Journal of Theoretical Accounting Research
ISSN: 1556-5106
Volume 22 Issue 1 Year 2026 Page 22-34

Combined Role Of Fintech Adoption And Financial Literacy For Sustainable Financial Inclusion In India

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Abstract
Financial inclusion in India has traditionally been examined as a problem of access to financial services; however, this study reconceptualizes the issue as a gap in accounting systems, particularly in the production, interpretation, and use of accounting information in digital environments. Drawing on accounting information usefulness and accountability perspectives, the paper argues that Fintech should be understood not merely as a financial delivery mechanism but as a digital accounting infrastructure that reshapes record-keeping, transaction visibility, and individual accountability. Existing research largely overlooks how Fintech adoption and financial literacy interact as accounting capabilities, thereby limiting theoretical explanations of inclusion in digitally mediated economies. Using survey data from rural India, this study examines Fintech adoption and financial literacy as proxies for accounting information accessibility, reliability, and user competence, and evaluates their joint influence on financial inclusion outcomes. The findings indicate that while Fintech adoption enhances access to accounting records and transaction traceability, financial literacy plays a more decisive role in enabling individuals to interpret, trust, and effectively use accounting information. This suggests that digital accounting systems alone do not ensure accountability unless users possess the literacy required to engage with them meaningfully. The study extends accounting theory by demonstrating how Fintech transforms the locus of accounting from organizational systems to individual users, highlighting the importance of accounting literacy in sustaining accountability within digital financial ecosystems.

Keywords: Fintech adoption, Financial literacy, Financial inclusion, Digital Financial Services, Rural India

1. Introduction

Financial inclusion has conventionally been defined as the provision of affordable, accessible, and relevant financial services to individuals and businesses previously excluded from formal financial systems. While this definition is widely accepted, from an accounting perspective, financial exclusion reflects a deeper structural limitation in the production, accessibility, and interpretation of accounting information at the individual level. In many emerging economies, including India, individuals remain excluded not solely due to the absence of financial services, but because they lack the accounting capabilities required to record, interpret, and utilize financial information embedded in modern digital systems. This conceptual distinction highlights an important gap in accounting theory, which has traditionally emphasized organizational-level reporting while underexploring individual-level accounting practices in digitally mediated environments.

Empirical evidence illustrates the persistence of this challenge. The Aggarwal (2014) reports that 19 percent of Indian adults remain unbanked, while small businesses continue to face difficulties accessing formal credit. Similarly, the Bhala (2018) indicates that only 55 percent of the rural population accesses formal financial services. While these statistics are often interpreted as indicators of financial exclusion, they may also be understood as symptoms of weak accounting infrastructures, characterized by limited record-keeping, low transparency, and constrained accountability mechanisms, particularly in rural contexts. Such limitations restrict individuals' ability to engage meaningfully with financial systems and undermine broader economic participation.

Financial Technology (Fintech) has emerged as a transformative force within this landscape. Fintech encompasses digital platforms such as mobile banking, digital wallets, peer-to-peer lending, and blockchain-based financial services. While much of the existing literature frames Fintech as a mechanism for improving access to financial services, this study conceptualizes Fintech more fundamentally as a form of digital accounting infrastructure that alters how transactions are recorded, stored, verified, and communicated. Mobile payment applications, for instance, automatically generate transaction histories, enable real-time reporting, and enhance traceability, thereby embedding accounting functions directly into everyday financial activities. In this sense, Fintech reshapes accounting processes by decentralizing record-keeping and transferring accounting responsibility from institutions to individual users.

The rapid diffusion of Fintech in India underscores its significance. According to the RBI (2023), digital transactions in India increased by more than 50 percent over the past five years, driven largely by platforms such as Paytm, PhonePe, and Google Pay. These platforms enable individuals to execute transactions without physical bank branches, thereby expanding the reach of digital accounting records into remote and rural areas. However, the mere availability of digital accounting systems does not guarantee effective accounting outcomes. Without the ability to understand, verify, and use accounting information, individuals may remain functionally excluded despite being digitally connected. This limitation draws attention to the role of financial literacy, which can be reinterpreted as accounting literacy—the capability to comprehend, evaluate, and act upon accounting information generated through digital systems.

Financial literacy in India remains notably low, particularly in rural regions. From an accounting standpoint, this deficit constrains the usefulness of accounting information, as users lack the skills required to interpret transaction records, assess financial positions, or exercise accountability over financial decisions. Consequently, Fintech-enabled accounting systems may enhance transparency in form but not in substance, as users are unable to convert information availability into informed economic behavior.

Recent technological developments, including artificial intelligence (AI) and data analytics, further intensify the accounting implications of Fintech adoption. AI-driven financial tools analyze transaction data to generate insights, forecasts, and recommendations (RBI, 2022). These tools effectively automate accounting judgments, raising important theoretical questions regarding accountability, information asymmetry, and user dependence on algorithmic systems. While such innovations can improve efficiency and personalization, they also shift the locus of accounting control and challenge traditional assumptions about who produces and governs accounting information.

Despite the growing relevance of these issues, the accounting literature has not sufficiently examined Fintech adoption and financial literacy as interacting components of accounting systems in emerging economies. Existing studies primarily address financial inclusion outcomes (Goswami et al., 2022; Bongomin et al., 2018) but offer limited theoretical insight into how digital technologies reshape accounting practices, information quality, and accountability at the individual level. In particular, the interaction between accounting literacy and digital accounting infrastructure remains under-theorized, leaving a gap in understanding how accounting systems function outside formal organizational boundaries.

This study addresses this gap by explicitly engaging with accounting theory, drawing on accounting information usefulness and accountability perspectives to examine Fintech adoption and financial literacy as complementary accounting mechanisms. Accounting information usefulness theory emphasizes that information must be understandable and relevant to support decision-making, while accountability theory highlights the role of records and transparency in governing economic behavior. By integrating these perspectives, the study argues that Fintech extends accounting beyond institutional reporting frameworks and redefines accounting as a participatory, user-centered process.

Using survey-based empirical evidence from rural India, this paper investigates whether financial inclusion is primarily a function of expanded digital accounting infrastructure (Fintech adoption), enhanced accounting capability (financial literacy), or their interaction. Rather than treating inclusion as a policy outcome, the study positions it as an accounting consequence of improved information production, dissemination, and interpretation. In doing so, the paper contributes to accounting theory by demonstrating how digital financial environments challenge traditional assumptions about accounting boundaries, users, and accountability.

2. Literature Review

Traditional research on Fintech adoption and financial inclusion has largely evolved within finance, development economics, and technology adoption paradigms. However, from an accounting perspective, this body of literature reveals a theoretical misalignment: Fintech-driven financial systems increasingly rely on accounting information production and interpretation at the individual level, while dominant accounting theories remain largely organization-centric. This section reviews existing studies through the lens of accounting theory, focusing on information asymmetry, accountability, and institutional accounting perspectives, and critically evaluates their explanatory power in digital financial environments.

2.1 Accounting Information Asymmetry and Fintech

Information asymmetry theory has long occupied a central position in accounting research, emphasizing the role of accounting information in reducing gaps between information producers and users. In traditional settings, accounting systems mitigate asymmetry through standardized reporting, auditing, and regulatory oversight. However, Fintech environments fundamentally alter this structure by shifting accounting information generation from institutions to individuals through digital platforms.

Empirical studies from developing countries illustrate this transformation. Jack and Suri (2011) demonstrate how mobile money platforms such as M-Pesa enabled individuals in Kenya to save, transfer, and access funds without formal bank accounts. While these outcomes are often framed as financial inclusion, they also represent a decentralization of accounting information, where individuals become primary record-keepers of their own financial transactions. Similarly, in India, platforms such as Paytm, PhonePe, Google Pay, and BharatPe generate

real-time transaction histories that reduce institutional dominance over financial records (RBI, 2022; NPCI, 2022).

Despite this progress, information asymmetry persists because access to accounting information does not ensure its effective interpretation. NCFE (2020) and Mandal and Madaan et al. (2021) show that low financial literacy—particularly in rural regions—prevents individuals from fully utilizing digital records. This exposes a limitation of classical information asymmetry theory, which assumes that information availability automatically enhances decision-making. In Fintech contexts, the asymmetry shifts from access-based to capability-based, where users possess data but lack the literacy to convert it into accounting knowledge.

2.2 Accountability Theory and Digital Accounting Practices

Accountability theory emphasizes the role of accounting records in enabling transparency, responsibility, and control over economic activities. Traditionally, accountability mechanisms are embedded within organizational hierarchies and regulatory frameworks. Fintech disrupts this arrangement by embedding accounting accountability within individual-level digital interfaces, thereby altering who is accountable and how accountability is exercised.

Studies in developing economies suggest that while Fintech increases transactional visibility, accountability outcomes remain uneven. Asif et al. (2023) report that Fintech adoption has expanded in urban India but has had limited impact in rural areas, largely due to insufficient financial literacy. From an accounting accountability perspective, this indicates that digital records alone do not generate accountability unless users understand and trust the accounting information produced.

In developed economies, accountability challenges take a different form. Arner et al. (2016) and Widiyatmoko et al., (2024) highlight how advanced Fintech tools—such as robo-advisors, blockchain-based systems, and peer-to-peer lending—enhance user autonomy but simultaneously shift accountability from institutions to individuals. This raises theoretical concerns regarding responsibility allocation, risk recognition, and oversight in digitally mediated accounting systems.

2.3 Institutional Accounting Theory and Digital Transformation

Institutional accounting theory explains how accounting practices are shaped by social norms, regulatory frameworks, and organizational structures. Fintech challenges these institutional foundations by introducing informal, platform-based accounting systems that operate outside traditional institutional boundaries. In developing countries, where formal institutions are often weak, Fintech platforms increasingly function as quasi-institutional accounting systems.

Empirical evidence from India illustrates this shift. RBI (2022) and NPCI (2022) document the exponential growth of digital transactions, suggesting that Fintech platforms are becoming dominant channels for recording and validating economic activities. However, institutional accounting theory struggles to explain how legitimacy, trust, and standardization are established when accounting systems are governed by private platforms rather than formal institutions. In developed economies, institutional adaptation has been more gradual. Widiyatmoko et al., (2024) observe that higher levels of financial literacy facilitate smoother integration of Fintech into existing accounting norms.

2.4 Financial Literacy as Accounting Capability

Across both developing and developed contexts, financial literacy emerges as a critical moderating factor. Studies by NCFE (2020), Cole et al. (2011), and Rahadjeng et al. (2023) demonstrate that financially literate individuals and businesses are better positioned to use Fintech tools effectively. From an accounting perspective, financial literacy can be reinterpreted as accounting capability—the ability to interpret, evaluate, and act upon accounting information generated through digital systems.

McDonnell (2025) provide evidence that users of financial management applications are more resilient to financial shocks due to improved monitoring of income and expenses. Similarly, Mbodj et al. (2025) show that while mobile banking reduces access barriers, its impact on financial stability remains limited without adequate literacy. These findings collectively suggest that Fintech enhances accounting infrastructure, but literacy determines accounting effectiveness.

2.5 Synthesis and Theoretical Gap

The reviewed literature demonstrates that Fintech and financial literacy jointly influence financial inclusion outcomes across contexts. However, existing studies largely treat these relationships descriptively, without adequately theorizing their implications for accounting systems. Traditional accounting theories, information asymmetry, accountability, and institutional accounting—offer valuable insights but fall short in explaining decentralized, user-driven, and algorithm-mediated accounting environments.

This study addresses this theoretical gap by integrating Fintech adoption and financial literacy into an accounting-theoretical framework, positioning Fintech as a mechanism of accounting information production and financial literacy as the capability required to ensure information usefulness and accountability. By doing so, the paper contributes to accounting research by extending traditional theories into digital financial ecosystems, particularly within emerging economies.

3. Theoretical Framework and Conceptual Model

This study develops a theoretical framework grounded in accounting theory to explain how Fintech adoption and financial literacy jointly reshape accounting systems in

digital economies. Traditional accounting theory has primarily focused on organizational reporting, institutional accountability, and periodic financial statements. However, the rise of Fintech has fundamentally altered accounting processes by embedding real-time transaction recording, reporting, and monitoring directly into digital platforms accessed by individuals. This shift requires a reconceptualization of accounting systems beyond firm-level structures.

The framework is anchored in accounting information usefulness theory and accountability theory, with support from institutional accounting perspectives. Accounting information usefulness theory posits that accounting information contributes to effective decision-making only when it is relevant, reliable, timely, and understandable to users (Atkinson and Messy, 2012; Lusardi and Mitchell, 2007). Accountability theory emphasizes the role of accounting records in enabling transparency, responsibility, and control over economic activities (Ain et al., 2020). Together, these theories provide a basis for examining Fintech as a digital accounting infrastructure rather than merely a financial access tool.

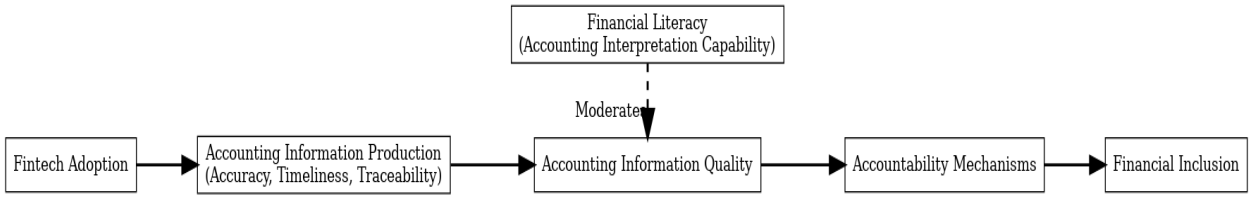
Within this framework, Fintech is conceptualized as a mechanism of accounting information production and dissemination. Digital payment systems, mobile banking applications, and Fintech-enabled credit platforms automatically generate transaction histories, financial summaries, and real-time records. These features resemble continuous accounting systems, reducing information asymmetry by increasing visibility and traceability of transactions (Jack and Suri, 2011; RBI, 2022). Unlike traditional accounting systems controlled by institutions, Fintech decentralizes accounting functions by shifting record-keeping responsibilities to individual users.

Financial literacy is reinterpreted as accounting literacy—users' capability to interpret, evaluate, and apply accounting information generated by digital systems. Prior research demonstrates that financially literate individuals are better able to manage budgets, assess credit, and monitor financial outcomes (NCFE, 2020; Cole et al., 2011). From an accounting perspective, this capability determines whether Fintech-generated data becomes useful accounting information or remains underutilized digital records. Accounting information usefulness theory suggests that information availability alone is insufficient; interpretive capacity is essential for effective decision-making and accountability.

The proposed conceptual model theorizes a causal pathway in which Fintech adoption enhances accounting information availability by improving record accuracy, timeliness, and accessibility. Financial literacy strengthens accounting information usefulness by enabling users to understand and apply these records. Together, improved accounting information quality and usability enhance accountability mechanisms, which ultimately support financial inclusion as an accounting outcome rather than a purely financial one. Institutional accounting theory further suggests that as Fintech platforms become dominant, they function as quasi-institutional accounting systems that reshape norms of transparency and control (Widiyatmoko et al., 2024).

Figure 1 illustrates the conceptual model developed in this study. The model depicts Fintech adoption as a driver of accounting information production, financial literacy as a moderating accounting capability, and accounting information quality as the mechanism through which accountability and financial inclusion are achieved. The figure visually represents the theorized flow from digital accounting infrastructure to accounting outcomes in Fintech-driven environments.

Figure 1. Conceptual Model of Fintech as Digital Accounting Infrastructure



4. Research Methodology of the Study

4.1 Research Design

The study adopts a quantitative, cross-sectional research design to empirically examine the relationships proposed in the theoretical framework. While cross-sectional designs are commonly employed in financial inclusion research, in the present study this design is justified from an accounting theory perspective, as it enables the examination of how digital accounting practices and accounting interpretation capabilities coexist at a specific point in time (Ain et al., 2020). The objective is not merely to observe access to financial services, but to assess the functioning of accounting information systems embedded in Fintech platforms and their usefulness to individual users.

The focus on rural India is theoretically motivated. Rural settings provide an appropriate context for examining accounting systems at the individual level, where formal organizational accounting infrastructures are weak and digital platforms increasingly perform accounting functions. The Aggarwal (2018) documents that while financial inclusion rates exceed 98% in urban India, rural inclusion remains below 50%. Similarly, the RBI Financial Literacy Index (2021) reports that only 27% of the population is financially literate, with rural populations lagging significantly. From an accounting

standpoint, these disparities reflect differences in accounting information accessibility, interpretation, and accountability rather than access alone.

Correlation and regression techniques are employed to test accounting-theoretical propositions regarding the role of Fintech as a digital accounting infrastructure and financial literacy as accounting interpretation capability. These methods allow for examining whether improvements in accounting information production and usability are associated with enhanced accountability and inclusion outcomes.

4.2 Sample of the Study

The study population comprises rural residents from northern India, specifically the states of Rajasthan, Punjab, and Haryana. Sample size was determined using Yamane's (1973) formula, resulting in an initial target of 500 respondents drawn from three districts: Sikar (Rajasthan), Ludhiana (Punjab), and Karnal (Haryana). These districts were selected because they share similar structural characteristics, including high dependence on agriculture, limited formal banking infrastructure, and reliance on informal economic practices.

From an accounting perspective, the homogeneity of these regions allows for isolating the effects of digital accounting practices while minimizing institutional variation. Respondents were drawn from diverse socio-economic groups, including self-employed individuals, traders, business owners, students, and employees. Data collection occurred during Gram-Sabha meetings, ensuring broad community participation. Questionnaires were administered with explanations provided to respondents to ensure accurate interpretation of accounting- and finance-related items.

4.3 Measurement and Operationalization of Variables

4.3.1 Fintech Adoption

Fintech adoption is measured using constructs of perceived usefulness, perceived ease of use, attitude, and intention (Mukhtar, 2015; Prastiawan et al., 2021; Prastiawan et al., 2021; Kurniasari & Abd Hamid, 2020; Chen & Li, 2017). In this study, these constructs are reinterpreted as proxies for accounting information production and dissemination, capturing how digital platforms generate accurate, timely, and traceable transaction records. Responses are measured on a five-point Likert scale, reflecting the extent to which individuals engage with Fintech-enabled accounting systems.

4.3.2 Financial Literacy

Financial literacy is measured using dimensions of knowledge, skills, attitudes, and behaviors (Atkinson and Messy, 2012; Lusardi and Mitchell, 2014; Lusardi, 2007; Ghadwan et al., 2022; Taylor, 2011). Rather than viewing financial literacy solely as financial competence, this study conceptualizes it as accounting interpretation capability—the ability to understand, evaluate, and utilize accounting information generated by Fintech systems. Likert-scale items assess respondents' confidence in interpreting records, monitoring transactions, and making informed financial decisions.

4.3.3 Financial Inclusion

Financial inclusion is operationalized using dimensions of access, usage, quality/relevance, and welfare impact (Telukdarie & Mungar, 2023). Within the accounting framework, these dimensions represent outcomes of effective accounting systems, reflecting improved accountability, transparency, and decision-making enabled by digital records.

4.4 Data Collection and Analysis

Data were collected using a semi-structured questionnaire designed following Churchill and Iacobucci (2004). The survey includes sections on demographic information, Fintech usage, financial literacy, and financial inclusion perceptions.

Data analysis employs descriptive statistics, reliability analysis, correlation, and regression techniques (Bryman, 2012; Cohen and Cohen, 2013; Aiken and West, 1991). The regression model explicitly tests accounting-theoretical propositions, examining whether Fintech adoption (as accounting information production) and financial literacy (as accounting interpretation capability) jointly influence financial inclusion as an accounting outcome:

$$FI_i = \alpha_0 + \beta_1 FT_i + \beta_2 FL_i + \varepsilon_i$$

Here, FI denotes financial inclusion, FT represents Fintech adoption, and FL denotes financial literacy. This specification allows for evaluating how digital accounting infrastructures and accounting capabilities interact to enhance accountability and inclusion, consistent with the theoretical framework developed in this study.

5. Data analysis and discussion

5.1 Demographic Characteristics

Table 1 outlines the demographic characteristics of the 437 respondents included in the study. The gender distribution indicates that 63% of respondents are male and 37% are female. From an accounting perspective, this composition is relevant because financial record-keeping, transaction authorization, and interaction with digital financial interfaces in rural households are often undertaken by male members, particularly among self-employed and trading households.

The age distribution shows that the majority of respondents fall within the economically active age groups of 28–43 years (35%) and 18–27 years (32%). These age cohorts are more likely to engage with digital transaction platforms that continuously generate accounting records such as payment histories, balances, and transaction confirmations, making them suitable for examining individual-level accounting practices in Fintech environments. Employment status reveals that 45% of respondents are self-employed, followed by 33% employed and 22% business owners or traders. This

occupational structure is particularly important from an accounting standpoint, as self-employed individuals typically rely on personal or informal accounting systems rather than standardized organizational reporting mechanisms.

Income levels indicate that the majority of respondents belong to lower- and middle-income brackets, which reinforces the relevance of studying Fintech-based accounting systems in resource-constrained settings. Literacy levels show that while 50% of respondents can both read and write, 14% lack both skills. This variation has direct implications for accounting information usefulness, as the ability to read and interpret digital transaction records determines whether accounting information can support informed decision-making and accountability. Educational background further reflects heterogeneity in accounting capability, with only 9% identifying as financial professionals. Overall, the demographic profile supports the study's focus on accounting systems embedded in digital platforms rather than formal institutional accounting environments.

Table 1 Summary of demographic characteristics of respondents

Demographic Characteristic	Category	Respondents Frequency	Respondents Percentage
1. Gender	Male	275	63%
	Female	162	37%
2. Age Group	18-27 years	138	32%
	28-43 years	152	35%
	43-60 years	98	22%
	61+ years	49	11%
3. Employment Status	Self-employed	196	45%
	Employed	145	33%
	Business owner/Trader	96	22%
4. Monthly Income (in Rs)	50,000–1,00,000 Rs	179	41%
	1,00,000–2,50,000 Rs	136	31%
	2,50,000–500,000 Rs	73	17%
	500,000–1,000,000 Rs	35	8%
	1,000,000 Rs and above	14	3%
5. Literacy Level	Both reading and writing	219	50%
	Reading only	140	32%
	Writing only	18	4%
	Neither	61	14%
6. Educational Background	Secondary	81	19%
	Senior Secondary	153	35%
	College/University	163	37%
	Financial professional	40	9%

5.2 Information on Fintech Usage and Awareness

Table 2 shows that 49% of respondents became aware of Fintech services through social media, followed by banks (31%) and family or friends (20%). This pattern indicates that accounting information related to Fintech systems is increasingly disseminated through informal and digital channels rather than exclusively through traditional financial institutions, supporting the conceptualization of Fintech as a decentralized accounting infrastructure.

Regarding duration of Fintech usage, 49% of respondents report using Fintech services for five years or more, while 37% report one to four years of usage. Sustained engagement suggests that Fintech-generated accounting records are embedded in routine financial practices rather than being used sporadically, reinforcing the argument that digital platforms now perform ongoing accounting functions for individuals.

Access to active bank accounts (87%), debit cards (78%), and mobile banking applications (89%) highlights the coexistence of traditional banking and digital accounting systems. From an accounting perspective, this coexistence reflects a hybrid system in which Fintech supplements rather than replaces institutional accounting structures by extending record-keeping to everyday transactions. The perception of financial inclusion among respondents (71%) and their families or friends (66%) reflects confidence in these systems, not merely access.

Ease of transaction (88%) is the most influential factor driving Fintech usage, followed by social or environmental pressure (50%) and perceived usefulness (24%). Ease of transaction can be interpreted as ease of accounting record creation and retrieval, suggesting that users value Fintech primarily for simplifying routine accounting activities rather than for complex financial analysis.

Table 2. The distribution of respondents' awareness, interest, and frequency of Fintech services

Characteristic	Frequency (N)	Percentage (%)
Getting to know about Fintech services		
- Social media	214	49%
- Bank	135	31%
- Family and friends	88	20%
Number of years since using Fintech services		
- Less than 1 year	64	15%
- 1 to 4 years	160	37%
- 5 and 5+ years	213	49%
An active bank account		
- Yes	379	87%
- No	58	13%
A debit card		
- Yes	341	78%
- No	96	22%
A mobile app to access your account		
- Yes	391	89%
- No	46	11%
Current financial inclusiveness of respondent		
- Yes	311	71%
- No	126	29%
Family/friend's current financial inclusiveness		
- Yes	288	66%
- No	149	34%
What influenced Fintech service usage? (choice multiple)		
- Ease of transaction	383	N/A
- Usefulness of Fintech	105	N/A
- Pressure from society, environment, and business partners	217	N/A

Note: Number of times each respondent selected the multiple response item, Percentage of respondents that selected the item, Cases (%) Percentage of time each item is selected.

5.3 Patterns of Fintech Use

Table 3 indicates high active use of Fintech for payments or receiving funds (72%), grocery purchases (87%), card services (64%), and utility bill payments (65%). These activities correspond to fundamental accounting functions such as recording inflows and outflows, monitoring expenditures, and managing liquidity, now executed through digital platforms.

In contrast, more advanced uses of Fintech remain limited. Only 25% of respondents actively use financial management tools to monitor income and expenses, while 79% rarely use Fintech tools to review their financial situation. This finding highlights a key accounting insight: while Fintech platforms generate accounting data automatically, users often do not engage in higher-level accounting analysis, reflecting constraints in accounting interpretation capability.

Table 3. Fintech use in Percentage

Characteristic	A (%)	O (%)	R (%)
How frequently do you use Fintech for payments or receiving funds?	72	20	8
How frequently do you use card services (POS, ATM, Credit card etc.) for contactless payments?	64	19	17
How frequently do you use Fintech services for paying internet subscriptions, and settling utility bills (such as gas and electricity etc.)?	65	22	13
Do you use Fintech services for social or religious contributions?	15	71	14
Do you use Fintech to pay for groceries or local market purchases?	87	9	4
Do you use Fintech for cryptocurrency or stock trading?	21	6	73
Have you used any Fintech tools to review your financial situation?	8	13	79
Do you use financial management tools to monitor your income and expenses?	25	43	32

Note: A=Actively, O =Occasionally, R= Rarely

5.4 Current and Future Use of Fintech Services

Table 4 shows strong current use of real-time mobile payments, QR-code payments, and digital credit facilities, with further increases expected in future usage. These services enhance the continuity, traceability, and immediacy of accounting information, which are core attributes of effective accounting systems. Anticipated growth in these services suggests increasing normalization of digital accounting records in rural financial practices.

Table 4. Respondents' Current and Future Use of Fintech Services

Current Fintech Services	**N**
Real-time payment or receipt through mobile apps (e.g., UPI, Google Pay, Paytm)	343
Easy access to a credit facility (e.g., personal loans, credit cards, Buy Now Pay Later)	217
Use of QR code for payment (e.g., scanning QR codes for UPI, Bharat QR)	349
Financial transactions through non-bank institutions (e.g., wallet services, P2P lending platforms)	118
Point of Sale (POS) payments (e.g., using debit/credit cards, mobile wallets at retail outlets	129
Total	**1156**
Future Fintech Services	**N**
Real-time payment or receipt through mobile apps (e.g., UPI, Google Pay, Paytm)	378
Easy access to a credit facility (e.g., personal loans, credit cards, Buy Now Pay Later)	267
Use of QR code for payment (e.g., scanning QR codes for UPI, Bharat QR)	374
Financial transactions through non-bank institutions (e.g., wallet services, P2P lending platforms)	114
Point of Sale (POS) payments (e.g., using debit/credit cards, mobile wallets at retail outlets	144
Total	**1277**

5.5 Descriptive Statistics

Table 5 reports mean scores of 15.25 for financial inclusion, 15.38 for Fintech adoption, and 15.27 for financial literacy. The close alignment of these means suggests that digital accounting infrastructure and accounting interpretation capability are developing concurrently among respondents. Standard deviations indicate moderate variability, which is theoretically meaningful because accounting information usefulness varies with individual capability even when accounting systems are similar.

Table 5. Descriptive Statistics of Variables Used in the Regression Analysis

Variables	**Observations(N)**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**
Financial Inclusion	437	15.25	2.66	6	20
Fintech Adoption	437	15.38	2.92	6	20
Financial Literacy	437	15.27	2.87	6	20

5.6 Correlation and Regression Results

Correlation results in Table 6 show a strong positive relationship between Fintech adoption and financial inclusion ($r = 0.769$, $p < 0.05$). This finding supports the accounting assumption that improved accounting information production and accessibility enhance inclusion by increasing transparency and transaction visibility. Financial literacy is moderately positively correlated with financial inclusion ($r = 0.585$) and with Fintech adoption ($r = 0.680$), indicating that accounting interpretation capability complements digital accounting infrastructure.

Table 6. Co-relation Matrix of Variables

Variable	**Financial Inclusion**	**Fintech Adoption**	**Financial Literacy**
Financial Inclusion	1.000		
Fintech Adoption	0.769	1.000	
Financial Literacy	0.585	0.680	1.000

Note: $p < 0.05$ indicates statistical significance at the 5% level.

Regression results in Table 7 indicate that Fintech adoption (β = 0.48, p = 0.000) and financial literacy (β = 0.35, p = 0.000) both significantly influence financial inclusion, with an R^2 of 0.70. These results confirm that financial inclusion is strongly associated with both the availability of digital accounting systems and the ability to interpret the accounting information they generate.

Table 7. Multiple regression results

Variable	Coefficient (β)	Standard Error	T-Statistic	P-Value
Fintech Adoption (β1)	0.48	0.05	9.60	0.000
Financial Literacy (β2)	0.35	0.06	5.85	0.000
No. of observation	437			
R Squared	0.70			
Adjusted R-Squared	0.69			
F-Statistic	89.50			
Prob > F	0.0000			

5.7 Discussion

The results confirm that financial inclusion in rural India can be more appropriately understood as an outcome of accounting system effectiveness rather than access alone. Fintech adoption significantly enhances inclusion by expanding the production and availability of accounting information, while financial literacy strengthens users' ability to interpret and apply that information.

The strong effect of Fintech adoption indicates that digital platforms effectively perform routine accounting functions. However, the substantial role of financial literacy aligns with earlier findings that individuals require interpretive skills to navigate complex financial systems (Cole et al., 2011). This supports the argument that accounting information usefulness depends on user capability, not merely on information availability.

The complementary relationship between Fintech adoption and financial literacy reinforces the view that increasing access to digital financial services alone is insufficient to ensure meaningful inclusion. Financial literacy moderates the effectiveness of Fintech-based accounting systems, enabling individuals to make informed decisions and exercise accountability. This interpretation is consistent with evidence that improved literacy enhances financial engagement and outcomes (Lusardi, 2007; Adam et al., 2017; Hastings et al., 2013). Overall, the findings extend existing empirical insights by demonstrating that digital financial ecosystems function as decentralized accounting systems, where inclusion emerges through the interaction between accounting information production and accounting interpretation capability. This perspective provides a stronger theoretical foundation for understanding financial inclusion in digitally mediated environments.

5. Conclusion, Recommendations, and Limitations

The findings of this study show that smartphone payments, UPI transactions, and agent banking services are among the most widely used financial services in rural India, indicating that Fintech technologies have improved access to financial services and enabled individuals to conduct transactions more independently; however, financial literacy remains a persistent constraint. Although a large proportion of respondents reported having mobile banking applications, the continued reliance on cash, ATMs, and POS services suggests that the adoption of digital financial tools does not automatically translate into their effective use. From an accounting perspective, this highlights a crucial distinction between the availability of accounting information generated through Fintech platforms and the ability of users to interpret and apply that information for decision-making and accountability. The observed disparity between banking app adoption and active debit card usage further reflects incomplete engagement with the accounting mechanisms embedded in digital financial systems. The statistical results reveal a positive relationship between Fintech adoption, financial literacy, and financial inclusion, indicating that while Fintech expands the production and accessibility of transaction records, financial literacy determines whether such records become useful accounting information. This study advances accounting theory by demonstrating that accounting information usefulness in digital environments depends jointly on digital accounting

infrastructure and user interpretation capability, rather than on access alone. By conceptualizing Fintech as a decentralized digital accounting system that generates, stores, and disseminates financial information at the individual level, the study positions financial inclusion as an accounting outcome shaped by information quality, transparency, and accountability. In doing so, the paper serves as a conceptual bridge between digital finance and accounting thought, extending accounting theory into Fintech-driven contexts where accountability increasingly operates outside traditional organizational reporting frameworks. The study is subject to limitations, including its cross-sectional design, regional focus on selected rural areas of northern India, and the exclusion of potential bidirectional relationships among Fintech adoption, financial literacy, and financial inclusion. Future research should adopt longitudinal and causal research designs, expand geographical scope, and incorporate additional accounting-relevant variables to further deepen understanding of how digital accounting systems function in emerging economies.

Declarations:

Ethical approval

Not applicable. The study did not involve human participants or animals.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Availability of data and materials

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declaration of interest

The authors declare that there are no conflicts of interest associated with this publication.

Author contributions

Pradeep Singh conceptualized the original research, designed methodology, collected and analyzed the data, and drafted the manuscript. Dr. Rupinder Katoch provided guidance on research design, statistical analysis, and critically reviewed the manuscript. Both authors contributed to the interpretation of results and approved the final version for submission.

Appendix 1

Questionnaire on the Effects of Fintech adoption on Financial Literacy and Financial Inclusion

Instructions:

This questionnaire aims to measure the impact of Financial Technology (Fintech) on financial activities with a particular focus on its association with financial literacy and inclusion. It encompasses various services, such as mobile banking and internet banking, online transactions, and digital payment systems.

Section 1. Background Information:

Gender:

☐ Male ☐ Female

Age Group:

☐ 18–27 ☐ 28–43 ☐ 43–60 ☐ 61+

Employment Status:

☐ Self-employed ☐ Employed ☐ Business owner/Trader ☐ Student

Monthly Income (in Naira):

☐ 50,000–1,00,000 ☐ 1,00,000–2,50,000 ☐ 2,50,000–5,00,000

☐ 5,00,000–10,00,000 ☐ 10,00,000 and above

Literacy Level:

☐ Both reading and writing ☐ Reading only ☐ Writing only ☐ Neither

Educational Background:

☐ Secondary ☐ Senior Secondary ☐ College/University ☐ Financial professional

Section 2. Access to Financial Services

Duration of Fintech Service Usage:

☐ Less than 1 year ☐ 1 to 4 years ☐ 5 to 5+ years

Source of Awareness about Fintech Services:

☐ Social media /T.V. ☐ Banks ☐ Family & Friends

Do you have an active bank account?

☐ Yes ☐ No

Do you have a debit card?

☐ Yes ☐ No

Do you use mobile apps to access your financial account?

☐ Yes ☐ No

Current financial inclusiveness of respondents?

☐ Yes ☐ No

Family/friend's current financial inclusiveness?

☐ Yes ☐ No

Section 3. Fintech Service Engagement

What Influenced FinTech Service Usage ? (Select multiple that apply)

☐ Ease of transaction ☐ Usefulness of FinTech

☐ Pressure from society, environment, and business partners

Which of the following Fintech services have you used or currently use?

(Select multiple that apply)

☐ Real-time payment or receipt through mobile apps (e.g., UPI, Google Pay, Paytm)

☐ Easy access to a credit facility (e.g., personal loans, credit cards, Buy Now Pay Later)

☐ Use of QR code for payment (e.g., scanning QR codes for UPI, Bharat QR)

☐ Financial transactions through non-bank institutions (e.g., wallet services, P2P lending platforms)

☐ Point of Sale (POS) payments (e.g., using debit/credit cards, mobile wallets at retail outlets)

Which of the above services would you like to continue using?
(Select multiple that apply)
☐ Real-time payment or receipt through mobile apps (e.g., UPI, Google Pay, Paytm)
☐ Easy access to a credit facility (e.g., personal loans, credit cards, Buy Now Pay Later)
☐ Use of QR code for payment (e.g., scanning QR codes for UPI, Bharat QR)
☐ Financial transactions through non-bank institutions (e.g., wallet services, P2P lending platforms)
☐ Point of Sale (POS) payments (e.g., using debit/credit cards, mobile wallets at retail outlets)

Section 4. Fintech Usage

S.N.	Question	Actively	Occasionally	Rarely
1	How frequently do you use Fintech for payments or receiving funds?	☐	☐	☐
2	How frequently do you use card services (POS, ATM, Credit card etc.) for contactless payments?	☐	☐	☐
3	How frequently do you use Fintech services for paying internet subscriptions and utility bills (gas, electricity, etc.)?	☐	☐	☐
4	Do you use Fintech services for social or religious contributions?	☐	☐	☐
5	Do you use Fintech to pay for groceries or local market purchases?	☐	☐	☐
6	Do you use Fintech for cryptocurrency or stock trading?	☐	☐	☐
7	Have you used any Fintech tools to review your financial situation?	☐	☐	☐
8	Do you use financial management tools to monitor your income and expenses?	☐	☐	☐

Section 5. Perceptions of Fintech Financial Inclusion and Literacy

Please mark how strongly you agree or disagree with the following statements regarding Fintech's role in promoting financial inclusion and literacy.

(Use a 5-point scale, where 1 = Strongly Disagree and 5 = Strongly Agree.)

S.N.	Statements	1(Strongly Disagree)	2(Disagree)	3(Neutral)	4(Agree)	5(Strongly Agree)
1	Fintech has improved financial inclusivity.	☐	☐	☐	☐	☐
2	Fintech has contributed to better financial knowledge in society.	☐	☐	☐	☐	☐
3	People are more aware of their financial status.	☐	☐	☐	☐	☐
4	People are more financially responsible.	☐	☐	☐	☐	☐
5	There is a shift away from cash-based transactions in the community.	☐	☐	☐	☐	☐
6	Fintech promotes business growth.	☐	☐	☐	☐	☐
7	Fintech services make credit more accessible.	☐	☐	☐	☐	☐
8	Financial knowledge has improved due to Fintech.	☐	☐	☐	☐	☐
9	Fintech has contributed to economic growth.	☐	☐	☐	☐	☐
10	Fintech has encouraged more people to start small businesses (SMEs).	☐	☐	☐	☐	☐
11	Fintech has made it easier to track financial transactions.	☐	☐	☐	☐	☐
12	People feel confident using digital financial tools.	☐	☐	☐	☐	☐

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