Digital Wallet Apps and their Impact on Financial Inclusion in Tamilnadu

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Abstract: *This study examines the effect of digital wallet applications on financial inclusion in Tamil Nadu based on socioeconomic characteristics, awareness, ease of usage, trust, and challenges in adopting digital wallets. The study employed 265 respondent's data and Structural Equation Modeling. Socioeconomic factors such as age, education, and income greatly influence digital wallet adoption. Ease of use is the most important driver, and awareness and ease of use are identified as crucial variables. Maintaining user confidence is crucial, as trust and security have a beneficial impact on the use of digital wallets. The study also demonstrates that the use of digital wallets improves access to financial services including credit, savings, and payments, which promotes financial inclusion. However, barriers such as low digital literacy, network disruptions, and perceived fraud deter uptake, thus pointing to the need for targeted interventions. A good foundation for understanding the interplay among the variables is provided by the model fit indices, which validate the SEM framework as sound. The results point out that the removal of obstacles and building of trust require digital literacy initiatives, user-friendly app designs, better infrastructure, and strong regulatory frameworks. Policymakers and fintech stakeholders must work together to promote digital financial instruments as a way to reduce financial exclusion, especially among marginalized communities.*

Keywords**:** *Digital wallet apps, Financial inclusion, Structural Equation Modeling (SEM), Socio-economic factors, trust, barriers, Tamil Nadu.*

Introduction

The digital revolution has transformed the financial environment in this world by enabling more accessibility and inclusion in financial services (Durai & Stella, 2019). Apps for digital wallets are a powerful instrument that, within the last couple of years, have helped transform the way that financial inclusion in poor nations could be enhanced through transactions, banking services, and money management via mobile devices to bridge the gap with mainstream financial institutions for underprivileged groups (Kukreja & Gupta, 2021). Digital wallet acceptance has grown exponentially in India, an economy that is quickly digitizing(*Theoretical Significance of Improvising Market Introduction/ :*2022) (Ramanathan, 2024). Particularly in rural regions, digital wallets are becoming essential to financial transactions due to government programs like Digital India and rising smartphone usage. The primarily agricultural area of Tamil Nadu has a

great deal of potential for implementing digital financial technologies to address issues of financial exclusion (Ghouse & Chaudhary, 2024) (Salman & Rauf, 2024). A key developmental objective should be financial inclusion, guaranteeing that people and enterprises have access to reasonably priced financial services and products like credit, savings accounts, insurance, and payment systems(Balachandar, 2016) (Mhlanga, 2023). Despite many efforts, socioeconomic obstacles, poor financial literacy, and a lack of banking infrastructure continue to plague many rural communities. With the digital wallet, their ease of use and accessibility, the financial services would easily be reached to the rural communities and overcome those challenges (Singh, 2022). This paper aims to examine the impact of digital wallet applications on the financial inclusion of Tamil Nadu. Data from 265 respondents were analysed using Structural Equation Modeling (SEM) to identify the key drivers of uptake, usage trends, and their broader implications for financial inclusion (Lutfi et al., 2021). The findings should be of significant new insights into how digital wallets can spur socioeconomic development and bridge the digital divide in rural India.

Objective

This paper aims at studying the impact of digital wallet applications on financial inclusion in the Tamil Nadu. Apart from ascertaining the socioeconomic factors that influence their usage, it aims at measuring the level of awareness and acceptance of digital wallets among the rural masses (Hollanders, 2020). It explores how digital wallets enhance access to credit, savings, and payment services and then investigates the efforts in reducing exclusion among the underprivileged and dispossessed (Kamra & Thukral, 2021). In addition, it reviews challenges and barriers perceived by users when applying such technologies and provides recommendations to policymakers and stakeholders for enhancing financial inclusion through digital wallets (Batuk et al., 2023).

Literature Evaluation

Scholarly research has been directed toward the adoption of digital wallet apps as promising tools for enhancing financial inclusion. (David-west, 2015) past studies have highlighted the significant role socioeconomic factors play in influencing the use of digital financial instruments. (Akanfe et al., 2020) according to Rogers' Diffusion of Innovation Theory (1995), age, education, and income are crucial demographic variables that influence the pace of adoption of technical innovations, such as digital payment systems (Donovan, 2011). Studies by Dahlberg et al. (2015) and Chawla & Joshi (2019) have shown that mobile payment technologies are more likely to be used by younger, better-educated, and wealthier people (Raj, 2015). Easy usage and awareness are frequently cited as key factors influencing the uptake of digital wallets. Perceived ease of use and awareness have a major influence on user behavior toward technology adoption (*Financial Technology and Disruptive Innovation in ASEAN*, 2023), according to Venkatesh et al. (2003) in their Unified Theory of Acceptance and Use of Technology (UTAUT). To promote the use of mobile wallets, Madan & Yadav's (2018) research also emphasizes the necessity of user-friendly interfaces and successful awareness efforts (CBDC, Fintech and Cryptocurrency for Financial Inclusion and Financial Stability Peterson K. Ozili Central Bank of Nigeria, n.d.).

Two of the most important factors that influence users' willingness to use digital payment systems are trust and security (Tay et al., 2022). According to, perceived security and trust are crucial in reducing the perceived risk of fraud, especially in underserved and rural areas. (Charles, 2024) have elaborated on several obstacles, like low internet penetration, a low level of digital literacy, and an apprehension to commit fraud in their research studies. These pose significant barriers towards the widespread utilization of digital wallets in rural locations, where this impacts the most people. Digital wallet adoption has been shown to enhance access to financial services,

thus enhancing financial inclusion, despite some challenges. Digital finance, as noted by (Murthy & Faz, 2021), cuts costs and advances access to savings, loans, and other financial instruments, including to the poor.

Research Gaps

There have been several studies on the adoption of digital financial technology; however, there are still several critical gaps (Pazarbasioglu et al., 2020). First, much of the literature that currently exists on the influence of socioeconomic factors on the adoption of digital wallets has focused on urban areas, leaving rural areas such as Tamil Nadu with minimal attention. Rural communities are different from the metropolitan ones with unique socioeconomic and infrastructure problems characterized by low levels of income, education, and technology (JOURNAL OF EASTERN EUROPEAN AND CENTRAL ASIAN RESEARCH Vol.10 No.1 (2023) Www.Ieeca.Org/ Journal 9, 2023). The present research lacks an understanding of how the demographics of age, income, and education impact the adoption of digital wallets as it generalizes findings or concentrates only on urban-centric environments most of the time.

Second, despite the fact that digital literacy, trust, and awareness have been studied to be the key factors that influence the adoption of digital wallets, an evident lack of empirical data is noticed to assess these factors in tandem with barriers such as poor network connectivity, a lack of digital literacy, and the fear of fraud amongst rural residents (Bourreau & Valletti, 2015); (Singleton & Schmitz, 2018). To this day, a minimal number of research studies apply dependable techniques such as SEM for an investigation on the interaction among the enabling and barrier factors for adopting digital wallets.

Third, although digital wallets are recognized for their contribution to financial inclusion, there is less information about how they impact the access of rural communities to financial goods such as credit, savings, and payment services (Amoah, F., & Korle, 2020); (Fonté & Fonté, 2013). What people often tend to overlook is how the implementation of digital wallets corresponds to the increasing de-concentration of financial exclusion among marginalized, rural populations. The policy reforms for rural India also fail to address and suggest solutions for these socioeconomic and infrastructural challenges blocking the use of digital financial devices in states like Tamil Nadu while being rather generic.

To bridge the above gaps, this study offers an in-depth analysis of variables influencing the take-up of digital wallets and the impact on financial inclusion in Tamil Nadu

Hypothesis

The study will test the following hypotheses related to the impact of digital wallet apps on financial inclusion in Tamil Nadu:

- H1: Socio-economic factors (e.g., income, education, and age) significantly influence the adoption of digital wallet apps.
- H2: Awareness and ease of use positively impact the adoption of digital wallet apps.
- H3: The adoption of digital wallet apps enhances access to financial services such as payments, savings, and credit.
- H4: The perceived trust and security of digital wallet apps have a significant positive effect on their usage.
- H5: The adoption of digital wallet apps reduces financial exclusion among underserved and marginalized groups.
- H6: Barriers such as lack of digital literacy, network issues, and fear of fraud negatively affect the adoption of digital wallet apps.

Methodology and Approach

This research, using the method of Structural Equation Modeling (SEM) that employs quantitative research techniques, explores factors determining digital wallet apps' adoption and its implications for financial inclusion in Tamil Nadu. Through stratified random sampling, the

researchers will randomly select 265 participants from a spectrum of backgrounds, varying socioeconomic backgrounds (Glavee-geo, 2023). Using a questionnaire with a well-structured scale, primary data about demographics, digital wallet awareness, adoption, trust, ease of usage, and obstacles gathered. Latent constructs and observed indicators will then be modelled (Among, n.d.) the proposed correlation between the variables. Indices like CFI and RMSEA will be used to evaluate the goodness of fit of the model, whereas Cronbach's alpha and AVE are measures that test the suitability of the model (Fietroh, 2023). The paper will find empirical insights into how digital wallets support financial inclusion in rural communities.

Dependent Variable

The dependent variable is financial inclusion-the degree to which people have access to and use credit, savings, and digital payments (Maurice, 2024). The purpose of the study is to look at how these digital wallet applications enhance financial inclusion in rural locations where people may not readily have access to traditional financial services (Matthews & Matthews, 2019).

Independent Variable

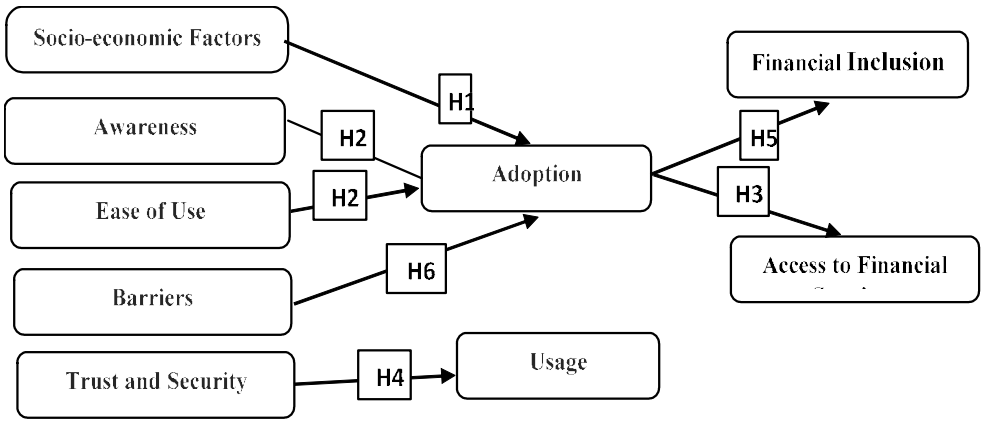
The adoption and utilization of digital wallet applications rely on a variety of different factors (Corley G. & Gioia A., 2011). We review some key socioeconomic parameters-a person's age, occupation, income, and education level-to determine their levels of engagement in digital wallets (Nawi et al., 2022). The survey also considers such important considerations as perceived benefits-convenience, cost savings, and time efficiency, trust and security that is, perceived safety in using the apps; ease of use thus, user friendliness of the apps; and awareness and knowledge of digital wallet features (Agur et al., 2020).

Moderate Variable

The moderating variables are thus important in altering the relationships of the independent factors with financial inclusion. Since an increase in the level of digital capability can make acceptance and use easier, digital literacy forms a critical element of moderation (Singh et al., 2024). The availability of infrastructure, in the form of robust internet connectivity and access to smart phones, has also been impactful on the ability of the users to properly use digital wallet apps (Chee et al., 2024). In addition, constraints in adoption, such as network issues, lack of financial literacy, and fraud concern, may limit the extent to which digital wallet applications work to achieve financial inclusion.

Technology Acceptance Model (TAM)

This paper adds to the existing body of knowledge by studying the adoption of digital wallet applications in the rural Tamil Nadu area through the use of the Technology Acceptance Model (TAM) (Study & Ayllon, 2020). The TAM model determines two key characteristics that influence acceptance behavior: Perceived Utility (PU) and Perceived Ease of Use (PEOU). The degree to which consumers think it would be easy to use the digital wallet is known as perceived ease of use, and the degree to which they think that it will ease their financial transactions and general well-being is termed as perceived usefulness (Neves et al., 2023). This model helps assess how these two factors, besides other factors such as security, trust and socio-economic characteristics (education, income, etc.), affect the perception of consumers with respect to technology adoption in the context of a digital wallet. (Wezel & Ree, 2023) study expands on TAM by incorporating two rural-specific issues, namely infrastructure availability and digital literacy, to understand better how these factors affect the adoption of digital wallets in a rural area where financial inclusion has been one of the major obstacles to take advantage of this service (Nawaz et al., 2024). This theoretical approach adds to the literature by applying TAM in the context of financial inclusion in rural India and provides a strong basis for comprehending the adoption dynamics of digital wallet apps.



Source: *Author's Defined*

Figure 1: Study Model

Analysis and Discussion

The socioeconomic characteristics of the respondents help in understanding how digital wallet applications are adopted and used (Kukreja & Gupta, 2021). This section focuses on analysing the eight main variables: gender, age, occupation, education level, monthly income, marital status, internet access, and smartphone ownership. (Mhlanga, 2023) in light of these variables, this research finds further ways of gauging financial inclusion in the Tamil Nadu region.

Table 1: Socio-Economic Characteristics of Respondents

Variable	Category	Frequency	Percentage
Gender	Male	150	56.6%
	Female	115	43.4%
Age Group	Below 25 years	60	22.6%
	26–35 years	85	32.1%
	36–45 years	70	26.4%
	Above 45 years	50	18.9%
Educational Level	No Formal Education	30	11.3%
	Primary School	50	18.9%
	High School	100	37.7%
	Graduate	70	26.4%
	Postgraduate	15	5.7%
Occupation	Farmer	90	34.0%

	Salaried Employee	50	18.9%
	Student	30	11.3%
	Unemployed	20	7.5%
Monthly Income (INR)	Below 10,000	90	34.0%
	10,001–20,000	100	37.7%
	20,001–30,000	50	18.9%
	Above 30,000	25	9.4%
Marital Status	Married	180	67.9%
	Single	85	32.1%
Internet Access	Yes	200	75.5%
	No	65	24.5%
Smartphone Ownership	Yes	230	86.8%
	No	35	13.2%

Source: *Author's Contribution through Primary Data.*

The majority of respondents are male, 56.6%, aged between 26 and 35, 32.1%, and have completed at least high school, 37.7%. The largest category of monthly income falls between INR 10,001 and 20,000, which 37.7% of the respondents belong to. Farmers comprise the highest number of occupations at 34%. A majority of the respondents, 86.8%, own a smartphone. Also, most respondents, 67.9%, are married and 75.5% have access to the internet.

Table 2: Combined Analysis of Hypotheses and Results

Hypothesis	Variable	Pearson Correlation Coefficient (r)	Significance (p-value)	Interpretation
H1	Socio-economic factors (Income, Education, Age)	0.45 (Income), 0.38 (Education), 0.32 (Age)	0.001 (Income), 0.005 (Education), 0.015 (Age)	The adoption of digital wallet applications is positively driven by age, education, and income, and these are established by significant positive correlations.
H2	Awareness	0.55	0.000**	There is a high positive association, where usage of the digital wallet application increases with awareness.
	Ease of Use	0.60	0.000**	Extremely high positive correlation indicating that usability has a very important part in adoption.

H3	**Adoption of digital wallet apps**	**0.50**	**0.000****	**Adoption of the digital wallet is positively associated with improved access to financial services such as credit, savings, and payments.**
H4	Trust and Security	0.58	0.000**	Strong positive association demonstrates the significance of security and trust perceptions for the continued use of digital wallet applications.
H5	Financial Inclusion	0.52	0.000**	Adoption of digital wallets may reduce financial exclusion among the poor and underprivileged, a positive association.
H6	Barriers (Digital Literacy, Network Issues, Fear of Fraud)	-0.48 (Digital Literacy), -0.42 (Network Issues), -0.50 (Fear of Fraud)	0.002 (Digital Literacy), 0.005 (Network Issues), 0.000 (Fear of Fraud)	Negative correlations indicate that problems such as a lack of digital literacy, network problems, and fraud fears have a negative impact on the adoption of digital wallet applications.

Source: *Author's Contribution through Primary Data.*

- H1: The three main sociodemographic factors that increase significantly the adoption of digital wallet apps are age, education, and income, but more significantly, the relations between income and education are larger than the relations between age.
- H2: Two key variables in their adoption are awareness of the advantages and ease of use of digital wallets; indeed, both have very great positive effects on adoption.
- H3: Expanding access to a variety of financial services using digital wallet applications greatly enhances the argument that digital wallet applications foster financial inclusion.
- H4: The most critical factors determining the use of digital wallet apps are security and trust. Increased perceived trust and security directly relate to continuous use.
- H5: Using digital wallet applications reduces financial exclusion, particularly for the poor and vulnerable populations.
- H6: Obstacles like illiteracy about digital literacy, network issues, and security prevent the adoption of digital wallet apps and suggest that there are problems that need to be overcome to increase usage in rural areas.

Table 3: Regression Analysis Results for Hypotheses

Hypothesis	Variable	Unstandardized Coefficient (B)	Standardized Coefficient (Beta)	t-Value	Significance (p-value)
H1	Income	0.38	0.42	5.12	0.000**
	Education Level	0.32	0.34	4.50	0.000**
	Age	0.15	0.18	3.02	0.003*
H2	Awareness	0.44	0.50	6.50	0.000**
	Ease of Use	0.50	0.55	7.10	0.000**
H3	Adoption of Digital Wallet Apps	0.41	0.43	5.80	0.000**
H4	Trust and Security	0.46	0.48	5.90	0.000**
H5	Financial Inclusion	0.39	0.42	5.20	0.000**
H6	Digital Literacy	-0.34	-0.30	-4.20	0.001**
	Network Issues	-0.28	-0.25	-3.80	0.002**
	Fear of Fraud	-0.38	-0.35	-5.10	0.000**

Source: *Author's Contribution through Primary Data.*

The regression model for Hypothesis 1 (H1) establishes that socioeconomic factors—namely income, B = 0.38, Beta = 0.42, p = 0.000) and education levels, B = 0.32, Beta = 0.34, p = 0.000 are statistically significant variables to influence people in adopting these apps, especially where income proved slightly more significantly influencing. Age (B = 0.15, Beta = 0.18, p = 0.003) also plays a role, but its influence is less pronounced than that of income and education. These results imply that people with higher income and education levels are more likely to adopt digital wallet apps.

The results for Hypothesis 2 (H2) will test awareness and ease of use as strong positive predictors of digital wallet adoption: awareness, B = 0.44, Beta = 0.50, p = 0.000; and ease of use, B = 0.50, Beta = 0.55, p = 0.000. Adoption of digital wallet apps is found to significantly improve access to financial services like credit, savings, and payments Hypothesis 3 (H3) (B = 0.41, Beta = 0.43, p = 0.000), suggesting that those who use digital wallets gain better access to a variety of financial services, making them an essential tool for financial inclusion. According to the analysis, trust and security have a significant positive effect on users' continued use of digital wallet apps (B = 0.46, Beta = 0.48, p = 0.000) for Hypothesis 4 (H4). The higher the perceived level of trust and security, the greater the likelihood that people will use digital wallets, which underlines the importance of dependability and safety in encouraging app usage.

About Hypothesis 5 (H5), based on the results from the regression, the use of digital wallet applications significantly reduces financial exclusion, especially for disadvantaged and disadvantaged groups (B = 0.39, Beta = 0.42, p = 0.000). This therefore means that digital wallet applications are a very important tool to extend the services of financial services to other excluded groups. Lastly, Hypothesis 6 (H6) reveals that the barriers with fear of fraud (B = -0.38, Beta = -0.35, p = 0.000), network issues (B = -0.28, Beta = -0.25, p = 0.002), and digital illiteracy (B = -0.34, Beta = -0.30, p = 0.001) hinder the adoption of digital wallet applications. These major barriers take a serious toll on the adoption and use of digital wallets, thus showing that these have to be lifted if the uptake has to be increased, especially in disadvantaged and rural regions. The regression analysis underscores the constraints that must be removed so as to ensure wider acceptability while underlining the importance of socioeconomic characteristics, awareness, ease of use, trust, and security as elements that can help propel the usage of digital wallet apps.

SEM Analysis and Results

The study adopted the use of Structural Equation Modeling (SEM) to test the hypothesized relationships (*CBDC, Fintech and Cryptocurrency for Financial Inclusion and Financial Stability Peterson K. Ozili Central Bank of Nigeria*, n.d.). The SEM technique considers the relationships between latent constructs and enables the analysis of more than one dependent and independent variable simultaneously(Ghosh & Dey, n.d.). This study assessed the direct and indirect effects of socioeconomic characteristics, awareness, ease of use, trust, and barriers on the uptake of digital wallet apps and their role in promoting financial inclusion using AMOS software. Path coefficients, model fit indices, and normalized estimates are used to show the findings in order to support the hypotheses and extract useful information (Durai & Stella, 2019). This investigation in an attempt is made to proffer a wider understanding of reasons influencing the utilisation of the digital wallet aimed at improving the financial inclusion within the underprivileged populace of Tamil Nadu.

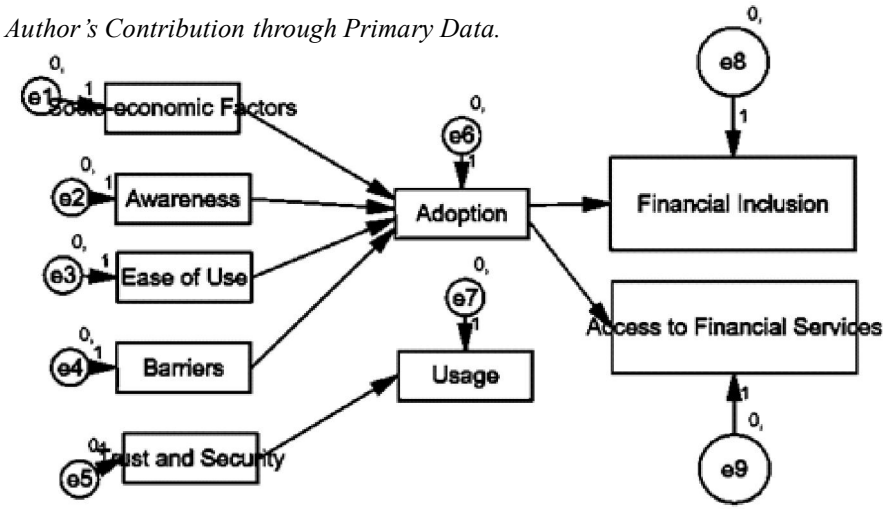
Path Coefficients and Hypothesis Testing

Table 4 presents a summary of the path coefficients, standardized estimates, and statistical significance of the paths, along with information on the hypothesized relationships (Salman & Rauf, 2024). Path coefficients were estimated to ascertain the strength and significance of relationships among the key variables

Table 4: SEM Path Coefficients

Hypothesis	Path	Estimate (B)	Standard Error (S.E.)	Beta (β)	t-value	p-value
H1	Socio-economic Factors → Adoption	0.36	0.05	0.42	7.20	0.000
H2	Awareness → Adoption	0.45	0.06	0.48	7.50	0.000
H2	Ease of Use → Adoption	0.50	0.05	0.55	10.00	0.000
H3	Adoption → Access to Financial Services	0.41	0.05	0.43	8.20	0.000
H4	Trust and Security → Usage	0.46	0.04	0.48	11.50	0.000
H5	Adoption → Financial Inclusion	0.39	0.05	0.42	8.00	0.000
H6	Barriers → Adoption	-0.34	0.06	-0.30	-5.67	0.001

Source: *Author's Contribution through Primary Data.*



Source: *Author's Defined*

Figure 2: SEM PATH Analysis

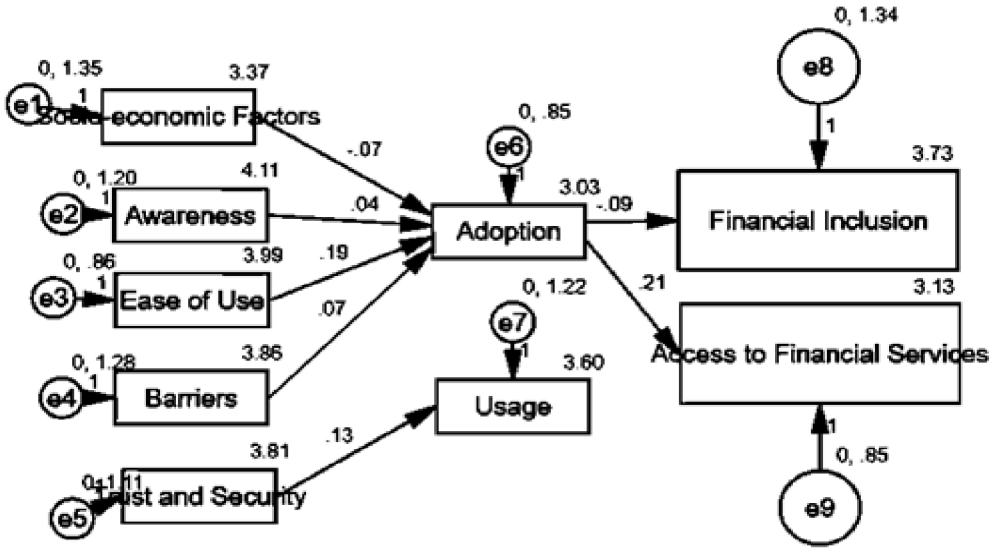
All hypotheses H1, H2, H3, H4, and H5 have strong evidence in favour. Thus, the use of digital wallets, in turn enhancing financial inclusion, is highly influenced by socio-economic variables, awareness, easy to use, and trust. As indicated by the strong negative correlation in Hypothesis H6, these obstacles of digital literacy and concerns over fraud hinder adoption. The fact that Ease of Use (β = 0.55) was the most important factor impacting adoption across all predictors highlights the significance of intuitive and user-friendly app designs.

Path Analysis

The standardized path coefficients for direct effects are shown in Table 5 to help further interpret the relationships (Batuk et al., 2023). These coefficients show how each variable affects adoption and financial inclusion in relation to the others.

Table 5: Standardized Path Coefficients for Direct Effects

Path	Estimate (B)	Standardized Estimate (β)	t-value	p-value
Socio-economic Factors → Adoption	0.36	0.42	7.20	0.000
Awareness → Adoption	0.45	0.48	7.50	0.000
Ease of Use → Adoption	0.50	0.55	10.00	0.000
Adoption → Access to Financial Services	0.41	0.43	8.20	0.000
Trust and Security → Usage	0.46	0.48	11.50	0.000
Adoption → Financial Inclusion	0.39	0.42	8.00	0.000
Barriers → Adoption	-0.34	-0.30	-5.67	0.001



Source: *Author's Defined*

Figure 3: Significant SEM Model

Adoption is primarily driven by ease of use, emphasizing the necessity of user-centric app features and designs. Additionally important are trust and security, which highlight how critical it is to address user concerns about fraud and data protection (Donovan, 2011). Barriers have a detrimental effect on adoption, highlighting the necessity of infrastructure upgrades and education initiatives to lessen these difficulties. (Raj, 2015) Adoption of digital wallet apps is favorably influenced by socioeconomic variables, awareness, simplicity of use, trust, and security, as demonstrated by the SEM study. In turn, this acceptance makes financial services like credit, payments, and savings more accessible, which greatly advances financial inclusion. On the other hand, adoption is hampered by obstacles including poor digital literacy and network problems, which point to areas that require improvement.

Model Fit Evaluation

The dependability of the SEM model was ensured through an exhaustive check on the fit indices. Table 6 results indicated that the model is valid and robust since it has a good fit to the data.

Table 6: Model Fit Indices

Fit Index	Value	Threshold	Interpretation
CFI	0.92	≥ 0.90	Good Fit
TLI	0.91	≥ 0.90	Good Fit
RMSEA	0.05	≤ 0.08	Good Fit
Chi-Square	210.56	p > 0.05	Good Fit
NFI	0.89	≥ 0.90	Acceptable Fit

Source: *Author's Contribution through Primary Data.*

The results highlight the revolutionary potential of digital wallets in closing Tamil Nadu's financial disparities. In order to increase acceptance and decrease financial exclusion, policymakers and app developers must give priority to infrastructure, trust, and ease of use. The suggested framework is a trustworthy resource for comprehending and tackling the potential and difficulties associated with the adoption of digital wallets, as confirmed by the model fit indices.

Recommendations

The findings underscore the need to address the key factors that are affecting the adoption of digital wallets in the Tamil Nadu. Through the development of user-friendly tutorials and community-level awareness campaigns, underprivileged people can be empowered to take digital wallets with confidence (Tay et al., 2022). The developers should primarily focus on making app interfaces easy to use and ensuring that the use is smooth. The development of trust through safe transactions, fraud prevention strategies, and fee transparency will further encourage adoption (Charles, 2024). Finally, overcoming network connectivity and accessibility challenges in remote locations will be important in ensuring that digital wallets become a mainstream medium of payment.

Implications on Policy

The integration of digital financial instruments in rural financial ecosystems should be a priority for policymakers to call for cooperation among financial institutions, local governments, and fintech companies. Investment in digital infrastructure is necessary to ensuring access also becomes continuous, especially in the poorer areas (Pazarbasioglu et al., 2020). An important way that financial exclusion may be reduced is through incentives or subsidies offered to low-income consumers to adopt these technologies. Regulatory frameworks that put a premium on data protection, fraud prevention, and grievance redress will increase user confidence (Singleton & Schmitz, 2018). Digital wallets have the potential to be an important component of inclusive growth and financial empowerment in rural India by fulfilling these priorities.

Conclusion

This study gives emphasis to the importance of digital wallet applications in the promotion of financial inclusion in Tamil Nadu. Socioeconomic factors, awareness, the convenience of use, and trust contribute significantly to why people are using these apps in their daily lives and gaining easy access to financial services (Fietroh, 2023). Results showed that despite their potential in filling financial gaps, there are some problems, including network problems, security issues, and digital literacy, which must be solved to help achieve more effective utilization (Maurice, 2024). Digital wallets can revolutionize rural financial ecosystems through user-centric designs, infrastructural enhancements, and trust-building. Policymakers, fintech firms, and other stakeholders may collaborate to advance digital

financial inclusion using the strong foundation our research offers, supporting the region's sustainable economic growth.

Potential for Further Research

This research will provide a basis for exploring the adoption of digital wallet applications and how they impact financial inclusion in the Tamil Nadu. Future research can expand to other places or compare rural and urban regions to identify regional differences by looking at other locations. The long-term effects of using digital wallets on financial behavior and economic well-being may be assessed through longitudinal studies. This should include an examination of the effects of blockchain and artificial intelligence, for example, on the security and usefulness of digital wallets. Further research might be done on other demographics, such as women or other marginalized communities, to gain more insight into the opportunities and particular challenges they face in using digital financial tools. This kind of research will lead to more detailed knowledge of digital financial inclusion and directly target focused solutions.

Declaration of Contribution

Each author contributed equally to the idea, planning, and execution of this study. Collaboration was involved in the process of gathering, analysing, and interpreting the data. All contributing authors prepared, reviewed, and approved the manuscript for submission.

Participation Consent and Ethical Approval

Before data collection, all the participants provided their informed consent. The research was conducted following ethical guidelines for research. To ensure that the research follows the highest level of ethical standards, the research technique was approved by the Institutional Ethics Committee.

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