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The Impact of Islamic Fintech on Poverty Alleviation in Indonesia: A Socio-Economic Implications

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ABSTRACT

Poverty alleviation remains a critical focus in Indonesia's agenda alongside technological advancement. The establishment of an inclusive Islamic financial ecosystem, integrating digital financial services (fintech), stands as a significant initiative. However, challenges including regulatory inadequacies, complex licensing, misuse in terrorism financing, and consumer disputes plague this evolving landscape. This study investigates the impact of Islamic fintech on poverty reduction from 2005 to 2022, utilizing an Ordinary Least Squares (OLS) model. Results indicate that Islamic fintech interventions exhibit promise in mitigating poverty while strengthening the financial system. This underscores the pivotal role of the financial infrastructure in societal welfare development. Compared to mere economic growth, Islamic fintech demonstrates potential for sustained socio-economic development, particularly aiding Shariah-compliant enterprises seeking expansion. The findings emphasize the necessity of addressing regulatory intricacies to fully harness the transformative potential of Islamic fintech. This study underscores the significance of fostering an enabling regulatory environment, contributing to Indonesia's long-term socio-economic development and poverty alleviation strategies.

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Introduction

In the contemporary globalization era, technical advances are emerging as a new engine of economic expansion. Specifically, financial technology is a new instrument that is supposed to boost financial inclusion and growth in the financial sector. Financial technology has grown in popularity in recent years. Fundamentally, fintech refers to an innovation in financial services based on technology that is integrated online to enable a range of transactions, including insurance premiums, household bills, installment payments, remittances, balance checks, funds, investments, and more. In term of diversity, this type of financial technology serves as the backbone for the advancement of numerous community initiatives in Indonesia. Furthermore, Fintech offers benefits over traditional banks (Laut & Hutajulu, 2019). FinTech provides easy access to financial services needed by the community in the era of the industrial revolution 4.0 (Firdaus et al., 2017). This convenience allows fintech to achieve development objectives especially related to the economy, such as decent work and economic growth, poverty reduction, hunger reduction, and the realization of prosperity (Trimulato et al., 2022).

Nowadays, Indonesia is experiencing a swift expansion in the development of Islamic Fintech, or financial technology (Hiyanti et al., 2020). Despite having the largest Muslim population in the world, Indonesia is not as huge as nations like Saudi Arabia, Iran, the United Arab Emirates (UAE), and Malaysia when it comes to the Islamic fintech sector. With transactions valued at $17.9 billion in 2020, Saudi Arabia is the largest market in the world, followed by Iran ($9.2 billion), the UAE ($3.7 billion), Malaysia ($3.0 billion), and Indonesia ($2.9 billion). This discrepancy is the result of multiple issues facing Indonesia's Islamic fintech sector. These difficulties include deficient regulatory environments, complex permission procedures, the misapplication of fintech to finance terrorism, the prevalence of unlicensed fintech businesses, and persistent customer complaints. However, a number of issues and occurrences in traditional Fintech have detrimental effects on society. Islamic Fintech must therefore be a response to this issue (Muzdalifa et al., 2018). As the nation's economic regulator, the government must enable all Indonesians, even those living in rural regions, to benefit from future technological advancements (Muzdalifa et al., 2018). The internet serves as the primary means of access in today's technology relationships. It is imperative to acknowledge that the emergence of Fintech may serve as a catalyst for a movement aimed at enhancing MSMEs in the digital age, particularly for those who may be marginalized (Cindy et al., 2019).

Zhang et al (2020) argue that Fintech helps the poor by expanding access to financial services. These services encourage transactions, reduce remittance costs, and provide opportunities for welfare improvement and smooth income flows. Guo et al (2019) also argue that Fintech reduces the vulnerability of the rural map to poverty by increasing access to finance, disseminating information and promoting social connections, and promoting rural e-commerce. Fintech is further said to foster income growth and financial development in some developing countries to a large extent to reduce poverty. Given the disruptive and innovation-enabling nature of the Fintech sector, this Study examines its implications for the economy, particularly in terms of reducing poverty and increasing access to financial services. To proxy for economic development, the Study considers two macroeconomic variables, the unemployment rate and the poverty rate. The Study's first hypothesis, that the Fintech sector helps reduce the unemployment rate in job creation. In addition, as Fintech activities go beyond the limitations of conventional banking, engagement in the rural economy and finance will allow this Study to measure its impact on poverty in Indonesia.

This study is organized with the following framework. Section II describes the scope of Fintech in Indonesia. Section III outlines the empirical model, theoretical framework, and main hypotheses of this Study. Section IV describes the data and preliminary analysis, while the empirical results are reported and discussed in Section V. Section VI summarizes the findings of this Study and points out opportunities for further research.

Literature Review

Indonesia Fintech Sector

The Fintech sector in Indonesia is experiencing significant growth, propelled by the escalating rates of Internet and mobile phone usage. According to Fintechnews Singapore's 2018 report, Indonesia's Fintech market exhibited an annual growth rate of 16.3% in 2017. Investments pouring into Fintech companies soared to US$176.75 million during the same period, marking a robust strengthening trend. The surge in Fintech entities mirrors this trend, with a notable rise from 53 companies in 2014 to 137 in 2017, representing a remarkable 158% increase (Figure 1). The momentum continued, with 167 Fintech companies operating in Indonesia by June 2018, predominantly established after 2015, as highlighted by Fintechnews Singapore (2018).

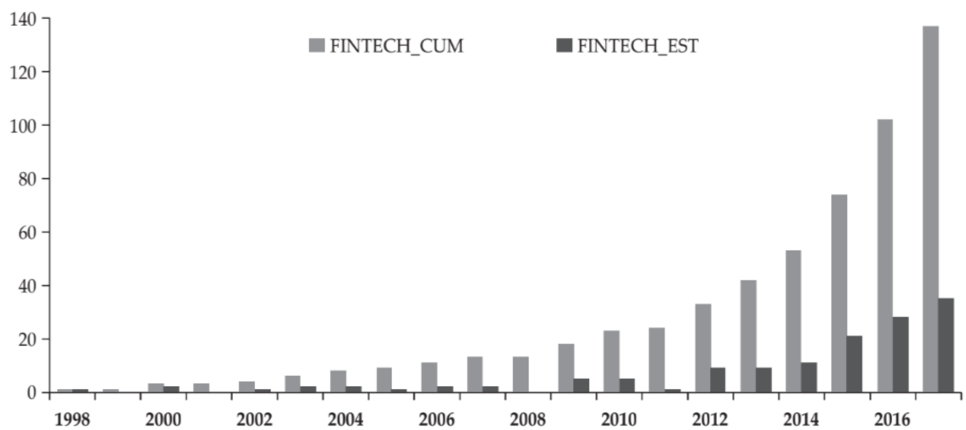


Figure 1. Fintech Start-ups Established (FINTECH_EST) and Cumulative (FINTECH_CUM) Each Year Over the Period 1998-2017

Source: Fintech Singapore News (2018)

Fintech companies operating in Indonesia predominantly focus on payments, with loans following closely (see Figure 2). The significant surge in Fintech's payment usage is evidenced by the expansion of SMS and mobile banking, internet banking, and e-money. In 2017, the transactional value in rupiah using SMS and mobile banking increased notably by 41.3%, while transactions via internet banking rose by 16.7%. Additionally, the public's ownership of e-money surged by 75.8% in 2017, reaching 90 million, with an average daily transaction amounting to Rp33.9 billion.

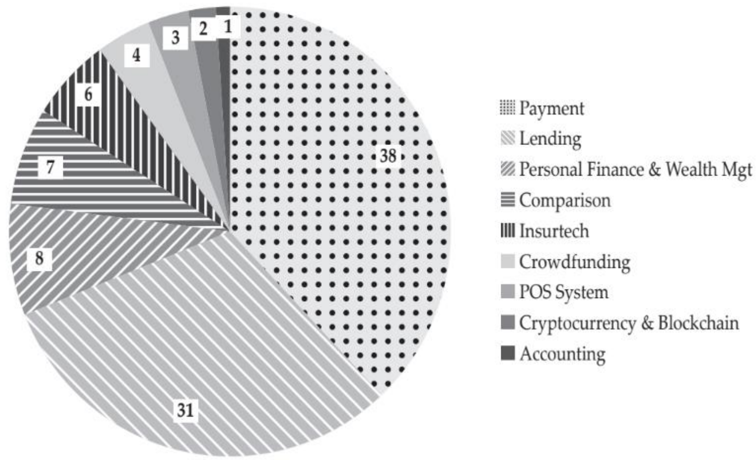


Figure 2. Composition of Fintech in Indonesia in 2017 (%)
Source: Fintech Singapore News (2018)

The number of lender accounts using Fintech in Indonesia as of May 2018 totaled 199,539, more than 70% higher than in January 2018. The growth of borrowers using Fintech grew even stronger, from only 330,154 in January 2018 to 1.8 million in May 2018 The rapid increase in the number of Fintech lenders and borrowers was followed by rapid growth in the amount of loans through Fintech. According to the Financial Services Authority (OJK), during the January-May 2018 period, outstanding loans through Fintech doubled to Rp6,160 billion.

Sharia Fintech

Islamic fintech amalgamates financial innovations with technology to facilitate transactions and investments in accordance with Sharia or Islamic law principles. This sector mandates adherence to Islamic law within its business operations. The legal framework for Sharia fintech is established under the Financial Services Authority Regulation (POJK) 77/2016 on Information Technology-Based Money Lending and Borrowing Services (Santi et al., 2017). This regulation broadly oversees various types of P2P fintech, encompassing both Sharia and conventional fintech. Furthermore, Sharia fintech aligns with the Fatwa of the National Sharia Council of the Indonesian Ulema Council (DSN MUI) Number 117 of 2018, outlining Information Technology-Based Financing Services based on Sharia Principles (Maulida et al., 2020).

The term 'fintech' denotes companies leveraging modern technology in the realm of finance. These entities emerged as a significant trend post-2010, largely comprising small to medium-sized enterprises with limited capital but innovative ideas aimed at introducing new or enhancing existing financial services in the market. The fintech landscape predominantly consists of startups, their numbers surpassing 10,000 companies according to various estimates. Typically, these firms secure funding through venture capital and crowdfunding. As banks adapt their business models and technical infrastructure to the digital era, they face intense competition among themselves in terms of operational efficiency. Failure by Islamic banks to integrate financial technology might lead to customer attrition, particularly among the younger demographic, posing a risk to the longevity of their customer base within the banking sector. Therefore, in the current financial technology era, concrete measures must be taken by banks to ensure their survival (Muchlis, 2018).

Several factors underpin the growth of financial technology. Firstly, changing consumer perceptions driven by increasing needs but with expectations of convenience and practicality. Secondly, the progression of digitalization, signifying the transformation of outdated systems into digital products beneficial to society. Thirdly, the rapid and continuous evolution and innovation in societal trends expedite change.

Fourthly, there's a diminishing sense of loyalty to brands and institutions. Fifthly, the heightened accessibility of fintech services. Finally, the profitability associated with the products offered in this domain also contributes to its growth (Ningsih, 2020).

Hypothesis Formulation

The impact of financial development with indicators of banking and financial system growth on poverty alleviation has been studied extensively; however, an important aspect of the financial system that has received less attention in the literature is Fintech. Fintech drives financial inclusion, economic growth, and financial development (Ozili, 2018). Theoretically, financial inclusion, economic growth and financial development are the three main channels through which Fintech can influence poverty. Fintech is recognized as promoting financial inclusion (Dranev et al., 2019)The concept of Fintech offers easier access to funds for Micro Small Enterprises that often experience great challenges in getting credit from state-owned banks mainly due to inadequate collateral security. This role helps solve the moral hazard and adverse selection problems associated with the traditional banking system. By increasing financial inclusion, Fintech helps reduce inequality and poverty (Ozili, 2018).

Regarding economic growth channels, Fintech encourages e-commerce, improves information transmission, promotes social connections, efficiency, and easier access to loans, and reduces risk by households (Fünfgeld & Wang, 2009)The impact will increase household consumption, savings, investment, business growth, employment, and income Fu et al (2020) thus affecting poverty. It is well-acknowledged in the literature that economic growth affects poverty (Perera & Lee, 2013).

Fintech can also affect poverty through financial development. It has been established that Fintech influences the financial sector in Indonesia by promoting size, profitability and security. It is empirically shown that financial development affects poverty (Quartey, 2008; Seven & Coskun, 2016). In summary, this study argues that as Fintech promotes financial inclusion, it can also reduce poverty. It is recognized that economic growth reduces poverty. So, as long as Fintech affects economic growth, it can also affect poverty. Finally, as long as Fintech drives financial development, it can also affect poverty. With this assumption, this Study hypothesizes:
Hypothesis 1 (H1). Fintech increases poverty in Indonesia.
Hypothesis 2 (H2). Fintech reduces poverty in Indonesia.

Methodology

This section presents the empirical model for hypothesis testing and provides theoretical support for the empirical framework. The study starts by building a theoretical framework related to the determinants of poverty and augments it with an exogenous influence, namely Fintech. The author employs the Ordinary Least Squares (OLS) method as the econometric technique in this paper for several reasons. OLS is a commonly used and widely accepted method in econometrics for estimating the parameters of a linear regression model. Its popularity stems from its simplicity and ease of interpretation. In this case, the empirical model being estimated for hypothesis testing involves a linear relationship between the poverty variable (PoV) and various determinants (Fintech and other factors denoted by X). OLS is particularly well-suited for linear regression models like the one presented in the paper. OLS estimation produces coefficients that are straightforward to interpret. For instance, in the provided equation, β represents the effect of Fintech on poverty (PoV) while controlling for other factors denoted by X. This ease of interpretation makes the results more accessible to readers and policymakers. OLS does have underlying assumptions, such as linearity, independence, homoscedasticity, and absence of multicollinearity. If these assumptions hold, OLS provides statistically efficient and unbiased estimates. The author may have tested these assumptions or employed robustness checks to ensure the reliability of the OLS results.

The poverty model (PoV) is estimated using the ordinary least square method:

$$PoV_t = \alpha_0 + \beta Fintech_t + \pi X_t + \epsilon_t$$

In this model, in addition to PoV (Y variable), Fintech is the volume of Fintech companies, measured as the cumulative number of all companies each year (FINTECH). The poverty model is augmented with Fintech, which is measured as the cumulative number of Sharia Fintech startups each year over the 2019-2022 period. While Fintech is seen as a disruptive innovation, it also makes technology possible to cut costs, improve the quality of financial services and create a more diverse and stable financial landscape (Lee & Shin, 2018). Fintech can thus be seen as a financial instrument that has the ability to reduce the marginal cost of providing and consuming financial services. Therefore, this study hypothesizes that Fintech will reduce poverty.

Finally, X_t represents a vector of control variables, namely the unemployment rate, economic growth, and the level of public financial literacy. The study expects Fintech to have a statistically significant negative effect on the poverty rate in Indonesia. That is, Fintech improves the welfare and standard of living of Indonesians. Given the financial repression of the banking system, the study expects financial development to have a negative effect on the poverty rate. The unemployment rate, meanwhile, has a negative effect on the poverty rate.

Data and Preliminary Analysis

This study uses annual time-series data on the number of Fintech companies and macroeconomic data, namely the unemployment rate, and poverty rate over the period 2005-2022. Fintech company data is sourced from the Indonesian Fintech Association. Macroeconomic data is sourced from BPS data. In Table 1, the study depicts all series corresponding to the economic model developed below.

Tabel 1
Variable Description

Variable	Definition	Author's Calculation	Source
FINTECH (X_1)	Total number of Fintech start-up each year	Cumulative per year	Fintech Indonesia Association
UNEM (X_2)	Unemployment rate for Indonesia	%	BPS
PoV (Y)	Poverty rate for Indonesia	%	BPS
Findev (X_3)	Indonesian public financial literacy index	%	OJK

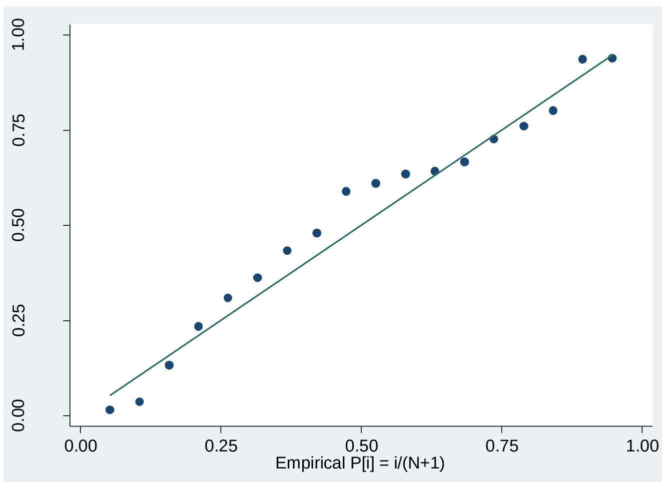
This table presents general statistics for the variables covered in this study over the sample period specified for each variable. Fintech_Est is the number of newly established Islamic Fintech companies and Fintech_Cum is the cumulative number of Islamic Fintech companies each year. Other variables are poverty rate (Pov,%), unemployment rate (Unem,%), economic growth rate (GDP), and financial development rate (Findev).

Table 2
Descriptive Statistics

	Fintech_Cum	Fintech_Est	Unemp	Pov	Findev	GDP
Mean	0.022	0.013	7,067	12,3	0.304	5,421
Minimum	0	0	5,23	9,22	0	3,59
Maximum	11	5	10,84	17,75	38,03	6,9
Std.Dev	0,412	0,234	1,751	2,708	3,105	0,782
Observation	18	18	18	18	18	18

The poverty rate over the period 2005-2022 averaged almost 12% while the unemployment rate averaged 7%. The Poverty Rate in Indonesia reached 16.58% in 2005, and the study period shows the lowest inflation (9.2%) in 2019. The high variability is depicted in the standard deviation series of 41.2%. This variability can be explained by the financial development index (with a standard deviation of 3.1). Findev averaged 0.3 over the period 2005-2022, reaching a maximum level of 38.03 in 2022. The economic growth rate averaged 5.4 percent over the study period, reaching the highest level (6.9%) in 2007, and recording the lowest (3.59) in 2021.

Figure 1. Normality Test Result



The normality test results reported in Figure 1, show that all samples are normally distributed. This means that the model used in this study is suitable for regression analysis. Normality test is conducted to determine the distribution of residuals from the regression model, if the residuals are normally distributed then the model can be analyzed by regression analysis, but if the residuals are not normally distributed then the model cannot be analyzed by regression analysis

Results and Discussion

Table 3 presents the results of the direct effect of Islamic Fintech on poverty. The results show that Fintech has a positive and statistically significant effect on poverty levels. This result supports Hypothesis 2 (H2) of this study that Islamic Fintech reduces poverty. Fintech helps the poor through financial inclusion (Ozili, 2018). Islamic fintech reduces transaction costs, provides easier access to finance, reduces household information asymmetry and risk, provides rural e-commerce, provides social connections opportunities to accumulate wealth and smooth income (Wang & He, 2020), thereby improving living standards and welfare. This is a new result. The next result shows that the development of a better financial system will also reduce the poverty rate. This means that a better, more inclusive financial system makes people more financially empowered so that they are able to increase their level of economic and financial capability. These results support the findings of Pereira & Lee (Perera & Lee, 2013) in nine Asian countries including Uddin et al (2014) in Bangladesh that the development of a good financial system supported by economic growth will reduce poverty levels. In addition, Zhang et al (Zhang et al., 2020) support that an improved financial system will increase household income through several channels such as providing cheap working capital, and reducing the risk of economic vulnerability in certain economic shock cycles. In addition, the advantageous monetary policy increases the standard of living and welfare of citizens, thereby reducing poverty.

Tabel 3. Sharia Fintech and Poverty (full sample)

VARIABLES	(1) Pov	(2) Pov	(3) Pov	(4) Pov	(5) Pov robust
Unemp			1.165*** (0.113)	1.163*** (0.156)	1.165*** (0.149)
Findev		-0.145 (0.029)***	-0.0391** (0.0146)	-0.0393** (0.0166)	-0.0391** (0.0157)
Fintech_Est	-0.749 (0.368)*	0.1276 (0.2920)	-0.192* (0.108)	-0.257 (0.151)	-0.192** (0.0763)
Fintech_Cum				0.0395 (0.0748)	
Constant	12.814*** (0.6442)	4.869*** (0.9716)	4.870*** (0.972)	4.886*** (1.264)	4.870*** (1.208)
Observations	18	18	18	18	18
R-squared	0.205	0.957	0.965	0.965	0.965

Standard errors in parentheses: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 3 shows that the existence of Islamic Fintech since 2018 had a negative impact on the poverty rate. The results of this econometric estimation illustrate that there is an inverse relationship since the emergence of Islamic Fintech to poverty. This study estimates model 2 by adding a financial development index in Indonesia, where the better the financial system is built, the more it reduces the poverty rate in Indonesia. These two triggers are then used as the basis for building a full model of the relationship between Islamic Fintech and poverty in this study. When viewed in model 3, simultaneously the level of quality of the financial system along with the presence of Islamic Fintech has a negative impact on poverty. This means that in the context of this study, Islamic Fintech has the potential to reduce poverty in Indonesia. This implies that Fintech complements economic growth to reduce poverty in Indonesia.

FinTech plays a pivotal role in reshaping consumer behavior, altering lifestyle trends, and elevating consumer expectations by offering convenient access to data and information (Muzdalifa et al., 2018). It has delivered numerous advantages for consumers, entrepreneurs, and the national economy, such as broadening product options, reducing prices, enhancing service quality, streamlining financing, facilitating accessibility, expediting transaction processes, fostering economic growth, and hastening the transmission of monetary policies.

The presence of FinTech in Indonesian society holds immense benefits, especially for individuals in areas underserved by traditional banking institutions. It brings convenience to the public and offers alternative funding through financial services that are more effective, efficient, transparent, and affordable (Hadad, 2017). This presence not only caters to segments overlooked by conventional banks but also provides a convenient avenue for reliable and accessible financial solutions to a wider population.

Furthermore, the pursuit of Sharia FinTech extends beyond mere financial inclusion, aiming to foster comprehensive and sustainable societal development (Rabbani, Bashar, et al., 2021). Its overarching goal involves addressing inequality and promoting justice within social constructs. Grounded in ethical, moral, and risk-sharing principles, the Sharia FinTech system operates selectively, prioritizing the protection of the needs and interests of vulnerable populations, particularly those affected by crises. The significance of Sharia FinTech transcends financial realms by advocating for equitable income distribution and economic justice. Additionally, it serves as an ethical alternative within society, notably for Muslims, as Sharia-based FinTech adheres to the principles of Islamic finance. This adherence excludes the endorsement of unethical practices like arms trading, alcohol, pornography, gambling, and other forbidden activities (Rabbani, Ali, et al., 2021). Consequently, Sharia FinTech stands as a beacon for promoting financial ethics and principles while providing an ethical avenue for financial engagement within society. The effect of Fintech and financial development, as well as credit and financial development on poverty rate, is negative and significant, while the effect of unemployment rate on poverty rate is positive and significant. This means that Fintech is expanding the financial system in Indonesia which facilitates more financing to beneficiaries, thereby increasing the production, welfare, and living standards of Indonesians.

Conclusion

The existence of Fintech, especially those with sharia business models, is a refresher in the landscape of the financial industry in Indonesia. The founders are confident in bringing a vision that a financial system supported by technology will help many people in Indonesia. Departing from this reason and coupled with the sharia system, the big goal to be pursued is not only a contribution to the macro economy but welfare reflected in the impact on the lowest group of society, namely the poor. In addition, achieving zero poverty is also a major agenda of the United Nations. Motivated by this goal, this study estimates the impact of Islamic Fintech on poverty in Indonesia. The study found that Islamic Fintech reduces poverty in Indonesia. The study also found that a better financial system will reduce poverty. Islamic Fintech also contributes to the reduction of unemployment and the improvement of an inclusive financial system.

Therefore, this research proposes that policymakers extend their backing for the advancement of Islamic Fintech within Indonesia. Specifically, they should advocate for investments in both internet and mobile internet infrastructure, recognizing their fundamental role in facilitating Fintech operations. Policymakers ought to foster collaborations among civil society, private enterprises, and governmental bodies to stimulate investments in internet accessibility. Furthermore, policymakers need to fortify cybersecurity measures not only for Islamic Fintech but across all Fintech platforms. They are also urged to ensure transparency in information sharing, implement deposit insurance, vet investors, and safeguard consumer privacy. Moreover, policymakers should enhance Fintech education, specifically by providing training that aligns Sharia principles with information technology. This proactive step will contribute to narrowing the digital gap and boosting the uptake of Islamic Fintech.

The study has some shortcomings. First, this research is limited to Islamic Fintech in Indonesia. However, Fintech is a worldwide phenomenon. Thus, future investigations should use data from other countries to examine the link between Fintech and poverty. This study only investigated the linear relationship between Islamic Fintech and poverty. Therefore, it is recommended that future investigations should analyze the non-linear impact of Islamic Fintechs on poverty. In addition, this study concentrated on the macro level of poverty as the only proxy for poverty. Consequently, future investigations should use household or headcount ratios if data is available. Lastly, this study's data covers a short period (2005 to 2022) given the availability of data. Thus, future research should use the current dataset to examine the Fintech-poverty relationship.

Author's Contribution

The author conceptualizes the research, designs the research methodology, collects and analyzes the data, and interprets the findings. The entire manuscript, including literature review, methodology, results, discussion, and conclusions, is authored by the authors. In addition, the authors take full responsibility for the intellectual content, accuracy of data analysis, and adherence to ethical considerations in conducting this research. This manuscript has undergone several revisions and editing processes, all of which were carried out by the authors themselves.

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Declaration of Competing Interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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