

Do Social and economic empowerment attain through mobile banking? An empirical assessment

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Abstract: Financial inclusion has proven to be the most effective tool for overcoming poverty and enhancing underprivileged individuals' social and economic status. However, the role of mobile banking in achieving financial inclusion remains unclear. Therefore, this research investigates the relationship between mobile banking adoption and financial inclusion. Data from two hundred twenty-three respondents was collected through online surveys conducted in countries such as India, Pakistan, Bangladesh, Nepal, Bhutan, and China. A confirmatory factor analysis was utilized to assess the validity of the data gathered from respondents. Structural equation modeling was employed to test the hypothesis and analyze the structural relationships. The results indicated that mobile banking adoption positively influences financial inclusion, contributing to social and economic empowerment. However, this analysis focuses solely on the role of mobile banking in the social and economic empowerment of individuals. Future studies may consider additional variables related to financial inclusion. The findings of this study are beneficial for banking institutions to understand the factors influencing customer adoption behavior towards mobile banking in South Asian countries. Additionally, the results are valuable for policymakers and managers in implementing effective strategies to attract non-users and potential mobile banking customers, thereby enhancing the impact of digital financial inclusion on society. This analysis is original and offers novelty in mediating the role of financial inclusion in social and economic empowerment through mobile banking adoption.

1. Introduction

According to the Financial Inclusion Index released by the RBI for 2021, India now holds the world's second-highest percentage of unbanked individuals, with around 190 million adults lacking adequate access to formal financial instruments (RBI, 2021). China has the highest number of unbanked people globally, followed by India (190 million), Pakistan (100 million), and Indonesia (95 million). One contributing factor is that Indian culture tends to discourage risk-taking. Nevertheless, banks are essential financial institutions that protect individuals from these risks, particularly in managing and accessing finances. Although the world has witnessed substantial economic growth over the past 20 years, social cohesion is deteriorating in many countries, impeding further progress in both organized and unorganized sectors. Growth must be inclusive and holistic, encompassing all sectors and segments of the economy for sustainable long-term development, supported by improving living standards, reducing poverty and inequality, promoting agricultural growth, and creating new job opportunities. Therefore, financial inclusion has emerged as a critical agenda within sustainable development goals for promoting sustainable economic growth and empowerment (Mpofu, 2022). Mobile banking is an effective strategy for achieving financial inclusion (Sharma & Jain, 2019). This individual can utilize official banking services online. Furthermore, with mobile banking, users can access financial and banking services via their mobile phones anytime and from any location (Kara et al., 2021). Thus, mobile banking has emerged as a key topic in the discussion on financial inclusion. Financial inclusion supported by mobile banking promotes inclusive growth. Thanks to the digital revolution, rural residents can now access mobile and internet services even in remote areas. Mobile banking services in India are growing slowly but steadily, with significant potential for further expansion and adoption in the future (Jain et al., 2022). Mobile banking simplifies transactions and makes various financial instruments accessible (Zhu et al., 2022). Users are eager to utilize mobile banking services to access diverse financial instruments, enhancing their financial inclusion (Sharma & Jain, 2019; Jain et al., 2022). Financial inclusion enables low-income individuals to overcome poverty, achieve financial stability, and become economically independent (Sharma & Jain, 2019; Hussain et al., 2023). In the relevant literature, only a few studies have focused on the adoption of mobile banking services among users and its role in achieving financial inclusion (Alrabei et al., 2022; Adamek & Solarz, 2023; Kemal, 2019). The relationship between financial inclusion and social and economic empowerment seems to have received less attention in the existing literature, both in writing and analysis. Thus, the present study analyzes the role of financial inclusion in social and economic empowerment through mobile banking adoption. Additionally, this study validates the hypothesized measurement model to identify the effect of mobile banking adoption on financial inclusion. For effective policy formation in this context, a study linking mobile banking adoption to financial inclusion becomes essential.

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2. Hypothesis development

2.1 Mobile Banking and Social-Economic Empowerment

Mobile banking services are reachable to underprivileged citizens because of possessing attributes like anytime accessibility, availability, usage, and customized devices (Jain et al. 2022). Andrianaivo & Kpodar (2012) reported that the government's ability to promote innovation and digital payments, such as BHIM UPI, catalyzes social and economic development. Mobile phone proliferation facilitates in development of rural households in terms of risk-sharing of families and enables them to use the mobile banking service at home. Further, Rajkhowa & Qaim (2022) revealed that besides banking services, mobile phones also extend access to customers for health, education, and other related services. Johnson (2016) analyzed the digital financial inclusion status in Kenya and concluded that social factors positively impact the demand for mobile banking services in urban and rural areas (Johnson, 2016). Additionally, increasing mobile wallet usage might increase the use of mobile financial services because of personal area networks (Maurer, 2012). Culturally, the articles indicate that specific attributes such as demographic factors and mobile banking user interface positively affect mobile financial services adoption in developing countries (Alafeef et al. 2012). Ghosh (2016) studied mobile banking in MENA countries and revealed that mobile financial services positively impact the region's economic growth. Kikulwe et al. (2014) empirically revealed that small farmers using mobile-based micro-finance services in rural parts of Kenya benefit more than those not adopting mobile banking services. Mobile phones can improve the welfare of consumers, producers and manufacturers in the developing world. Further, mobile phone development positively impacts social and economic development and opens the doors for needy individuals, especially in developing countries. Gaur and Potnis (2022) concluded that innovative services enhance the significance and value of mobile banking services in developing nations, especially for poorer sections. Therefore, it is hypothesized that:

H1: Mobile banking has a significant positive effect on social empowerment

H2: Mobile banking has a significant positive effect on economic empowerment

2.2 Social Empowerment and Economic Empowerment

Several researchers found that gender empowerment opportunities have been possible through expanding information technology services. Chawla & Joshi (2020) analyzed the moderating role of gender and age in the adoption of mobile banking services and concluded that in terms of age and gender, mobile wallets are more popular among male youths than female. Sam (2017) also measured the impact of mobile phones on the socio-economic empowerment of marginalized youths in developing nations. The study revealed that mobile phones could empower socially marginalized youth to improve their livelihood. Han (2012) conducted a study on rising mobile cellphone dissemination in South Africa and concluded that reinforced and extended mobile phone facilities reduced the socio-economic disparity among individuals and favored community segments. Sey (2011) conducted a study on the impact of mobile phone usage in Ghana and concluded that mobile phone usage is very helpful in the socio-economic expansion of users in terms of sustainable livelihood. Thus, it is hypothesized that:

H3: Social empowerment has a significant positive impact on economic empowerment

2.3 Mobile Banking and Financial Inclusion

Eldomyaty et al. (2020) conducted a study exploring the factors of financial inclusion among leading economies of the world and concluded that governance indicators play an important role in mobile banking. Mobile banking services have been increasing rapidly in developing countries and become an essential instrument for financial inclusion for unaffiliated populations in emerging nations. Mobile banking is one of the services that offers a pipeline for customers to connect with the bank via mobile devices. Merritt (2010) conducted a study on electronic payments through mobile phones and concluded that electronically transferring money through mobile banking empowers the low-pay individuals in developing countries. Hinson (2011) pointed out that mobile banking is important in providing banking services to poor people in accessing financial services in Ghana. Allen et al. (2014) analyzed the gaps in financial inclusion of African nations and concluded that the use of mobile devices positively affects financial profoundness and financial operations. Della-Peruta (2018) pointed out that mobile money improves financial inclusion by providing financial connections between customers through branchless banking. The study also showed that compliance with mobile currency services is the highest in nations with minimal access to formal banking facilities. Okello et al. (2020) conducted a study on the role of digital financial literacy in financial inclusion and concluded that social networks mediate between financial inclusion and financial literacy amongst microfinance banks in emerging economies. Hence, it is hypothesized as follows:

H4a: Mobile banking has a significant impact on Financial Inclusion

2.4 Financial Inclusion and Social-Economic Empowerment

Ghosh (2017) conducted a study on integrating bank accounts with mobile phones and concluded that integration of banking with mobile phones reinforces financial inclusion. Nandru and Rentala (2020) carried out a study measuring the impact of financial inclusion on tribal groups and reported that financial inclusion is one of the tools to empower people that considerably influences socio-economic empowerment. Ali and Hatta (2012) explored a study on the role of microfinance in women's empowerment in Bangladesh. They revealed that microfinance is helpful in poverty reduction and empowering women by opening the doors for the poor and low-

pay individuals, leading to a positive outcome in socio-economic empowerment, financial strengthening, and social, political, and lawful strengthening. Gwalani and Parkhi (2014) revealed that financial inclusion is a way to strengthen poorly qualified people who belong to small-town families in India. Drasarova and Srnc (2016) studied microfinance service's role in poverty reduction in Mexico and revealed that financial inclusion through microfinance creates propensities for financial freedom and independence and is considered the best component to empower people. Financial inclusion states pecuniary benefits for the growing economy and is important for accomplishing inclusive growth. Cull et al. (2012) analyzed the macroeconomic resistance of financial inclusion, which demonstrates that well-created money-related frameworks have a solid positive effect on economic sustainability over the long haul. Uma and Rupa (2013) studied the role of self-help groups (SHGs) in the financial inclusion of the deprived section of society. They concluded that SHGs help bring people into financial services, leading to greater economic and social equity to speed up the country's economic development. Hendriks (2019) analyzed to identify the impact of financial inclusion in promoting women empowerment and reported that increasing economic advocacy because of influential financial inclusion programs may give women a huge opportunity to make an investment, which may improve the household's income later. Ozili (2020) carried out a study to acknowledge the relationship between social and financial inclusion and concluded that there is a significant association between financial inclusion and the social inclusion of people. Morduch and Haley (2002) suggested that an inclusive financing system provides increased funding for investment, notably to assist small businesses. Raza et al. (2019) pointed out that people experiencing poverty residing in rural regions of emerging nations have a lack of accessibility to financial banking services due to a scarcity of basic facilities and slow economic status. Mobile phone technology has positively impacted job prospects, enhanced literacy and healthcare, and reduced poverty. It has also enabled the best social networks. Therefore, it is hypothesized that,

H4b: Financial Inclusion has significant effects on social empowerment

H4c: Financial Inclusion has significant effects on economic empowerment

Based on the literature review, the following research framework was proposed:

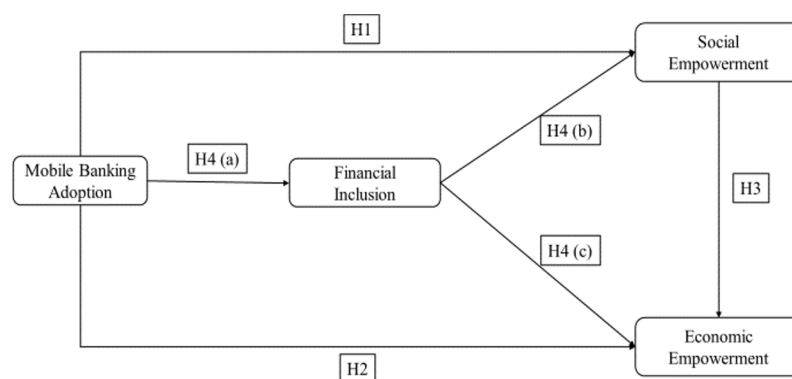


Fig 1: A research framework

3. Methodology

3.1 Sampling and Data Collection

The study used quantitative methods to test the hypothesis. Data was collected using a self-administered questionnaire from mobile banking users from India, especially from underprivileged people. The data is gathered from the beneficiaries of financial inclusion related to five different types of banks, i.e., public sector banks, private sector banks, cooperative banks, regional rural banks, and other microfinance institutions. The sample frame included the registered users of various banks such as public, private, cooperative, regional, rural and microfinance banks. Respondents were chosen by using non-probability purposive sampling. The current study used a 5-point Likert scale (1-5), where 1 represents strongly disagree, and 5 strongly agree to measure all theoretical constructs. Firstly, a questionnaire in English was developed, then converted to Hindi and other local languages because the target respondents were from different parts of the country. Questionnaire was floated to approximately thousand respondents in rural and semi-urban areas. Out of 987 questionnaires distributed among respondents, only 526 questionnaires were received back from the respondents, and after deep scanning, 223 questionnaires were complete in all aspects. Subsequently, the final sample size for further analysis in this study is 223 respondents.

Table 1: Demographic details

Variables	Categories	Frequency	Percent
Age	Below 20	93	41.70
	20-30	97	43.50
	30-40	28	12.56
	40-50	5	2.24
Sex	Male	165	73.99
	Female	58	26.01
Occupation	Farmer	44	19.73
	Owned Business	72	32.29
	Private Job	61	27.35
	Government Job	31	13.90
	Labourer	15	6.73
Qualification	Illiterate	45	20.18
	Below 10th	69	30.94
	10th	65	29.15
	12th	31	13.90
	Graduation	13	5.83
Income	Below 10000	93	41.70
	10000.-20000	102	45.74
	20001-30000	27	12.11
	30001-40000	1	0.45
Have you any account in the bank?	Yes	223	100.00
Type of bank	Public sector Bank	96	43.05
	Co-operative bank	12	5.38
	Microfinance bank	56	25.11
	Private sector bank	59	26.46
Do you aware about mobile banking?	Yes	223	100.00

3.2 Statistical tools

In the present analysis, exploratory factor analysis (EFA) has been employed to finalize the factors (Watkins, 2018). In this regard, Kaiser-Meyer-Olkin (KMO) and Bartlett's sphericity test were utilized to quantify sample adequacy. Afterward, confirmatory factor analysis (CFA) was conducted to check the validity of the hypothesized measurement model. Furthermore, structural equation modeling (SEM) tests the hypothesis to analyze the structural relationship. The SPSS 20 and AMOS 22 versions were utilized for analyzing the data. After conducting the pilot study, confirming the adjusted scales' appropriateness is necessary. In this regard, both reliability and validity tests were conducted in the present analysis to examine the suitability of the adjusted scales. Moreover, Cronbach alpha was used to determine the reliability of the constructs. However, only items with a Cronbach alpha estimate of 0.7 or more were valued in the study. The exploratory factor analysis (EFA) was performed in direction to finalize the factors and their attributes measures in the present study is mentioned as follows: The mobile banking adoption (MBA) variable includes five factors and seventeen attributes, namely, attitude towards adoption intention (ATTI), economic cost and credibility (ECC), financial cost (FC), perceived ease of use (PEOU) and perceived usefulness (PU). The factor 'attitude towards adoption intention' includes six attributes (ATAI1 to ATAI6). The 'economical cost and credibility' factor comprises two attributes (ECC1 to ECC2). The 'financial cost' contains two attributes (FC1 to FC2). The 'perceived ease of use factor' includes four attributes (PEOU1 to PEOU4), and the 'perceived usefulness' factor contains three factors (PU1 to PU3). The financial inclusion (FI) variable includes three factors and nine attributes, namely, availability (AVA), usage (USAGE) and accessibility (ACC). The factor 'availability' includes four attributes (AVA1 to AVA4). The 'usage' factor comprises three attributes (USAGE1 to USAGE3), and the 'accessibility' factor contains two attributes (ACC1 to ACC2). The social empowerment (SE) variable contains two factors and nine attributes, namely, literacy and creditworthiness (LC) and awareness (AWA). The factor 'literacy and creditworthiness' include six attributes (LC1 to LC6). The 'awareness' factor comprises two attributes (AWA1 to AWA2).

4. Data Analysis and Measurement Model

This section is devoted to validating the data analysis part through confirmatory factor analysis to assess the measurement model and utilize SEM for path analysis to model fit. The present analysis is a cross-sectional study that gathers the measurement of all study variables from a common respondent source. From a total sample of 223 respondents, the descriptive statistics of respondents are depicted in Table 1. A total of 223 ultimate responses were

gathered from the respondents under four variables, namely mobile banking adoption (MBA), financial inclusion (FI), social empowerment (SE) and economic empowerment (EE). The sample comprises 73.9 percent male respondents, while the rest of 22.1 percent were female respondents to all variables. In the initial data analysis stage, CFA was carried out on adopting mobile banking, financial inclusion, and social and economic empowerment. The outcomes specify a good model fit. The fit indices of the final model are within the recommended boundary. The final CFA model of ‘mobile banking adoption’ is exemplified, and the value of χ^2 was 196.231 along with $df=106$ and $\chi^2/df=1.851$. RMSEA was .049, respectively. GFI was .906, and AGFI was .904. The incremental fit measures i.e NFI= .913, RFI= .901, IFI= .958, TLI= .945, CFI=.958. The value of PRATIO, PNFI and PCFI was .779, .712, and .746, respectively. Afterward, the final CFA model on ‘financial inclusion’ is exemplified, and the value of χ^2 was 38.079 along with $df=23$ and $\chi^2/df=1.656$. RMSEA was .054, respectively. GFI was .963, and AGFI was .928. The incremental fit measures i.e NFI= .953, RFI= .927, IFI= .981, TLI= .970, CFI=.981. The value of PRATIO, PNFI and PCFI was .639, .609, and .627, respectively. Subsequently, the final CFA model of social empowerment is exemplified, and the value of χ^2 was 43.286 along with $df=26$ and $\chi^2/df=1.665$. RMSEA was .055, respectively. GFI was .959. The incremental fit measures i.e NFI= .959, RFI= .943, IFI= .983, TLI= .976, CFI=.983. As depicted in Table 2, the value of PRATIO, PNFI and PCFI was .722, .693, and .710. Consequently, the final CFA model on ‘economic empowerment of users’ is determined, and the value of χ^2 was 9.559 along with $df=4$ and $\chi^2/df=2.390$. RMSEA was .049, respectively. GFI was .993. The incremental fit measures i.e., NFI= .981, RFI= .952, IFI= .989, TLI= .971, CFI=.988. As illustrated in Table 2, the value of PRATIO, PNFI and PCFI was .400, .392, and .395. This goodness of fit statistics reflects that the model sufficiently fits the data. The outcomes from the CFA ratify the validity of the instrument for MBA, FI and SE in the Indian context, and therefore, the variables were further utilized for analyzing the hypothesis. Results showed that the factor loading of almost all the factors was near the suggested value of 0.5, attributes had strong face validity amongst all factors, and an average variance extracted value equal to or higher than 0.4. The construct reliability, average variance extracted and discriminant Validity of MBA, FI and SE are presented in Table 2

Table 2: Reliability and Validity Analysis

Construct and Factors (Code)	Factor Loadings	Construct Reliability	Average Variance Extracted(AVE)
Mobile Banking Adoption (MBA)			
MBA 1	0.753	0.879	0.547
MBA 2	0.738		
MBA 3	0.78		
MBA 4	0.705		
MBA 5	0.744		
MBA 6	0.716		
Financial Inclusion (FI)			
FI1	0.74	0.835	0.559
FI2	0.744		
FI3	0.757		
FI4	0.749		
(C) Social Empowerment (SE)			
SE1	0.713	0.894	0.585
SE2	0.766		
SE3	0.835		
SE4	0.782		
SE5	0.756		
SE6	0.729		
(D) Economic Empowerment			
EE1	0.707	0.83	0.55
EE2	0.782		
EE3	0.783		
EE4	0.689		

4.3 Testing the Hypothesis

The results indicates that the model fits well based on the hypothesis tested, as presented in Table 3. The results highlighted that out of six hypothesis three hypothesis were accepted and three were not. For instance, the hypothesized path between MBA and SE with a β value of 0.090 was statistically not significant at 5 percent significance level (T value = 0.386). Similarly, the impact of MBA over EE was also not significant ($\beta=0.056$, $T\text{-value}=0.097$ & $p>0.05$). Hence, H1 and H2 were rejected. However, the impact of SE on EE was found to be significant ($\beta=0.425$, $T\text{-value}=4.218$ & $p<0.05$). Similarly, MBA affects FI significantly ($\beta=0.490$, $T\text{-value}=5.289$ & $p<0.05$). Therefore, H3 and H4a were accepted. We have also checked the effect of FI on SE, which was found to be significant ($\beta=0.121$, $T\text{-value}=3.924$ & $p<0.05$). Finally, the impact of FI over EE was also assessed by using

path coefficient and found that FI significantly impact the EE ($\beta=0.461$, $T\text{-value}=4.113$ & $p<0.05$). Hence, H4b and H4c were also accepted.

Table 3: Hypothesis Testing

No.	Hypothesis	p-value	Path coefficient β value	t-value	Findings
H1	MBA→SE	0.128	0.090	0.386	Not-supported
H2	MBA→EE	0.268	0.056	0.097	Not-supported
H3	SE→EE	***	0.425	4.218	Supported
H4a	MBA→FI	***	0.490	5.289	Supported
H4b	FI→SE	***	0.121	3.924	Supported
H4c	FI→EE	***	0.461	4.113	Supported

*** Significant at 1 percent significant level

4.4 Structural Equation Model

The SEM analysis used 223 respondents to assess the relationship among independent variables. The goodness of fit indices of the SEM model is presented in Table 5. The obtained value of χ^2 was 38.909 and $df=13$ and $\chi^2/df=2.993$. RMSEA was 0.031, respectively. GFI was 0.921, and AGFI was 0.924, representing that the model is a good fit. The incremental fit measures i.e., NFI=.955, RFI=0.912, IFI=0.956, TLI=0.923, CFI=0.922. The value of PRATIO, PNFI and PCFI was 0.673, 0.665 and 0.653. The abovementioned goodness of fit statistics indicates that the model sufficiently fits the data. The ultimate result determined that the model fit the data in Table 5. Hereafter, no further modification, and improvement were crucial.

5. Discussion

Based on the data analysis of the measurement model through SEM analysis, this section discusses the study's findings. It has been shown from the results that there is a significant positive relationship between mobile banking adoption and financial inclusion for users of mobile banking. This result was consistent with the previous research (Alrabei et al. 2014) as they explored that mobile banking adoption influenced financial inclusion and reflected that financial inclusion could be possible in developing countries by using mobile banking or people come under digitalization (Siddik et al. 2014) also shown that policymakers should design mobile banking services in such a way as to extend the reach and use of mobile banking services to all underdeveloped countries or developing countries which helping to influence financial inclusion. Other studies also found a significant positive relationship between mobile banking adoption and social empowerment. This result is supported by a past study (Asongu & Boateng, 2018), which reported that information and communication technology (ICT) transformed people's lifestyles and made them socially more prestigious. Moreover, the study also revealed a substantial positive relationship between mobile banking adoption and economic empowerment. This outcome was consistent with past results (Kim et al. 2018) as the study confirms that the development of mobile phones and usage significantly contributes to economic empowerment and growth, leading to greater financial inclusion. It has been shown from the results that there is a significant affirmative relationship between financial inclusion with social empowerment for users of mobile banking. This result was consistent with the previous research (Reyes et al., 2010), as reported in his study that financial inclusion is a mechanism for empowering economic and financial users and its positive impact on social empowerment. Social-economic factors also influence financial inclusion, i.e., increasing confidence levels, reducing family distress and social violence and helping improve cleanliness and education (Gomathy, 2015). Other studies also found a significant positive relationship between financial inclusion and economic empowerment. This result is supported by the past study (Allen et al. 2016), which reported that financial inclusion positively influences economic empowerment. With the help of financial inclusion programs, access to financial facilities increases. Financial inclusion creates employment opportunities, increases living standards, reduces poverty, and enables people to enjoy better financial status (Morduch & Haley, 2002). It has been shown from the results that there is a substantial positive relationship between social empowerment and economic empowerment for both users and non-users. This result was consistent with the previous research (Reddy & Manak, 2005), which explored the relationship between social empowerment's positive influences on economic empowerment. Education plays a significant role in social-economic development. Financial inclusion promotes education in society and helps increase confidence levels, technical ability, and skills, leading to greater social empowerment. If people are socially empowered, they raise the standard of living in society, create new employment opportunities, and develop economically (Rao et al. 2014). So, studies confirm that social empowerment contributes positively to economic empowerment. Theoretically, financial inclusion and social and economic empowerment in South Asia can potentially increase access to financial services for underbanked and unbanked populations. Mobile banking can make it simple and economical for people to access banking services, allowing them to open accounts, conduct transactions, and use credit and savings options. So, it may help close the region's gap in financial exclusion. Theoretical ramifications also imply that financial inclusion and mobile banking can harness the potential of technology to empower people. People can perform financial transactions, access information, and manage their accounts more easily using mobile phones, which are widely used throughout South Asia. This can result from increased economic agency, better financial judgment, and more control over personal finances. Financial inclusion and mobile banking can

potentially propel socio-economic growth in South Asia. These programs can encourage entrepreneurship, increase economic output, and promote financial resilience among people and communities by increasing access to financial services. The decrease in poverty, the creation of jobs, and overall economic growth can all result from this. When creating mobile banking services, managers must embrace a user-centric strategy. To create user-friendly interfaces, clear apps, and reasonable pricing models, it is crucial to comprehend the target population's needs, preferences, and limitations. The mobile banking experience may be honed and improved with the help of user research, usability testing, and ongoing feedback gathering, which will increase adoption rates and customer satisfaction. Promoting financial literacy and awareness is essential for mobile banking and financial inclusion to provide their full potential. Managers should support educational programs that improve financial literacy among the populace, paying special attention to digital financial literacy. It can enable people to fully use the features and functionalities of mobile banking systems, make informed financial decisions, and avoid financial hazards. Managers should actively engage with legislators and regulators to help create a regulatory framework that supports financial inclusion and mobile banking. It involves promoting laws encouraging innovation, competitiveness, and interoperability in the mobile banking industry. Managers can also create laws that protect consumer rights, solve privacy issues, and encourage ethical financial behavior. Each study has some boundaries and limitations, and this analysis does not exclude this. Cross-sectional data are necessary for the investigation; however, longitudinal data can also be used. The study is limited to the perception of those who have benefited from financial inclusion, but it might be expanded to include the perspectives of other partners, such as bank officials, business associates, and sarpanches. The study's methodology is solely based on quantitative data; qualitative research could benefit from more inquiry. Case studies and meeting strategies can be used to identify the core problems facing clients.

6. Conclusion

Based on the result analysis and discussion, this study concludes that financial inclusion through mobile banking is just an intervention for cell phone-based mobile banking. The main vision of the Indian government for as long as hardly many decades has been to accomplish economic development and achieve empowerment. Financial inclusion and social and economic empowerment are comprehensive when formal banking services are available to the most vulnerable segments and low-salary people at a reasonable cost. Increasing bank branches is not efficient; technology is the only way forward. Given the rising mobile phone utilization in the nation, mobile banking has an extraordinary potential for empowering financial services and accessing financial products to the unbanked and under-banked in rural and semi-urban zones. From empirical research, it has been reported that there is a huge potential for financial inclusion through mobile banking if the adoption barrier is removed for rural and semi-urban populations in India. The significant supply-side barriers are seen as (a) high financial/transaction costs, (b) security and privacy issues, (c) lack of trust (d) unaffordable products. The significant demand-side barriers are seen as (a) lack of awareness of financial/banking products, (b) low literacy level (c) irregular income. These barriers can be evacuated by arranging financial literacy programs and training, credit advising, etc. Mobile banking, with its pervasive type, can potentially carry the rural population into the formal financial system if identified barriers are removed.

References

1. Adamek, J., & Solarz, M. (2023). Adoption factors in digital lending services offered by FinTech lenders. *Oeconomia Copernicana*, 14(1), 169-212.
2. Aker, J. C., & Mbiti, I. M. (2010). Mobile Phone and Economic Development in Africa. *The Journal of Economic Perspectives*, 24(3), 207-232.
3. Alafeef, Mohammad, Dingh Dalbir, A. K. (2012). The Influence of Demographic Factors and User Interface on Mobile Banking Adoption: A Review. *Asian Network for Scientific Information*, 12(20), 2082-2095. <https://doi.org/10.3923/jas.2012.2082.2095>
4. Allen, F., Carletti, E., Cull, R., Qian, J. Q., Senbet, L., & Valenzuela, P. (2014). The African Financial Development and Financial Inclusion Gaps. *Journal of African Economies*, 23(5), 614-642.
5. Allen, Franklin, Demircuc-Kunt, A., Klapper, L., & Martinez Peria, M. S. (2016). The foundations of financial inclusion: Understanding ownership and use of formal accounts. *Journal of Financial Intermediation*, 27, 1-30.
6. Alrabei, A. M., Al-Othman, L. N., Al-Dalabih, F. A., Taber, T. A., & Ali, B. J. (2022). The impact of mobile payment on the financial inclusion rates. *Information Sciences Letters*, 11(4), 1033-1044.
7. Andotra, N., & Manhas, R. (2017). Financial Inclusion and Economic Development: Role of Post Offices. *International Journal of Applied Marketing and Management*, 2(1), 35-43.
8. Andrianaivo, M., & Kpodar, K. (2012). Mobile Phones, Financial Inclusion, and Growth. *Review of Economics and Institutions*, 3(2).
9. Asongu, S., & Boateng, A. (2018). Introduction to Special Issue: Mobile Technologies and Inclusive Development in Africa. *Journal of African Business*, 19(3), 297-301.
10. Banerjee, A. V., & Newman, A. F. (n.d.). Occupational Choice and the Process of Development. In *Journal of Political Economy* (Vol. 101, pp. 274-298). The University of Chicago Press.
11. Chawla, D., & Joshi, H. (2020). The moderating role of gender and age in the adoption of mobile wallet. *foresight*, 22(4), 483-504.

12. Cull, Robert, Kunt, Asli Demirguc, & Lyman, T. (2012). Financial Inclusion and Stability: What Does Research Show? *CGAP*.
13. Della Peruta, M. (2018). Adoption of mobile money and financial inclusion: a macroeconomic approach through cluster analysis. *Economics of Innovation and New Technology*, 27(2), 154–173.
14. Drašarová, M., & Srnec, K. (2016). Microfinance as a Tool for Poverty Reduction: A Study in Mexico. *Mediterranean Journal of Social Sciences*. <https://doi.org/10.5901/mjss.2016.v7n5p18>
15. Eldomiaty, T., Saeed, Y., Hammam, R., & AboulSoud, S. (2020). The associations between stock prices, inflation rates, interest rates are still persistent: Empirical evidence from stock duration model. *Journal of Economics, Finance and Administrative Science*, 25(49), 149-161.
16. Gaur, A., & Potnis, D. D. (2022). Service innovations in mobile banking for creating value for the poor in developing countries. *The Electronic Journal of Information Systems in Developing Countries*, 88(4), e12209.
17. Ghosh, S. (2016). How important is mobile telephony for economic growth? Evidence from MENA countries. *Info*, 18(3), 58–79.
18. Gomathy M. (2015). An Overview of Financial Inclusion and rural development in India. *IOSR Journal of Business and Management*, 17(8), 6–11.
19. Gwalani, Hema, Parkhi, S. (2014). Financial inclusion - Building a success model in the Indian context. *Procedia - Social and Behavioral Sciences* 1, 133, 372–378.
20. Han, C. (2012). South African perspectives on mobile phones: Challenging the optimistic narrative of mobiles for development. *International Journal of Communication*, 6, 25.
21. Hendriks, S. (2019). The role of financial inclusion in driving women's economic empowerment. *Development in Practice*, 29(8), 1029-1038.
22. Hinson, R. E. (2011). Banking the poor: The role of mobiles. *Journal of Financial Services Marketing*, 15(4), 320–333.
23. Hussain, S., Gul, R., & Ullah, S. (2023). Role of financial inclusion and ICT for sustainable economic development in developing countries. *Technological Forecasting and Social Change*, 194, 122725.
24. Jain, P., Sharma, B. K., Jain, R., Pandey, A., & Khare, S. (2022). Mobile Banking Adoption for Digital Financial Inclusion. In *2022 7th International Conference on Business and Industrial Research (ICBIR)*. <https://doi.org/10.1109/icbir54589.2022.9786477>
25. Johnson, S. (2016). Competing visions of financial inclusion in Kenya: The rift revealed by mobile money transfer. *Canadian Journal of Development Studies*, 37(1), 83–100.
26. Kara, A., Zhou, H., & Zhou, Y. (2021). Achieving the United Nations' sustainable development goals through financial inclusion: A systematic literature review of access to finance across the globe. *International Review of Financial Analysis*, 77, 101833.
27. Kemal, A. A. (2019). Mobile banking in the government-to-person payment sector for financial inclusion in Pakistan. *Information Technology for Development*, 25(3), 475-502.
28. Kikulwe, E. M., Fischer, E., & Qaim, M. (2014). Mobile Money, Smallholder Farmers, and Household Welfare in Kenya. *PLoS ONE*, 9(10), e109804.
29. Kim, M., Zoo, H., Lee, H., & Kang, J. (2018). Mobile financial services, financial inclusion, and development: A systematic review of academic literature. *Electronic Journal of Information Systems in Developing Countries*, 84(5).
30. Maurer, B. (2012). Mobile Money: Communication, Consumption and Change in the Payments Space. *Journal of Development Studies*, 48(5), 589–604.
31. Merritt, C. (2010). *Mobile Money Transfer Services: The Next Phase in the Evolution in Person-to- Person Payments*.
32. Morduch, J., Wagner Graduate, R. F., & Haley, B. (2002). *Analysis of the Effects of Microfinance on Poverty Reduction*. <http://www.nyu.edu/wagner/workingpapers.html>.
33. Mpofu, F. Y. (2022). Industry 4.0 in Financial Services: Mobile Money Taxes, Revenue Mobilisation, Financial Inclusion, and the Realisation of Sustainable Development Goals (SDGs) in Africa. *Sustainability*, 14(14), 8667.
34. Okello Candiya Bongomin, G., & Ntayi, J. (2020). Trust: mediator between mobile money adoption and usage and financial inclusion. *Social Responsibility Journal*, 16(8), 1215-1237.
35. Ozili, P. K. (2020). Theories of financial inclusion. In *Uncertainty and challenges in contemporary economic behaviour* (pp. 89-115). Emerald Publishing Limited.
36. Rajkhowa, P., & Qaim, M. (2022). Mobile phones, off-farm employment and household income in rural India. *Journal of Agricultural Economics*, 73(3), 789-805.
37. Rao, S., Vlassoff, C., & Sarode, J. (2014). Economic Development, Women's Social and Economic Empowerment and Reproductive Health in Rural India. *Asian Population Studies*, 10(1), 4–22.
38. Reyes, G. P. (2010). Financial inclusion indicators for developing countries: The Peruvian Case. *Working Paper of SBS, Peru and 102 CGAP*.
39. Sam, S. (2016). South African Perspectives on Mobile Phones: Challenging the Optimistic Narrative of Mobiles for Development | Han | International Journal of Communication. *Telematics and Informatics*. <https://doi.org/http://dx.doi.org/10.1016/j.tele.2016.06.003>
40. Sam, S. (2017). Towards an empowerment framework for evaluating mobile phone use and impact in developing countries. *Telematics and Informatics*, 34(1), 359–369.
41. SantaMaria. (2016). *Does financial inclusion via Microfinance reduce poverty? - Learning without Borders » Learning without Borders*.

42. Sey, A. (2011). 'We use it different, different': Making sense of trends in mobile phone use in Ghana. *New Media & Society*, 13(3), 375–390.
43. Sharma, B. K., & Jain, P. (2019). Financial Inclusion: Impact of Accessibility, Availability, and Usage of Financial Services- a Study on Household Workers in Madhya Pradesh, India. *International Journal of Public Sector Performance Management*, 1(1), 1.
44. Shinimol, M. K. (2016). Socio-Economic Women Empowerment. In *National Seminar On Accelerating Rural Growth: By Empowering Women Through Innovation And Technology I J R T E R- Special Issue*.
45. Sultana, H. Y., Jamal, M. A., & Najaf, D.-E. (2017). Impact of microfinance on women empowerment through poverty alleviation: an assessment of socio- economic conditions in chennai city of tamil nadu. *Asian journal for poverty studies (ajps)*, 3(2).
46. The Role of SHGS in Financial Inclusion. A Case Study. (2013). *International Journal of Scientific and Research Publications*, 3(6). <https://doi.org/ISSN 2250-3153>
47. Uma, H. R., & Rupa, K. N. (2013). The role of SHGS in financial inclusion: A case study. *International Journal of Scientific and Research Publications*, 3(6), 1-5.
48. Zhu, Q., Lyu, Z., Long, Y., & Wachenheim, C. J. (2022). Adoption of mobile banking in rural China: Impact of information dissemination channel. *Socio-Economic Planning Sciences*, 83, 101011.