

The Influence of Financial Literacy on Financial Inclusion in Indonesia with Fintech as a Mediator

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ABSTRACT

This study aims to examine the relationship between financial literacy and financial inclusion in Indonesia, with fintech as a mediating factor. Financial literacy plays a crucial role in enabling individuals to make informed financial decisions and effectively participate in the formal financial system. Fintech, on the other hand, has emerged as a transformative force, providing innovative financial services to previously underserved populations. This research investigates whether financial literacy positively impacts financial inclusion and whether fintech acts as a mediator in this relationship. The study utilizes a quantitative research design, employing survey data collected from a representative sample of Indonesian residents. The findings of this research will contribute to our understanding of the importance of financial literacy and fintech in promoting financial inclusion and provide insights for policymakers, financial institutions, and fintech providers.

Keywords: Financial Literacy, Financial Inclusion, Fintech

1. Introduction

The globalization era has driven the development of financial services businesses in Indonesia, which continue to grow with increasingly advanced technology (Mulasiwi & Julialevi, 2020). Financial technology, or fintech, is an innovation in the financial industry that makes financial transactions faster and more efficient (Afdi & Nizar, 2017). Fintech encompasses various financial services such as lending, fundraising, and investment, but operates more efficiently due to its utilization of technology (Kusumawati et al., 2022). Fintech's origins can be traced back to the 1970s with the introduction of automated teller machines (ATMs), followed by phone banking in the 1980s and the emergence of various financial products in the capital market during the 1990s. The widespread use of internet banking further propelled the adoption of branchless banking, allowing transactions to be conducted anytime and anywhere (Afdi & Nizar, 2017).

Fintech is designed to help individuals access and utilize financial services more easily and effectively (Dara & Mariah, 2020). The continuous development of financial innovations aims to facilitate business transactions, particularly in the online sector. The high interest among Indonesian society in using fintech services has made this technology popular, with its usage becoming increasingly dominant. Bank Indonesia (2018) defines fintech as a combination of financial

services and technology that transforms traditional business models into simpler ones (Bank Indonesia, 2018). According to data from the Financial Services Authority (OJK) as of April 22, 2022, there were 102 licensed and registered fintech lending companies in Indonesia (Otoritas Jasa Keuangan, 2022). Fintech classifications include crowdfunding and peer-to-peer lending, market aggregators, risk and investment management, and payment, settlement, and clearing (Dara & Mariah, 2020). Fintech companies are typically start-ups that provide financial services and solutions to customers, such as mobile payments, money transfers, loans, fundraising, and asset management (Djawahir, 2018). The digitalization adopted by financial institutions brings benefits to the financial system and users but also poses new complexities and challenges for regulatory frameworks and oversight (Financial Stability Review, 2022). Therefore, coordination between authorities is necessary to strike a balance between innovation and the risks associated with digitalization. The Financial Services Authority Regulation No. 13/2018 emphasizes that Digital Financial Innovation (DFI) in the Financial Services Sector requires fintech companies to conduct activities that enhance financial literacy and inclusion among the public (Otoritas Jasa Keuangan, 2018).

Financial literacy refers to the knowledge, skills, and confidence that influence attitudes and

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behaviors related to improving decision-making and financial management for overall well-being (Strategi Nasional Literasi Keuangan Indonesia, 2021). The 2019 National Survey on Financial Literacy and Inclusion (SNLIK) revealed a financial literacy index of 38.03%, indicating that only about one-third of the Indonesian population is well-literate in financial matters. The financial inclusion index stands at 76.19% and is still dominated by the use of banking sector products and services (Strategi Nasional Literasi Keuangan Indonesia, 2021). In comparison to the financial literacy and financial inclusion indices of ASEAN countries, Singapore has a rate of 98%, Malaysia 85%, and Thailand 82% (Kementerian Luar Negeri Republik Indonesia, 2021), indicating that Indonesia's figures are relatively lower. Therefore, there is an urgent need to accelerate the improvement of financial literacy and inclusion indices (Djawahir, 2018). Financial literacy contributes to empowering communities, individual well-being, consumer protection, and increasing financial inclusion (Otoritas Jasa Keuangan, 2021).

The level of financial inclusion in Indonesia is still relatively low compared to neighboring ASEAN countries. However, during President Jokowi's administration, financial inclusion in Indonesia has shown improvement. Meanwhile, financial literacy in ASEAN countries, on average, has a relatively high level of knowledge, surpassing 80%. According to the Bank of Uganda, financial inclusion refers to a state where everyone who can use financial services has access to a complete range of quality services provided at an affordable price, in a convenient and dignified manner for clients (Bongomin et al., 2018). Indonesia had a financial literacy rate of 38.03% in 2019, an increase from 29.7% in 2016 (Notonegoro, 2020). According to data from the National Strategy for Financial Literacy in Indonesia, the population of Indonesia increased by 1.5% from 2006 to 2016, with a recorded population of 222.8 million in 2006 and 258.7 million in 2016 (Otoritas Jasa Keuangan, 2017).

2. Research Methods

2.1 Type of Research

The research requires an appropriate method to support its implementation. Research methodology refers to the steps taken by researchers to collect data or information, followed by an investigation of the acquired data (Hidayat, 2017). Research methods can be conducted using two approaches: qualitative and quantitative. Quantitative research is described in numbers and graphs. Quantitative methods include observation of existing data, experiments, and surveys using closed-ended questions. On the other hand, qualitative research is conducted to understand concepts, where the collected data allows researchers to gain deeper insights and knowledge on a topic that they have limited understanding of. Qualitative methods are typically carried out through open-ended interviews and literature reviews that explore concepts and theories (Streefkerk, 2021). The

method to be employed in this research is quantitative.

2.2 Data Collection Techniques

Primary data is used in this research, which was obtained through the distribution of a Google Form directly to respondents via social media. The study developed a questionnaire for the health financial inclusion variable based on (Mindra et al., 2017). The questionnaire for fintech was developed based on the research of (Dara & Mariah, 2020), while the questionnaire for financial literacy was adopted from (Dara & Mariah, 2020). The questionnaire in this research consists of two parts. The first part is related to demographic questions about the respondents, and the second part consists of 25 questions to measure the three variables of the study. The variables are measured using a Likert scale ranging from 1 to 5, with the scale ranging from strongly disagree to strongly agree.

2.3 Data Analysis Techniques

Structural Equation Modeling (SEM) is the method used in this research to analyze the respondents' data. The PLS-SEM model is employed in this study to validate the model. SEM is a combination of regression or path analysis and factor analysis. The Smart PLS (Partial Least Squares) version 3 system is used to process the collected data from the respondents to test causal relationships and identify the overall influence of each variable. Descriptive analysis is used for the demographic data of the respondents, such as gender, age, and income level.

3. Results And Discussion

The questionnaires that were distributed and collected amounted to 359. Descriptive analysis of the respondents was conducted based on several criteria, such as gender, age, and monthly income.

Table 1. Respondent Data Based on Gender

Gender	Amount	Percentage
Male	94	31,54
Female	204	68,46
Total	298	100,0

Source: Data Processed 2023

From the collected questionnaire data, it was found that 31.54% of the respondents were male, while 68.46% were female.

Table 2. Respondent Data Based on Age

Age	Amount	Percentage
16-24	243	81,54
25-34	47	15,78
35-44	7	2,35
45-55	1	0,33
Total	298	100,0

Source: Data Processed 2023

The majority of the respondents, 81.54%, were in the age group of 16-24 years, followed by 15.78% in the age group of 25-34 years. Respondents aged 35-44 years accounted for 2.35%, and the remaining 0.33% were in the age group of 45-55 years.

Table 3. Respondent Data Based on Income

Income (IDR)	Amount	Percentage
<4.000.000	50	16,78
4.000.000-7.000.000	190	63,76
7.000.001-10.000.000	34	11,41
10.000.001-15.000.000	12	4,02
15.000.001-25.000.000	7	2,35
>25.000.000	5	1,68
Total	298	100,0

Source: Data Processed 2023

In terms of monthly income, 16.78% of the respondents, which is 50 individuals, had an income below Rp4,000,000. A total of 190 respondents, equivalent to 63.76%, reported an income ranging from Rp4,000,001 to Rp7,000,000. Additionally, 11.41% of the respondents, or 34 individuals, had an income between Rp7,000,001 and Rp10,000,000. Furthermore, 4.02% of the respondents, amounting to 12 individuals, had an income between Rp10,000,001 and Rp15,000,000. There were 2.35% of the respondents, or 7 individuals, with an income ranging from Rp15,000,001 to Rp25,000,000. Finally, 1.68% of the respondents, or 5 individuals, reported a monthly income exceeding Rp25,000,000.

These findings provide a comprehensive overview of the respondent characteristics in terms of gender, age, and monthly income.

3.1 Model Evaluation

Evaluation of the measurement model, also known as the outer model evaluation, is used in research to assess the validity and reliability of the model.

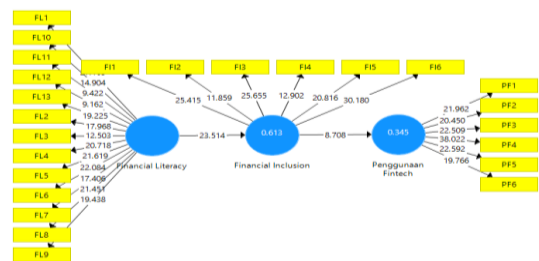


Figure 1. Research Model before Outlier (Source: Processed Primary Data 2023)

Validity testing is conducted to determine whether the questions used in the research accurately represent the variables under investigation, where validity relates to how well a concept is operationalized by a measure (Hair, Babin, et al., 2019). This testing is done by examining the Average Variance Extracted (AVE) and outer loading values using the Smart PLS system. The validity of each variable is determined based on its outer loading in the component matrix table. If the outer loading value is below 0.6, the corresponding question is removed and not

included in further analysis. Outer loading values of variables are considered valid if they exceed 0.6 (Hair et al., 2017). A variable is considered valid if its AVE value is greater than 0.5 (Ghozali, 2021).

The Outer Loadings Rule of Thumb is commonly used to assess convergent validity, where outer loading values should be above 0.6 for exploratory research. However, for initial research stages and scale development, outer loading values between 0.5 and 0.6 are still considered acceptable.

Table 4. Outer Loading Test Results

	FI	FL	PF
FI1	0.697		
FI3	0.617		
FI4	0.721		
FI5	0.756		
FI6	0.706		
FL1		0.625	
FL11		0.695	
FL12		0.690	
FL2		0.692	
FL4		0.593	
FL6		0.736	
PF1			0.810
PF2			0.741
PF3			0.806
PF4			0.798
PF5			0.733
PF6			0.770

Source: Data Processed 2023

The results of the Outer Loadings indicate that the indicators FI2, FL3, FL5, FL7, FL9, FL10, and FL13 do not meet the criteria for convergent validity and are considered invalid. It is recommended to remove these 7 indicators and not include them in further analysis. The removal of indicators can be done directly from the structural model diagram in Smart PLS. After removal, the research model diagram will appear as follows:

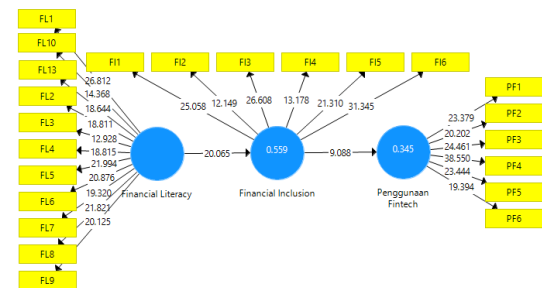


Figure 2. The research model after Outliers (Source: Processed Primary Data 2022)

Table 5. Average Variance Extracted (AVE) Test Results

	Average Variance Extracted (AVE)
FI	0.492
FL	0.454
PF	0.604

Source: Data Processed 2023

Based on the results, it can be concluded that only the variable of fintech usage has met the criteria for convergent validity, as its AVE value is above 0.5. On the other hand, the variables of

Financial Inclusion and Financial Literacy have AVE values below 0.5.

Table 6. Cross Loading test results

	FI	FL	PF
FI1	0.697	0.622	0.472
FI3	0.617	0.630	0.418
FI4	0.721	0.535	0.488
FI5	0.756	0.674	0.512
FI6	0.706	0.699	0.478
FL1	0.621	0.625	0.531
FL11	0.624	0.695	0.590
FL12	0.573	0.690	0.586
FL2	0.562	0.692	0.588
FL4	0.576	0.593	0.504
FL6	0.681	0.736	0.625
PF1	0.549	0.687	0.810
PF2	0.486	0.642	0.741
PF3	0.565	0.669	0.806
PF4	0.548	0.671	0.798
PF5	0.482	0.6633	0.733
PF6	0.520	0.655	0.770

Source: Data Processed 2023

The cross-loading values indicate the correlation of each indicator with other variables. Cross-loading requires that indicators should cluster with their respective variables, with a minimum value of 0.7 (Ghozali, 2021). The table shows that some indicators have correlation values below 0.7, but these indicators have strong accumulated relationships with their respective variables.

Table 7. Fornell-Larcker Criterion Test Results

	FI	FL	PF
FI	0.701		
FL	0.900	0.673	
PF	0.677	0.849	0.777

Source: Data Processed 2023

Based on the table, there are four variables that do not meet the criteria. Financial Inclusion and Financial Literacy, because their correlation of 0.900 is still higher than the correlation between the indicators within the same variable (0.701 and 0.673). Similarly, Financial Literacy and Fintech, as their correlation of 0.849 is higher than the correlation between the indicators within the same variable (0.673 and 0.777).

Table 8. Heterotrait-Monotrait Ratio (HTMT Ratio) Test Result

	FI	FL	PF
FI			
FL	0.898		
PF	0.673	0.844	

Source: Data Processed 2023

The HTMT table above shows that all construct variables are below 0.9, indicating that the data meets the criteria for discriminant validity.

Table 9. Composite Reliability Test Result

	Cronbach's Alpha	Composite Reliability
FI	0.830	0.828
FL	0.834	0.832
PF	0.902	0.901

Source: Data Processed 2023

The results of the reliability test indicate that all constructs have Cronbach's alpha and composite reliability values greater than 0.6. Therefore, it can be concluded that all constructs are reliable.

Table 10. Path Coefficient Test Result

	O Sample	M Sample	STDEV	T Statistic	P Values
FL->PF	0.737	0.732	0.056	13.092	0.000
PF->FI	0.586	0.582	0.074	7.920	0.000

Source: Data Processed 2023

The "Original Sample" column represents the regression coefficients using the data before bootstrapping, while the "Sample Mean" column represents the regression coefficients based on the data from bootstrapping. These values show the direction and magnitude of the influence of each latent variable on one another.

Table 11. Indirect Effect Test Result

	O Sample	M Sample	STDEV	T Statistic	P Values
FL->PF->FI	0.432	0.430	0.083	5.217	0.000

Source: Data Processed 2023

The indirect effects demonstrate the role of the mediating variable in the research model. The indirect influence between variables can be observed in the Specific Indirect Effects table provided. In Table 8, it can be seen that the variable "Fintech" has a mediating effect on both "Financial Literacy" and "Financial Inclusion" variables.

Table 12. R Square Test Result

	Sample Mean (M)
FI	0.345
PF	0.539

Source: Data Processed 2023

The R-squared value in Table 9, representing the relationship between Financial Inclusion and Fintech, is 0.345 (34.5%), indicating that 65.5% of the variance is influenced by other variables not included in the model. According to the criteria set by (Hair et al., 2019), R-squared values < 0.50 indicate "moderate" prediction results. The variable "Fintech usage" is explained by 53.5% by "Financial Literacy," while other factors and variables account for the remaining 46.5% of the unmodeled variance. Once again, based on Hair et al.'s criteria (2019), R-squared values > 0.50 indicate "moderate" prediction results.

Table 13. 4.3.4 Standardized Root Mean Square Residual (SRMR) Test Result

	Sample Mean (M)
Saturated Model	0.048
Estimated Model	0.051

Source: Data Processed 2023

SRMR (Standardized Root Mean Square Residual) is defined as the difference between observed correlations and model-implied correlation matrices. Therefore, the SRMR value can be considered as a measure of the fit between the correlation matrix and the model. According to the Rule of Thumb, an SRMR value < 0.1 indicates a well-fitting model that is consistent with the data. The following output shows that the SRMR value meets the criteria.

3.2 GoF (Goodness of Fit) Index

GoF Index (Goodness-of-Fit Index) is used to assess the overall model fit. It is calculated as follows:

$$GoF = \sqrt{\text{Comm} \times R^2}$$

GoF : Goodness-of-Fit criteria to measure the quality index (model accuracy)
 Comm : Average communalities (Average Variance Extracted / AVE)
 R2 : Average R-squared

Based on the results, we have:

$$GoF = \sqrt{0.516229551 \times 0.589683721} = 0.551736$$

Based on the results, according to the criteria, the generated model falls into the "strong" category.

3.3 Hypothesis Discussion

H1: Financial Literacy has a significant positive impact on Fintech.

Table 12 shows that Financial Literacy has a significant positive impact on Fintech. This can be observed from the T-statistics value of 20.065, which is greater than 1.96, with a significance level of 5%. Financial literacy refers to the process in which individuals who are not financially fluent enhance their knowledge and understanding of financial services, products, concepts, and risks through the acquisition of financial information. This helps them make informed choices, seek financial assistance, and act effectively in their financial usage to improve societal well-being. The higher the level of financial literacy among the population, the higher the adoption of fintech. This finding is supported by previous studies conducted by (Kusumawati et al., 2022), (Irawan & Matoati, 2021a), (Farida et al., 2021), and (Morgan & Trinh, 2019).

H2: Fintech has a significant positive impact on Financial Inclusion in Indonesia.

Table 12 states that this hypothesis is accepted, indicating that fintech has an impact on financial inclusion. The results of hypothesis testing can be seen in Table 4.17, where Table 4.13 shows that the T-statistics value is 9.088, which is greater than 1.96, with a significance level of 5%. Bank Indonesia (2018) defines fintech as the combination of financial services with technology that transforms the traditional business model into a simplified one (Bank Indonesia,

2018). The higher the level of fintech usage, the higher the level of financial inclusion in Indonesia. This finding is supported by previous studies conducted by (Rizki Miftahur Rohmah dan Tri Gunarsih, 2021), (Nurohman et al., 2021), (P Wewengkang et al., 2021), (Dewi, 2022), (Rizka Erlianta et al., 2021), and (Murdhayati Hilma Purba, 2020).

H3: Fintech mediates the influence of Financial Literacy and Financial Inclusion.

The study found positive and significant results, indicating that fintech mediates the relationship between financial literacy and financial inclusion. This means that as financial literacy increases, the ability to use fintech also increases, allowing individuals to apply financial products and services wisely, thereby enhancing financial inclusion. This finding is supported by previous research conducted by (Kusumawati et al., 2022), (Irawan & Matoati, 2021b), (Murdhayati Hilma Purba, 2020), and (Sitanggang, 2021).

4. Limitations

There were several limitations encountered during the course of this research, including:

1. Limited independent variables: The study utilized a limited number of independent variables, which may have overlooked other potential factors that could influence the research outcomes. Including additional variables could provide a more comprehensive understanding of the relationships being investigated.
2. Difficulty in accessing reference materials: The researcher faced challenges in accessing relevant reference materials due to the limited availability of campus and public libraries. This may have impacted the depth and breadth of the literature review conducted for the study.
3. Lack of familiarity with fintech: Some individuals in the target population were not familiar with fintech products, which required the researcher to provide explanations and clarifications to potential respondents. This could have introduced biases or affected the respondents' understanding and responses regarding fintech-related questions.

5. Conclusion

The research was conducted with the aim of determining the influence of financial literacy on financial inclusion in Indonesia, with fintech as the mediator. The study conducted on Indonesian society who use fintech in their daily lives concluded the following results:

1. It can be said that H1 is accepted, which means that financial literacy has a significant positive influence on fintech. The research findings are supported by (Kusumawati et al., 2022), (Irawan & Matoati, 2021), (Farida et al., 2021), and (Morgan & Trinh, 2019).
2. It can be said that H2 is accepted, which means that fintech has a significant positive influence on financial inclusion. The research

findings are supported by (Rizki Miftahur Rohmah and Tri Gunarsih, 2021), (Nurohman et al., 2021), (P Wewengkang et al., 2021), (Dewi, 2022), (Rizka Erlianta et al., 2021), and (Murdhayati Hilma Purba, 2020).

3. It can be said that H3 is accepted, which means that fintech is able to mediate the influence of financial literacy and financial inclusion. This research is supported by (Kusumawati et al., 2022), (Irawan & Matoati, 2021), (Murdhayati Hilma Purba, 2020), and (Sitanggang, 2021).

6. Recommendation

The recommendations that the researcher wants to convey for further research are as follows:

1. For future researchers, it is recommended to include additional variables beyond the scope of this study.
2. Financial institutions should pay attention to the public's knowledge about all financial concepts, not just the theories but also how to properly apply them in daily life. It would be beneficial for financial institutions to organize educational webinars on important financial topics and the utilization of fintech to enhance the public's level of knowledge.
3. Individuals should be aware of and stay informed about current technological advancements, so they can develop sufficient literacy to effectively use fintech products to meet their needs and carry out transactions easily.
4. It is recommended for the Financial Services Authority (OJK) to continue implementing strategies to enhance financial literacy among the public, ensuring that individuals can avoid economic disadvantages in the future.
5. Fintech payment companies are advised to not only improve accessibility and ease of transactions but also strengthen the security systems of fintech payment methods to prevent fraud. They should also actively contribute to the creation of a cashless society in Indonesian society.

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