

Economic and Business Horizon

ISSN: 2963-2765

Economic and Business
Horizon

Volume: 04

Issue: 02

Year: 2025

Page: 415-430

Citation:

Makusara, K., Widiastuti,
C. A., Pangestuti, I. R. D.,
& Mawardi, W. (2025).

Optimizing financial
inclusion through mobile
banking and digital wallet
during COVID-19
pandemic. *Economic and
Business Horizon*, 4(2), 415-
430.

Optimizing Financial Inclusion through Mobile Banking and Digital Wallet during COVID-19 Pandemic

Kumaralalita Makusara^{1*}, Cahyaning Ajeng Widiastuti¹, Irene Rini Demi
Pangestuti¹, Wisnu Mawardi¹

¹Universitas Diponegoro, Semarang, Central Java, Indonesia

* Corresponding author: Kumaralalita Makusara (kumaralalita.makusara@gmail.com)

Abstract

The COVID-19 pandemic has greatly affected multiple sectors in Indonesia, particularly the financial sector. Amidst economic uncertainty, financial inclusion is crucial to support economic recovery and community welfare. Mobile banking and digital wallets have emerged as effective solutions in improving financial inclusion, facilitating wider access to financial services for people, especially in remote areas. This research uses the journal review method, by analyzing various research sources related to the role of mobile banking and digital wallets in improving financial inclusion in Indonesia during the pandemic. The findings show that digital financial technology has accelerated the process of financial inclusion, with positive impacts on economic sustainability. By enabling easier and safer access to finance, mobile banking and digital wallets support the achievement of sustainability goals through reducing social and economic inequality. This research contributes to a better understanding of the potential of digital technology in supporting sustainable financial inclusion, and its implications for public policy in Indonesia.

Keywords

Financial Inclusion, Financial Technology, Mobile Banking

1. Introduction

Financial inclusion is an important step in realizing a country's social and economic welfare. Financial inclusion refers to equitable access to financial services needed by all levels of society, especially those who have previously been marginalized (Badra et al., 2025; Saeed & Donkoh, 2024). Financial inclusion is increasingly gaining attention for developing countries in providing opportunities for people to gain access to financial products such as savings, credit, insurance, and investment, which can help improve their quality of life. Based on OJK, the level of financial inclusion in Indonesia has continued to show an increase over the past 11 years, with a significant increase from 2019 to 2022, amounting to 8.91%. This increase is also driven by the growing financial literacy, which is reflected in the increase of 11.65% during the COVID-19 pandemic. Financial literacy is an important basic knowledge in choosing financial products and services as an effort to improve economic welfare (Carè et al., 2025).

Based on WHO's appeal in handling the spread of the Covid-19 virus, the government must establish a health protocol policy, provide health facilities and implement a social distancing policy which has developed into a Large-Scale Social Restriction in several regions in Indonesia, especially areas that are vulnerable to the Coronavirus. The policies issued have changed people's behavior during the Covid-19 pandemic, especially in transactions (Nandru et al., 2023). The impossibility of using offline financial services, and the public's desire to use safer payment methods to maintain health during a pandemic, so that this encouraged bankers to consider creative, modern and digital-based payment methods (Melamedov, 2020).

Financial technology is an innovation in the financial sector that utilizes digital technology to create more efficient, inclusive, and easily accessible financial services (Sung et al., 2019; Thakor, 2020; Wójcik, 2021). By combining the disciplines of finance, technology management, and innovation to provide better financial solutions, it helps drive economic growth and financial inclusion (Iman, 2020). FinTech provides easy access to financial services for people who have had difficulty accessing financial services (Junarsin et al., 2023). Based on a survey conducted by Populix in 2021, it showed that there were two financial technologies used by the Indonesian people during the pandemic namely Mobile banking and E-wallet. The increase in the use of Mobile banking and e-wallet is due to its simplicity, direct connection to e-commerce and easy to use. On the other hand, the use of financial technology during the pandemic has increased compared to pre-pandemic conditions due to prevention and avoidance of health risks in the spread of the virus (Aji et al., 2020; Alwi et al., 2021). The Covid-19 outbreak has strengthened the spread of digital financing in countries with low financial inclusion (Siddika et al., 2023).

The use of mobile banking and e-wallets has not only increased during the COVID-19 pandemic, but also shows potential for sustainability after the pandemic ends. The use of m-banking in transactions helps users to transfer money, pay bills, and save safely using mobile phones (Del Sarto & Ozili, 2025). Several studies Siano et al. (2020) show that mobile banking is a major vector of financial inclusion in many developing countries, allowing for reduced transaction costs and bad debts, thereby increasing the efficiency of microfinance institutions. The results of the study Salman et al. (2024) show that E-wallets increase financial inclusion by providing easy and efficient access to people, especially in remote areas, to conduct financial transactions without relying on physical infrastructure, thereby encouraging participation in the formal economy. In addition, the use of e-wallets is the most widely used payment solution today (Putra et al., 2024). With ease of use and the role of government support, it influences the intention to use e-wallets as a payment method during Covid-19 (Aji et al., 2020).

Technological change is a gradual process over the medium term, and external disruptions like pandemics can speed up the adoption of financial innovations, amplifying their influence on the financial industry's structure (Boot et al., 2021). However, not everyone or every consumer is able to quickly adjust to digital financial products and services. Access to physical infrastructure, a solid financial framework, and sufficient financial resources are necessary for consumers to effectively utilize digital financial services (Khera et al., 2021). Confidence in the security of witness transactions carried out is a driving factor for people to use digital payment services during the pandemic (Nandru et al., 2023). Through financial literacy helps someone in increasing awareness of the benefits and practical use of fintech services that continue to grow (Siddika et al., 2023). Combining digital financial tools and financial literacy, the unbanked can have access to financial services and escape poverty (Ezzahid & Elouaourti, 2021).

This article aims to analyze how mobile banking and e-wallets can improve financial inclusion in Indonesia during the COVID-19 pandemic. Using an analytical approach, this article evaluates the driving factors that influence the use of both financial technologies and the barriers faced by the community in adopting them. The focus of this article is on the impact of financial technology on the structural changes of the financial industry in Indonesia during the pandemic, and how these technologies can accelerate more inclusive financial access. This research provides insights into the important role of mobile banking and e-wallets in supporting more inclusive and sustainable economic growth, especially in challenging times such as the COVID-19 pandemic.

2. Literature Review

FinTech refers to innovative financial products and services, and includes products such as cryptocurrencies, digital payment platforms, insurance products, and remittances, that use specialized software and algorithms deployed on computers and smartphones (Olaoye et al., 2025). By leveraging internet-enabled mobile devices, fintech facilitates the ease of saving, remitting, borrowing, and investing for underserved communities (Ebuka Ezenwafor et al., 2022; Lyons et al., 2022). Fintech to drive financial inclusion, provides insights into how these technologies can be optimized to drive economic empowerment and sustainable development (Carè et al., 2025). The development of digital technologies in financial services has given rise to digital finance, a crucial driver for financial institutions with the potential to revolutionize finance, the economy, and society (Siddika et al., 2023).

Financial inclusion is an important factor in economic growth in a country (Fundji, 2024). Financial inclusion provides great benefits to groups that are usually excluded such as the poor, rural communities, women, or young people, with effective policies (Del Sarto & Ozili, 2025). The policies in question include reducing account fees, increasing proximity to services, ensuring stronger legal rights, and maintaining political stability (Farah et al., 2018). So that making financial inclusion one of the 17 SDGs, and 169 targets set to help realize the sustainable development agenda by 2030. Economic growth driven through financial inclusion enables unbanked communities to access savings, investment, and insurance facilities (Morgan, 2022). To increase household income and reduce income inequality (Ibrahim & Aliero, 2020).

Financial literacy refers to an individual's ability to comprehend and make informed decisions regarding their financial matters, which includes the knowledge, skills, attitudes, and behaviors needed to make the right financial decisions (Kodongo, 2018). The development of financial technology in helping consumers from traditional banking transactions to sophisticated digital financial devices. Making financial literacy an important solution in increasing awareness of the

benefits and practical use of the ever-growing fintech services (Anagreh et al., 2024; Siddika et al., 2023). The results of the study showed that financial literacy and high levels of education reduce barriers that lead to voluntary exclusion (Ezzahid & Elouaourti, 2021; Mothobi & Kebotsamang, 2024.) So that through financial literacy, a person understands complex financial products and has an impact on increasing demand for formal and informal financial products, which ultimately contributes to increasing financial inclusion (Khan et al., 2022).

Intelligent financial services offer easy and adaptable access to the banking system via smart devices (Ezzahid & Elouaourti, 2021; Tawfik et al., 2024; Yaseen et al., 2022). The increasing growth of mobile banking helps in creating potential in offering social benefits, developing creative and financial income opportunities for users (Rey-Ares et al., 2021). for individuals with limited income and small businesses, allowing them to take part in financial transactions without having to bear exorbitant costs (Anagreh et al., 2024). Because the use of mobile banking aims to help in reducing transaction costs, increasing transparency, and improving the efficiency of the financial system, thereby driving economic growth and reducing poverty (Del Sarto & Ozili, 2025; Tawfik et al., 2024). Access to affordable financial services and credit is a significant catalyst for economic development and growth, especially for marginalized populations. (Durai et al., 2019; Calderón & Ruiz, 2015).

E-wallet is one of the cashless payment methods is server-based payment or digital payment (Sardana & Singhanian, 2018). Mobile wallets play an important role in driving financial inclusion in rural areas by expanding access to banking and payment services and reducing financial disparities (Ghouse et al., 2024). Findings in Indonesia show that the use of digital payments in rural areas is increasing every day in the digital era. The application of this financial technology by rural residents is very important to achieve acceptance of electronic payments in rural areas (Kadek Sutresna et al., 2023). E-wallets can facilitate traditional payment methods like card payments, electronic transfers, and e-money, as well as newer products like CBDCs and stablecoins (Hollanders & Marc, 2020). by using an electronic wallet makes users much more independent about their financial choices because they can see all records and spending patterns in real time (Rahman et al., 2022; Sophia Bukhari, 2023).

3. Methods

This study uses a Systematic Literature Review (SLR) approach to identify, assess, and analyze relevant research on the topic with specific research questions. This approach was chosen because of its ability to provide specific answers to research questions and to explore certain topics or phenomena in depth. So that researchers use the SLR system in studying the function of mobile banking and e-wallet in increasing financial inclusion in Indonesia during the Covid-19 pandemic. Data were collected using the Watase Uake platform from the Scopus database, the keywords used in this study are: Financial Inclusion, Financial Technology, Mobile Banking. By applying predetermined keywords and criteria. The search was carried out within a certain time period, namely from 2020 to 2025 to obtain articles that match the topic and objectives of the study. The data that has been collected will be tabulated, compared and then analyzed to obtain conclusions. The identified journals are internationally indexed journals using English. with the Scopus database. from Q1 to Q3 based on the Scopus ranking index.

4. Results

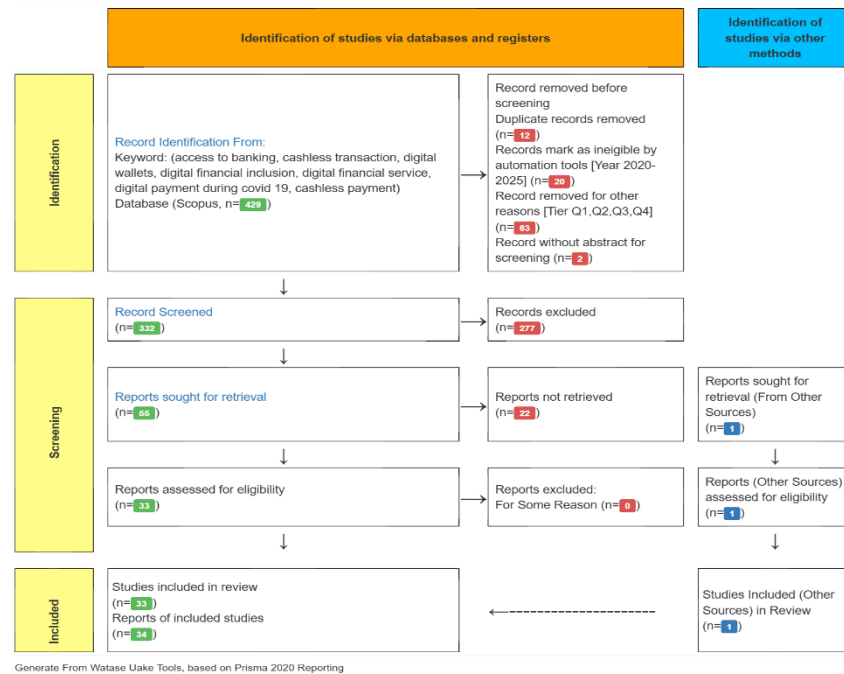


Figure 1. Prisma Analysis Report

Based on the search results obtained using the specified keywords, it resulted in 429 articles which were then selected and found as many as 34 articles. From the articles that fit the criteria, there are 33 articles that come from the Watase Uake tools and the sides are obtained from outside the tools. Furthermore, 22 articles did not pass the screening on the Watase Uake site. From the articles that have been obtained, the researcher conducted a descriptive analysis.

In the article screening stage based on the established criteria, 55 articles from 2020-2025 relevant to the systematic literature review topic were obtained, as shown in Table 2. Furthermore, 22 articles failed to meet the screening criteria on the Watase Uake website. Table 1 shows the journals where these articles were published.

Tabel 1. Journal Publications

Journal Name	Number of Paper	Journal Rank	H-Index	Publisher
Sustainability (Switzerland)	1	Q1	207	Multidisciplinary Digital Publishing Institute (MDPI)
F1000Research	1	Q1	119	F1000 Research Ltd
International Journal of Bank Marketing	1	Q1	113	Emerald Group Publishing Ltd
Internet Research	1	Q1	118	
Frontiers in Environmental Science	1	Q1	91	Frontiers Media SA
Emerging Markets Review	1	Q1	75	Elsevier B.V.
Journal of Open Innovation: Technology, Market, and Complexity	2	Q1	63	

Journal Name	Number of Paper	Journal Rank	H-Index	Publisher
Proceedings of the ACM on Human-Computer Interaction	1	Q1	77	Association for Computing Machinery
Electronic Markets	1	Q1	63	Springer Verlag
Electronic Commerce Research	1	Q1	58	Kluwer Academic Publishers
Journal of Behavioral and Experimental Finance	1	Q1	46	Elsevier B.V.
International Journal of Central Banking	1	Q1	41	Association of the International Journal of Central Banking
Journal of Asia Business Studies	1	Q1	37	Emerald Group Publishing Ltd
Journal of Financial Reporting and Accounting	1	Q1	33	
International Journal of Financial Studies	1	Q2	306	Multidisciplinary Digital Publishing Institute (MDPI)
International Journal of Environmental Research and Public Health	1	Q2	229	
Journal of Consumer Policy	1	Q2	63	SpringerNew York
Digital Policy, Regulation and Governance	1	Q2	43	Emerald Publishing
International Journal of Data and Network Science	1	Q2	40	Growing Science
Journal of Advances in Management Research	1	Q2	39	Emerald Group Publishing Ltd.
Journal of Science and Technology Policy Management	1	Q2	35	
Journal of Financial Services Marketing	2	Q2	34	Palgrave Macmillan Ltd.
Journal of Indian Business Research	1	Q2	33	Emerald Group Publishing Ltd
Electronic Journal of Information Systems in Developing Countries	1	Q3	51	John Wiley and Sons Inc
De Economist	1	Q3	36	Springer
International Journal of Pervasive Computing and Communications	1	Q3	25	Emerald Group Publishing Ltd.
Zhournal Novoi Ekonomicheskogo Associacii	1	Q3	13	New Economic Association
International Journal of Computing and Digital Systems	1	Q3	19	University of Bahrain

Tabel2.JournalPublications

NO	Reference	Result
1.	Cashless payments beyond access: What influences the intensity of use? (Bongomin et al., 2023)	The use of cashless payments is greatly influenced by the perception of benefits felt by consumers, such as transaction speed, cashback, and convenience. The study found that individuals who consider cashless payments more beneficial, have higher monthly expenses tend to use cashless payments more than 50%.
2.	Switching from Cash to Cashless Payments during the COVID-19 Pandemic and Beyond	The COVID-19 pandemic has prompted Europeans to shift from cash to non-cash payments due to concerns about the risk of transmitting the virus through money. This habit was formed during the lockdown and is likely to continue after the pandemic.
3.	Continuance intention to use digital payments in mitigating the spread of COVID-19 virus (Chaveesuk et al., 2022)	To avoid the transmission of infectious diseases and prevent COVID-19, Perceived Ease of Use of digital payment systems, User Satisfaction and Attitude influence Continuation Intention to use.
4.	Digital Financial Inclusion: Covid-19 Pandemic as a Catalyst for Adoption (Siddika et al., 2023)	The Covid-19 pandemic has expedited the adoption of digital financial services, particularly in emerging economies. The main driving factors are the need for remote transactions and government support.
5.	Six Feet Apart: Online Payments During the COVID-19 Pandemic (Shaikh et al., 2022)	The pandemic has accelerated the adoption of digital payment methods across a wide range of audiences, including age groups that were previously less familiar with online payment technology. social distancing and concerns about virus transmission through cash or physical payment devices.
6.	E-Wallet: A Study on Cashless Transactions Among University Students, (Chelvarayan et al., 2022)	The occurrence of covid 19 among students in Malaysia, proves the use of e-wallets is increasing. Ease of use, reduced risk of spreading viruses from money, and trust
7.	Mobility restrictions and payment choices: The case of the Covid-19 pandemic, (Carbó-Valverde et al., 2023)	The pandemic appears to have accelerated the transition to a cashless society, Lockdowns, travel restrictions and business closures were imposed across the world, which governments had to implement to limit the spread of the virus.
8.	How Does Digital Payment Transform Society as a Cashless society? An empirical study in the developing economy, (Bhuiyan et al., 2024)	Perceived ease of use, personal innovativeness, and perceived usefulness have a positive impact on individual attitudes toward adopting digital payment methods.
9.	I won't touch money because it is dirty: examining customer's loyalty toward M-payment (Goel et al., 2022)	The study concludes that trust and intimacy play an important role in building loyalty towards M-payment. Perceived usefulness also influences loyalty, although not always directly. User satisfaction also strengthens loyalty towards mobile payment services.
10.	Sustainable Economic Development, Digital Payment, and Consumer Demand: Evidence from China	that digital payments play an important role in increasing consumer demand and supporting sustainable economic development, especially in the context of the COVID-19 pandemic.

NO	Reference	Result
	(Zhou, 2022)	
11.	Financial Technology in Recovery: Behavioral Usage of Payment Systems by Indonesian MSMEs in the Post-Pandemic Era (Firstian Aldhi et al., 2024)	This study found that performance expectations, business expectations, and social influence influence the intention of Indonesian MSMEs to adopt FinTech payment systems post-pandemic.
12.	Covid-19 and mobile payment in Belgium: Closing the digital divide or just for the young, social, and impulsive? (Hellemans et al., 2023)	The study found that mobile payment adoption in Belgium increased after the COVID-19 pandemic, but was still influenced by factors such as age, social status, and impulse buying tendencies. The use of social media, especially Instagram and Facebook, also influenced the adoption of digital payments.
13.	Adoption of digital money (e-wallet) in the post COVID-19 era: The moderating role of low distribution charges and low transit time in impulsive buying: A developing country perspective (Wei et al., 2023)	concluded that digital wallet (e-wallet) adoption is positively associated with impulse buying in Pakistan post-COVID-19.
14.	FinTech and the COVID-19 pandemic: Evidence from electronic payment systems (Tut, 2023)	Based on this study, it can be concluded that the COVID-19 pandemic accelerated the adoption of FinTech in Kenya, particularly in the use of mobile banking for payment transactions.
15.	A framework for measuring the adoption factors in digital mobile payments in the COVID-19 era (Jegerson & Hussain, 2023)	findings show that 18 sustainability factors influence digital payment adoption, providing insights for policy makers and service providers to encourage wider adoption.....
16.	Effect of digital banking-related customer experience on banks' financial performance during Covid-19: a perspective from Vietnam (Hunget al., 2025)	revealed that after the pandemic, acceptance of digital payment systems has increased, but there needs to be an increase in supporting facilities and policies so that this adoption is more evenly distributed and optimal.
17.	Determinants of youth financial inclusion in MENA countries: account holding versus the use of digital services (Berguiga & Adair, 2024)	These findings provide important insights for policies that support the adoption of digital technologies in the MSME sector in the post-pandemic era.
18.	Godigital: can the money-gift function promote the use of e-wallet apps? (Limet al., 2022)	This study concludes that the money-gift feature in e-wallet applications can increase continued use by increasing cognitive absorption and positive user perceptions of the ease and usefulness of the application.
19.	Role of perceived countries' advantages of cashless economy in behavioral intentions of using cashless transactions: an empirical analysis (Raj Letal., 2020)	The study found that factors like ease of use, usefulness, social influence, and trust impact the intention to adopt cashless transactions. Additionally, new elements such as the reduction of economic violations and economic security also play a significant role in the adoption of digital payment systems.
20.	Investigating Customer	that ease of use, usability, and security have a positive

NO	Reference	Result
	Behavior of Using Contactless Payment in China: A Comparative Study of Facial Recognition Payment and Mobile QR-Code Payment (Zhong & Moon, 2022)	effect on user satisfaction and post-adoption behavior in contactless payments. QR-code users are more satisfied and tend to use the service more.
21.	The Effectiveness of Centralized Payment Network Advertisements on Digital Branding during the COVID-19 Crisis (Sakas et al., 2022)	This study shows that digital advertising and web analytics increased the brand visibility of centralized payment systems during the COVID-19 crisis, with higher organic traffic and global rankings strengthening branding strategies and supporting corporate sustainability.
22.	The Global Pandemic, Laboratory of the Cashless Economy? (Srouji & Torre, 2022)	The COVID-19 pandemic has accelerated the global adoption of digital payments, with both developed and developing countries increasing the use of cashless systems. Despite infrastructure challenges, central banks in some countries, such as China, are accelerating the development of digital currencies. However, fragmentation remains in the global payments system.
23.	The digital payment-financial inclusion nexus and payment system innovation within the global open economy during the COVID-19 pandemic (Niankara & Traoret, 2023)	that digital financial inclusivity and contactless payment systems increased during the COVID-19 pandemic
24.	Customer Attitude toward Digital Wallet Services (Ilieva et al., 2023)	These findings highlight the importance of policies that support digitalization and technological infrastructure to facilitate FinTech adoption among MSMEs.
25.	An Empirical Analysis of Cashless Payment Systems for Business Transactions (Rahman et al., 2022)	This research provides insights for businesses to better understand the factors that support the adoption of digital payment technologies.
26.	An empirical study to explore the influence of the COVID-19 crisis on consumers' behaviour towards cashless payment in Malaysia (Lu & Kosim, 2024)	The study also highlights the importance of changing consumer perceptions of cashless payments during the pandemic, which accelerated the transition to using digital technology for transactions.
27.	Determinants of Trust in Banks' Payment Services During COVID: An Exploration Using Daily Data (Bijlsma et al., 2022)	The study found that trust in bank payment services was influenced by the phase of the COVID-19 pandemic, with higher trust during the first lockdown.
28.	Financial Vulnerability, Financial Literacy, and the Use of Digital Payment Technologies (Seldal & Nyhus, 2022)	This study shows that digital payment technology can increase financial vulnerability, especially among young people and individuals with low financial literacy.
29.	Wallet wars or digital public infrastructure? Orchestrating a digital identity data ecosystem from a government perspective	government orchestration in the digital identity ecosystem is critical to creating value between the public and private sectors

NO	Reference	Result
	(Degen&Teubner,2024)	
30.	Factors influencing the adoption of cashless transactions during COVID-19: an extension of enhanced UTAUT with pandemic precautionary measures (Raj Letal.,2020)	This study is that the COVID-19 pandemic has accelerated the adoption of cashless transactions (CLT), with factors such as performance expectations, ease of use, social influence, and trust being key drivers.
31.	What insisted baby boomers adopt unified payment interface as a payment mechanism ? an exploration of drivers of behavioral intention (Saha & Kiran, 2022)	found that factors such as performance expectations, social influence, ease of use, and perceived security are the main drivers for baby boomers to adopt UPI (Unified Payment Interface) as a payment method, especially during the COVID-19 pandemic.
32.	Does the cashless transaction work? An analysis of policy challenges in an emerging economy (Panda et al., 2022)	In India, the use of financial transactions during the pandemic has begun to be implemented, although there are still those who oppose it.
33.	How do digital technologies influence the dynamic capabilities of micro and small businesses in a pandemic and low-income country context? (Owoseni et al., 2022)	These findings provide insights into how MSMEs can leverage dynamic capabilities and digital technologies to adapt and thrive post-pandemic, and suggest policies that support digital innovation and entrepreneurial growth in developing countries.

5. Discussion

This study demonstrates that the COVID-19 pandemic has accelerated the adoption of mobile banking and digital wallets, which play a crucial role in driving financial inclusion in Indonesia. These findings are consistent with previous research showing that changes in consumer behavior, driven by concerns about virus transmission through cash transactions, prompted individuals to switch to digital payment methods (Gallo, 2023; Shaikh et al., 2022). Furthermore, the ease of use, transaction speed, and convenience of digital payment methods were key factors influencing the widespread adoption of cashless payments (Bongomin et al., 2023). This shift was not limited to younger demographics but also extended to older age groups who were previously less familiar with digital payment technologies (Shaikh et al., 2022).

However, despite the increase in adoption, several barriers continue to affect the speed and extent of technology uptake. One of the major obstacles is low digital literacy, particularly among older generations and those in remote areas. As Seldal and Nyhus (2022) point out, low financial literacy increases financial vulnerability, especially among individuals unfamiliar with digital payment technologies. Additionally, infrastructure factors such as internet connectivity and the availability of digital devices pose significant barriers to broader adoption (Siddika et al., 2023).

Moreover, this study highlights the important role of government support in facilitating the adoption of these technologies through policies and digital infrastructure initiatives (Ekaputri et al., 2024). Government-driven programs, such as subsidies for mobile banking platforms and e-wallets, have successfully accelerated financial inclusion, particularly in previously underserved areas (Aji et al., 2020; Carbó-Valverde et al., 2023). This support has also enhanced user trust in the security of digital transactions, a key driver of long-term adoption (Goel et al., 2022).

The adoption of mobile banking and digital wallets has had a significant impact on economic empowerment, particularly for Micro, Small, and Medium Enterprises (MSMEs). These technologies enable MSMEs to access banking services without relying on limited physical infrastructure, thus fostering economic growth (Firstian Aldhi et al., 2024). Additionally, the efficiency resulting from reduced transaction costs and increased financial transparency helps small businesses survive and thrive amid economic crises (Del Sarto & Ozili, 2025).

However, to ensure more widespread adoption, particularly among marginalized groups, further efforts are needed to improve digital literacy and infrastructure in underdeveloped regions. For example, research by Wei et al. (2023) shows that the use of digital wallets accelerates impulse buying transactions, indicating that consumers are increasingly reliant on digital payment technologies for convenience (Prasta, 2024). With better literacy, people will be better equipped to fully utilize the potential of these technologies, reducing access inequalities and increasing economic participation.

Moving forward, it is crucial for policymakers to continue developing policies that support financial technology innovation while considering the social and economic factors affecting the adoption of these technologies (Ferdiansyah & Sudarso, 2024). Adequate infrastructure availability and comprehensive financial literacy programs will be key to creating sustainable financial inclusion. As Raj et al. (2020) highlighted, factors such as ease of use, security, and social influence will continue to affect people's intentions to adopt digital payment technologies, and policies supporting these factors will be essential for expanding financial inclusion.

6. Conclusion

The COVID-19 pandemic has acted as a catalyst for the accelerated digital transformation in the financial sector, particularly in driving financial inclusion using mobile banking and digital wallets. This study shows that the limitations on physical mobility during the pandemic have encouraged society, including groups that previously lacked access to formal financial services, to switch to digital financial solutions.

Mobile banking and digital wallets have proven to provide faster, cheaper, and more inclusive access to financial services, especially for people in remote areas and low-income groups. Technological innovation, collaboration between the public and private sectors, and the enhancement of digital financial literacy have been key factors in optimizing the role of this technology.

However, significant challenges remain, such as digital infrastructure gaps, low levels of digital and financial literacy, and data security issues that need to be addressed systematically. Therefore, to optimize sustainable financial inclusion, an integrated approach is needed, including adaptive regulatory policies, strengthening digital infrastructure, and educational programs targeting vulnerable groups. Thus, the COVID-19 pandemic has not only been a crisis but also a strategic opportunity to accelerate financial inclusion through the more equitable and sustainable use of digital financial technology across all levels of society.

References

- Aji, H. M., Berakon, I., & Md Husin, M. (2020). COVID-19 and e-wallet usage intention: A multigroup analysis between Indonesia and Malaysia. *Cogent Business & Management*, 7(1), 1804181.
- Aldhi, I. F., Suhariadi, F., Supriharyanti, E., Rahmawati, E., & Hardaningtyas, D. (2024). Financial technology in recovery: Behavioral usage of payment systems by Indonesian MSMEs in the post-pandemic era. *International Journal of Computing and Digital Systems*, 16(1), 1329-1341.

- Anagreh, S., Al-Momani, A. A., Maabreh, H. M. A., Sharairi, J. A., Alrfai, M. M., Haija, A. A. A., ... & Al-Hawary, S. I. S. (2024). Mobile payment and digital financial inclusion: a study in Jordanian banking sector using unified theory of acceptance and use of technology. In *Business Analytical Capabilities and Artificial Intelligence-Enabled Analytics: Applications and Challenges in the Digital Era, Volume 1* (pp. 107-124). Cham: Springer Nature Switzerland.
- Badra S., Ja n, S., & V chore, S. (2025). Fintech and financial incuse on conceptual foundations and research landscape. In *Global Knowledge, Memory and Commun cat on*. Emerald Publishing.
- Berguiga, I., & Adair, P. (2025). Determinants of youth financial inclusion in MENA countries: account holding versus the use of digital services. *Journal of Financial Reporting and Accounting*, 23(2), 550-574.
- Bijlsma, M., van der Cruijssen, C., & Koldijk, J. (2022). Determinants of trust in banks' payment services during COVID: An exploration using daily data. *De Economist*, 170(2), 231-256.
- Boot, A., Hoffmann, P., Laeven, L., & Ratnovski, L. (2021). Fintech: what's old, what's new?. *Journal of financial stability*, 53, 100836.
- Bukhari, S. S. (2023). Digital Payment Adoption in India and Pakistan: A Comparative Analysis. *Focus*.
- Carbó-Valverde, S., Cuadros-Solas, P. J., Rodríguez-Fernández, F., & Sánchez-Béjar, J. J. (2023). Mobility restrictions and payment choices: The case of the Covid-19 pandemic. *Journal of Behavioral and Experimental Finance*, 40, 100850.
- Carè, R., Boitan, I. A., Stoian, A. M., & Fatima, R. (2024). Exploring the landscape of financial inclusion through the lens of financial technologies: A review. *Finance Research Letters*, 106500.
- Chaveesuk, S., Khalid, B., Bsoul-Kopowska, M., Rostańska, E., & Chaiyasoonthorn, W. (2022). Comparative analysis of variables that influence behavioral intention to use MOOCs. *Plos one*, 17(4), e0262037.
- Chelvarayan, A., Yeo, S. F., Yi, H. H., & Hashim, H. (2022). E-wallet: a study on cashless transactions among university students. *F1000Research*, 11, 687.
- Degen, K., & Teubner, T. (2024). Wallet wars or digital public infrastructure? Orchestrating a digital identity data ecosystem from a government perspective. *Electronic Markets*, 34(1), 50.
- Del Sarto, N., & Ozili, P. K. (2025). FinTech and financial inclusion in emerging markets: a bibliometric analysis and future research agenda. *International Journal of Emerging Markets*, 20(13), 270-290.
- Durai, T., & Stella, G. (2019). Digital finance and its impact on financial inclusion. *Journal of Emerging Technologies and Innovative Research*, 6(1), 122-127.
- Ekaputri, A. M., Dani, A. N., Sukresna, I. M., & Indriani, F. (2024). Customer Interest in Saving with Easy Mobile Banking to Support Green Marketing. *Research Horizon*, 4(4), 233-238.
- Ezenwafor, E. C., Ayodele, A. A., & Esiti, B. G. (2022). E-service quality dimensions and customer satisfaction among users of automated saving platforms in a typical developing economy. *World Review of Entrepreneurship, Management and Sustainable Development*, 18(5-6), 566-580.
- Ezzahid, E., & Elouaourti, Z. (2021). Financial inclusion, mobile banking, informal finance and financial exclusion: micro-level evidence from Morocco. *International Journal of Social Economics*, 48(7), 1060-1086.
- Farah, M. F., Hasni, M. J. S., & Abbas, A. K. (2018). Mobile-banking adoption: empirical evidence from the banking sector in Pakistan. *International Journal of Bank Marketing*, 36(7), 1386-1413.
- Ferdiansyah, F., & Sudarso, A. P. (2024). The Influence of Service Quality and Brand Trust on Brand Image and Its Implications on Panin Bank Customer Loyalty in the Use of Mobile Banking. *Economic and Business Horizon*, 3(2), 11-24.
- Fundji, O. J. (2024). The impact of financial inclusion on economic growth based on East, West and Southern Africa. *International Journal of Economics and Financial Issues*, 14(5), 203-209.
- Gallo, A. (2023). What is psychological safety. *Harvard Business Review*, 15(02), 2023.

- Ghouse, S. M., Shekhar, R., & Chaudhary, M. (2025). Driving financial inclusion: exploring mobile wallet adoption among rural Omani millennials. *Journal of Islamic Marketing*, 16(4), 1229-1257.
- Goel, P., Garg, A., Sharma, A., & Rana, N. P. (2022). I won't touch money because it is dirty: examining customer's loyalty toward M-payment. *International Journal of Bank Marketing*, 40(5), 992-1016.
- Hellemans, J., Willems, K., & Brengman, M. (2023). Covid-19 and mobile payment in Belgium: Closing the digital divide or just for the young, social, and impulsive?. *Electronic Commerce Research*, 23(3), 1539-1564.
- Hollanders, M. (2020). FinTech and financial inclusion: Opportunities and challenges. *Journal of payments strategy & systems*, 14(4), 315-325.
- Ibrahim, S. S., & Aliero, H. M. (2020). Testing the impact of financial inclusion on income convergence: Empirical evidence from Nigeria. *African Development Review*, 32(1), 42-54.
- Ilieva, G., Yankova, T., Dzhabarova, Y., Ruseva, M., Angelov, D., & Klisarova-Belcheva, S. (2023). Customer attitude toward digital wallet services. *Systems*, 11(4), 185.
- Iman, N. (2020). Financial innovations in Islamic countries: the road to perdition or salvation. *Journal of Islamic Marketing*, 11(6), 1579-1600.
- Jegerson, D., & Hussain, M. (2023). A framework for measuring the adoption factors in digital mobile payments in the COVID-19 era. *International Journal of Pervasive Computing and Communications*, 19(4), 596-623.
- Junarsin, E., Hanafi, M. M., Iman, N., Arief, U., Naufa, A. M., Mahastanti, L., & Kristanto, J. (2023). Can technological innovation spur economic development? The case of Indonesia. *Journal of Science and Technology Policy Management*, 14(1), 25-52.
- Khera, P., Ng, S., Ogawa, S., Sahay, R., Adnan, T., Čihák, M., Eriksson Von Allmen, U., Lahreche, A., Beaton, K., Bazarbash, M., Alonso-Gamo, P., Berkmen, P., Blancher, N., Dabla-Norris, E., Das, B., Elliott, J., Grnberg, F., Drk, J., Grolleman, F., ... Carcel, H. (2021).
- Kodongo, O. (2018). Financial regulations, financial literacy, and financial inclusion: Insights from Kenya. *Emerging Markets Finance and Trade*, 54(12), 2851-2873.
- Lim, X. J., Ngew, P., Cheah, J. H., Cham, T. H., & Liu, Y. (2022). Go digital: can the money-gift function promote the use of e-wallet apps?. *Internet Research*, 32(6), 1806-1831.
- Lu, M. P., & Kosim, Z. (2022). An empirical study to explore the influence of the COVID-19 crisis on consumers' behaviour towards cashless payment in Malaysia. *Journal of Financial Services Marketing*, 1.
- Lyons, A. C., Kass-Hanna, J., & Fava, A. (2022). Fintech development and savings, borrowing, and remittances: A comparative study of emerging economies. *Emerging Markets Review*, 51, 100842.
- Morgan, P. J. (2022). Fintech and financial inclusion in Southeast Asia and India. *Asian Economic Policy Review*, 17(2), 183-208.
- Mothobi, O., & Kebotsamang, K. (2024). The impact of network coverage on adoption of Fintech and financial inclusion in sub-Saharan Africa. *Journal of Economic Structures*, 13(1), 5.
- Nandru, P., Chendragiri, M., & SA, S. (2025). Factors affecting the adoption of mobile payment services during the COVID-19 pandemic: an application of extended UTAUT2 model. *Journal of Science and Technology Policy Management*, 16(3), 405-431.
- Niankara, I., & Traoret, R. I. (2023). The digital payment-financial inclusion nexus and payment system innovation within the global open economy during the COVID-19 pandemic. *Journal of Open Innovation: Technology, Market, and Complexity*, 9(4), 100173.
- Olaoye, O. O., Shaddady, A., & Tabash, M. I. (2025). Does FinTech enhance the effectiveness of financial inclusion to reduce income inequality? Evidence from Sub-Saharan Africa. *International Journal of Emerging Markets*.
- Owoseni, A., Hatsu, S., & Tolani, A. (2022). How do digital technologies influence the dynamic capabilities of micro and small businesses in a pandemic and low-income country context?. *The Electronic Journal of Information Systems in Developing Countries*, 88(2), e12202.
- Panda, D. K., Reddy, S., & Vaithianathan, S. (2022). Does the cashless transaction work? An analysis of policy challenges in an emerging economy. *Digital Policy, Regulation and Governance*, 24(2), 179-198.

- Prasta, J. G. (2024). Accelerating Digital Transformation in Islamic Banking. *Arthatama: Journal of Business Management and Accounting*, 8(1), 30-37.
- Rahman, M., Ismail, I., Bahri, S., & Rahman, M. K. (2022). An empirical analysis of cashless payment systems for business transactions. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(4), 213.
- Rahman, N. L. A., Abd Mutalib, H., Sabri, S. M., Annuar, N., Mutalib, S. K. M. S. A., & Rahman, Z. S. A. (2022). Factors influencing E-wallet adoption among adults during Covid-19 pandemic in Malaysia: extending the tam model. *International journal of academic research in business & social sciences*, 12(7), 983-994.
- Raj L, V., S, A., & K, A. (2021). Role of perceived countries' advantages of cashless economy in behavioral intentions of using cashless transactions: an empirical analysis. *Journal of Indian Business Research*, 13(3), 413-433.
- Rey-Ares, L., Fernández-López, S., Castro-González, S., & Rodeiro-Pazos, D. (2021). Does self-control constitute a driver of millennials' financial behaviors and attitudes?. *Journal of Behavioral and Experimental Economics*, 93, 101702.
- Saeed, M. M., & Donkoh, E. (2024). Mobile banking services and financial inclusion among customers of commercial banks: Evidence from an emerging economy. *Business Strategy & Development*, 7(4), e70035.
- Saha, P., & Kiran, K. B. (2022). What insisted baby boomers adopt unified payment interface as a payment mechanism?: an exploration of drivers of behavioral intention. *Journal of Advances in Management Research*, 19(5), 792-809.
- Sakas, D. P., Kamperos, I. D. G., Reklitis, D. P., Giannakopoulos, N. T., Nasiopoulos, D. K., Terzi, M. C., & Kanellos, N. (2022). The effectiveness of centralized payment network advertisements on digital branding during the COVID-19 crisis. *Sustainability*, 14(6), 3616.
- Salman, M., Rauf, N., & Murtaza, Z. (2024). Unlocking financial inclusion and economic empowerment in rural Pakistan: The interplay of financial literacy and infrastructure development in the impact of digital wallets. *Journal of Excellence in Management Sciences*, 3(3), 141-160.
- Sardana, V., & Singhania, S. (2018). Digital technology in the realm of banking: A review of literature. *International Journal of Research in Finance and Management*, 1(2), 28-32.
- Seldal, M. N., & Nyhus, E. K. (2022). Financial vulnerability, financial literacy, and the use of digital payment technologies. *Journal of Consumer Policy*, 45(2), 281-306.
- Shaikh, O., Ung, C., Yang, D., & Chacon, F. A. (2022). Six Feet Apart: Online Payments During the COVID-19 Pandemic. *Proceedings of the ACM on Human-Computer Interaction*, 6(CSCW2), 1-33.
- Siano, A., Raimi, L., Palazzo, M., & Panait, M. C. (2020). Mobile banking: An innovative solution for increasing financial inclusion in Sub-Saharan African Countries: Evidence from Nigeria. *Sustainability*, 12(23), 10130.
- Siddika, A., Sarwar, A., & Bakar, R. B. (2023). Digital financial inclusion: Covid-19 pandemic as a catalyst for adoption. *Journal of System and Management Sciences*, 13(5), 88-106.
- Srouji, J., & Torre, D. (2022). The global pandemic, laboratory of the cashless economy?. *International Journal of Financial Studies*, 10(4), 109.
- Sung, A., Leong, K., Sironi, P., O'Reilly, T., & McMillan, A. (2019). An exploratory study of the FinTech (Financial Technology) education and retraining in UK. *Journal of Work-Applied Management*, 11(2), 187-198.
- Sutresna, I. K., Safira, N., & Kartono, R. (2023). Intention to use digital payment during the Covid-19 pandemic in the rural area. *Jurnal Ilmiah Manajemen, Ekonomi, & Akuntansi (MEA)*, 7(3), 135-154.
- Tawfik, O. I., Ahmed, M. A., & Elmaasrawy, H. E. (2024). The Mediating Role of Mobile Banking-Based Financial Inclusion Disclosure on the Relationship Between Foreign Investment and Bank Performance. *International Journal of Financial Studies*, 12(4), 128.
- Thakor, A. V. (2020). Fintech and banking: What do we know?. *Journal of financial intermediation*, 41, 100833.
- Tut, D. (2023). FinTech and the COVID-19 pandemic: Evidence from electronic payment systems. *Emerging Markets Review*, 54, 100999.
- Wei, Q., Xiao, W., Yaqub, R. M. S., Irfan, M., Murad, M., & Yaqub, M. Z. (2023). Adoption of digital money (e-wallet) in the post COVID-19 era: The moderating role of low

- distribution charges and low transit time in impulsive buying: A developing country perspective. *Frontiers in Environmental Science*, 10, 984316.
- Wójcik, D. (2021). Financial geography I: Exploring FinTech—maps and concepts. *Progress in Human Geography*, 45(3), 566-576.
- Yaseen, S. G., El Qirem, I. A., & Dajani, D. (2022). Islamic mobile banking smart services adoption and use in Jordan. *ISRA International Journal of Islamic Finance*, 14(3), 349-362.
- Zhong, Y., & Moon, H. C. (2022). Investigating customer behavior of using contactless payment in China: A comparative study of facial recognition payment and mobile QR-code payment. *Sustainability*, 14(12), 7150.
- Zhou, R. (2022). Sustainable economic development, digital payment, and consumer demand: Evidence from China. *International journal of environmental research and public health*, 19(14), 8819.



Copyright: © 2025 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution-ShareAlike 4.0 International License (<https://creativecommons.org/licenses/by-sa/4.0/>).