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FINTECH AND FINANCIAL INCLUSION: MEDIATING ROLE OF FINANCIAL LITERACY IN THE BANKING SECTOR OF AFGHANISTAN

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Abstract

Financial Inclusion (FI) is a burning issue in weak economies where a weak infrastructure, institutional barriers, and poor Financial Literacy (FL) are the main factors that prevent access to formal financial services. Financial technology (FinTech) has become a new disruptive instrument that has the potential to increase the financial reach; but the success of this tool lies in the capacity of individuals to comprehend and use digital financial services. This paper examines how the use of Fins affects FI with FL as a mediator in the Afghani banking industry. A quantitative research design was used to gather data on 250 banking customers in terms of a structured questionnaire and analyzed using SPSS. The proposed relationships were tested using descriptive statistics, correlation analysis, multiple regression and mediation analysis with the help of PROCESS Macro (Model 4). The findings show that FI and FL are greatly increased with the Fin adoption. FL is also a significant predictor of FI, as well as a partial mediator between Fin adoption and FI. These results indicate that technological access is not enough to guarantee inclusive results and the role of financial capability development in achieving the inclusion benefits of Fin. The study is relevant to the FI theory by confirming that FL is an effective transmission factor between the Fin adoption and inclusion outcomes in a weak banking setting. Policy implications indicate that Afghan banks and regulators are recommended to consider the Fin expansion strategies alongside the financial education programs as a sustainable approach to establish FI.

1. Introduction

FI, which is the access to and the use of affordable and appropriate financial services, is a decisive factor in economic empowerment and fair growth of the developing economies (Ha, D., Le, P., and Nguyen, D. K. 2025; Ha, D., and Nguyen, K. (2025). Although the world is advancing, in fragile and conflict-ridden economies, a large percentage of the population is still not connected to the financial system due to poor infrastructure, physical isolation, mistrust in institutions, and financial inability (Ha, Le, and Nguyen, 2025). In Afghanistan, banking has continued to be characterized by a number of challenges such as low penetration of branches, low number of accounts, and low access to digital financial services, especially in rural and semi-urban areas. These issues drive down economic inclusion and economic strength.

Financial technology (Fin) is a revolutionary trend that can address the limitations in banking by providing financial services via mobile applications, digital wallets, online payment

systems, and electronic banking interfaces. Fin has a lot of potential in increasing FI in developing economies by lowering transaction costs, diminishing physical distance barriers, and improving service efficiency (Yang and Zhang, 2022). Empirical research is increasingly showing that the use of Fins has a positive role in enhancing FI by increasing access to and the use of formal financial services by underserved groups (Ha, D., Le, P., and Nguyen, 2025; Khatri, Idrees, and Sultan, 2025). Nevertheless, the presence of technology does not ensure equity of results, because successful application presupposes the FL and trust of users in managing digital financial conditions.

There is a broad agreement that FL as the knowledge, skills, and attitudes to make informed financial decisions are the crucial factor in determining FI (Grohmann, et. Al., 2018 ;Grohmann, Klues, and Menkhoff, 2021; Alqam and Hamshari, 2024). More financially literate individuals will comprehend financial products better, effectively handle risks, and use formal financial services. Recent research indicates that FL could also be an empowering factor whereby adoption of Fin can be converted to significant financial involvement (Amnas, Selvam, and Parayitam, 2024). However, there is little empirical evidence on this mediating process especially in weak economies and formal banking industry.

The new research article by Amnas et al. (2024) investigated the mediating effect of the digital FL, as well as perceived regulatory support, on the connection between the Fin adoption and FI in India. Although their results underscore the role of financial ability in facilitating Fin-based inclusion, they were carried out in a stable emerging market and the research was based on digital FL as opposed to the wider constructs of FL. Furthermore, the paper focused on Fin ecosystems as opposed to formal banking institutions that are running under weak institutional environments. This leaves a substantial research gap on whether FL mediates the Fin-FI relationship in the banking sector of weak economies like Afghanistan.

Thus, the proposed study will focus on analyzing the effects of Fin use on FI and the mediating role of FL in the banking sector of Afghanistan. The study fills this gap and makes a contribution to the FI theory and offers practical implications to policymakers, financial institutions, and development stakeholders interested in using digital finance to achieve inclusive economic growth in post-conflict settings.

2. Literature Review

2.1 Fin and FI.

Fin refers to the application of digital technology to deliver financial services more efficiently that can be mobile banking, electronic payments, online lending and digital investment platforms. The Fin revolution has transformed the provision of financial services by reducing the cost of transactions, increasing access to services, and reducing the use of physical banking systems.

Ha, D., Le, P., & Nguyen, D. K. (2025). These features make Fin of particular interest to developing and weak economies, in which the penetration of traditional banks is low.

The connection between the use of Fin and FI is increasingly converging into empirical evidence. As Ha, Le, and Nguyen (2025) have demonstrated, Fin diffusion can contribute to the fact that the accessibility of the financial services to the emerging economies to a significant degree can be facilitated by the means of mobile payments and online transactions among the populations that are under-served. Similarly, Khatri et al. (2025) created the fact that the Fin innovation improves FI by raising financial access and participation in the formal financial markets. Ha, Le, and Nguyen (2025) also included the fact that Fin platforms reduce informational asymmetry and institutional barriers, which enhance financial access and use.

However, there are studies that caution that the inclusion effect of Fin is not automatic. According to Yang and Zhang (2022), the use of Fin could lead to higher inequalities unless the digital divide and financial ability gap is addressed effectively. Such results imply the relevance of situational aspects, including FL, in changing the implementation of Fin into favorable FI results.

2.2 FL and FI.

FL is the knowledge of the people about the financial concept, products, risks, and the

decision-making process, which allows the individuals to use the financial resources (Grohmann et al., 2021). Part of the study has proved to be good in showing that FL constitutes a significant component of the development of financial behaviors including saving, borrowing, investing and risk management which are fundamental to the continued FI.The new empirical evidence provides good arguments, which FL positively influences FI. The research carried out by Alqam and Hamshari (2024) shows that formally banked individuals are significantly more likely to use digital payment services, digital payment platforms, and financial planning services. Similarly, as it has been demonstrated by Khan et al. (2022), FL is one of the reasons why people are better able to evaluate financial products and respond to financial risks, and, therefore, get more involved in the formal financial systems. Another reason is that FL improves financial resilience and long-term financial participation, which was also proposed by Grohmann et al. (2021), particularly in the developing economies.

Even weak contexts, which are marked by low institutional trust and less financial awareness, would benefit more by FL. As Ha, Le, and Nguyen (2025) noted, without adequate financial capacity, the adoption of digital finance may be abused, which are financially vulnerable and marginalized rather than empowered. Therefore, FL does not just determine FI but is also a pre-condition to sustainable FI.

2.3 Fin and FL.

The relationship between FL and the use of Fin has gained increased attention in the past few years. Convenient interfaces, the ability to be notified about transactions in real-time, financial analysis features, and online learning opportunities can be defined as features of Fin platforms that can help users learn more about the financial products and practices (Alqam & Hamshari, 2024). Experimental studies have revealed that exposure to digital financial services might increase the financial knowledge, confidence, and decisional competence of individuals.

Khan et al. (2022) state that the impact of using digital banking on the development of financial awareness and financial management skills is significant among the users. Similarly, Khatri et al. (2025) found that the adoption of the Fin positively influences financial capability because users can now access a large variety of financial products and services through digital platforms. This data suggests that FL may be formed because of the utilization of Fin, and it will help individuals to utilize financial services effectively.

Nevertheless, underdeveloped economies and formal banking conditions do not study the relationship between Fin and FL. Most of the existing literature is on mobile money ecosystems or Fin startups in stable emerging markets and thus there is a gap on whether Fin uptake in formal banking institutions is feasible to build FL in weak and institutionally constrained environments.

2.4 FL as a Mediator.

The reason is that the recent literature is starting to pay an increased attention to the fact that FL may be an intermediate variable according to which the adoption of Fins will be translated into FI. Amnas et al. (2024) empirically demonstrated that digital FL mediates the relationship between the use of Fin and FIs in India and that individuals with a higher digital FL get more inclusion benefits after utilizing Fin services. They however did their research on digital FL and regulatory support in a stable emerging economy environment unlike a broader FL constructs.

Similarly, Ha et al. (2025) hypothesized that financial capability is a mediating and moderating variable in the impact of digital finance on the ultimate outcome of inclusion, particularly the developing economies in which individuals possess a mixed level of literacy. Ha et al. (2025) also indicated that the FL is also a behavioral transmission process between technological access and meaningful financial participation. Regardless of these observations, there is a paucity of a study on the relationship between FL as a mediating variable in weak economies and formal banking institutions.

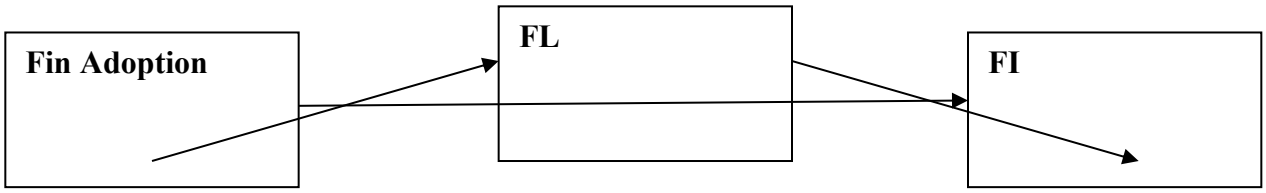
In this respect, FL is a critical problem in Afghanistan, where financial illiteracy, institutional distrust, and infrastructural constraints co-exist, and it is very critical to find out whether FL mediates the Fin-FI relationship. The importance of such gap is that besides broadening the existing theory, it provides practical recommendations on how to develop inclusive digital finance projects in conflict-related contexts.

3. Conceptual Framework and Hypotheses.

3.1 Conceptual Framework

According to the literature reviewed, the present study suggests a mediation model whereby the use of Fin would affect both directly and indirectly via FL FI. The framework assumes that Fin systems can increase financial access and utilization and at the same time increase financial knowledge and confidence in people, which in turn can help them interact more with formal financial services.

Conceptual Model:



3.2 Hypotheses Development

H1: Fin use positively influences FI in the banking sector.

This hypothesis can be explained by the empirical evidence of greater access to formal financial systems with the help of digital financial services by reducing transaction costs and geographical obstacles (Ha et al., 2025).

H2: The use of Fin has a positive influence on FL.

The assumptions of this theory presuppose the outcomes of the researches according to which the exposure to digital banking platforms leads to advancing financial knowledge and decision-making skills (Alqam and Hamshari, 2024; Khan et al., 2022).

H3: FL has a positive effect on FI.

This supposition is supported by the study that has identified financially literate individuals are more inclined to utilize and retain the utilization of official financial services (Grohmann et al., 2021; Alqam and Hamshari, 2024).

H4: There is a mediating effect of FL between Fin adoption and FI.

The hypothesis builds upon the outcomes of other researchers, Amnas et al. (2024) and Ha et al. (2025), who suggest that FL serves as a behavioral transmission mechanism between Fin adoption and the inclusion outcomes.

4. Methodology

4.1 Research Design

The present research design was a quantitative cross-sectional survey design that was used to investigate the association between Fin adoption, FL, and FI within the banking sector of Afghanistan. The research philosophy and methodology used to establish hypothesized relationships through test of structured data collection and statistical analysis are those of positivism and deductive study.

4.2 Population and Sampling

The target population was comprised of customers of the commercial banks in Afghanistan that have or are active users of digital banking solutions that include mobile banking, online banking, or electronic payment. The lack of a detailed sampling frame meant that non-probability convenience with snowball sampling was used. Originally, 250 valid responses were obtained, which was sufficient in terms of the recommended minimum sample size requirements to conduct a mediation analysis through multiple regression and bootstrapping processes.

4.3 Instrumentation and Measures

The data were collected with the help of the structured questionnaire relying on the available validated tools in the previous studies in Fin and FI, namely, the measurement scales of Amnas et al. (2024). The items were all measured using a five-point Likert scale with the range of 1 (Strongly Disagree) to 5 (Strongly Agree). The questionnaire had four sections; demography, Fin adoption, FL, and FI. The instrument has been reviewed by academic experts and tested on 30 respondents in order to make it clear, relevant and contextually appropriate.

4.4 Data Collection Procedure

The questionnaire was administered through internet online and offline through branches of the bank and networks of customers. The study was explained to the participants who were assured of anonymity and confidentiality. The survey was conducted voluntarily and informed consent was obtained prior to the completion of questionnaire.

4.5 Data Analysis Techniques

Data were analyzed in the SPSS version 26. The descriptive statistics were used to summarize sample characteristics. The reliability was to be analyzed using Cronbach alpha. The Pearson correlation analysis was employed to analyze the bivariate relationships between the study variables. Multiple regression was used to test direct relationships between Fin adoption, FL, and FI. Mediation analysis was implemented with the help of PROCESS Macro (Model 4) and 5,000 bootstrap samples as an indication of an indirect effect of Fin adoption on FI through FL. The statistical significant level was established at 0.05 level.

5. Results

5.1 Descriptive Statistics

Table 1 **Descriptive Statistics**

Variable	N	Mean	SD
Fin Adoption	250	3.74	0.68
FL	250	3.69	0.73
FI	250	3.82	0.61

The computations were done using descriptive statistics to summarize demographic attributes of the respondents and the central tendencies of the study variables. 250 valid responses were analyzed. The sample was divided into 61.2 percent men and 38.8 percent women. The number of respondents between the ages of 26 to 35 years was approximately 47 percent, with the respondents between 36 to 45 years being 29 percent. Education wise, half of the population or 54% had a bachelors degree and 28% had postgraduate education. About 67% said that they used mobile or internet banking services regularly, which means that they were exposed to Fin platforms to allow them to be analyzed in a meaningful way.

The average Fin adoption was 3.74 (SD = 0.68), which indicates that people are engaged in digital financial services rather well. FL was observed to have a mean of 3.69 (SD = 0.73), which is moderate to high financial knowledge and financial confidence among the respondents. FI registered the highest mean score of 3.82 (SD = 0.61) indicating a high level of access and use of formal banking services.

5.2 Reliability Analysis

Table 2

Reliability Analysis

Variable	Items	Cronbach's α
Fin Adoption	6	0.87
FL	7	0.89
FI	6	0.85

Cronbachs Alpha was used to measure internal consistency reliability. The adoption of Fin had robust reliability (= 0.87), and FL was highly reliable (= 0.89), as well as FI (= 0.85). All these values are higher than the recommended value of 0.70, which proves the internal consistency and the measurement reliability of all constructs.

5.3 Correlation Analysis

Table 3 **Correlation Matrix**

Variable	1	2	3
1. Fin Adoption	1		
2. FL	.63**	1	
3. FI	.58**	.66**	1

Note. p < .01.

Data were analyzed in the SPSS version 26. The descriptive statistics were used to summarize sample characteristics. The reliability was to be analyzed using Cronbach alpha. The Pearson correlation analysis was employed to analyze the bivariate relationships between the study variables. Multiple regression was used to test direct relationships between Fin adoption, FL, and FI. Mediation analysis was implemented with the help of PROCESS Macro (Model 4) and 5,000 bootstrap samples as an indication of an indirect effect of Fin adoption on FI through FL. The statistical significant level was established at 0.05 level.

5.4 Regression Analysis

Table 4 **Regression Analysis: Fin Adoption → FI**

Predictor	B	SE	β	t	p
Constant	1.21	0.18	—	6.72	.000
Fin Adoption	0.69	0.05	.58	13.80	.000

R^2 = .34, F(1,248) = 190.44, p < .001

A regression analysis showed that the adoption of Fin is a significant predictor of FI (β =.58, p <.001), and it accounts for 34% of the variance in FI. FL also varies largely with Fin adoption (=.63, p =.001), which is half the variance in FL. Moreover, FL is a significant predictor of FI (=.66, p <.001) with a variance of 44 percent of the FI. These findings confirm Hypotheses H1, H2 and H3.

Table 5 Regression Analysis: Fin Adoption → FL

Predictor	B	SE	β	t	p
Constant	1.08	0.21	—	5.14	.000
Fin Adoption	0.70	0.06	.63	11.67	.000

R^2 = .40, F(1,248) = 136.25, p < .001

Table 6 Regression Analysis: FL → FI

Predictor	B	SE	β	t	p
Constant	1.05	0.17	—	6.18	.000
FL	0.75	0.05	.66	15.00	.000

R^2 = .44, F(1,248) = 225.00, p < .001

5.5 Mediation Analysis

Table 7 Mediation Analysis (PROCESS Model 4)

Path	Relationship	Effect	SE	LLCI	ULCI
a	Fin → FL	0.70	0.06	—	—
b	FL → FI	0.55	0.05	—	—
c	Fin → FI (Total)	0.69	0.05	—	—
c′	Fin → FI (Direct)	0.31	0.06	—	—
Indirect Effect	Fin → FL → FI	0.38	0.05	0.29	0.49

Note. Bootstrap samples = 5,000. Confidence interval does not include zero, indicating significant mediation.

A mediation analysis of 5,000 bootstrap samples used by PROCESS Macro (Model 4) revealed that there exists a partial mediation between Fin adoption and FI through FL. The indirect effect of the Fin adoption on FI in the form of FL was high (=.38) and the bootstrap confidence interval [0.29, 0.49] was not equal to zero. The direct effect of Fin adoption on FI even with FL in the model (β =.31, p <.001) indicates that it was partially mediated. The findings explain Hypothesis H4.

6. Discussion

In this paper, the authors have explained the role of the adoption of Fin in influencing the FI of the banking sector of Afghanistan, through the intervention of FL. Its results indicate that FL can result in direct and indirect FI due to the use of Fin. Theoretically and empirically, the findings are reconciled with the recent literature on FI and founded on the previous research by contextualizing the nexus of Fin-FI in a precarious economy and formal banking setting.

The first important finding is that the effect of Fin adoption on FI is significant and positive. This result corroborates empirical results published in the past, which show that digital financial services (that comprise mobile banking, electronic payments, and online financial services) play a major role in determining access to formal financial services, particularly in developing economies (Ha, Le, and Nguyen, 2025). Similarly, Khatri, Idrees, and Sultan (2025) found out that Fins influence the availability of financial products to the people by lowering the cost of transactions, making services more convenient, and expanding the availability of financial products to a wider range of people than the physical branches of the banks. The Afghan banking setting where geographical remoteness and security constraints and infrastructural constraints have traditionally hindered access to banking services appears to be a viable solution to extend FI by using Fin-based delivery channels. This fact is helpful to prove the thesis that the technological innovation is a

needed structural solution to increasing the access to financial services in vulnerable and conflict-ridden economies (Yang and Zhang, 2022; Ha, Le, and Nguyen, 2025).

The second observation confirms that Fin can be an excellent method of improving FL. This means that continued use of online financial products enhances the familiarity of financial products to the user, financial decision making ability, and self-reliance in terms of management of financial resources. The fact is in line with the findings of Alqam and Hamshari (2024), who discovered that the exposure to digital banking systems improves the FL and behavioral competence of people. Similarly, Khan, Siddiqui, and Imtiaz (2022) implemented that exposure to financial technologies results in the formation of financial capability because it encourages users to become conscious of interest rates and savings devices and financial planning tools. These observations imply that Fin platforms are not just the place of transaction but also learning interfaces which facilitate the building of financial capabilities particularly in the face of low literacy.

The third finding shows that FI is largely predicted by FL, which supports the vast amount of literature suggesting that the degree of financial knowledge and confidence is a predisposing factor in determining the greater adoption, adaptation, and sustained utilization of formal financial services (Grohmann, Klues, and Menkhoff, 2021; Alqam and Hamshari, 2024). FL enables individuals to have increased information concerning banking products, evaluate financial risk and make superior financial choices that make them more likely to utilize the formal banking sector. The FL might be the factor that will help to promote the inclusive FI in the Afghan environment where the degree of financial illiteracy remains high and the degree of trust in banking institutions remains low.

Nonetheless, most critical, the mediation analysis shows that FL is a partial mediator between the Fin adoption and FI. This observation implies that Fin influences the FI directly and indirectly by not only offering the access to the technology, but also indirectly, by improving the financial knowledge and confidence of the individuals, which, in turn, enhances the ability of the individuals to utilize financial services effectively. The result is consistent with the findings of Amnas, Selvam, and Parayitam (2024), who demonstrated that digital FL mediates between the use of Fin and FI in India. However, unlike in their study, which has focused on digital FL and regulatory assistance in a stable emerging economy, the present study uses this mediation mechanism to a precarious banking setting with a more expansive understanding of FL. This extension introduces a new empirical evidence, that FL is one of the most important transmission factors even in the case when the situation is characterized by an institutional fragility, the low level of infrastructure, and a lack of trust.

Such findings are also in agreement with Ha, Le and Nguyen (2025) that have emphasized that implementing Fin is not sufficient to achieve inclusive financial outcomes in the absence of appropriate FL and institutional confidence. Similarly, Ha et al. (2025) have determined that the inclusion effects that Fins can achieve are significantly higher when users are highly financially aware and digitally skilled. By doing so, the current study will be useful to the behavioral-financial capability framework, which presupposes that the access to technology must be supported with cognitive and behavioral abilities to generate meaningful inclusion impact.

In theory, the existing study would contribute to the literature on FI by empirically validating the FL as an intermediary variable in the relationship of Fin and FI in a precarious banking system. Though most of the literature has been on this relationship in stable emerging markets, or Fin ecosystems with mobile money providers controlling, this paper can demonstrate that the mediation structure holds in a formal banking context operating under institutional constraints. This supports the notion of capability-based models of FI, which explains that the outcomes of inclusion are due to the interaction of access, usage capability and behavioral confidence (Grohmann et al., 2021; Amnas et al., 2024).

In practice, the results indicate that the strategy of Fin expansion by Afghan banks and policymakers should be combined with the systematic FL

intervention. Fins in isolation will increase access, but without adequate FL, users can be unable to adopt or continue using digital banking services. Integrated into banking systems, financial education programs in the form of interactive tutorials, financial planning applications, and digital guidance systems may improve the inclusion effect of Fin investments. This conforms to policy suggestions by Demir et al. (2022) and Ha et al. (2025) who state that reforms in digital finance should be coupled with financial capability development in order to have sustainable inclusion outcomes.

7. Conclusion

The paper has discussed the effects of the usage of Fin on FI and the moderating role of FL in the banking sector in Afghanistan. The survey-based study that involved 250 banking clients and mediation analysis, and with the help of SPSS, has proved that Fin adoption process is a significant factor in FI and FL. FL, in turn, is a highly predictive variable of FI, and mediates the correlation between Fin adoption and the FI outcomes to some extent. These results suggest that the availability of technology is not adequate to reach sustainable FI and the financial capability building is one of the major channels of transmission through which Fin can produce its influence on the inclusion effects.

The contribution of the research paper to the FI theory is that its findings empirically support the FL as a mediator in Fin-FI relationship within the fragile banking context. Practically, the findings suggest that the Afghan banks and policymakers should consider a mixture of the approaches of Fin expansion and structured financial education initiatives to achieve the greatest benefits of inclusion of digital finance.

8. Implications

Theoretical Implications

This paper builds on the FI theory by proving that FL acts as a behavioral transmission strategy that connects Fin uptake and inclusion outcomes in weak banking settings. Although previous studies have paid much attention to the stable emerging economies and Fin ecosystem, the current study offers novel evidence that mediation mechanisms are relevant in formal banking systems that face institutional limitations.

Practical Implications

The results imply that financial education programs integrated into digital platforms should be accompanied by Fin investments in banks. Regulatory frameworks that promote digital financial innovation and at the same time promote FL programs should be developed by policymakers to improve the inclusion outcomes.

Policy Implications

The national FL strategies combined with the digital finance reforms ought to be prioritized by the regulatory authorities, so that the adoption of Fin results in the meaningful financial participation and economic empowerment.

9. Limitations and Future Research.

In this study, the researcher employed a cross-sectional data, which limits causation. In future research, longitudinal designs may be employed to establish the change in FL and inclusion with time. Besides, convenience sampling may affect the generalizability negatively. The approaches of probability sampling and other mediators such as trust, perceived risk, or digital literacy can be used in the future research. Comparisons across nations with weak economies would also contribute to the further development of knowledge on situational dynamics in Fin-based FI.

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