financial inclusion index, suggesting that more people access financial services, especially in the banking sector.

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## CONCLUSION

This study analyzes the effect of economic growth, human development index, regional gross domestic product per capita, and the number of banks on the financial inclusion index for composite, conventional, and sharia banks in 34 provinces in Indonesia. This study found that the financial inclusion index for composite and conventional banks is influenced by economic growth, human development index, regional gross domestic product per capita, and branch offices. Meanwhile, it was found that the financial

inclusion index for sharia banks is influenced by economic growth, regional gross domestic product per capita, and the number of branch offices.

Based on the findings of this study, a policy strategy consisting of increasing economic growth, increasing human quality through increasing the human development index, increasing regional gross domestic product per capita, and branch offices is recommended to increase the financial inclusion index in the banking sector for conventional, sharia and composite banking. According to this study, Bank Indonesia and the Financial Authority should implement a set of policies, particularly enhancing financial literacy to increase financial inclusion and increase the combination of policies that support the climate of financial inclusion, predominantly in banking.

## AUTHOR CONTRIBUTIONS

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## REFERENCES

1. Adusei, M. (2015). The impact of bank size and funding risk on bank stability. *Cogent Economics & Finance*, 3(1), 1111489. <https://doi.org/10.1080/23322039.2015.1111489>
2. Asian Development Bank. (2020). *Asia Small and Medium-Sized Enterprise Monitor 2020: Volume 1 – Country and Regional Review*. Mandaluyong City: Asian Development Bank. <https://dx.doi.org/10.22617/TCS200290-2>
3. Bank Indonesia. (2020). *Financial Inclusion*. Retrieved from <https://www.bi.go.id/en/fungsi-utama/stabilitas-sistem-keuangan/keuangan-inklusif/Default.aspx>
4. Barr, M. S., Kumar, A., & Litan, R. E. (2007). *Building Inclusive Financial Systems: A Framework for Financial Access*. Washington, DC: The Brookings Institution. Retrieved from <http://www.ascde-greecollege.ac.in/wp-content/uploads/2020/12/Building-Inclusive-Financial-Systems.pdf>
5. Beck, T., & Brown, M. (2011). *Which Household Use Banks? Evidence from the Transition Economies* (ECB Working Paper No. 1295). <https://dx.doi.org/10.2139/ssrn.1761435>
6. Bongomin, O. G., Munene, J. C., Mpeera, N. J., & Malinga, C. A. (2017). Financial Intermediation and Financial Inclusion of The Poor: Testing The Moderating Role of Institutional Pillars in Rural Uganda. *Cogent Economics & Finance*, 5(1), 1-16. <https://doi.org/10.1080/23322039.2017.1362184>
7. Brekke, T. (2018). Halal Money: Financial Inclusion and Demand for Islamic Banking in Norway. *Research and Politics*, 5(1), 1-7. <https://doi.org/10.1177%2F2053168018757624>
8. Chithra, N., & Selvam, M. (2013). Determinants of financial inclusion: An empirical study on the inter-state variations in India. Available at SSRN 2296096. <https://doi.org/10.2139/ssrn.2296096>
9. Datta, S. K., & Singh, K. (2019). Variation and Determinants of Financial Inclusion and association with Human Development: A Cross Country Analysis. *IIMB Management Review*, 31(4), 336-349. <https://doi.org/10.1016/j.iimb.2019.07.013>
10. Demircuc-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2017). *The Global Findex Database 2017: Measuring Financial Inclusion and The Fintech Revolution*. Washington, DC: World Bank Group. Retrieved from <http://hdl.handle.net/10986/29510>

11. Fahmi, I. (2014). *Bank & Lembaga Keuangan Lainnya: Teori dan Aplikasi*. Bandung: Alfabeta.
12. Financial Action Task Force (FATF). (2020, March 17). *Financial Inclusion and NPO issues*. Retrieved from [http://www.fatf-gafi.org/publications/financial\\_inclusion/?hf=10&b=0&s=desc\(fatf\\_releasedate\)](http://www.fatf-gafi.org/publications/financial_inclusion/?hf=10&b=0&s=desc(fatf_releasedate))
13. Gujarati, D. N. (2004). *Basic Econometrics* (4th ed.). United States: The MacGraw-Hill Companies. Retrieved from <http://eprints.stiperdharmawacana.ac.id/180/1/Basic%20Econometrics%20-%20Gujarati.pdf>
14. Habibullah, H. (2019). Inklusi Keuangan dan Penurunan Kemiskinan: Studi Penyaluran Bantuan sosial Non Tunai. *Sosio Informa*, 5(1), 38-53. <https://dx.doi.org/10.33007/inf.v5i1.1657>
15. Jouti, A. T. (2018). Islamic Finance: Financial Inclusion or Migration? *ISRA International Journal of Islamic Finance*, 10(2), 277-288. <https://doi.org/10.1108/IJIF-07-2018-0074>
16. Kim, D.-W., Yu, J.-S., & Hassan, M. K. (2018). Financial inclusion and economic growth in OIC countries. *Research in International Business and Finance*, 43, 1-14. <https://doi.org/10.1016/j.ribaf.2017.07.178>
17. Kim, D.-W., Yu, J.-S., & Hassan, M. K. (2020). The Influence of Religion and Social Inequality on Financial Inclusion. *The Singapore Economic Review*, 65(1), 193-216. <https://doi.org/10.1142/S0217590817460031>
18. Kumar, C., & Mishra, S. (2011). Banking outreach and household level access: Analyzing financial inclusion in India. In *13th Annual Conference on Money and Finance in the Indian Economy* (pp. 1-33).
19. Laha, A. (2015). Association between Financial Inclusion and Human Development in South Asia: A Cross-Country Analysis with Special Reference to India. *Journal of Economic Policy and Research*, 10(2), 69-91. Retrieved from [https://www.ipeindia.org/wp-content/uploads/journals/jepr/JEPR\\_10\\_2\\_4.pdf](https://www.ipeindia.org/wp-content/uploads/journals/jepr/JEPR_10_2_4.pdf)
20. Leyshon, A., & Thrift, N. (1996). Financial Exclusion and the Shifting Boundaries of the Financial System. *Environment and Planning A: Economy and Space*, 28(7), 1150-1156. <https://doi.org/10.1068/a281150>
21. Mbutor, M. O., & Uba, I. A. (2013). The Impact of Financial Inclusion on Monetary Policy in Nigeria. *Journal of Economics and International Finance*, 5(8), 318-328. <https://doi.org/10.5897/JEIF2013.0541>
22. Musau, S., Muathe, S., & Mwangi, L. (2018). Financial Inclusion, GDP, and Credit Risk of Commercial Banks. *International Journal of Economics and International Finance*, 10(3), 181-195. <https://doi.org/10.5539/ijef.v10n3p181>
23. Muthia, F., Raneo, A. P., & Andaiyani, S. (2019). Financial Inclusion and Bank Efficiency in Indonesia. *Journal of Advanced Research in Law and Economics*, 10(2), 595-602. [https://doi.org/10.14505/jarle.v10.2\(40\).21](https://doi.org/10.14505/jarle.v10.2(40).21)
24. Ngo, A. L. (2019). Index of Financial Inclusion and The Determinants: an Investigation in Asia. *Asian Economic and Financial Review*, 9(12), 1368-1382. Retrieved from <https://archive.aessweb.com/index.php/5002/article/view/1896/2928>
25. Otoritas Jasa Keuangan (OJK). (2016). *Peraturan Otoritas Jasa Keuangan Nomor 76/POJK.07/2016. tentang Peningkatan Literasi dan Inklusi Keuangan di Sektor Jasa Keuangan bagi Konsumen dan/ atau Masyarakat*. Jakarta: Otoritas Jasa Keuangan. Retrieved from <https://peraturan.bpk.go.id/Home/Details/128403/peraturan-ojk-no-76poj072016-tahun-2016>
26. Otoritas Jasa Keuangan (OJK). (2020). *Survey Nasional Literasi Keuangan 2019-SNLK 2019*. Jakarta: Otoritas Jasa Keuangan. Retrieved from <https://sikapi-uangmu.ojk.go.id/FrontEnd/CMS/DetailMateri/494>
27. Pass, C., & Lowes, B. (1988). *Dictionary of Economics* (2nd ed.). United Kingdom: HarperCollins Publishing, Ltd.
28. Rosengard, J. K., & Prasetyantoko, A. (2011). If the Banks are Doing so Well, Why Can't I Get a Loan? Regulatory Constraints to Financial Inclusion in Indonesia. *Asian Economic Policy Review*, 6(2), 273-296. <https://dx.doi.org/10.1111/j.1748-3131.2011.01205.x>
29. Saraswati, B. D., Maski, G., Kaluge, D., & Sakti, R. K. (2020). The Effect of Financial Inclusion and Financial Technology on Effectiveness of The Indonesian Monetary Policy. *Business: Theory and Practice*, 21(1), 230-243. <https://doi.org/10.3846/btp.2020.10396>
30. Sarma, M. (2012). *Index of Financial Inclusion-A Measure of Financial Sector Inclusiveness* (Working Paper No. 07/2012). Berlin Working Papers on Money, Finance, Trade and Development. Retrieved from [https://finance-and-trade.htw-berlin.de/fileadmin/HTW/Forschung/Money\\_Finance\\_Trade\\_Development/working\\_paper\\_series/wp\\_07\\_2012\\_Sarma\\_Index-of-Financial-Inclusion.pdf](https://finance-and-trade.htw-berlin.de/fileadmin/HTW/Forschung/Money_Finance_Trade_Development/working_paper_series/wp_07_2012_Sarma_Index-of-Financial-Inclusion.pdf)
31. Sarma, M., & Pais, J. (2011). Financial Inclusion and Development. *Journal of International Development*, 23(5), 613-628. <https://doi.org/10.1002/jid.1698>
32. Shinkafi, A. A., Yahaya, S., & Sani, T. A. (2020). Realizing Financial Inclusion in Islamic Finance. *Journal of Islamic Marketing*, 11(1), 143-159. <https://doi.org/10.1108/JIMA-02-2017-0020>
33. Sloman, J., Wride, A., & Garratt, D. (2012). *Economics* (8th ed.). Edinburgh Gate: Pearson Education Limited.
34. Sun, Y., & Siagian, P. (2015). Financial Inclusion in Indonesia and Its Challenges. *Pertanika Journal of Social Sciences and Humanities*, 23(1), 85-96. Retrieved from <https://research.binus.ac.id/publication/D68F70A1-6015-475D-BFDF-3E431EFE8D59/financial->

- [inclusion-in-indonesia-and-its-challenges/](#)
35. Umar, A. I. (2017). Index of Syariah financial Inclusion in Indonesia. *Buletin Ekonomi Moneter dan Perbankan*, 20(1), 99-126. <https://doi.org/10.21098/bemp.v20i1.726>
  36. Ummah, B. B., Nuryartono, N., & Anggraeni, L. (2015). Analisis Inklusi Keuangan dan Pemerataan Pendapatan di Indonesia. *Jurnal Ekonomi dan Kebijakan Pembangunan*, 4(1), 1-27. Retrieved from <https://media.neliti.com/media/publications/228317-analisis-inklusi-keuangan-dan-pemerataan-190aecba.pdf>
  37. United Nations (UN). (2020). *Latest Human Development Index Ranking*. Human Development Reports. Retrieved from <http://hdr.undp.org/en/content/latest-human-development-index-ranking>
  38. Widarwati, E., Sari, P., & Nurmalasari, N. (2019). Role of Financial Inclusion to Stability: The Case of Indonesia's Sharia Banking. *HOLISTICA–Journal of Business and Public Administration*, 10(1), 7-15. <https://doi.org/10.2478/hjbpa-2019-0001>
  39. Zulkhibri, M. (2016). Financial inclusion, Financial Inclusion Policy, and Islamic Finance. *Macroeconomics and Finance in Emerging Market Economies*, 9(3), 1-17. <https://doi.org/10.1080/17520843.2016.1173716>