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THE ROLE OF ISLAMIC FINANCIAL INCLUSION IN POVERTY, INCOME INEQUALITY, AND HUMAN DEVELOPMENT IN INDONESIA

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ABSTRACT

This study empirically analyses the role of Islamic financial inclusion in overcoming poverty, income inequality, and human development problems by employing yearly panel data of 33 provinces in Indonesia from 2014 to 2022. Our analysis reveals that Islamic financial inclusion exerts significant roles in poverty reduction and human development improvement, while it is insignificantly related to income inequality. During the Covid-19 pandemic, the effect on human development of financial inclusion is further strengthened. We further note that the effects of Islamic financial inclusion depends on the levels of Human Development Index (HDI), where poverty reduction and human development improvement are apparent only in provinces with high and very high HDI.

Keywords: Financial inclusion, Islamic bank, Poverty, Income inequality, Human development.
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I. INTRODUCTION

Since the inception of 17 sustainable development goals (SDGs), much discussion has been directed towards the issues of poverty, income equality and human development. Poverty alleviation, income inequality reduction and human development remain huge challenges in developing countries. Indonesia is no exception to these challenges. Based on the Central Bureau of Statistics (2023), the poverty rate in Indonesia remains elevated at 9.57%. Income inequality is also an issue. Although some progress has been made in human development, with the score of 72.91, the recent Covid-19 pandemic has greatly slowed down its progress. Thus, in the post-pandemic recovery, there are urgent needs for the authorities to embark on initiatives to resolve these issues, one of which is arguably promoting financial inclusion.

In the literature, financial inclusion is considered key to reducing poverty, narrowing income gaps and improving human development (Omar & Inaba, 2020; Park & Mercado, 2018; Matekenya et al., 2021; Abdelghaffar et al., 2023). However, in the context of Indonesia, the level of financial inclusion is still low by international standard. Based on data from the Global Findex (Financial Inclusion Index) Database 2021, only 52% of the adult population in Indonesia have access to formal financial institutions (Demirguc-Kunt et al., 2022), although the inclusion index provided by the National Council on Financial Inclusion and FSA (Financial Services Authority) is much higher at 85.10%.

With the fast-growing Islamic finance in the country, many emphasize its importance for financial inclusion and consequently its roles in poverty alleviation, income distribution and development. Built on *Shariah* principles, Islamic finance offers an alternative to the interest-based financial system. The prohibition of interest rate and prohibited activities by Islam, avoidance of speculation (*maysir*) and uncertainty in contracts, objects and consequences (*gharar*), and promotion of justice, are asserted as drivers for overcoming gaps in income and wealth distribution and mitigating poverty. The social functions carried out by Islamic banks, for examples in the forms zakat, *infaq*, and *sadaqah,* as well as *qardh financing* and microfinancing, can also be a source of public financing funds and development. However, with very limited studies on the socio-economic impacts of Islamic financial inclusion, there has been no concrete evidence to support these assertions.

In light of this, the present study empirically examines the effects of Islamic financial inclusion on poverty rate, income inequality and human development for the case of Indonesia. In addition, it also assesses whether the level of human development drives the impacts of financial inclusion. The paper employs a panel dataset of 33 provinces in Indonesia over the period 2014-2022 and applies the panel regression techniques for data analysis. As a preview to the key results, we find that Islamic financial inclusion contributes to poverty reduction and human development but exerts no equalizing effect on income distribution. Further, we note that the contributive roles of Islamic financial inclusion are apparent only in provinces with high human development level, hinting that human development serves as a conditionality for the benefits of inclusion to be realized.

The study is organized as follows: In section II, the study reviews related theoretical and empirical literature. In section III, the study describes data and

methodology, and in section IV, the results are discussed. Lastly, section V concludes the study concludes and highlights recommendations.

II. LITERATURE REVIEW

2.1. Background

Poverty refers to a state of material and social deprivation, which leads to individuals being below the minimum standard of decent living. Living under poverty, individuals often experiences deprivation during difficult times as compared to others (Hall & Midgley, 2004). The poverty problem is also summarized as helplessness in meeting primary needs or in having an appropriate life. Market imperfections, underdevelopment, and lack of capital lead to low productivity, which causes inadequate income, savings, and investments. In this context, the low investment is capable of leading to underdevelopment and backwardness. This study uses The Central Bureau of Statistics data on the percentage of poor people to measure the poverty level.

The problem of poverty is frequently accompanied by income inequality, a condition where total national income is not proportionally distributed (Todaro & Smith, 2012). Many measures are available for measuring inequality. These include the range technique, Kuznets and Gini ratios, absolute mean deviation, and coefficient of variation. In this study, the secondary data from the Central Bureau of Statistics, namely the Gini ratio, is employed.

Besides income aspect, poverty eradication also requires human development. It is well acknowledged that human development goes beyond economic or material aspects; it covers social, health, educational and other aspects as well, all underly the welfare of society. The Human Development Index (HDI) as developed by UNDP is on Amartya Sen's capability method. According to Sen, as discussed in Todaro & Smith (2012), the concept of the capability method states that poverty is not only based on income but also on what a person is, or can be, and does, or can do (capability to function). Sen (2001) also urges the requirement of community freedom for the principles of development. This include economic freedom and opportunities to participate in financial activities or simply financial access. In line with this study, Islamic financial inclusion is expected to be an enabler for reduction in poverty.

People's capabilities are consistent with the improvement of the real sector. One of the importance of the government's role in encouraging Islamic financial inclusion is to overcome the adverse effects arising from the large gap between the financial sector and the real sector. Islamic banks work well as intermediaries that collect funds and channel them to profitable investments that lead to capital growth. This affects the expansion of real economic sectors, which means an increase in economic activity, which will have a positive impact on economic growth and poverty reduction (Agustina et al., 2022). Moreover, the social function of Islamic banks (among others, collecting and distributing funds from zakat, infaq, and sadaqah as well as qardh financing and micro financing) if properly mobilized can be sources of funds for financing the community as well as for development. For example, through the function of zakat fund transfer, it can encourage recipients

to become bankable and have access to finance to improve their business, which can eventually be a way out of the poverty cycle.

According to Sarma (2008), financial inclusion refers to accessibility, availability, and usage of the formal capital system by all members of an economic system. Demirguc-Kunt et al. (2008) also equates financial inclusion with broad access to capital services, with no barriers (price and non-price). In this case, inclusion process explains the patterns by which people has a formal account, including the saving and credit accounts suggesting their involvement in financial sector.

The objectives of the Islamic economy emphasize not only religious perspectives but also welfare as described by Al Ghazali in *maqashid al-shari'ah* -which are protection of *dien* (faith), *nafs* (soul), *'aql* (intellect), *nasl* (lineage), and *maal* (property). When the indicators of Islamic objectives are met, society welfare can be realized. The Islamic economic system is comprehensively presented to focus on poverty and income inequality issues (Mahri et al., 2021). This is in line with the goals in the SDG, but with an even broader scope.

2.2. Previous Studies

The roles of financial inclusion in socio-economic development have received substantial focus in the literature, especially after the inception of the United Nations' Sustainable Development Goals in 2015. Several studies have provided substantive evidence suggesting positive impacts of financial development and access on poverty reduction and income inequality. According to Omar & Inaba (2020), financial inclusion significantly reduces poverty and income inequality in developing countries, although its effectiveness varies depending on economic conditions and characteristics of each nation. Salazar-Cantu et al. (2015) also states that, while financial inclusion may initially leads to greater income inequality, it results in lower income inequality once it surpasses a certain point.

Not all studies however document favorable effects of financial inclusion. Analyzing 138 developed and developing countries, Jauch & Watzka (2016) find that the development of financial system positively affects income inequality. According to them, while all benefit from financial development, greater benefits are reaped by those already economically better. Likewise, Park & Mercado (2018) finds insignificant relation between financial inclusion and income inequality in Asian developing countries, although their relation is significant for the global sample.

Based on Aginta et al. (2018), financial inclusion does not significantly affect inequality at the national level in Indonesia. However, a negative and significant effect is only observed in manufacturing and mining-based provinces. Manufactured-based provinces are mostly in suburban areas and hence more developed. This shows that the significant effect of financial inclusion on reducing poverty and income inequality is solely achieved under specific conditions or characteristics, for instance the economic conditions of the region or the quality of human resources.

Many studies also provide empirical evidence of financial inclusion effect on human development. In Sarma & Pais (2011), a positive and significant relationship is observed between financial inclusion and HDI, where countries with high levels

of human development have relatively great degrees of financial inclusion. In line with this, Matekenya et al. (2021) and Abdelghaffar et al. (2023) empirically show that inclusion positively and significantly impacts human development, as proxied by HDI.

Of the previous empirical studies, specific research related to Islamic financial inclusion in Indonesia is still very limited. Umar (2017) and Ali et al. (2019) show a positive correlation between the Islamic financial inclusion index and the human development index. Until now, no empirical study has offered evidence for the overall effect of Islamic financial inclusion on poverty rate, income inequality, and human development in Indonesia, the gap that we seek to fill in this study.

III. METHODOLOGY

3.1. Data

We gather provincial-level data covering 33 provinces from 2014 to 2019 from the Financial Services Authority (FSA), the Central Bureau of Statistics, and other reports. The year 2014 marks the development of Sharia financial services in Indonesia with the formulation of the Indonesian Sharia Financial Services Master Plan.

The dependent variables in the analysis are poverty, income inequality, human development, measured by the poverty rate, the Gini ratio, and the HDI, respectively. The key independent variable is Islamic financial inclusion using (1) Islamic banking third-party funds, (2) the number of Islamic bank office networks, and (3) the amount of Islamic banking financing, respectively capturing penetration/accessibility, availability, and usage of financial inclusion. These are total third-party funds in all Islamic banks third-party funds per 1,000 adult population, total of Islamic bank financings per 1,000 Gross Regional Domestic Product (GRDP), and total of Islamic bank offices per 100,000 adult population to adjust to the number of Islamic bank offices (Table 1). In the following sub-section, we detail the construction of Islamic financial inclusion index based on these indicators.

In addition to those key variables, we also include control variables deemed relevant in explaining our dependent variables. These are GRDP per capita, government, inflation, average years of schooling, and Covid-19 pandemic. These control variables are added sequentially in the estimation.

Table 1.
Dimensions and Indicators of Islamic Financial Inclusion Index

Dimension	Description	Indicator		
Penetration/ Accessibility (*d1*)	This measures the level of Islamic banking penetration as a proxy for the number of banked adults.	d1 =	Total of Islamic bank (IB, IBU, and IRB) third-party funds / Total Adult Population	x 1,000
Availability (*d2*)	This reflects how Islamic banking easily available to the population.	d2 =	Total of Islamic bank (IB, IBU, and IRB) offices / Total Adult Population	x 100,000
Usage (*d3*)	This indicates how adequately the utilization of Islamic bank.	d3 =	Total of Islamic bank (IB, IBU, and IRB) financings / GRDP	x 1,000

Source: adopted from Sarma (2012)

3.2. Islamic Financial Inclusion Index (IFII)

In constructing the IFII, we first express the index value for dimension *i*, where i = 1,2,3, as:

$$d_i = w_i \frac{A_{ik,t} - m_i}{M_i - m_i} \quad (1)$$

where:
d_i = index value of dimension i
w_i = weight attached to dimension i indicator ($0 \leq w_i \leq 1$)
$A_{ik,t}$ = The value of dimension i indicator in province k and year t
m_i = minimum value of dimension i in the sample
M_i = maximum value of dimension i in the sample

Similar to the Sarma (2012), the weights (w_i) used are 1, 0.5, and 0.5 for the penetration, availability, and usage respectively. This weightage shows the relative importance of a dimension in measuring financial system inclusiveness. The determination of a weight of 1 for the penetration dimension is due to the fact that banking penetration is the main indicator of financial inclusion, where third party funds used as an indicator determine the amount of financing disbursed.

Based on Sarma (2012), the achievement of a country in is represented by point X = (d1, d2, d3, ..., dn) within the n-dimensional space. This ranges from points O = (0, 0, 0, ..., 0) and W = (w1, w2, ..., wn), which represent the worst and ideal conditions of financial inclusion, respectively. To calculate the IFII, the values of X_1 and X_2, which denoted the (normalized) Euclidean distances of X from the worst (O) and ideal (W) points are initially estimated:

$$X_1 = \frac{\sqrt{{d_1}^2 + {d_2}^2 + \ldots + {d_n}^2}}{\sqrt{{w_1}^2 + {w_2}^2 + \ldots + {w_n}^2}} \tag{2}$$

$$X_2 = 1 - \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + \ldots + (w_n - d_n)^2}}{\sqrt{{w_1}^2 + {w_2}^2 + \ldots + {w_n}^2}} \tag{3}$$

In determining the IFII, the average value of X_1 and X_2, which combines the distance from the worst and ideal points, were computed as follows:

$$IFII = \frac{1}{2}\left[X_1 + X_2\right] \tag{4}$$

By using a weighting of 1, 0.5, and 0.5 for the penetration, availability, and Islamic banking usage dimension indexes, the IFII calculation is:

$$IFII = \frac{1}{2}\left[\frac{\sqrt{{d_1}^2 + {d_2}^2 + {d_3}^2}}{\sqrt{1{,}5}} + \left(1 - \frac{\sqrt{(1 - d_1)^2 + (0{,}5 - d_2)^2 + (0{,}5 - d_3)^2}}{\sqrt{1{,}5}}\right)\right] \tag{5}$$

3.3. Empirical Model

To evaluate the relationship between Islamic financial inclusion and the dependent variable of interest, we specify the following panel model:

$$\begin{aligned} Dep_{i,t} \;=\; & \alpha_{o} + \beta_1 lnIFII_{i,t} + \beta_2 lngdppc_{i,t} + \beta_3 lngovexp_{i,t} + \beta_4 Inflation_{i,t} + \beta_5 yoschool_{i,t} \\ & + \beta_6 dummy\_Covid19_{i,t} + \beta_7 lnIFIIxdummy\_Covid19_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{6}$$

where *Dep* is the dependent variable (*Pov*: poverty rate, *lngini*: the gini ratio or *HDI*:human development index ratio), *IFII* is Islamic financial inclusion index, *gdppc* is GRDP per capita, *govexp* is the realization of local government expenditure, *Inflation* is inflation rate, *yoschool* is the average years of schooling, *dummy_Covid19* is the Covid-19 dummy, and the prefix *ln* is the natural logarithm. In the model, we also include the interaction term between financial inclusion and Covid-19 to gauge the impacts of financial inclusion during the Covid-19 period.

In the model, we allow the error term to include the individual-specific effect and the standard error term, the former is to allow heterogeneity between provinces (Ascarya & Indra, 2022). The Hausman test is performed to determine whether the individual-specific effects should be fixed or random and, accordingly, the fixed-effects panel estimator or the random-effects panel estimator as an appropriate estimation procedure (Ascarya & Indra, 2022). We also conduct Chow-F test and the Breusch-Pagan Lagrange Multiplier test to determine whether there are individual heterogeneities in the sample.

Table 2.
Classification of Provinces Based on Annual Average HDI 2014-2022

Subsample 1 High & Very High HDI	Subsample 2 Low & Moderate HDI
Aceh	Gorontalo
Bali	West Kalimantan
Banten	South Kalimantan
Bengkulu	Lampung
DI Yogyakarta	Maluku
DKI Jakarta	North Maluku
Jambi	West Nusa Tenggara
West Java	East Nusa Tenggara
Central Java	Papua
East Java	West Papua
Central Kalimantan	West Sulawesi
East Kalimantan	Central Sulawesi
Bangka Belitung	South Sumatera
Riau Islands	
Riau	
South Sulawesi	
Southeast Sulawesi	
North Sulawesi	
West Sumatera	
North Sumatera	

Source: BPS (2023), reprocessed

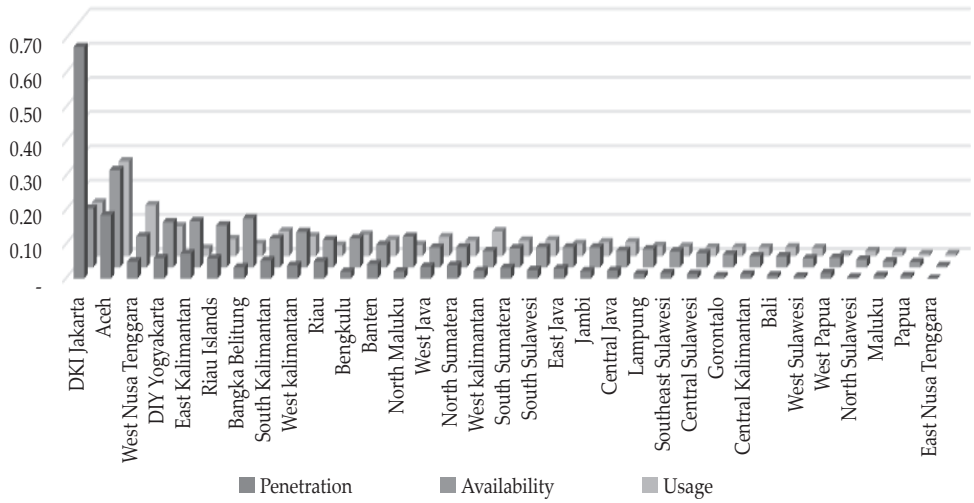
As an additional analysis, we also divide the provinces two sub-samples based on the HDI. This is to assess whether the level of human development is important for the benefits of financial inclusion to be realized. The sub-sample analysis is in line with existing studies that note the difference in the results based on the characteristics of each province (Aginta et al., 2018; Jauch & Watzka, 2016).

The categorization of the provinces is given in Table 2, which is based on the Central Bureau of Statistics guidelines. Namely, provinces with HDI score greater than 80 are categorized as very high HDI, provinces with HDI score of less than 80 but greater than 70 are high HDI provinces, provinces with HDI score of less than 70 but greater than 60 are moderate HDI provinces, while the rest low HDI provinces.

IV. RESULTS AND ANALYSIS

4.1. Measurement of Islamic Financial Inclusion Index

Figure 1 depicts the index for each financial inclusion dimension. From the data we compile, we note that the average Islamic banking third-party funds for all Indonesian provinces is IDR 1.7 billion per 1000 adult population, while average availability and usage are 1.55 units per 100,000 adult population and 25.51, respectively.



Source: processed by the author (2023)

Figure 1.
Average of Penetration Dimension, Availability Dimension, and Usage Dimension in IFII Measurement for the Period of 2014 to 2022

The highest penetration dimension index is in DKI Jakarta, accompanied by Aceh (moderate) and East Nusa Tenggara (lowest). Based on the availability dimension, Aceh tops the list with the highest attainability of Islamic banking, compared to other provinces in Indonesia. Similarly, on the usage dimension, the province has the highest value. The penetration, availability, and usage dimensions in Aceh has increased rapidly since 2016, driven in great part by (1) the transition of Bank Aceh to a fully Islamic financial institution in 2016 and (2) the enactment of Aceh Qanun Number 11/2018 on Islamic Bank on January 4, 2019. From the enactment processes, the Islamic scheme is the only option in the banking system within the province. Meanwhile, the second province with the highest availability and usage ratio of Islamic banking is DKI Jakarta, with East Nusa Tenggara, and West Papua placed at the bottom.

The implementation of a multidimensional indicator is necessary for calculating the financial inclusion index. For example, DKI Jakarta Province is ranked top in Islamic banking penetration dimension. However, the province show a not-very-high value regarding the number of banking branch networks per 1000 adult population (availability dimension). In this case, DKI Jakarta lags behind Aceh, which is ranked highest in availability and usage dimensions. Another example is the West Papua Province having the lowest usage dimension, despite exhibiting higher access to Islamic banking (penetration dimension) than East Nusa Tenggara.

Based on the 2022 Indonesian Islamic Finance Report, published by FSA (2023), the growth in the number of physical Islamic banking offices has declined since 2020, due to the acceleration of digitalization and changes in customers' banking behavior. However, due to data limitations, the indicators used to measure the availability dimension of Islamic financial institutions do not include

digitalization, such as the number of ATMs and mobile banking. In this context, other dimensions are used to obtain a more comprehensive picture of financial inclusion. These are in line with Sarma (2008; 2012), where using only one indicator or one dimension is insufficient to determine inclusion index, leading to the need for a multidimensional index measurement to obtain a more comprehensive picture of financial inclusion condition in a region.

Thus, in this study, the calculation of IFII is based on three dimensions. Table 3 presents the IFII for all provinces from 2014 to 2022. Almost all provinces have a low IFII with a range between 0.004 to 0.225. Aceh and DKI Jakarta are the exception, which can be considered as having moderate and high financial inclusion since 2019 and 2020. However, the overall average IFII in Indonesia continues to increase during the study period, with DKI Jakarta occupying the first position with an average of 0.551. The province is always ranked the highest from 2014-2022, primarily due to the high penetration rate of Islamic banking than in other provinces. In addition, Aceh and West Nusa Tenggara are in the second and third positions with the highest average IFII among all provinces at 0.317 and 0.129, respectively.

Table 3.
Islamic Financial Inclusion Index at the Provincial Level in Indonesia

Provinces	2014	2015	2016	2017	2018	2019	2020	2021	2022	Average	Rank
DKI Jakarta	0,411	0,410	0,464	0,532	0,550	0,586	0,601	0,674	0,728	0,551	1
Aceh	0,091	0,091	0,264	0,286	0,282	0,312	0,487	0,526	0,516	0,317	2
West Nusa Tenggara	0,060	0,059	0,059	0,068	0,145	0,165	0,187	0,201	0,215	0,129	3
DI Yogyakarta	0,110	0,111	0,108	0,114	0,123	0,135	0,137	0,141	0,141	0,124	4
East Kalimantan	0,098	0,105	0,104	0,106	0,112	0,117	0,121	0,124	0,130	0,113	5
Riau Islands	0,094	0,090	0,095	0,091	0,088	0,091	0,090	0,097	0,225	0,107	6
Bangka Belitung	0,124	0,120	0,121	0,077	0,113	0,112	0,090	0,093	0,064	0,101	7
South Kalimantan	0,084	0,082	0,083	0,095	0,092	0,097	0,099	0,106	0,112	0,094	8
West Sumatera	0,094	0,089	0,085	0,082	0,080	0,085	0,089	0,099	0,107	0,090	9
Riau	0,069	0,061	0,055	0,056	0,060	0,065	0,071	0,087	0,165	0,077	10
Bengkulu	0,081	0,071	0,068	0,075	0,078	0,066	0,073	0,080	0,084	0,075	11
Banten	0,063	0,061	0,059	0,066	0,070	0,074	0,074	0,085	0,091	0,071	12
North Maluku	0,036	0,035	0,038	0,061	0,057	0,087	0,090	0,096	0,101	0,067	13
West Java	0,057	0,060	0,059	0,060	0,063	0,069	0,075	0,076	0,080	0,067	14
North Sumatera	0,063	0,060	0,059	0,061	0,061	0,065	0,068	0,071	0,074	0,065	15
West Kalimantan	0,054	0,054	0,058	0,060	0,062	0,062	0,068	0,075	0,085	0,064	16
South Sumatera	0,060	0,053	0,048	0,052	0,057	0,061	0,065	0,069	0,075	0,060	17
South Sulawesi	0,059	0,058	0,055	0,054	0,054	0,057	0,060	0,063	0,065	0,058	18
East Java	0,051	0,050	0,049	0,051	0,054	0,060	0,062	0,064	0,065	0,056	19
Jambi	0,061	0,055	0,045	0,046	0,052	0,052	0,057	0,060	0,065	0,055	20
Central Java	0,043	0,043	0,045	0,048	0,051	0,053	0,055	0,056	0,060	0,050	21
Lampung	0,042	0,038	0,040	0,040	0,041	0,044	0,049	0,050	0,051	0,044	22
Southeast Sulawesi	0,043	0,038	0,038	0,039	0,038	0,041	0,044	0,046	0,044	0,041	23

Table 3.
Islamic Financial Inclusion Index at the Provincial Level in Indonesia (Continued)

Provinces	2014	2015	2016	2017	2018	2019	2020	2021	2022	Average	Rank
Central Sulawesi	0,037	0,036	0,031	0,032	0,032	0,033	0,035	0,043	0,045	0,036	24
Gorontalo	0,051	0,040	0,029	0,025	0,027	0,027	0,028	0,030	0,033	0,032	25
Central Kalimantan	0,033	0,033	0,028	0,030	0,031	0,032	0,034	0,035	0,033	0,032	26
Bali	0,032	0,031	0,029	0,030	0,031	0,031	0,030	0,029	0,033	0,031	27
West Sulawesi	0,020	0,018	0,017	0,021	0,025	0,027	0,031	0,035	0,037	0,026	28
West Papua	0,026	0,025	0,025	0,024	0,023	0,024	0,025	0,025	0,023	0,024	29
North Sulawesi	0,027	0,022	0,016	0,016	0,015	0,017	0,019	0,019	0,022	0,019	30
Maluku	0,017	0,017	0,017	0,018	0,018	0,016	0,018	0,020	0,023	0,018	31
Papua	0,019	0,017	0,015	0,014	0,014	0,013	0,013	0,012	0,013	0,014	32
East Nusa Tenggara	0,007	0,006	0,005	0,005	0,005	0,004	0,005	0,005	0,006	0,005	33
Average Total	0,067	0,065	0,070	0,074	0,079	0,084	0,092	0,100	0,109	0,082	

Source: processed by the author (2023)

During the study period, the highest IFII growth was achieved by Aceh, from 0.091 in 2014 to 0.516 in 2022, driven by the transition of Regional Development Bank (BPD) Aceh into a fully Islamic banking system in 2016 and the enactment of Aceh Qanun Number 11 of 2018. These developments have caused the penetration rate, availability, and usage of Islamic banking to increase rapidly since 2016, ultimately leading to a significant increase in the IFII of the province. The second highest IFII growth is achieved by West Nusa Tenggara, which also witnessed the transition of a regional bank (BPD NTB) into a fully Islamic bank. Thus, it seems that the conversion of BPD from a conventional system to a Islamic system is effective in increasing the level of Islamic financial inclusion in the province.

Meanwhile, East Nusa Tenggara is the province with the lowest IFII during the 2014-2022 study period, with an average index of 0.005. Consistent with Umar (2017) and Ali et al. (2019), during the research period, the majority of provinces in Eastern Indonesia have a lower IFII than provinces in the western part of Indonesia, except for West Nusa Tenggara and North Maluku. The all three dimensions of Islamic banking (penetration, availability, and usage) in these provinces also show low index results. This is a challenge for the government to encourage Islamic banking system in the eastern provinces of Indonesia, especially related to the banking availability with the number of Islamic banking office as a proxy. Furthermore, one of the reasons for the low inclusion of Islamic finance is due to the lagging innovation and competitiveness of Islamic banking compared to conventional banking, including the extensive network of conventional offices that can reach remote areas compared to Islamic banking which still has inadequate infrastructure. For this reason, innovation and digitalization of Islamic banking are needed to attract and meet customer needs (FSA, 2003).

4.2. Estimation Results

In this sub-section, we present the estimation results of our model. We start with the results using the whole sample for each dependent variable under study and then proceed to the sub-samples, where we form the sub-samples based on the HDI.

4.2.1. Islamic Financial Inclusion and Poverty

Table 4 presents the results of our model where poverty is the dependent variable. Based on the Hausman test, Chow test, and the Breusch-Pagan Lagrange Multiplier test results reported at the bottom of the Table, the random effect method is the appropriate method.

From Table 4, we may observe a significant negative coefficient of Islamic financial inclusion in all regressions except one. This shows that the relation between poverty and Islamic financial inclusion is robust to addition of control variables into the model. In regression 7, which includes control variables, the coefficient of IFII is -0.46, suggesting that the in IFII by 1% is associated with the reduction in the poverty rate by 0.46 percentage point. The result is in line with Park & Mercado (2018), Omar & Inaba (2020), Polloni-Silva et al. (2021), and Khan et al. (2022), where a negative relationship between overall banking inclusion and poverty rate is documented. As in Agustina et al., 2022, this indicates that Islamic banks efficiently carry out an intermediary role in collecting funds and allocating them to productive investments that have an impact on capital growth and subsequently have an impact on the expansion of the real economic sector and consequently on poverty reduction. However, our result differs from Honohan (2008) and Neaime & Gaysset (2018), where no significant relation is observed between financial inclusion and poverty. This difference may be due to different indicators in measuring financial inclusion, sample and period, control variables, and regression estimation method.

For the control variables, we find that schooling has the largest negative coefficient and significant effect on the poverty rate in Indonesia. Government expenditure realization and inflation are also significantly and negatively. Meanwhile, the Covid-19 pandemic significantly and positively affected poverty, where the poverty rate in Indonesia increased by 0.997 percentage point during the COVID-19 pandemic. However, there is no strengthening of the impact of Islamic financial inclusion on poverty in the year affected by the Covid-19 pandemic, as the interaction term is not significant in the model.

Table 4.
Islamic Financial Inclusion and Poverty

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Pov	Pov	Pov	Pov	Pov	Pov	Pov
lnIFII	-1.084***	-.575***	-.478**	-.466**	-.192	-.357*	-.46**
	(.203)	(.197)	(.204)	(.205)	(.206)	(.198)	(.215)
lngdppc		-3.358***	-.392	-.409	.524	1.245*	1.031
		(.452)	(.691)	(.693)	(.696)	(.677)	(.699)
lngovexp			-2.005***	-2.107***	-1.318***	-.998***	-.96***
			(.309)	(.352)	(.381)	(.369)	(.371)
Inflation				-.014	-.047**	-.053**	-.049**
				(.024)	(.024)	(.023)	(.023)
yoschool					-1.199***	-2.256***	-2.157***
					(.26)	(.324)	(.333)
dummy_Covid19						.661***	.997***
						(.129)	(.299)
dummy_Covid19* lnIFII							.124
							(.1)
_cons	7.85***	21.136***	42.349***	44.071***	39.383***	40.034***	39.049***
	-1.056	-2.057	-3.717	-4.723	-4.662	-4.446	-4.515
Sample (Provinces)	33	33	33	33	33	33	33
Observations	297	297	264	264	264	264	264
R-squared	.081	.237	.378	.38	.421	.475	.478
Adjusted R^2	.078	.232	.371	.370	.410	.463	.464

Hausman Test Prob>chi2 = 0.2796

LM-Test Prob>chibar2 = 0.0000

Chow Test Prob>F = 0.0000

Standard errors are presented in parentheses.

The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: author's preparation (2023)

4.2.2. Islamic Financial Inclusion and Income Inequality

Table 5 presents the results for income inequality. Based on the Hausman test, Chow test, and the Breusch-Pagan Lagrange Multiplier test result, the fixed effect method is used to estimate the model. From Table 5, we may note that Islamic financial inclusion has no significant impact on income inequality. The consistent insignificant coefficients of Islamic financial inclusion in almost all regressions show robustness of the result to sequential inclusion of control variables in the model.

Table 5.
Islamic Financial Inclusion and Income Inequality

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	lngini	Lngini	lngini	lngini	Lngini	lngini	lngini
lnIFII	-.034**	0	.014	.008	.022	.024	.022
	(.016)	(.014)	(.016)	(.013)	(.014)	(.014)	(.015)
lngdppc		-.241***	-.169**	-.155***	-.11**	-.119**	-.123**
		(.038)	(.063)	(.054)	(.046)	(.049)	(.051)
lngovexp			-.055	0	.044	.038	.039
			(.032)	(.03)	(.03)	(.03)	(.03)
Inflation				.008***	.006***	.006***	.006***
				(.002)	(.002)	(.002)	(.002)
yoschool					-.061***	-.046*	-.044*
					(.018)	(.024)	(.025)
dummy_Covid19						-.009	-.003
						(.008)	(.021)
dummy_Covid19* lnIFII							.002
							(.006)
_cons	-1.136***	-.188	.455	-.487	-.783**	-.777**	-.793**
	(.047)	(.14)	(.357)	(.358)	(.346)	(.349)	(.357)
Sample (Provinces)	33	33	33	33	33	33	33
Observations	297	297	264	264	264	264	264
R-squared	.026	.231	.253	.325	.359	.361	.361
Adjusted R^2	.023	.226	.244	.314	.346	.346	.344

Hausman Test Prob>chi2 = 0.0129

LM-Test Prob>chibar2 = 0.0000

Chow Test Prob>F = 0.0000

Standard errors are presented in parentheses.

The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: author's preparation (2023)

The result is in line with Park & Mercado (2018) for a sample of developing countries in Asia as well as Aginta et al. (2018) for Indonesia. In Park & Mercado (2018), poverty reduction effect of financial inclusion in developing Asia is not limited to the poor. Financial inclusion benefits people in various income groups, rendering no impact on income inequality. Our result is also consistent with the previous study, where Islamic financial inclusion is unable to decrease income inequality in Indonesia despite significantly affecting the reduction of poverty. Since the beneficiaries consist of various income levels, income gap in Indonesia is not affected.

Notwithstanding the above, the potential for Islamic banking in reducing income inequality is promising, with the social functions of Islamic banking regulated by the law. The banks are able of obtaining funds from *zakat*, *infaq*, *sadaqah*, grants, or other social financial sources, with distribution by *zakat* managers. For example, the expansion of access for poor people is carried out by considering *mustahiq* or recipients of zakat as new Islamic banking customers.

This encourages increased ownership of Islamic banking accounts and enabling productive financing for people experiencing poverty.

Among all control variables, inflation has the largest positive and significant effect on income inequality in Indonesia. Meanwhile, the remaining variables, GRDP per capita and average years of schooling, showed negative and significant influence on income inequality, indicating that an increase in these determinants equalize income distribution in Indonesia.

4.2.3. Islamic Financial Inclusion and Human Development

Table 6 presents the results for the relation between Islamic financial inclusion and human development index. Based on the Hausman test, Chow test, and the Breusch-Pagan Lagrange Multiplier test result, the fixed effect method is chosen to estimate the model.

Table 6.
Islamic Financial Inclusion and Human Development

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	HDI	HDI	HDI	HDI	HDI	HDI	HDI
lnIFII	2.592***	1.239***	.822***	.915***	.229**	.31***	.193**
	(.334)	(.251)	(.187)	(.174)	(.091)	(.086)	(.092)
lngdppc		9.526***	2.208***	1.985***	-.317	-.647**	-.921***
		(.587)	(.668)	(.62)	(.322)	(.308)	(.314)
lngovexp			4.542***	3.626***	1.375***	1.162***	1.209***
			(.294)	(.309)	(.177)	(.171)	(.168)
Inflation				-.126***	-.049***	-.046***	-.041***
				(.02)	(.01)	(.01)	(.01)
yoschool					3.101***	3.649***	3.766***
					(.119)	(.149)	(.151)
dummy_Covid19						-.316***	.051
						(.057)	(.127)
dummy_Covid19* lnIFII							.136***
							(.042)
_cons	77.686***	40.259***	-6.303*	9.492**	24.621***	24.848***	23.741***
	(.975)	-2.406	-3.335	-3.991	-2.077	-1.953	-1.944
Sample (Provinces)	33	33	33	33	33	33	33
Observations	297	297	264	264	264	264	264
R-squared	.186	.594	.804	.833	.958	.963	.965
Adjusted R^2	.084	.542	.774	.806	.952	.957	.959

Hausman Test Prob>chi2 = 0.021

LM-Test Prob>chibar2 = 0.0000

Chow Test Prob>F = 0.0000

Standard errors are presented in parentheses.

The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: author's preparation (2023)

As may be observed in Table 6, a significant positive impact of Islamic financial inclusion on human development is significant in all regressions at conventional levels of significance. Based on regression (7), the result shows that a 1% increase in Islamic financial inclusion is related to an increase in HDI by 0.20 point. This result is consistent with Matekenya et al. (2021) and Abdelghaffar et al. (2023), where the level of financial inclusion positively and significantly affects human development. This confirms how a better access to Islamic financial services helps to smoothen the expenditures related to human development, such as health and education. In addition, loans from formal Islamic financial institutions are also capable of improving the quality of human life.

The interaction between *lnIFII* and *dummy_Covid19* also carries a positive and significant coefficient, suggesting a strengthening of Islamic financial inclusion effect on human development during the pandemic. Moreover, the schooling is the control variable with the largest significant effect on human development in Indonesia. The government expenditure realization also significantly and positively impacts the HDI. Meanwhile, the GRDP per capita and inflation are negatively and significantly related to the HDI.

4.2.4. Sub-Sample Analysis

In this sub-section, we analyze the impact of Islamic financial inclusion for the subsamples with high & very high (20 provinces) HDI and low & moderate (13 provinces) HDI. The results are presented respectively in Table 7 and Table 8.

In Table 7, Islamic financial inclusion in the provinces with high & very high HDI significantly and negatively impacts poverty rate and positively impacts on human development, similar to the results using the whole sample. Likewise, in line with the whole sample results, Islamic financial inclusion system has no significant effect on income inequality. By contrast, Table 8 shows that Islamic financial inclusion has insignificant effect on all dependent variables in the provinces with low & moderate HDI.

Table 7.
Estimation Results - High and Very High HDI Provinces

Variable	(1)	(2)	(3)
	Poverty	*lngini*	*HDI*
lnIFII	-.713***	.01	.282**
	(.191)	(.021)	(.12)
lngdppc	-2.631	-.262**	1.431**
	-2.032	(.113)	(.632)
lngovexp	-.61	.109***	.606**
	(.486)	(.042)	(.234)
Inflation	-.051**	.007***	-.047***
	(.022)	(.002)	(.011)
yoschool	-1.441**	-.071*	3.4***
	(.543)	(.037)	(.21)
dummy_Covid19	1.259***	.04	-.105
	(.321)	(.027)	(.15)

Table 7.
Estimation Results - High and Very High HDI Provinces (Continued)

Variable	(1)	(2)	(3)
	Poverty	*lngini*	*HDI*
dummy_Covid19* lnIFII	.194	.014	.072
	(.125)	(.01)	(.055)
_cons	38.642***	-1.184***	28.747***
	-5.775	(.389)	-2.184
Sample (Provinces)	20	20	20
Observations	160	160	160
R-squared	.586	.438	.971
Adjusted R^2	.567	.329	.965

Standard errors are presented in parentheses.

The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: author's preparation (2023)

The results indicate that the effects of Islamic financial inclusion on poverty and human development depends on the level of human development in each province. The provinces with high & very high HDI score have higher capability in benefiting from access to financial products and services and consequently resulting in reduction in poverty and improvement in human development.

Table 8.
Estimation on Low & Moderate HDI Provinces

Variable	(1)	(2)	(3)
	Poverty	**lngini**	**HDI**
lnIFII	-.093	.021	-.052
	(.391)	(.017)	(.145)
lngdppc	2.33**	-.008	-1.599***
	-1.003	(.04)	(.381)
lngovexp	-.859	-.002	1.634***
	(.7)	(.028)	(.268)
Inflation	-.035	.003	-.026
	(.049)	(.003)	(.018)
yoschool	-2.447***	-.061***	3.971***
	(.543)	(.018)	(.216)
dummy_Covid19	-.055	-.032	.466*
	(.695)	(.039)	(.254)
dummy_Covid19* lnIFII	-.135	-.009	.264***
	(.203)	(.011)	(.075)
_cons	38.932***	-.446	15.997***
	-9.423	(.41)	-3.505

Table 8.
Estimation on Low & Moderate HDI Provinces (Continued)

Variable	(1)	(2)	(3)
	Poverty	lngini	HDI
Sample (Provinces)	13	13	13
Observations	104	104	104
R-squared	.453	.271	.967
Adjusted R^2	.413	.218	.959

Standard errors are presented in parentheses.

The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: author's preparation (2023)

V. CONCLUSION AND RECOMMENDATION

In this paper, we construct Islamic financial index (IFII) for 33 provinces in Indonesia over the period 2014-2022 and assess its impacts on poverty, income inequality and human development. Almost all provinces record low IFII, except Aceh (moderate) and DKI Jakarta (high). However, we also observe that the IFII in Indonesia has increased over time. High IFII in DKI Jakarta primarily due to the high penetration rate of Islamic banking than in other provinces. While the transition of Regional Development Bank in Aceh into a fully Islamic banking system and the enactment of Aceh Qanun Number 11 of 2018 are the reasons for fast-growing inclusion in Aceh.

From the panel-model estimation, Islamic financial inclusion is an effective tool to overcome poverty problems and to improve human development. However, it has no significant link with income inequality. Our further analysis using sub-samples further reveals that the beneficial effects of Islamic financial inclusion on poverty and human development are apparent only in provinces with high human development level. Thus, a province needs to reach a certain level of human development first before the benefits of Islamic financial inclusion can be realized.

Since Islamic financial inclusion contributes to poverty reduction and human development, authorities should pay serious attention to increasing access, availability and usage of Islamic bank products and services, especially in provinces with low IFII. Some examples of policies are to encourage, (1) the social function of Islamic banking, for example encouraging *mustahiq* who are entitled to receive zakat to have Islamic bank accounts, (2) the improvement of innovation/ digitalization of financial products and services that are attractive, useful, and easily accessible to all levels of society, especially the poor or low-income people, and (3) the conversion of Regional Development Banks into Islamic banks. Furthermore, in preparing financial inclusion development strategies, the human resource quality should be considered.

We also recommend that the Financial Services Authority publish an economic inclusion index with a more comprehensive multidimensional measurement that includes not only usage dimensions obtained from survey methods, but also penetration and availability dimensions. The obtained results can reflect more complete picture of financial inclusion as a basis and measure for the preparation of policy strategies to achieve the desired level of financial inclusion, and develop into an even more comprehensive database.

Future studies are recommended to obtain more comprehensive indicators and expand the scope in measuring IFII. This collection and expansion process should be carried out through several indicators, such as number of Islamic banking accounts and ATMs, use of mobile/internet banking services, and also non-banking Islamic financial institutions. The more comprehensive dimensions and indicators are used, the better they reflect the state of financial inclusion. Furthermore, future research may also adopt estimation methods that can reduce potential bias due to endogeneity problems that may arise in this study.

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