# Financial Technology and Financial Inclusion: A Systematic Literature Review

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**Abstract: -This Study aims to systematically explore the approaches used by previous studies in analyzing the role of financial technology in financial inclusion. Inclusive finance is one way to reduce poverty. One of the causes of poverty is lack of public access to financial services. This study uses a systematic literature review to analyze the role of fintech in financial inclusion, based on previous study. The data in this study were derived through empirical literature based on 9 articles published between 2019-2023. The articles are found by searching for keywords in databases such as Scopus. Based on 9 selected articles, the result of analysis show that financial technology(fintech) has an impact on increasing financial inclusion.**

***Keywords:** Financial technology, financial inclusion, poverty, systematic literature review.*

## I. INTRODUCTION

Poverty is one of the crucial problems faced by various countries in the world. According to the report of the United Nations Office for the Coordination of Humanitarian Affairs (2020), there are 11 causes of poverty globally: inequality and marginalization, conflicts, and health problems such as hunger, malnutrition, and stunting. Poor health systems, lack of access to clean water, climate change. Low level of education, lack of government support, low availability of jobs, and lack of anticipation in financial and food reserves. In addition to these causes, several studies state that one of the causes of people trapped in poverty is a lack of access to financial services. Access to finance is needed to facilitate daily life. Meanwhile, it is difficult for low-income people to get this access.

According to world bank data (2021), 1.4 billion adults did not have bank accounts due to limited funds, difficulty in accessing the nearest financial institution, and inadequate documentation. Meanwhile, technological developments were increasing rapidly in the industrial revolution era. Daily activities are starting to adopt technology, including financial services. Financial technology, or fintech, results from combining financial services and technology that produces new business models, from conventional to moderate. All financial activities that previously required face-to-face meetings are now people can do it through remote transactions (World Bank, 2022).

This fintech potential is aligned with global goals to increase inclusive access for hard-to-reach populations. Key actors in this effort, such as governments, telecommunications providers, and financial service providers, must also invest in regulation and governance to ensure that products and services are available that are safe, affordable, and convenient, making them accessible to all adults in need (Demirgüç -Kunt, Klapper, Singer, & Ansar, 2021)

The Global Findex 2021 survey reveals a new opportunity to encourage financial inclusion for those who do not have a bank account and expand financial services for those who already have accounts. People can do this by utilizing digital payments as one of the financial technologies. Digitizing payments is a proven way to increase account ownership. As many as 39% of adults, or 57% of those who have an account, are driven by the need to receive payment of wages or receive money from the government, which can only be done through having an account. (Demirgüç-Kunt, Klapper, Singer, & Ansar, 2021).

Based on the background above, this study aims to systematically explore the approaches used by previous studies in analyzing the role of financial technology in financial inclusion. The implications of this research can be in the form of policy suggestions and further research opportunities related to financial technology and financial inclusion.

## II. LITERATURE REVIEW

### *A. Financial Technology*

Fintech is a financial service innovation that adopts technology, resulting in new business models, applications, products, and processes related materially to financial institutions and financial service providers (Bank of England, 2019). There are several potentials and benefits of fintech: First, the fintech industry can create jobs and attract investment, which can create economic opportunities for countries that implement it. Second, it can increase speed and efficiency in conducting transactions because digitization of finance allows services that may have taken days in the past to be completed in seconds. Third, a more resilient system because data copies are recorded by several participants simultaneously, minimizing the impact of data loss if one participant has a problem (Evans & Browning, 2021).

Fourth, fintech potential is being able to increase financial inclusion. Fintech can be a facility that reaches more people in the financial system. (Evans & Browning, 2021). Financial inclusion occurs when individuals and businesses can access valuable and affordable financial products and services that meet their needs, such as transactions, payments, savings, credit, insurance, and others (World Bank, 2022).

*B. Financial Inclusion*

Atkinson and Messy define financial inclusion as the process of promoting affordable, timely, and adequate access to various financial products and services and extending their use to all segments of society by adopting innovative approaches. In addition to promoting financial inclusion, financial awareness and education are also needed. (Atkinson & Messy, 2013).

The first step towards financial inclusion is when people already have access to transaction accounts because having a transaction account can save money, send and receive payments. The transaction accounts function as the first step to accessing other financial services. To ensure this condition, the World Bank Group (WBG) prioritizes transaction account ownership in achieving financial inclusion. Other dimensions related to access to financial services include financial services for payments and savings accounts. Up to credit, insurance, and pension funds. (Morgan, Zhang, & Kydyrbayev, 2018).

## III. RESEARCH METHOD

This study uses the systematic literature review method introduced by Yu Xiao and Maria Watson (2019). This research consists of; formulating problems, developing, and validating review protocols, tracing literature, screening and assessing the quality of papers that fall into the inclusion category, extracting data, analyzing and synthesizing data, and ending with report findings.

*A. Formulation For The Research Question*

- What approach are used to measure the role of Fintech in financial inclusion?
- What is the role of Fintech in financial inclusion?

*B. Process in identification, screening, and eligibility*

In identifying journals appropriate to the topic needed, this paper uses several keywords based on research questions, including the primary keyword synonyms. The electronic data source used the primary literature. At the beginning of the search process through Scopus, 247 documents were found that were relevant to the keywords.

The next stage is screening. This study filters the articles from database searches based on inclusion and exclusion criteria. The inclusion and exclusion criteria are as follows:

Table 1: The inclusion and exclusion criteria

| Criterions | Eligibility | Exclusion |
|---|---|---|
| Language | English | Non-english |
| Keyword | “Fintech”, “Financial inclusion” | Article without use fintech and financial inclusion as keyword |

After filtering based on the criteria above. The selection of the remaining articles depends on their quality, and the articles were published in journals for the last five years, not in book chapter. The final step is checking eligibility. This research selects articles that can answer research questions for discussion and final analysis. Therefore, nine articles were selected for further analysis as a result of this study.

## IV. RESULT AND DISCUSSION

*A. Result of Review*

➢ *Result of Article Mapping*

Based on identifying and collecting articles through Scopus in the 2018-2023 period, there were 247 articles. The number of articles published in 2018 is 5; it is 12 in 2019, it is 45; in 2020, it is 44; in 2021, it is 87; in 2022, it is 54; in 2023, Over the past five years, 2022 has been the year with the most research articles, with 87 articles as shown in Figure 1

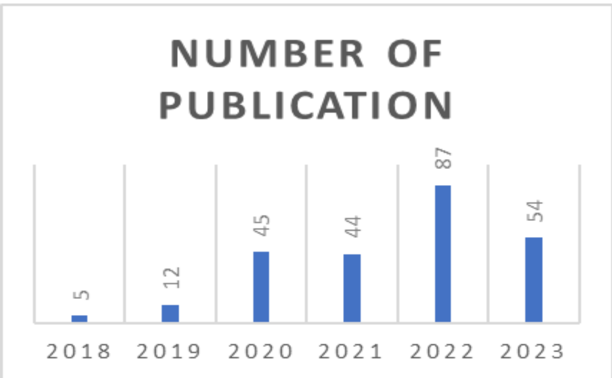


Fig. 1: Number of Publication

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This study identifies several methods used by previous studies in analyzing the role of fintech on financial inclusion. There are nine selected articles, four articles used qualitative methods, and five articles used quantitative methods as shown in Figure 2.

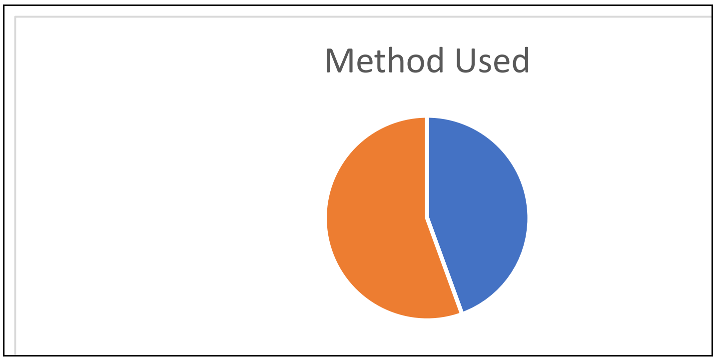


Fig. 2: Method Used by article

➢ *The results of visualization of the bibliometric network using VOSviewer*

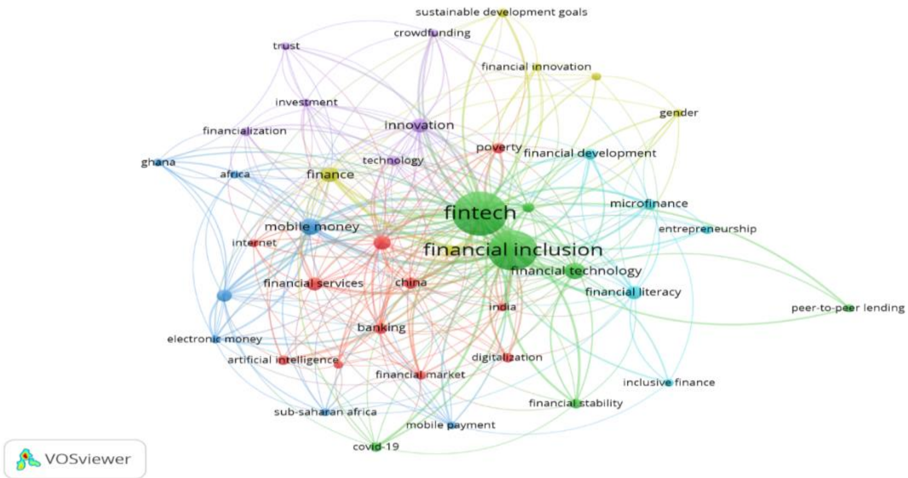


Fig. 3: Visualization of Fintech Networks and Financial Inclusions using VOS viewer

Based on the analysis using VOSviewer, 43 items were obtained, divided into 6 clusters. Cluster 1 contained 11 items, cluster 2 contained 9 items, cluster 3 contained 8 items, cluster 4 contained 7 items, cluster 5 contained 6 items, and cluster 6 contained 3 items. Topics related to fintech, and financial inclusions are closely related, and dominate connected networks. Topics related to financial services, financial systems, financial markets, digitalization, and banking topics that are connected to financial inclusion and become frequently discussed.

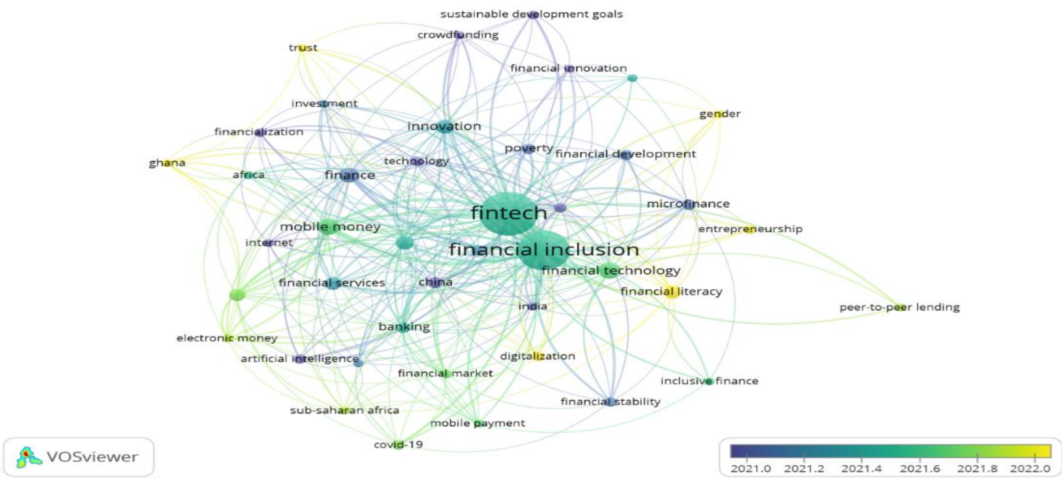


Fig. 4: Fintech and Financial Inclusions overlay visualization using VOSviewer

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Overlay mapping shows developments over time in historical research, and years of research are shown according to color in this research.

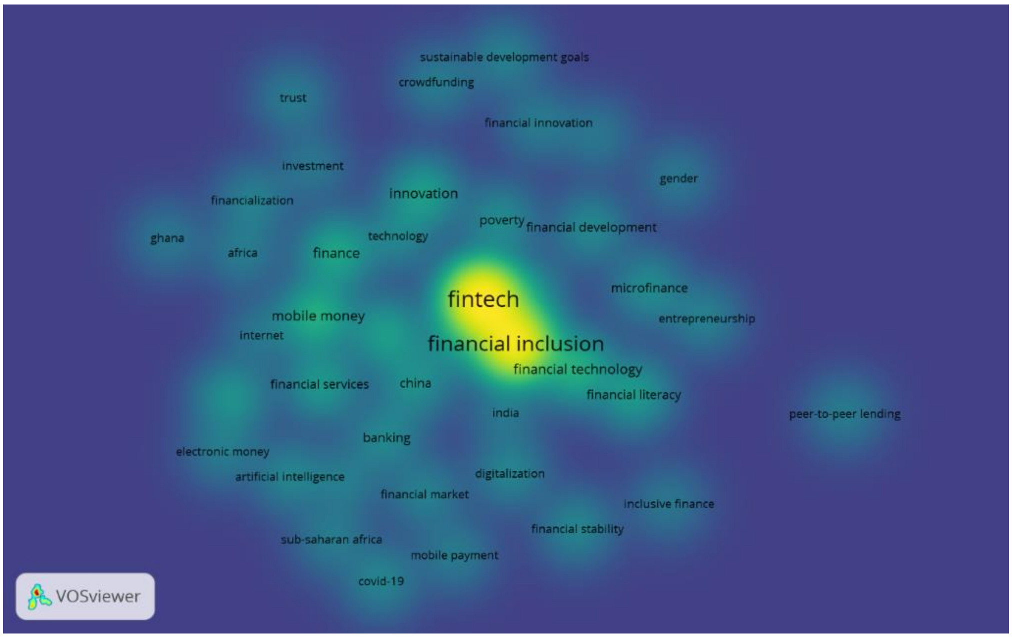


Fig. 5: Visualization of Density Fintech and Financial Inclusions using VOSviewer.

The results of the density visualization, as shown in Figure 5, can be identified as faint colors indicating topics that have not been widely discussed and become research ideas, including the topics of artificial intelligence, crowdfunding, mobile payments, peer-to-peer lending, mobile money, and financial development. Meanwhile, topics related to fintech and financial inclusion with brightly colored nodes density reflecting these topics have been extensively researched.

- *Systematic Literature Review*

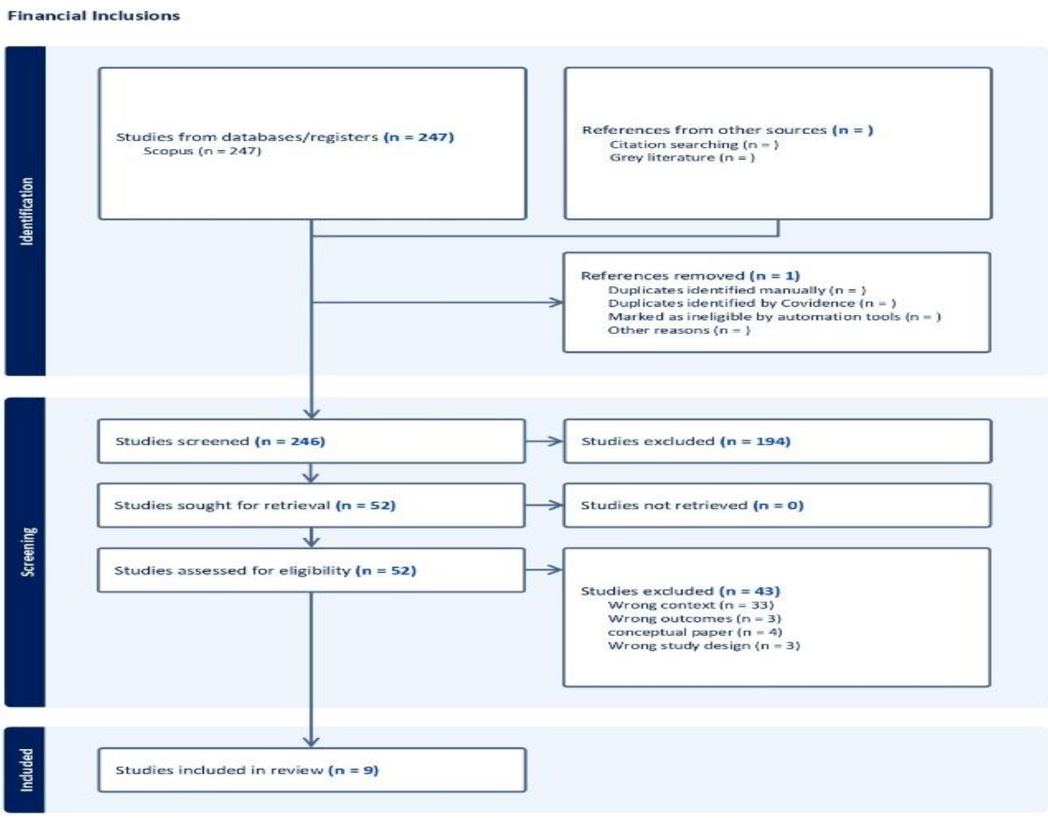


Fig. 6: Systematic Literature Review

Researchers used a series of SLR processes on the Scopus database and generated 247 publications. The total number of journals among the selected publications is 9. Figure 6 shows the journal selection process using the PRISMA flow chart, and Table 2 contains the details of the journals among the selected articles used in this study :

Table 2: Journal Details

| No | Authors | title | Years | SourceTitle |
|---|---|---|---|---|
| 1 | Vinay Kandpal, Rajat Mehrotra | Financial Inclusion: The Role of Fintech and Digital Financial Services in India | (2019) | Indian Journal of Economics & Business |
| 2 | Md. Morshadul Hasan and Lu Yajuan, Appel Mahmud | Regional Development of China's Inclusive Finance Through Financial Technology | (2020) | Sage Journals |
| 3 | Piotr Łasak | The role of financial technology and entrepreneurial finance practices in funding small and medium-sized enterprises | (2021) | Journal Of Entrepreneurship, Management And Innovation |
| 4 | Luiz Antonio Joia, Joaquim Pedro Vasconcelos Cordeiro | Unlocking the Potential of Fintechs for Financial Inclusion: A Delphi-Based Approach | (2021) | MDPI Journals |
| 5 | Shoaib Khan, Fahad Abdallah F. Alhadi | Fintech and Financial Inclusion in Saudi Arabia | (2022) | Review of Economics and Finance |
| 6 | Md. Morshadul Hasan, Lu Yajuan, Shajib Khan | Promoting China's Inclusive Finance Through Digital Financial Services | (2022) | Global Business Reviews |
| 7 | Ayse Demir, Vanesa Pesqué-Cela, Yener Altunbas & Victor Murinde | Fintech, financial inclusion and income inequality: a quantile regression approach | (2022) | The European Journal of Finance |
| 8 | Kyungha Kim | Assessing the impact of mobile money on improving the financial inclusion of Nairobi women | (2022) | Journal of Gender Studies |
| 9 | Mohammad Asif, Mohd Naved Khan,Sadhana Tiwari, Showkat K. Wani, Firoz Alam | The Impact of Fintech and Digital Financial Services on Financial Inclusion in India | (2023) | Journal of Risk and Financial Management |

*B. Discussion*

- *Approach used by previous studies in assessing the role of fintech in financial inclusion*

This study identifies the approach used by previous studies in assessing the role of fintech in financial inclusion. The aim to get an overview of the approach used so that we can assess the most suitable approach to use and as a gap for future research. The description of each method used from the 9 selected articles is as follows:

Kandpal & Rajat Mehrotra's research (2019) on the role of Fintech and digital financial services in India. In India, people have low financial awareness and literacy, this condition have an impact on slow economic growth. Most people do not have access to formal financial services. This study uses a qualitative approach with descriptive analysis methods by describing the problems affecting Fintech in India, such as low Internet penetration, many people do not even own bank accounts, lack of funds, and lack of hardware rights and proper information so that making it difficult for this new sector to grow. Next, the researcher describes descriptively the future prospects of Fintech towards financial inclusion, challenges, and opportunities for Fintech expansion.

Hasan et al research (2020), which aims to examine fintech status in China in developing financial inclusion. This study uses a qualitative approach with the systematic research process method. Previous research related to fintech was collected from reputable journals such as Scopus, Web of Science, Google Scholar, and the World Bank database. Studies related to FinTech, internet finance, digital finance, inclusive finance, rural finance, and financial inclusion are centered on this research. After selecting articles that met the criteria, the researcher conducted a content analysis of the selected articles to be used as material for discussion in the research.

Research by Lasak (2021) regarding the role of financial technology in SME financing. This research is a theoretical approach based on a narrative review of the literature. The main focus of this research is the application of financial technology in providing financing to SMEs in developing countries. There are examples of the application of financial technology and the type of technology adopted by these countries, such as Artificial intelligence used by Nigeria, Big data used by Ethiopia, Kenya, Distributed Ledger Technology (Blockchain) used by Algeria, Iran, Jordan, Lebanon, Egypt, Pakistan, Tunisia. In addition, researchers also analyze content from previous studies on the impact of financial technology and fintech-based entities

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on SME activities in developing countries. Researchers also provide gaps for further research based on the analysis results obtained.

Research by Luiz Antonio and Joaquim (2021) uses a Delphi-Based Approach to collect, analyze and combine the point of views of professionals in the field of Fintech, regarding how Fintech can affect financial inclusion in developing countries. This research analysis uses three domains that have an impact on financial inclusion. Such as the role of Fintech in serving people who do not have bank accounts in conventional finance, the role of Fintech in reducing transaction costs, and the role of Fintech in accommodating financial services to people who live in remote locations.

Research by Shoaib Khan and Fahad Abdallah F. Alhadi (2022) examines the determinants of financial inclusion, barriers to financial inclusion, and motivation for savings and loans through the formal financial sector in Saudi Arabia. This study uses a quantitative approach using probit estimation. This study uses three dependent variables to measure financial inclusion: formal accounts refer to individuals who have accounts at formal financial institutions or mobile money or alternative financial service providers. Formal savings refers to an individual using a financial institution for savings over the past 12 months. Formal credit is where the individual borrowed money from any formal financial institution in the past 12 months.

Research by Hasan et al. (2022) aims to explore digital financial services' role in financial inclusion in China. This study uses a systematic review method. In this process, there is a data coding system divided into three parts: data related to digital financial services, data related to conditions in China, and data related to inclusive finance. The data analysis process includes classification, coding, and text analysis steps. Researchers also used a self-judgment approach to the data collected based on these three criteria.

Research by Ayse Demir (2022) aims to analyze the linkages between FinTech, financial inclusion, and inequality. This research shows that financial inclusion is the primary channel through which FinTech reduces the country's income inequality. This study uses a quantitative approach with the quantile regression methodology to test the effect of financial inclusion on reducing inequality through applying fintech. In addition, researchers examine whether there are differences in the effect of financial inclusion on income inequality in countries with different incomes.

Research by Kyungha Kim (2022) regarding the impact of using mobile money in increasing inclusion among Nairobi women. Researchers used two data collection methods, questionnaire surveys and in-depth interviews. The questionnaire was carried out by collecting data related to the respondent's standard of living, economic situation, financial activity, and use of mobile money. This research was conducted from October 2016 to February 2016 in eight different districts in Nairobi. The total number of respondents reached 358 people. This quantitative data set was then digitized and analyzed using SPSS.

Research by Mohammad Asif et al. (2023) analyzes the factors to determine the impact of fintech and digital financial services on financial inclusion in India. Researchers used confirmatory factor analysis to find the most contributing factors in structural equation modeling to analyze the data. This method is used because the confirmatory factor analysis is an important part of the initial phase of this research to find the variables of financial innovation adoption. In determining whether there is an association, researchers use statistical tests. Hypothesis testing is carried out using a structural equation model.

➢ *Critical analysis of the approaches used in analyzing the role of fintech in previous studies.*

Table 3 shows the critical analysis of the approaches used in analyzing the role of fintech in previous studies.

➢ *The role of fintech in financial inclusion*

This study reveals a growing trend in research regarding the role of fintech in financial inclusion. In addition, researchers also conclude from the 9 selected studies that fintech has a significant contribution to increasing financial inclusion. This statement is proven by Asif et al. (2023), Khan & Alhadi (2022), and Hasan et al. (2020) research. Each research examines the role of fintech in Asian regions such as India, Saudi Arabia, and China. The results of this study state that the role of fintech has proven to be significant in increasing financial inclusion; people who initially had difficulty in accessing financial services, now they can get this access through fintech services. In addition, research by Łasak (2021) examines the role of fintech in funding SMEs who have difficulty getting access to financial services in developing countries such as Nigeria, Ethiopia, Kenya, Algeria, Iran, Jordan, Lebanon, Egypt, Pakistan, Tunisia also shows the conclusion that financial technology plays an essential role in driving the financial situation of SMEs and providing greater financial inclusion for these entities.

Another study by Demir et al. (2022) used data from 140 countries using the Global Findex waves of survey data for 2011, 2014, and 2017. Shows a strong relationship between fintech and financial inclusion in reducing inequality. Financial inclusion can be increased through fintech to reduce inequality in all quintiles of the distribution of inequality.

Table 3: Summary and critical analysis

| | | | | | |
|---|---|---|---|---|---|
| 1. | Shoaib Khan, Fahad Abdallah F. Alhadi2 | Probit estimation | Saudi Arabia | | In this case, Fintech startups or use of technology can solve this problem by providing cheap financial services with fast and easy access. In terms of business loans, only 7.4 percent of individuals use the formal sector to borrow for business. |
| 2. | Md. Morshadul Hasan1 Lu Yajuan, Shajib Khan1 | systematic review method of qualitative sampling | China | | In China, the mobile payment system is considered one of the best tools for the development of financial inclusion. Fintech is a major factor in their history of digital success. |
| 3. | Ayse Demir, Vanesa Pesqué-Cela, Yener Altunbas & Victor Murinde | Regression models | 140 countries based on the data Global Findex survey | | The use of FinTech can reduce income inequality, indirectly this happens because fintech can be financial inclusion. |
| 4. | Kyungha Kim | a structured questionnaire survey and in depth interviews. | Nairobi | | Mobile money has an impact in increasing financial inclusion for women in Nairobi. Adoption of mobile money can overcome some of the barriers for women in getting access to financial services. Mobile money is able to reach various types of women in Nairobi, even young women who have low levels of income and education. |

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|---|---|---|---|---|---|
| 5. | Mohammad Asif, Mohd Naved Khan,Sadhana Tiwari, Showkat K. Wani, Firoz Alam | Regression and correlation | India | Rural communities in India conclude that using fintech is a simple matter. Service fees charged by fintech are very affordable and fair. Fintech use is heavily influenced by their behavior patterns. | The variables used in this research questionnaire focus more on respondents' intentions to use fintech, while the impact of fintech on financial inclusion is only provided in 1 variable. Neglected the main purpose of this study.<br><br>Research respondents were limited to the rural sector in India, therefore cannot be generalized to assess the effect of fintech on financial inclusion in India as a whole. |

## V. CONCLUSION

Based on the results and discussion of the research, various approaches are used by previous research. From 9 articles selected based on inclusion criteria, 5 used a quantitative approach, and 4 used a qualitative approach. The most frequently used method is regression analysis; other articles are used the Delphi-based approach, probit estimation, structural equation model, systematic research process, and narrative literature review. The implication of this research for policymakers is to provide digital finance facilities for unreached areas because access to digital finance is limited in rural areas. In addition, implications for further research have been provided in the form of critical analysis to become a research gap for further research.

## REFERENCES

[1.] Asif, M., Khan, M. N., Tiwari, S., Wani, S. K., & Alam, F. (2023). The Impact of Fintech and Digital Financial Services on Financial Inclusion in India. Journal of Risk and Financial Management, 1-12.
[2.] Atkinson, A., & Messy, F.-A. (2013). Promoting Financial Inclusion through Financial Education: OECD/INFE Evidence, Policies and Practice. OECD Working Papers on Finance, Insurance and Private Pensions.
[3.] Bank of England. (2019). Embracing the promise of fintech. Quarterly Bulletin.
[4.] Demir, Ayse, Pesqué-Cela, V., Altunbas, Y., & Murinde, V. (2022). Fintech, financial inclusion and income inequality: a quantile regression approach. The European Journal of Finance, 86-107.
[5.] Demirgüç-Kunt, A., Klapper, L., Singer, D., & Ansar, S. (2021). The Global Findex Database 2021. Washington: The World Bank.
[6.] Evans, J., & Browning, S. (2021). Fintech: a guide to financial technology. Briefing Paper.
[7.] Hasan, M. M., Yajuan, L., & Khan, S. (2022). Promoting China’s Inclusive Finance Through Digital Financial Services. Global Business Review, 984–1006
[8.] Hasan, M. M., Yajuan, L., & Mahmud, A. (2020). Regional Development of China’s Inclusive Finance Through Financial Technology. Sage Open, 1-16.
[9.] Hussain, S., & Rasheed, A. (2023). Financial inclusion based on financial technology and risky behaviour of micro-finance institutes: evidence from South Asian micro-finance banks. Emerald Publishing Limited.
[10.] Joia, L. A., & Pedro, J. (2021). Unlocking the Potential of Fintechs for Financial Inclusion: A Delphi-Based Approach. MDPI Journal:Sustainability, 1-19.
[11.] Kandpal, V., & Mehrotra, R. (2019). Financial Inclusion: The Role of Fintech and Digital Financial Services In India. Indian Journal of Economics & Business, 85-93.
[12.] Khan, S., & Alhadi, F. A. (2022). Fintech and Financial Inclusion in Saudi Arabia. Review of Economics and Finance, 857-866.
[13.] Kyungha, K. (2022). Assessing the impact of mobile money on improving the financial inclusion of Nairobi women. Journal of Gender Studies, 306–322.
[14.] Łasak, P. (2021). The role of financial technology and entrepreneurial finance practices in funding small and medium-sized enterprises. Journal of Entrepreneurship, Management and Innovation, 1-23.
[15.] Morgan, P. J., Zhang, Y., & Kydyrbayev, D. (2018). Overview Of Financial Inclusion, . ADBI Working Paper Series, Asian Development Bank Institute..
[16.] United Nations Office for the Coordination of Humanitarian Affairs. (2020, March 4). Relief Web. Retrieved from News and Press Release : https://reliefweb.int/report/world/11-top-causes-global-poverty
[17.] Velazquez, P. V., Bobek, V., Vide, R. K., & Horvat, T. (2022). Lessons from Remarkable FinTech Companies for the Financial Inclusion in Peru. Journal of Risk and Financial Management, 1-46.
[18.] Inclusive Finance Through Financial Technology. Sage Open, 1-16.
[19.] Hussain, S., & Rasheed, A. (2023). Financial inclusion based on financial technology and risky behaviour of micro-finance institutes: evidence from South Asian micro-finance banks. Emerald Publishing Limited.
[20.] World Bank. (2022, March 29). Financial inclusion is a key enabler to reducing poverty and boosting prosperity. Retrieved from The World Bank: https://www.worldbank.org/en/topic/financialinclusion/overview
[21.] Xiao, y., & Watson, M. (2019). Guidance on Conducting a Systematic Literature Review. Journal of Planning Education and Research, 93-112.