"Empowering Rural Households: Impact of Financial Literacy, Inclusion and Digital Finance on Savings Behavior in Delta Districts of Tamil Nadu"

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Abstract:

Financial literacy equips individuals with the knowledge and skills necessary to make informed financial decisions. Financial inclusion refers to the accessibility of affordable financial products and services for all individuals, particularly marginalized populations. Digital finance has emerged as a transformative tool that enhances financial inclusion by offering safe and convenient access to financial services via technology. The novelty of this research is to understand how financial literacy, inclusion and digital finance interact to influence savings behavior among marginalized rural households.

This study investigates how digital finance, together with financial inclusion and literacy initiatives, empowers marginalized groups by improving their saving habits. A structured questionnaire was utilized to collect from 386 respondents from rural households in the region, and statistical analysis was conducted using SPSS and AMOS software. This research study examines the influence of financial literacy, financial inclusion and digital finance on savings behavior of rural households in the delta districts of Tamil Nadu, India. Mainly, Rural Households face significant challenges such as limited access to education, underemployment and social marginalization which inhibit their financial stability.

The study highlights that higher levels of financial literacy, financial inclusion and digital finance correlate positively with improved saving behaviors. The model demonstrates strong explanatory power, with squared multiple correlations for key variables such as financial inclusion (0.865) and financial literacy (0.787), indicating the reliability of the analysis. Demographic factors such as education, occupation, income levels can influence savings behaviors.

The key findings of this study indicate that financial literacy and financial inclusion have a major impact on rural savings behavior, with digital finance acting as an indicator for greater involvement in regulated financial organizations. The findings can help policymakers and practitioners in designing more effective rural development programs aimed at improving financial access and inclusion in rural India.

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The study highlights that while financial literacy is vital, digital finance plays a critical role in providing quick and secure access to financial services, particularly in remote rural areas. The research contributes to the current information by providing valuable insights into how these factors can be used to strengthen the financial well-being of rural households, resulting in economic empowerment and social advancement. Access to banking services, such as savings accounts, credit facilities and insurance products is essential for fostering saving habits. Digital platforms not only simplify transactions but also encourage saving by providing users with tools and incentives to save regularly.

Keywords*: Financial literacy, financial inclusion, Digital Finance, Savings Behavior, Rural Households.

Introduction:

Rural households in India face major challenges in achieving financial stability security. Problems such as lack of educational facilities, underemployment, and caste discrimination play a major role in the marginalization of rural women. Initiatives relating to digital finance, inclusion, and financial literacy have become important tools in addressing these problems by enabling rural households and enhancing their saving habits (Admin., 2023). According to the 2021 survey, 65 percent of the country's population lives in the rural areas, with 47 percent dependent on agriculture as the primary source of livelihood. Financial literacy enables individuals with the knowledge and skills to make informed financial decisions, while financial inclusion offers access to affordable financial products and services (Pandey, 2023). Technology-enabled digital finance increases financial inclusion by offering safe, easy access to financial services, even in remote locations (Ye, 2020).

The purpose of the study is to evaluate the effects of digital finance, inclusion, and financial literacy on the saving habits of rural households in the Delta districts of Tamil Nadu, India. The research reveals light on the degree to which rural people are aware of and engage in various rural development programs, offering insights into the effectiveness of these measures in strengthening rural communities (Singh, 2013). There is a need for specialized studies measuring the influence of digital finance on saving behaviors among rural households, as research particularly addressing its significance in rural regions remains rare.

The findings of this study will contribute to the understanding of how financial literacy, inclusion, and digital finance can be leveraged to improve household's financial well-being of rural households. The insights gained can inform the design and implementation of more effective rural development programs, ultimately increase rural India's economic empowerment and social advancement in rural India.

Literature Review
Financial Literacy and Savings Behavior

The term financial literacy is defined as the capacity to comprehend and use a variety of financial skills, such as investing, budgeting, and personal financial management. Financial literacy is essential for making informed financial decisions that impact investments and savings. Lusardi A (2014) highlights that some demographic factors especially those with lower income and education levels have lower levels of financial literacy. Previous research highlights that low to moderate income household's saving behavior is greatly impacted by financial literacy. Henager (2015) discussed about the household's decisions to save consistently were strongly correlated with their perceptions of their financial literacy and their regularity in financial planning. This implies that raising financial literacy may be an effective way to increase saving rates among those who are struggling financially. Similarly, financial literacy plays an important role in influencing saving behavior. Peiris (2021) discovers, through

a research involving employed individuals in Sri Lanka, that financial literacy strongly effects individual savings behavior. Based on the mediation impact of saving intentions, the study found that greater saving practices are correlated with higher levels of financial literacy. Therefore, it is hypothesized,

H1: There is a significant impact between financial literacy and savings behavior.

Financial Inclusion and Savings Behavior

Duvendack (2019) revealed that programs for financial inclusion often have a positive influence on saving behavior; however these impacts are frequently marginal and unreliable. When it comes to poor individuals, having access to savings opportunities is often more beneficial than credit since there are more positive consequences. Herrerias (2020) found that the financial inclusion is positively correlated with household financial behavior in Mexico, specifically with savings accounts and insurance but not with government transfers, credit products, payroll accounts, or pensions. Mossie (2022) studied that the primary factors influencing financial inclusion are age, wealth, education, and males in Ethiopia. The main cause of gender gaps is the exclusion of women from the non-financial sector. Therefore, it is hypothesized,

H2: There is a significant impact between financial inclusion and savings behavior.

Digital Finance and Savings Behavior

Savings behavior is significantly impacted by digital finance, which includes digital payment technology and digital financial literacy (DFL). Gurusamy (2023) studied that how digital payment technologies have the potential to improve expenditure efficiency, but they may also result in more spending than saving. This implies that although digital banking technologies have their advantages, they may also promote increased expenditure. Yuneline (2023) found that it is important to note that using digital finance for transactions does not always result in better saving practices. To make the most of these technologies, financial literacy must be raised. Therefore, it is hypothesized,

H3: There is a significant impact between digital finance and savings behavior.
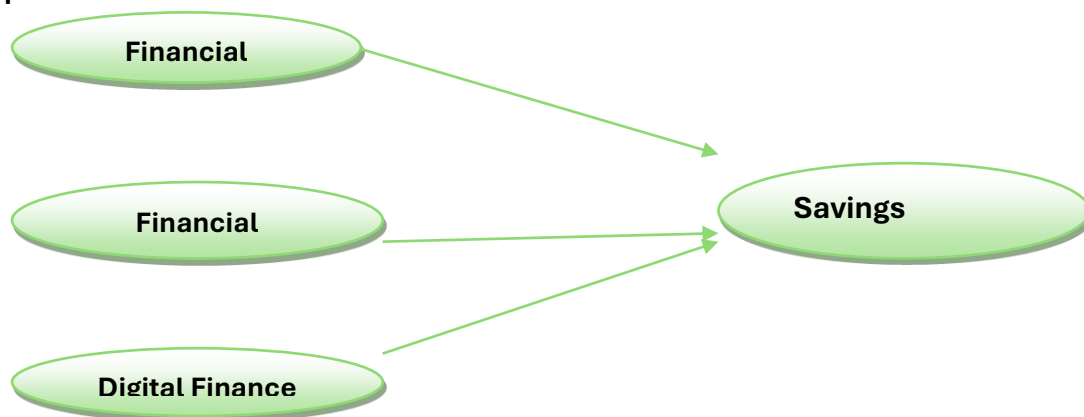
Conceptual Framework

Figure 1: Conceptual framework

Methodology

This study uses a Purposive Sampling method to gather data from the rural households in the Delta districts of Tamil Nadu, India. A structured questionnaire method was used for primary data collection. Given the substantial working population in Tamil Nadu size exceeding 55 lakhs, a confidence level of 95% was selected to calculate the sample size, resulting in a derived sample size of 400. However,

approximately 14 data were rejected due to incomplete responses, resulting in a final sample size of 386 to assess reliability; Cronbach's Alpha coefficient was calculated for the scale, a value of 0.857, indicating strong internal consistency and reliability of the data collected through the questionnaire. This suggests that the measures utilized in the study are reliable or analysis. The statistical tools employed for data analysis include SPSS and AMOS used for quantitative data analysis.

Data Analysis and Findings

Percentage Analysis

The percentage analysis includes age, education qualification, occupation, number of members in the family, number of earning members in the family, and monthly income of the respondent.

Table 1 Percentage Analysis

Demographic variables		Number of respondents (n = 386)	Percentage
Age	Below 20	53	13.7
	21-30	107	27.7
	31-40	76	19.68
	41-50	86	22.27
	51-60	45	11.65
	Above 60	19	4.92
	TOTAL	386	100
Education Qualification	SSLC	42	10.88
	HSC	66	17.09
	Graduate	116	30.05
	Post Graduate	131	33.93
	Doctoral	31	8.03
	TOTAL	386	100
Occupation	Student	73	18.99
	Government Employee	68	17.61
	Private Employee	112	29.09
	Business/Self-employed	67	17.35
	Professional	43	11.13
	Seeking employment	23	5.95
	TOTAL	386	100

No. of Members in the family	*1-2*	*123*	*31.86*
	3-4	*113*	*29.27*
	5-6	*83*	*21.50*
	Above 6	*67*	*17.35*
TOTAL		*386*	*100*
No. of Earning Members in the family	*1-2*	*211*	*54.66*
	3-4	*97*	*25.12*
	5-6	*52*	*13.47*
	Above 6	*26*	*6.73*
TOTAL		*386*	*100*
Monthly Family Income (Rs.)	*Below 20,000*	*76*	*19.68*
	20,001-40,000	*93*	*24.09*
	40,001-60,000	*104*	*26.94*
	60,001-80,000	*57*	*14.76*
	80,001-1,00,000	*39*	*10.10*
	Above 1,00,000	*17*	*4.40*
	TOTAL	*386*	*100*

Source: Primary data. Processed by SPSS 20

Table 1 shows the percentage analysis of demographic variables, where the majority of the respondents are in the age group between 21 and 30, followed by those between 41and 50. The majority of respondent are highly educated, holding postgraduate degrees or graduates, with a family monthly income between Rs.20, 001 and Rs.60, 000. Occupation-wise, the largest groups are private employees, followed by students. Most Families have 1-2 family members and 1-2 earning members in their families.

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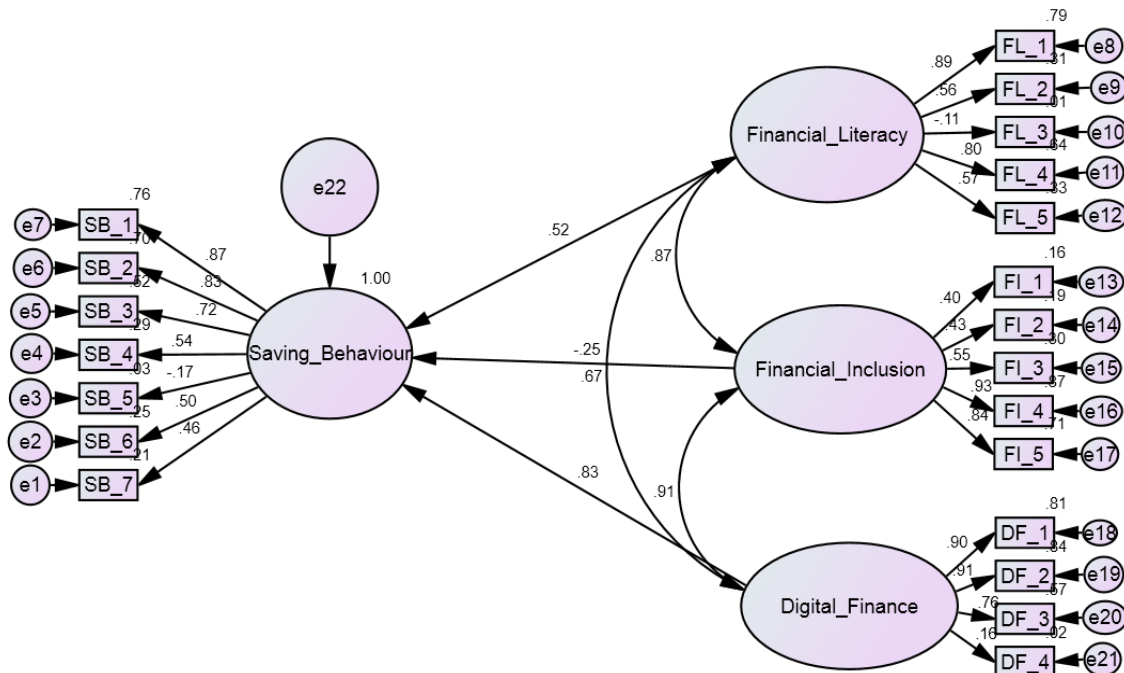## Confirmatory factor analysis

Figure 2: AMOS MODEL

Model Fit in CFA

In order to assess the measurement model to describe the actual observed data, our study compared it to eight varying measures, such as the Chi-square ratio to degrees of square root approximation mistake; freedom ($χ^2/df$); (RMSEA), which stands for the standard remainder square root measured (SRMR); the Tucker-Lewis index (TLI); normative data; comparative fitness index (CFI); The NFI, or Normative conformity index. The indicators, as stated by (Hair J. F., 2010) were taken into account to assess the Model Fit:

The suggested threshold is followed by all actual relevant indicators, which are as follows:

RMSEA = 0.04 shows an excellent fit since it is below the threshold value of 0.05;

CMIN/df = 2.875 falls within the acceptable range (≤ 3); CFI = 0.871 and GFI = 0.90

As a result, the model fits well. In order to validate the measurement model, we conduct a CFA using AMOS 24.0

Quality of observed variables in CFA

Regression weights for the latent main variables are statistically different in predicting their observed variables when the p-value is less than 0.001

Table 2: Regression weights Results

Relationship			Estimate	S.E.	C.R.	P
SB	<---	FL	1.000			
SB	<---	FI	0.865	0.051	15.757	***

SB	*<---*	*DF*	*0.871*	*0.058*	*11.194*	*****
SB_7	*<---*	*SB*	*1.000*			
SB_6	*<---*	*SB*	*0.074*	*0.064*	*7.099*	*****
SB_5	*<---*	*SB*	*0.591*	*0.063*	*9.563*	*****
SB_4	*<---*	*SB*	*1.228*	*0.066*	*7.417*	*****
SB_3	*<---*	*SB*	*1.392*	*0.063*	*8.537*	*****
SB_2	*<---*	*SB*	*1.752*	*0.094*	*9.048*	*****
SB_1	*<---*	*SB*	*1.987*	*0.021*	*9.184*	*****
FL_1	*<---*	*FL*	*1.000*			
FL_2	*<---*	*FL*	*0.875*	*0.058*	*11.052*	*****
FL_3	*<---*	*FL*	*1.208*	*0.098*	*9.167*	*****
FL_4	*<---*	*FL*	*0.715*	*0.039*	*10.376*	*****
FL_5	*<---*	*FL*	*0.878*	*0.033*	*11.422*	*****
FI_1	*<---*	*FI*	*1.000*			
FI_2	*<---*	*FI*	*1.135*	*0.092*	*5.907*	*****
FI_3	*<---*	*FI*	*1.848*	*0.076*	*6.687*	*****
FI_4	*<---*	*FI*	*1.284*	*0.094*	*7.927*	*****
FI_5	*<---*	*FI*	*1.399*	*0.029*	*7.754*	*****
DF_1	*<---*	*DF*	*1.000*			
DF_2	*<---*	*DF*	*1.196*	*0.044*	*11.938*	*****
DF_3	*<---*	*DF*	*1.003*	*0.055*	*14.125*	*****
DF_4	*<---*	*DF*	*1.171*	*0.059*	*2.887*	*****

Source: Author's compilation from primary data

Hypothesis and model test results:

Standardized regression weights result:

The following result can be obtained by checking the standardized regression weights

Table 3: Standardized regression weights

Relationship			Estimate
SB	*→*	*FL*	*0.521*
SB	*→*	*FI*	*0.252*

SB	**➔**	**DF**	**0.833**

Source: Author's compilation from primary data

The table 3 shows that digital finance, financial inclusion, and financial literacy all have differing degrees of effect on saving behavior. With an estimate of 0.521, financial literacy demonstrates a somewhat favorable impact, indicating that people's saving behaviors get better as they gain more financial literacy. A weaker estimate of 0.252 indicates that financial inclusion has a less significant impact on saving behavior, suggesting that access to financial services alone may not be enough to significantly improve saving habits in the absence of other guidance or assistance. On the other hand, digital finance shows a large positive impact (estimate = 0.833), suggesting that more use of digital financial instruments (e.g., online savings accounts, budgeting applications, and mobile banking) correlates with major improvements in saving behavior. These results demonstrate how crucial technology and financial education are to promoting saving habits. These results are similar to the results of (Phan, 2014).

Squared multiple correlations

Squared Multiple Correlations measure the proportion of variance in each dependent variable. The values range from 0 to 1 indicates higher value indicates better fit of the model.

Table 4: Squared multiple correlations

	Estimate
Saving_Behaviour	*0.999*
DF_4	*0.025*
DF_3	*0.57*
DF_2	*0.836*
DF_1	*0.813*
FI_5	*0.714*
FI_4	*0.865*
FI_3	*0.303*
FI_2	*0.185*
FI_1	*0.164*
FL_5	*0.326*
FL_4	*0.637*
FL_3	*0.011*
FL_2	*0.309*
FL_1	*0.787*
SB_1	*0.761*

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SB_2	*0.696*
SB_3	*0.515*
SB_4	*0.291*
SB_5	*0.029*
SB_6	*0.25*
SB_7	*0.215*

Source: Primary Data calculated by utilizing AMOS 24.0

The table 4 shows that squared multiple correlations indicate all the levels of fit for different variables in the model. The model explains performance with saving behavior, its variance (0.999) shows strong fits for DF_2 (0.836), DF_1 (0.813), FI_4 (0.865) and FL_1 (0.787). The high squared multiple correlations reflect the models very strong.

Summary of hypothesis testing

Table 5: Hypothesis testing

Hypotheses	*Relationship*	*Decision statement*
H1	*FL →SB*	*Supported*
H2	*FI → SB*	*Supported*
H3	*DF → SB*	*Supported*

Source: Primary Data calculated by utilizing AMOS 24.0

*FL – Financial Literacy, FI – Financial Inclusion, DF– Digital Finance, SB –Savings Behavior

From the standard regression weights and comparing hypotheses with actual results, we confirm that all three hypotheses are supported. Financial literacy, Financial Inclusion and Digital Finance have a positive impact on savings behavior. These outcomes are similar with those of earlier research. The degree of impact on savings behavior, ranked in descending order is Digital Finance, Financial Literacy and Financial Inclusion.

Discussions

This study explores the impact of digital finance, financial inclusion, and financial literacy on the saving behavior of rural households in the delta districts of Tamil Nadu. Financial literacy is essential for providing individuals with the knowledge necessary to understand a variety of financial products and services. Higher levels of financial literacy have been associated with better saving practices, as individuals are better equipped to manage their finances and assess investment opportunities. This knowledge becomes particularly crucial for rural households, as it empowers them to make informed savings decisions, ultimately improving their financial security.

Financial inclusion is equally important, as it helps marginalized groups gain access to basic financial services. In rural areas, where traditional banking facilities may be limited or nonexistent, financial inclusion plays an even more significant role. The integration of digital finance has greatly increased access to financial services, offering rural households new channels for engaging with formal savings and banking institutions. Research has demonstrated that individuals' propensity to save steadily

increases when they have access to savings accounts and other financial products, underscoring the strong relationship between financial inclusions and saving practices.

In this context, digital finance has become a crucial instrument that is transforming how rural households manage their money. Households are able to conduct financial transactions more efficiently and quickly due to digital platforms and mobile technologies, which also save time and money compared to traditional banking methods. Research shows that the adoption of technology is significantly influenced by digital financial literacy, which increases user savings rates. As rural households become more familiar with digital banking, their saving behavior improves.

The interaction of these three elements—digital finance, financial inclusion, and financial literacy creates a comprehensive framework for enhancing saving practices. As rural households in the delta districts of Tamil Nadu gain greater access to digital financial services and become more financially literate, their ability to save improves, which in turn supports the region's economic growth. Furthermore, targeted initiatives aimed at improving access to financial services and digital literacy can help bridge existing gaps, particularly for marginalized groups in rural areas. This holistic approach has the potential to significantly enhance the financial well-being of rural households in the region.

Practical Implications

From the study, it is identified that there are several practical aspects to the research on how digital finance, financial inclusion, and financial literacy affect rural households' saving habits in the delta districts of Tamil Nadu. First, by focusing on useful skills like investing, saving, and budgeting, targeted financial education programs may greatly improve rural consumer's understanding of financial products. Encouraging the use of digital financial services and providing training in digital literacy would enable families to utilize banking and savings facilities more effectively. To ensure that future generations are better prepared to manage their finances, policymakers should consider integrating financial literacy into rural education curricula.

Government agencies and financial institutions working together can organize seminars and workshops to increase financial literacy, while expanding rural households' access to microfinance services would help those overcome obstacles to investing and saving. Community-led initiatives may also foster a supportive environment for the exchange of financial expertise, thereby enhancing overall financial literacy. Additionally, the implementation of monitoring and evaluation procedures would facilitate the assessment of financial literacy campaigns and their impact on saving practices. It is imperative to give particular attention to marginalized groups to ensure they receive tailored support that enhances their financial inclusion. Financial education can reach a wider audience and become more accessible to rural households by utilizing mobile technologies. Subsequently, promoting long-term financial planning can enhance saving habits, strengthening the economies of these communities and increasing their resilience. To encourage healthier saving habits among rural households in Tamil Nadu, a comprehensive strategy integrating access, education, and community engagement is essential.

Conclusion And Scope for Future Research

From the study it is demonstrated that financial literacy significantly improves saving behavior of rural households, with more financially literate individuals being better able to manage their money, understand financial products, and make informed saving choices. Financial inclusion especially through digital finance is essential for providing rural areas with access to necessary financial services and fostering saving culture. Future research should expand demographic diversity to gain a thorough understanding of saving behavior, examine the role of emerging technologies in enhancing financial literacy and inclusion, and consider longitudinal analyses to evaluate the long-term effects of financial

literacy programs. Policymakers can use these insights to create targeted programs that address the specific needs of rural populations. Further research into the psychological aspects of saving behavior, an assessment of the effectiveness of collaborative efforts between government agencies, non-governmental organizations, and financial institutions, and an analysis of the impacts of specific financial products on saving practices will enhance our understanding of financial well-being. Additionally, best practices may be identified through comparative studies across countries and investigations into cultural influences on saving behavior. Finally, prioritizing the challenges faced by marginalized groups would promote equitable access to financial resources. By addressing these issues, we can significantly improve the financial well-being of rural households and promote sustainable economic growth in these areas.

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