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DeFi Adoption in India: Intersections of Technology Use, Social Influence, and Demographic Factors

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ABSTRACT

Decentralized Finance (DeFi) represents a transformative shift in the financial landscape by using blockchain technology to enable peer-to-peer services without traditional intermediaries. This study adopts a socio-cultural lens to examine the key factors that influence individuals' intentions to adopt DeFi technologies. In particular, we explore how performance expectancy (perceived usefulness), effort expectancy (perceived ease of use), social influence, and innovativeness drive user adoption, and how these relationships are moderated by demographic factors such as age, gender, education, and income. Drawing on survey data (N = 425) collected in India (an emerging market context), the research employs Structural Equation Modeling (SEM) to test the proposed framework. Results indicate that perceived usefulness and ease of use are significant positive predictors of DeFi adoption. Social influence and individual innovativeness also encourage adoption, especially among younger and more educated users. Moreover, demographic characteristics shape the strength of these effects: for instance, younger users find DeFi more useful and easier to use, women are more impacted by social recommendations, and higher-income individuals are more inclined to adopt innovative financial solutions. These findings underscore that DeFi adoption is not just a technical or economic process, but a culturally situated phenomenon influenced by social dynamics and user diversity. The paper discusses implications for improving digital financial inclusion and strategies for stakeholders to foster broader DeFi acceptance across different social groups.

Keywords: Decentralized Finance; Technology Adoption; Socio-cultural Factors; Demographics; Digital Financial Inclusion; UTAUT; Innovativeness

INTRODUCTION

Decentralized Finance (DeFi) has emerged as a groundbreaking innovation in global finance, leveraging blockchain technology to offer financial services without the need for centralized intermediaries like banks. By enabling transparent and secure peer-to-peer transactions, DeFi holds the promise of democratizing financial access and empowering users with greater control over their economic activities. This technological innovation, however, does not exist in a vacuum—its adoption and diffusion are deeply embedded in social and cultural contexts. Understanding who is inclined to embrace DeFi, and why, requires examining not only technical and economic factors but also cultural attitudes, social influences, and demographic characteristics within a society.

Despite rapid growth and the potential to disrupt traditional banking systems, DeFi faces notable barriers to broader adoption. Public awareness of DeFi remains limited outside of tech-savvy circles, and many potential users are deterred by the perceived complexity and risks of blockchain-based finance. These challenges are often exacerbated by socio-demographic divides. For example, younger adults generally show greater openness to digital innovations, whereas older individuals may approach DeFi with caution or skepticism. Similarly, higher levels of education and income might equip certain groups to navigate and trust new financial technologies, while others with less exposure to technology could feel excluded. Such disparities suggest that the spread of DeFi is not merely a matter of technological availability, but also of cultural acceptance and social inclusion.

This study aims to explore how cultural and demographic factors shape DeFi adoption. We investigate key behavioral determinants—namely performance expectancy (the belief that using DeFi will be beneficial and improve one's financial outcomes), effort expectancy (the perceived ease of using DeFi platforms), social influence (the impact of peers and societal norms on one's decision), and innovativeness (a personal trait reflecting openness to new technologies). These factors have been widely studied in technology adoption research and are adapted here to the context of decentralized finance. We also examine how these influences are moderated by demographic factors such as age, gender, education, and income. By doing so, we acknowledge that the adoption of financial technology is a social process—characteristics of different groups can amplify or dampen the importance of various drivers. For instance, women and men may respond differently to social encouragement in technology use, or younger users might place relatively more value on ease of use than older users do.

The significance of this inquiry lies in its potential to inform strategies for inclusive growth in the fintech revolution. If DeFi is to truly empower the future of finance for a broad user base, stakeholders must address both technical and cultural barriers. By identifying which factors most strongly motivate or hinder different segments of society, we can tailor DeFi platforms and educational initiatives to diverse user groups. This cultural analysis of DeFi adoption contributes to the literature on technology acceptance by highlighting the role of social context and demographic diversity in shaping a cutting-edge financial trend. It also offers practical insights for policymakers, developers, and community educators. By ensuring that the benefits of decentralized finance—such as increased financial autonomy, lower transaction costs, and improved access to services—can be realized across different strata of society, stakeholders can promote equitable social change in the financial domain.

LITERATURE REVIEW

Decentralized Finance and Financial Inclusion

Decentralized Finance refers to a broad range of financial services—such as payments, lending, borrowing, and asset trading—conducted on decentralized blockchain platforms. DeFi fundamentally challenges traditional centralized banking by eliminating intermediaries and using smart contracts to enforce rules and transactions. Scholars have noted both the opportunities and risks that this new paradigm presents. For instance, Zetzsche et al. (2020) describe DeFi as aiming for disintermediation but observe that it often results in partial decentralization, which can concentrate power in the hands of technology developers or platform founders operating outside established regulations (Zetzsche, Arner & Buckley, 2020). This scenario creates regulatory blind spots and accountability issues in the financial system. The authors propose an "embedded regulation" approach, integrating regulatory compliance into blockchain protocols, to mitigate systemic risks without stifling innovation. Complementing this perspective, Ozili (2022) emphasizes DeFi's potential to enhance financial inclusion by lowering barriers for unbanked populations and reducing transaction costs. However, he also notes that regulatory challenges, especially in developing regions, could impede DeFi's growth (Ozili, 2022). These studies highlight a tension between innovation and oversight in the DeFi ecosystem: while the technology can democratize finance, its success will partly depend on addressing governance and stability concerns in culturally diverse regulatory environments.

Technology Adoption Theories

The factors influencing the adoption of new financial technologies can be framed using established models from the technology adoption literature. A foundational example is the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003), which consolidates earlier theories into key determinants such as performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003). These constructs have been widely validated across various contexts, from e-government services to mobile apps. For example, research on internet banking in different countries has consistently found performance expectancy (the perceived usefulness of the service) to be a critical driver of adoption (Rahi et al., 2019). If users believe that a technology will improve their banking efficiency or financial well-being, they are far

more likely to use it. This aligns with Davis et al.'s (1989) Technology Acceptance Model (TAM), which underscored perceived usefulness and ease of use as fundamental influences on user attitudes (Davis, Bagozzi & Warshaw, 1989).

Performance and Effort Expectancy

Prior studies specific to digital financial services support the importance of these two expectancy-related factors. Rahi et al. (2019) found that in the context of internet banking, performance expectancy had the strongest effect on the intention to adopt, underscoring those practical benefits (e.g., faster transactions, greater financial control) are paramount. Effort expectancy—essentially the ease with which users can learn and use the service—also plays a significant role. Ghalandari (2012), in a study of e-banking adoption in Iran, observed that younger and male users were more inclined to adopt e-banking partly because they found it easier to use, suggesting an interaction between perceived ease and user demographics (Ghalandari, 2012). In mobile banking research, a similar pattern emerges user-friendly interface design and simple processes enhance adoption rates across age groups (Luarn & Lin, 2005). The implication for DeFi is clear: no matter how powerful the features of a decentralized platform, if the average user finds the interface unintuitive or the process confusing, adoption will lag. The learning curve must be kept gentle—through better user experience design and educational resources—to appeal to a broader audience.

Social Influence and Cultural Norms

Social influence refers to the way an individual's decisions are affected by the opinions and behaviors of important others (friends, family, colleagues, or the broader community). In the context of financial technology, social influence has proven to be a pivotal factor in numerous studies. For instance, Attuquayefio and Addo (2014) showed that among students adopting new ICT tools, peer endorsement significantly boosted willingness to use those tools. In the realm of banking, if one's social circle embraces internet or mobile banking, an individual is more likely to follow suit (Boateng et al., 2016). Social influence can be particularly powerful in collectivist cultures or tight-knit communities where trust in new technologies is built through word-of-mouth and communal validation. Applied to DeFi, one can anticipate that seeing respected peers or influencers successfully using cryptocurrency exchanges, lending platforms, or other DeFi applications could help legitimize these technologies for skeptical newcomers. On the other hand, a lack of visible adoption in one's community could reinforce caution. Cultural attitudes toward risk and innovation also intersect with social influence: in cultures that value tradition over experimentation, individuals might rely more heavily on social proof before trying DeFi. In contrast, in more individualistic or tech-forward cultures, early adopters might take pride in being ahead of the curve, subsequently influencing others by their example.

Innovativeness and Early Adoption

Personal innovativeness in the domain of technology is a trait describing how readily an individual experiments with new tools or ideas. Highly innovative individuals are often the early adopters who kick-start the diffusion of innovation (Rogers, 2003). In financial services, studies have linked a user's innovativeness or technology-readiness to their likelihood of using new platforms like digital-only banks or fintech apps. For example, Schmidt-Jessa and Stradomski's (2023) work on digital-only banks in Europe found that customers with greater openness to novel tech solutions were significantly more willing to open accounts with branchless, app-based banks. This suggests a parallel in DeFi: those who are generally curious and unafraid of new technologies will be disproportionately represented among early DeFi adopters. Innovativeness can also correlate with demographics (younger people or those with higher education levels might score higher on innovativeness), but not exclusively cultural factors like an entrepreneurial mindset or a community's general level of technological exposure play a role too. It is also worth noting that high personal innovativeness might help overcome some of the usability barriers; these users are more patient with learning complexities and navigating nascent, sometimes less-polished technologies.

Demographic Moderators

The influence of demographic factors on technology adoption has been a recurrent theme in research. Age, gender, education, and income can each modulate the impact of the aforementioned drivers. Venkatesh et al. (2012) extended the UTAUT model (creating UTAUT2) and explicitly included age, gender, and experience as moderators for various predictors of technology use (Venkatesh, Thong & Xu, 2012). Generally, younger individuals—having grown up in a digital era—may place different weight on factors like effort expectancy: they often expect intuitive digital experiences and may lose interest quickly if a technology is cumbersome. Older users might need stronger performance benefits to justify the effort of learning a new system. Gender differences have been observed as well: some studies indicate that women's adoption decisions in tech domains are more

strongly influenced by social factors than men's (Morris & Venkatesh, 2000; see also Rahi et al., 2019 for gender differences in internet banking). This does not imply any innate determinism, but rather could reflect social roles and the differing confidence with technology historically afforded to different genders. Education level tends to enhance one's comfort with complex concepts, so we expect highly educated users to navigate DeFi more easily (and also to perceive its usefulness more clearly), thereby amplifying performance and effort expectancy effects. Income can affect adoption in two ways: higher-income individuals have the financial slack to experiment with potentially risky innovations and also stand to gain more from sophisticated financial tools, whereas lower-income individuals might approach new financial technologies with caution due to risk aversion or lack of surplus funds to invest (Rizkalla, Tannady & Bernando, 2024). However, if DeFi can be shown to offer low-cost services (such as very low fees for remittances or micro-investment opportunities), it could also become attractive as a tool for lower-income users, aiding financial inclusion. Summarizing the literature, it is evident that any analysis of DeFi adoption should intertwine technological factors with social and demographic context. This study builds on these insights to propose a conceptual framework and hypotheses focused on how performance expectancy, effort expectancy, social influence, and innovativeness drive DeFi adoption, and how their effects vary across different demographic groups.

CONCEPTUAL FRAMEWORK AND HYPOTHESES

Building on the literature, we developed a conceptual model that positions four key constructs as direct determinants of behavioral intention to use DeFi: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Innovativeness (IN). We further posit that demographic attributes (specifically age, gender, education, and income) act as moderating variables that can strengthen or weaken the effects of these determinants on intention. The conceptual framework is illustrated schematically in Figure 1, which also reflects the hypothesized relationships tested in this study.

Hypothesis 1 (Performance Expectancy): We expect that individuals who perceive greater utility in DeFi platforms will be more inclined to adopt them. H1a therefore states that higher performance expectancy will positively influence an individual's intention to use decentralized financial technologies. Furthermore, because perceptions of usefulness can be shaped by one's background, H1b proposes that the impact of performance expectancy on intention is moderated by demographic factors (age, gender, education, and income). For example, the perceived benefits of DeFi might be especially compelling to younger users who are more open to new digital solutions, or to highly educated users who quickly grasp DeFi's advantages.

Hypothesis 2 (Effort Expectancy): Ease of use is expected to be another crucial determinant. H2a posits that higher effort expectancy (i.e., the belief that DeFi systems are easy to learn and use) will positively influence the intention to adopt DeFi. We also anticipate moderation in this case: H2b suggests that demographic factors will moderate the relationship between effort expectancy and adoption intention. It is conceivable, for instance, that older adults or those with less technical experience might require a very high degree of perceived ease before trying DeFi, whereas younger or tech-savvy individuals might tolerate some complexity—meaning the slope of the effect could differ by age or education level.

Hypothesis 3 (Social Influence): Social factors are predicted to play a role in DeFi adoption decisions. H3a states that positive social influence—such as encouragement or examples set by friends, family, or influential community members—will lead to a higher intention to use DeFi. We also hypothesize H3b: the strength of social influence's effect is moderated by demographic variables. Prior evidence suggests, for example, that gender may moderate susceptibility to social influence in tech adoption, with female users potentially more responsive to community opinions (Morris & Venkatesh, 2000). Similarly, cultural expectations tied to age or education might shape how strongly social recommendations sway someone's decision to join a new financial platform.

Hypothesis 4 (Innovativeness): Individuals with a propensity to seek out and experiment with new technologies are more likely to venture into DeFi. H4a proposes that a higher level of personal innovativeness will be associated with a greater intention to adopt DeFi technologies. Since innovativeness may interact with one's demographic context, H4b posits that demographic factors (age, gender, education, income) moderate this relationship. For instance, an innovative mindset coupled with ample financial resources (higher income) might strongly drive DeFi adoption, as such individuals not only enjoy new tech but also have the means to invest or transact in these platforms.

Taken together, these hypotheses form a moderated model of DeFi adoption. We also recognize an overarching expectation that demographic characteristics can influence multiple paths in the model (consistent with the UTAUT framework's treatment of moderators). Although we enumerate specific H1b–H4b for clarity on each primary construct, our broader aim is to examine how each demographic factor might change the effects of performance expectancy, effort expectancy, social influence, and innovativeness on the intention to use DeFi.

The following sections describe the methodology for testing this model and present the results of our hypothesis tests.

METHODOLOGY

Research Design

This study employed a quantitative survey research design to test the proposed model of DeFi adoption. We designed a structured questionnaire that included measurement items for each of the main constructs (performance expectancy, effort expectancy, social influence, innovativeness, and behavioral intention to use DeFi), as well as items capturing demographic information (age, gender, education level, and income range). All item measures were adapted from validated instruments in the technology acceptance literature, with wording modified to fit the context of decentralized finance. For example, items for performance expectancy were derived from prior studies on banking technology (e.g., an item stated "Using DeFi would increase my efficiency in financial transactions"), and effort expectancy items assessed perceived ease (e.g., "DeFi platforms are easy to learn to use"). Social influence items gauged agreement with statements like "People important to me think I should use DeFi." Innovativeness was measured through items reflecting a person's tendency to try new technologies (e.g., "I am usually among the first of my peers to experiment with new financial technologies"). Responses were collected on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree), a range that captures degrees of agreement and has been shown to work well in similar adoption studies (Dhingra & Gupta, 2020; Rahi et al., 2019).

Sample and Data Collection

The target population for the survey was emerging adult and adult consumers who have at least some awareness of digital finance. To capture a relevant cross-section, we administered the survey online in India, where cryptocurrency and DeFi usage is growing (especially among tech-savvy groups) but where adoption remains far from mainstream. Participants were recruited through a combination of university networks, social media outreach, and professional contacts, aiming for diversity in gender and educational backgrounds. We obtained 425 valid responses, which provided a robust sample for the statistical analyses. Table 1 presents the demographic profile of the respondents. The sample was notably skewed toward younger individuals: roughly three-quarters (about 75.5%) of respondents were between 18 and 25 years old, with the remaining ~24.5% between 26 and 50 years. No respondent in our sample was above 50, reflecting that older generations constitute only a small minority of the DeFi-interested population in our outreach. In terms of gender, the sample was 79.1% male and 20.9% female. While this imbalance might indicate greater interest or representation of men in the DeFi space, it also underlines the need to examine gender as a factor in adoption. Educationally, the majority (about 83%) were undergraduates (either current students or bachelor's degree holders), about 13% held postgraduate degrees, and a small fraction had other qualifications.

This suggests our respondents are relatively well educated overall, which could influence their engagement with cutting-edge financial technology. Regarding income (self-reported monthly income in Indian Rupees, reflecting personal income or, in the case of students, perhaps family support), the sample spanned various brackets. There was a concentration in middle to upper-middle ranges: roughly one-third earned INR 30,001–40,000, another one-third earned above INR 50,000, and the rest were in lower brackets (INR 20,000–30,000 or INR 40,001–50,000). These income distributions imply that many respondents had at least moderate financial capacity, which can be relevant for adoption since participating in DeFi often requires some investable assets or disposable income. Overall, the sample characteristics highlight a young, educated cohort with a bias toward male respondents—demographics that we will examine as moderators in the analysis.

Table 1. Demographic Profile of Respondents (N = 425)

Category	Subgroup	Percentage (%)
Age	18–25 years	75.5%
	26–50 years	24.5%
	>50 years	0%
Gender	Male	79.1%
	Female	20.9%
Education	Undergraduate (Bachelor's)	83.3%
	Postgraduate	13.2%
	Other qualifications	3.5%

Income (Monthly)	INR 20,000–30,000	15.8%
	INR 30,001–40,000	32.5%
	INR 40,001–50,000	17.6%
	> INR 50,000	34.1%

(*Note:* INR = Indian Rupees. Income represents personal monthly income, or family support level for student respondents.)

Data Analysis

For data analysis, we used a two-step Structural Equation Modeling approach (SEM): first validating the measurement model, then testing the structural relationships. We tested the moderation hypotheses using two approaches: multi-group SEM analyses (splitting the sample by demographic subgroups, e.g., comparing younger vs. older respondents) and hierarchical regression with interaction terms. In the regression approach, we centered the continuous variables and created interaction terms (e.g., Performance Expectancy × Age) to include in a hierarchical regression model predicting intention to use DeFi. A significant interaction term would indicate a moderating effect. We also examined changes in R^2 to gauge how much explanatory power the moderators added. To maintain rigor in model evaluation, we assessed the structural model's overall goodness-of-fit using indices such as chi-square/degrees of freedom (χ^2/df), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). We adopted common thresholds for acceptable model fit: $\chi^2/df < 3$, CFI and TLI close to or above 0.90, and RMSEA < 0.08 (Hu & Bentler, 1999).

RESULTS

Descriptive Statistics

Before testing hypotheses, it is useful to consider the general perceptions of DeFi among the respondents. Table 2 summarizes the descriptive statistics (mean and standard deviation) for each main construct. On average, attitudes toward DeFi were positive: all mean scores were above the neutral midpoint of 3 on our 5-point scale. Performance Expectancy had the highest mean (M = 3.77), suggesting that respondents generally agree that using DeFi could be beneficial and improve their financial outcomes. Social Influence and Effort Expectancy were close behind with means of 3.74 and 3.73, respectively, indicating moderate agreement that peers encourage DeFi use and that DeFi platforms are reasonably easy to work with. Intention to Use DeFi was also fairly high (M = 3.62), which is notable given that DeFi is still an emerging concept—this implies a leaning toward adoption among our sample. Innovativeness scored somewhat lower (M = 3.25) relative to the other factors, perhaps reflecting that only a subset of respondents see themselves as bold experimenters with new technology. The variability in responses, as indicated by the standard deviations (SD), ranged from about 1.08 to 1.33. Notably, the SD for Performance Expectancy and Intention to Use (around 1.1) was at the lower end, meaning opinions on these were somewhat more consistent across individuals, whereas Social Influence had a slightly higher variance (SD ~1.3), hinting that social experiences with DeFi differ more widely (some might have strong encouragement from peers, others none at all).

Table 2. Descriptive Statistics of Key Constructs

Construct	Mean (M)	Standard Deviation (SD)
Performance Expectancy (PE)	3.77	1.12
Effort Expectancy (EE)	3.73	1.20
Social Influence (SI)	3.74	1.08
Innovativeness (IN)	3.25	1.33
Intention to Use (BI)	3.62	1.22

Note: BI = Behavioral Intention (to use DeFi). All variables were measured on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).

These descriptive results point to generally favorable perceptions of DeFi in terms of its usefulness and usability among our respondents, aligning with the profile of a young, educated sample. They see clear benefits (high performance expectancy) and do not find the concept overly difficult (effort expectancy is high). The moderate score for innovativeness suggests that while many are willing to consider new technology, not everyone identifies as a bold early adopter; this could mean that continued growth in actual DeFi usage might depend on

appealing beyond the "tech enthusiast" segment into more mainstream users. Additionally, the relatively high Social Influence mean indicates that community and peer discussions about DeFi are fairly prevalent—this social dimension may have a meaningful role in driving adoption, as we hypothesized.

Measurement Model Validation

We conducted a Confirmatory Factor Analysis (CFA) to validate our measurement instruments. The CFA results demonstrated a good fit for the measurement model: $\chi^2/df = 2.86$, CFI = 0.942, TLI = 0.935, and RMSEA = 0.066, all of which fall within acceptable ranges for model fit. These statistics suggest that the hypothesized factor structure (with five latent constructs corresponding to our main variables) fits the data well. Each survey item loaded significantly on its intended factor, with standardized factor loadings mostly above 0.70, indicating strong item reliability. A few items had slightly lower loadings (in the high 0.60s), but none were low enough to warrant concern or deletion (commonly, loadings ≥ 0.5–0.6 are considered acceptable in social science research).

We then assessed construct reliability and validity. Table 3 provides the Composite Reliability (CR), Cronbach's alpha (α), and Average Variance Extracted (AVE) for each construct. All constructs had Cronbach's α values well above the 0.70 threshold (ranging roughly from 0.88 to 0.90), confirming good internal consistency. Likewise, CR values exceeded 0.85 for every construct, further evidence that the items collectively capture their underlying factor reliably. The AVE values ranged from approximately 0.59 to 0.71, all above the recommended 0.50 level, indicating convergent validity (each construct explains more than half the variance of its indicators on average). For example, Effort Expectancy had an AVE of about 0.60, meaning the items measuring EE share substantial common variance attributable to the EE construct.

Table 3. Reliability and Convergent Validity of Constructs

Construct	Cronbach's α	Composite Reliability (CR)	Average Variance Extracted (AVE)
Performance Expectancy (PE)	0.891	0.894	0.630
Effort Expectancy (EE)	0.896	0.892	0.595
Social Influence (SI)	0.877	0.880	0.616
Innovativeness (IN)	0.892	0.904	0.662
Intention to Use (BI)	0.881	0.898	0.706

In terms of discriminant validity, we compared the square root of the AVE for each construct with its inter-construct correlations. In all cases, the square root of AVE for a given construct was greater than the Pearson correlation between that construct and any other construct in the model. As an illustrative example, the square root of AVE for Performance Expectancy ($\sqrt{AVE} \approx 0.79$) exceeded its correlation with Effort Expectancy and with all other factors, confirming that PE is more closely related to its own items than to any other construct. We observed a similar pattern for all constructs, thereby satisfying the Fornell-Larcker criterion for discriminant validity. This indicates that while our constructs are conceptually related (as expected in an adoption model—e.g., it's plausible that those who find a technology useful might also find it easy to use, leading to some correlation between PE and EE), they are not redundant with each other. Users do distinguish, say, the perceived usefulness of DeFi from the social pressure to use it. Given this solid evidence of reliability and validity, we proceeded to interpret the structural relationships with confidence that measurement issues were unlikely to confound the findings.

Structural Model and Hypothesis Testing

With a validated measurement model, we next evaluated the structural model to test the hypotheses. The overall fit of the structural model remained good (the fit indices were nearly identical to the CFA, since the structural model built on the measurement model). Crucially, the path coefficients revealed support for all the direct hypothesized influences (H1a through H4a):

Performance Expectancy → Intention (H1a): Performance expectancy had a positive and significant effect on the intention to use DeFi. The standardized path coefficient was $\beta \approx 0.41$ ($p < 0.001$) in the SEM analysis. This indicates that respondents who believe DeFi will improve their financial outcomes are much more likely to intend to adopt it. Performance expectancy emerged as one of the strongest predictors in the model. This finding aligns with prior technology acceptance research in banking and fintech, reinforcing the notion that highlighting the practical benefits of DeFi (e.g., higher returns, faster transactions, greater financial autonomy) can substantially drive user interest. In terms of variance explained, performance expectancy alone accounted for a significant portion of the variance in intention, underscoring its importance.

Effort Expectancy → Intention (H2a): Effort expectancy also showed a positive, significant effect on intention, with a standardized coefficient of $\beta \approx 0.32$ ($p < 0.001$). This suggests that ease of use is a critical factor: the easier and more user-friendly individuals perceive DeFi platforms to be, the more likely they are to plan on using them. In our model, effort expectancy's impact—while strong—was slightly lower than that of performance expectancy, making it the second most influential predictor. This echoes findings in related domains that usability can make or break adoption, especially for technologies that might intimidate newcomers. It implies that even if DeFi is known to be useful, complex interfaces or steep learning curves could significantly dampen adoption. Therefore, reducing technical jargon in DeFi apps, providing tutorials, and designing intuitive user experiences should be priorities for platform developers.

Social Influence → Intention (H3a): Social influence had a significant positive effect on intention ($\beta \approx 0.17$, $p < 0.001$), supporting H3a. While the magnitude of this coefficient is more modest compared to the expectancy factors, it is nonetheless meaningful. It indicates that the social environment and peer opinions play a role in an individual's decision to adopt DeFi. In practical terms, if someone perceives that "people important to me think I should use DeFi," or observes many peers using it successfully, that person's likelihood of intending to use DeFi increases. This result resonates with the idea that community validation and word-of-mouth can facilitate the spread of new financial innovations. It likely reflects the influence of online communities (such as forums, social media groups, or influencers in the cryptocurrency space) in shaping attitudes toward DeFi. Given this finding, outreach strategies that create positive buzz or leverage testimonials could be effective in promoting DeFi adoption, especially in populations that rely strongly on social cues for decision-making.

Innovativeness → Intention (H4a): Innovativeness also emerged as a significant predictor of DeFi adoption intention ($\beta \approx 0.29$, $p < 0.001$). Individuals who see themselves as innovators or early adopters—those who enjoy exploring new technologies—showed substantially higher intentions to use DeFi. This confirms H4a and aligns with the idea that DeFi's current user base may be dominated by tech enthusiasts and experimenters. These are the people who likely tried cryptocurrency and blockchain applications early on and are now extending that curiosity to decentralized finance platforms. Over time, as DeFi matures, the influence of personal innovativeness might wane if the technology becomes mainstream; however, at this relatively nascent stage, it is clearly a strong differentiator of who is interested in DeFi. For practitioners, this suggests that early marketing of DeFi services might best target innovative segments (e.g., through tech meetups or online tech forums) but eventually needs to "cross the chasm" to more pragmatic users.

Together, these factors (PE, EE, SI, IN) explained a large proportion of variance in the Behavioral Intention to use DeFi. The R^2 for intention was around 0.68 in the structural model, indicating that about 68% of the variability in people's intent to adopt DeFi is accounted for by the model's predictors. This R^2 value is quite high for behavioral studies, suggesting that our model captures the major influences well.

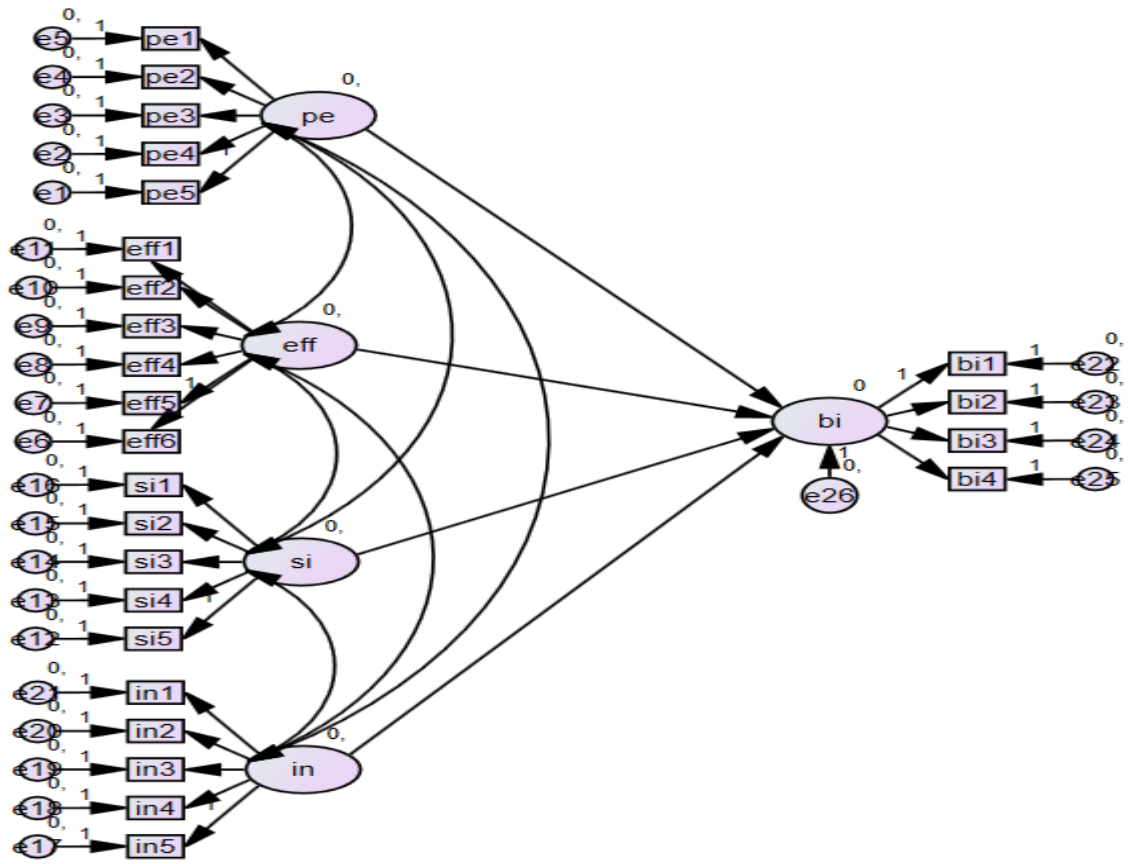

Figure 1.1: Structural Equation Model illustrating the relationships among core factors and the intention to adopt DeFi. Latent constructs are depicted as oval nodes – pe (Performance Expectancy), eff (Effort Expectancy), si (Social Influence), in (Innovativeness), and bi (Behavioral Intention to Use DeFi).

Arrows denote hypothesized causal paths. The numbers along the paths are standardized coefficients (factor loadings for measurement items and beta coefficients for structural relations) obtained from the SEM analysis. All shown paths from pe, eff, si, and in to bi are positive and statistically significant ($p < 0.001$), supporting H1a–H4a. This diagram also includes the measurement model details (each construct's observed indicator variables and their loadings).

Moderating Effects of Demographics

The second part of our analysis examined H1b–H4b, the moderating effects of the demographic variables on the relationships between the main predictors and adoption intention. We found partial but insightful support for these moderations:

Age as a Moderator: Age significantly moderated the influence of certain factors. In particular, we observed that the effect of performance expectancy on intention was stronger among younger respondents than older ones. In a regression including the interaction term (Performance Expectancy × Age), the interaction was significant ($p < 0.01$), indicating that younger individuals derive even more motivation from perceived usefulness than older individuals do. This suggests that young adults are highly responsive to the benefits of DeFi—if they see clear value, it greatly boosts their intent—whereas older adults remain relatively lukewarm even if they acknowledge some benefits. We also found age moderation for effort expectancy: the interaction term (Effort Expectancy × Age) had a negative coefficient (β around –0.16, $p < 0.05$). This indicates that the positive effect of ease of use on adoption intention diminishes for older users. Put another way, making DeFi easy to use is especially crucial for older people (if it's not easy, they likely won't attempt it at all), whereas younger users may adopt even if there's a slight learning curve. Age did not significantly moderate the effects of social influence or innovativeness in our data—likely because almost all respondents were within a relatively young range, limiting our ability to detect differences by age for those particular factors.

Gender as a Moderator: Gender's most notable moderating effect was on the relationship between social influence and intention. Our analysis showed that being female amplified the impact of social influence: women in the sample were more influenced by peer opinions and social norms when deciding on DeFi use (the Social Influence × Gender interaction was significant, $p < 0.05$). This finding is consistent with some prior studies of technology adoption and confirms H3b in the context of gender—indicating that community and social validation might be a particularly effective lever to encourage DeFi uptake among women. For example, seeing other women successfully engage in DeFi or having female role models in the fintech space could significantly increase intention for female users. On the other hand, the data suggested that male respondents' intentions were comparatively less swayed by social consensus and more driven by the intrinsic qualities of the technology (like its perceived usefulness and perhaps the novelty of innovation). We did not find a statistically significant moderation by gender for performance expectancy or effort expectancy; both men and women valued usefulness and ease similarly in those respects. There was a marginal moderation for innovativeness by gender: the Innovativeness × Gender interaction approached significance ($p \sim 0.06$), hinting that innovativeness might translate to intention slightly differently for men vs. women, but this effect was not strong enough to draw firm conclusions. It could be explored in future research with a more gender-balanced sample or with qualitative follow-up.

Education as a Moderator: Education level showed a meaningful moderating influence on two factors. First, it strengthened the effect of performance expectancy on intention (Education × Performance Expectancy interaction was significant, $p < 0.01$). Highly educated respondents (e.g., postgraduates) were even more likely to intend to use DeFi if they perceived it as useful, compared to those with lower education. This might be because those with higher education can more readily appreciate advanced features or long-term benefits of DeFi (such as complex yield-generating protocols or the notion of financial sovereignty) and thus are more motivated when they see those benefits. Secondly, education moderated the effort expectancy effect (interaction $p < 0.001$): individuals with higher education found DeFi easier to use (perhaps due to greater exposure to technology or better financial literacy), and thus the positive influence of ease-of-use perceptions on their intention was amplified. Conversely, for those with less formal education, even if they found DeFi relatively easy, they might still face other barriers (like limited prior knowledge of digital finance) that temper the conversion of that perception into actual intention. These interactions support H1b and H2b in the context of education and highlight that educational outreach could play a role in making DeFi accessible—by raising users' understanding, we effectively raise their "perceived ease" and "perceived usefulness," which in turn drives adoption.

Income as a Moderator: Among the demographic factors, income had a narrower but interesting moderating effect. We found a significant interaction between innovativeness and income (Innovativeness × Income, $p < 0.05$), aligning with H4b (specifically regarding income). Higher-income individuals who are innovative showed substantially greater intention to adopt DeFi than lower-income but equally innovative individuals. This suggests that having financial resources provides the means or confidence to act on one's innovative tendencies in the financial domain. A high-income, tech-curious person might be willing to allocate funds to experiment with DeFi platforms (investing in cryptocurrencies, providing liquidity in DeFi protocols, etc.), whereas an equally tech-curious person with low income might feel constrained from doing so because of the potential financial risks or simply having less spare money to try new things. Interestingly, income did not significantly moderate the effects of performance expectancy or effort expectancy – it appears that regardless of

income level, people value usefulness and ease similarly. Nor did income significantly change the impact of social influence in our study. The moderation impact of income was focused on innovativeness, indicating that financial capacity coupled with a penchant for innovation creates a particularly potent recipe for early adoption of DeFi.

To synthesize the moderation findings, several clear patterns emerged:

Younger, educated users represent a segment for whom DeFi's perceived usefulness and ease-of-use are especially pivotal. They respond very strongly to these factors, making them likely early adopters when those factors are favorable.

Women users are more strongly driven by social validation in the context of DeFi than men are. Thus, community-building and visible peer support may be key to increasing adoption among women.

Higher-income innovators are leading the way in early DeFi adoption, likely because they have both the means to participate and an intrinsic drive to try new financial innovations.

Factors that were not significantly moderated (like the influence of usefulness across genders, or social influence across age groups) suggest that those particular effects are relatively universal in our sample – meaning the baseline influence applies broadly across those demographics.

Summary of Hypothesis Tests: For clarity, we summarize the hypothesis testing outcomes below:

H1a: Performance expectancy has a positive effect on intention – Supported (significant positive β).

H1b: Demographics moderate PE's effect – Partially Supported (significant moderation by age and education for PE's effect, as detailed).

H2a: Effort expectancy has a positive effect on intention – Supported.

H2b: Demographics moderate EE's effect – Partially Supported (significant moderation by age and education for EE's effect).

H3a: Social influence has a positive effect on intention – Supported.

H3b: Demographics moderate SI's effect – Partially Supported (significant moderation by gender for SI's effect; other moderators less pronounced).

H4a: Innovativeness has a positive effect on intention – Supported.

H4b: Demographics moderate IN's effect – Partially Supported (significant moderation by income, and weakly by gender, for IN's effect).

In sum, all of our model's direct paths were validated, and we identified several important ways in which user diversity (age, gender, education, income) changes the influence of the adoption drivers. These results paint a nuanced picture: while certain fundamentals (usefulness, ease, social push, innovative disposition) drive DeFi interest generally, the strength of those fundamentals can vary across different cultural and demographic segments of the population.

DISCUSSION

The findings of this research provide meaningful insights into the social and cultural dynamics underpinning the adoption of decentralized finance. Consistent with broader technology acceptance theory, all four proposed factors significantly shape individuals' intentions to adopt DeFi. Among these, perceived usefulness (performance expectancy) emerged as the most influential predictor of adoption intention, with a strong effect size ($\beta \approx 0.41$, $p < 0.001$). This underscores that, no matter how novel or disruptive a technology is, users gravitate toward it when they clearly perceive personal or economic benefits. In a DeFi context, such benefits might include obtaining higher returns on investments compared to traditional banks, faster loan approvals without bureaucracy, or greater control over one's assets. Our result echoes findings in digital banking that users' expectation of concrete benefits heavily influences uptake (Rahi et al., 2019). For younger cohorts in particular, who have fewer entrenched loyalties to traditional banks, the promise of an alternative financial system that better serves their needs appears highly attractive. This suggests a cultural shift in financial expectations: newer generations are less content with one-size-fits-all finance and more eager to adopt innovations that promise empowerment and efficiency in managing money.

Ease of use (effort expectancy) was another major driver of DeFi adoption intentions, showing a robust influence ($\beta \approx 0.32$, $p < 0.001$). It was the second strongest effect in our model, resonating with the idea that DeFi platforms must overcome a usability hurdle to gain widespread acceptance. This finding aligns with classical TAM arguments (Davis et al., 1989) and recent fintech studies (Dhingra & Gupta, 2020) that emphasize simplicity and intuitiveness as keys to adoption. It also reflects common observations in the community that first-time DeFi users often find tasks like setting up crypto wallets, safeguarding private keys, or navigating decentralized exchanges daunting. Our data confirms that if people perceive these tasks to be easy, their willingness to engage with DeFi jumps significantly. The clear implication is that developers and educators in the DeFi space should prioritize user experience. Simplifying onboarding processes, integrating familiar design

patterns, and providing adequate guidance (e.g., tutorials or peer support) can reduce the intimidation factor and broaden DeFi's appeal beyond the tech-savvy elite.

The role of social influence in DeFi adoption, while less dominant than the expectancy beliefs, is nevertheless crucial and highlights the inherently social nature of financial behaviors. Our study demonstrates that individuals do not leap into something as novel as decentralized finance entirely on their own; rather, they look for cues and validation from their environment. This can manifest in various ways: discussions with friends who have already experimented with a DeFi lending app, reading testimonials or success stories of people profiting from DeFi yield farming, or seeing influencers on social media endorse certain DeFi projects. The fact that social influence significantly predicts intention ($\beta \approx 0.17$, $p < 0.001$) suggests that community trust and word-of-mouth are vital ingredients for mainstreaming DeFi. This result is congruent with innovation diffusion theory (Rogers, 2003) and research on peer effects in technology use. In practical terms, encouraging adoption among a new user segment might require creating social proof—for example, launching referral programs, showcasing active user communities, or leveraging respected community leaders who can advocate for DeFi in relatable terms to their peers. Conversely, this also implies that skepticism or negative perceptions can propagate socially; maintaining positive community engagement and addressing public misconceptions about DeFi (such as the notions that it is only for illicit activities or is excessively risky) is important for building trust in the ecosystem.

Innovativeness as a personal trait proved to be a significant differentiator in our study ($\beta \approx 0.29$, $p < 0.001$). This aligns with the notion that in the early phase of any technological diffusion, a large portion of the user base consists of enthusiasts and innovators who are willing to try something new even when uncertainties exist. The finding that innovative individuals—often found among younger, well-educated, and perhaps more affluent demographics—are driving early DeFi adoption indicates that at this stage, DeFi might still be perceived as a niche or avant-garde pursuit, not yet fully normalized for the general public. Innovators often serve as testers and evangelists, smoothing out the kinks in new technology and then encouraging the early majority to follow. To transition from this niche to broader usage, DeFi will likely need to become more approachable (reinforcing the importance of effort expectancy) and to demonstrate tangible value to more risk-averse or traditional users (reinforcing performance expectancy in practical terms). Innovators can also aid in this transition by sharing their experiences and knowledge—effectively mentoring their less adventurous peers—which leverages social influence to bring new users on board.

The moderating effects of demographics add an important layer of socio-cultural interpretation to these findings. They reveal that DeFi adoption is not monolithic across society; different groups engage with it in different ways:

Youth vs. Older Adults: Younger individuals (particularly those in their twenties) emerged as the primary enthusiasts for DeFi in our sample, responding exceptionally strongly to DeFi's core appeals of usefulness and ease-of-use. Older individuals—who were few in our data—appear more hesitant and would likely require extra assurance or simplification to come on board. This generational disparity reflects a broader pattern in digital innovation uptake, where youth are often pioneers of new technology. Culturally, it suggests that younger generations could become the agents of change in how financial systems are perceived, shifting from bank-centric to decentralized paradigms, while older generations integrate these changes more slowly and cautiously. As the current young cohort ages, overall DeFi usage may naturally increase, but there is an immediate opportunity to design platforms with older users' needs in mind. For example, emphasizing security and trust (attributes that older adults typically value highly) or offering hybrid interfaces that bridge familiar traditional banking elements with DeFi functionalities could help engage more senior users.

Gender Dynamics: Our findings suggest that women's intentions are more influenced by social factors, whereas men's intentions are slightly more driven by perceived utility and by their own willingness to embrace innovation. This provides a nuanced gender perspective on DeFi adoption. Culturally, finance (especially cryptocurrency and DeFi) has often been seen as a male-dominated arena. If women are indeed more responsive to community and trust-building aspects, then fostering inclusive and supportive DeFi communities could help close the gender gap in participation. Initiatives such as women-led blockchain education workshops or highlighting female success stories in DeFi can create a more inviting atmosphere. Our results indicate that when the environment normalizes women's involvement in DeFi and offers social support, women's interest in adopting these tools can rise significantly. This is a valuable insight for promoting diversity in fintech—ensuring that the benefits of DeFi are accessible and appealing to all genders, not just the current male majority.

Education: Education's moderating role implies that people with higher education levels have a head start in understanding and appreciating DeFi's value proposition, which in turn accelerates their adoption. Conversely, those with less formal education might not find DeFi as straightforward or compelling, possibly due to lower financial or technological literacy. This points to a need for educational outreach and simplified communication about DeFi, especially if the goal is to use DeFi to enhance financial inclusion for underbanked or less-educated

segments. By simplifying terminology, providing analogies to familiar financial concepts, and transparently addressing risks, we can help demystify DeFi for everyone regardless of academic background. In essence, improving the public's understanding of DeFi (not just technically, but in terms of how to use it prudently and safely) could convert more "on-the-fence" individuals into confident users.

Income: The influence of income—particularly on enabling innovators to act—highlights a socio-economic dimension to DeFi adoption. While DeFi in theory aims to democratize finance, our findings suggest that in its early stages it may be the relatively wealthier individuals who feel most comfortable engaging with it. High-income users have the financial resources to experiment with potentially risky innovations; lower-income individuals, on the other hand, no matter how interested or tech-savvy, might be held back by financial constraints or risk aversion. There is a risk that DeFi's initial growth could replicate or even widen existing financial inequalities if only those with means participate early. On the optimistic side, DeFi has use cases like microloans or community lending which could benefit lower-income users—but to realize that promise, these users must first be brought into the fold. As the technology matures, efforts must be made to demonstrate how DeFi can serve people at various income levels. For example, stakeholders could highlight how someone with a very small investment can still use DeFi to earn a modest yield or secure a micro-loan, potentially bettering their economic situation. Showing that DeFi is not just "by and for" those with disposable income, but can also provide value to those with limited means, will be crucial for making DeFi a tool of broad-based financial empowerment.

In summary, our study's results reinforce that the adoption of decentralized finance is not purely a technical or economic phenomenon, but fundamentally a socio-cultural one. Factors of perceived usefulness and ease-of-use do drive behavior as with any technology, but the context—who the users are, what their peers say, and what their background is—significantly colors the adoption narrative. From a cultural analysis perspective, DeFi should be seen as part of a broader story of social change: it is about how different groups perceive trust and authority in financial transactions, how communities influence individual choices, and how new technologies can either bridge or deepen existing societal gaps (like the digital divide). These findings encourage stakeholders to take a holistic approach in promoting decentralized finance: one that includes refining technology and user experience (to meet performance and effort expectations), cultivating supportive communities and trustworthy reputations (to leverage social influence positively), and crafting inclusive strategies that account for demographic differences (so that age, gender, education, or income do not become barriers to participation).

CONCLUSIONS AND RECOMMENDATIONS

This study set out to identify the key drivers of DeFi adoption and to examine how these drivers vary across different segments of the population. In doing so, we sought to interpret decentralized finance adoption through a cultural and social lens. Our findings confirmed that performance expectancy, effort expectancy, social influence, and innovativeness are all significant positive influences on the intention to use DeFi technologies. In other words, people are more likely to consider using DeFi when they perceive it to be beneficial for them, when they find it easy to use, when their social environment encourages it, and when they themselves are inclined to try new things. These core insights are broadly in line with established technology acceptance models (like UTAUT and TAM) and reaffirm those theories in the cutting-edge domain of blockchain-based finance.

Crucially, we also found that demographic factors moderate these relationships, revealing different emphases for different groups. Younger, well-educated, and higher-income individuals are currently at the forefront of DeFi adoption – they respond strongly to the technology's promises and often have the means or knowledge to engage. Meanwhile, characteristics like gender and education level shape how adoption happens: for example, women may rely more on community validation to adopt DeFi, and users with lower education may need simpler interfaces and more guidance to see DeFi as a viable option. Understanding these nuances helps in crafting strategies to broaden DeFi's reach. If left solely to organic trends, DeFi might develop primarily within tech-forward subcultures, potentially neglecting large portions of society. However, with targeted efforts, the playing field can be leveled so that decentralized finance truly serves a diverse user base and not just a tech-savvy elite.

Based on our research, we offer several recommendations for stakeholders interested in empowering the future of finance through DeFi:

1. ***Enhance Platform Design and Usability:*** Developers of DeFi applications should focus on intuitive design and user education. Simplified interfaces, clear instructions, and readily available customer support or FAQs can lower the entry barrier. For example, wallet providers might implement guided setup wizards, and DeFi lending platforms could use straightforward language (avoiding heavy crypto jargon) to explain how to deposit and borrow. Given that effort expectancy had such a strong impact on adoption, investments in user experience (UX) design are likely to yield

significant dividends in user acquisition and retention. Additionally, offering demo modes or test-net environments where new users can practice using DeFi with no real money at stake could help build user confidence and competence.

2. ***Communicate Tangible Benefits:*** To capitalize on the importance of performance expectancy, outreach efforts should clearly communicate why using DeFi is worthwhile. Whether the message is "earn higher interest than your bank savings account" or "access loans without credit checks," the value proposition must be front and center. Case studies or success stories illustrating how DeFi helped individuals achieve specific financial goals (such as a small entrepreneur obtaining funding through DeFi that they couldn't get from a bank) can make the benefits concrete. For more skeptical audiences, comparing DeFi services side-by-side with traditional services in terms of fees, speed, or returns might be persuasive. The core idea is to answer the user's question: "What's in it for me?" with clarity and evidence.
3. ***Leverage Social Influence Positively:*** Marketing and community-building efforts should leverage the fact that people often look to others when deciding whether to trust a new financial tool. Fostering community forums, local meetup groups, and social media communities for DeFi can provide spaces where potential users ask questions and see peer endorsements. Referral programs (where existing users get rewards for bringing in friends) or ambassador programs (where respected individuals in certain communities or on campuses introduce DeFi to their peers) can harness social networks to spur adoption. It's also important to manage the public narrative: engaging with users on platforms like Reddit, Twitter, or Telegram to address concerns in a transparent way will help build collective trust. Considering the stronger effect of social influence on women observed in our study, special initiatives such as women-in-DeFi groups or mentorship programs could be effective for encouraging more women to participate by providing a supportive peer environment.
4. ***Tailor Strategies to Different Demographics:*** One-size-fits-all approaches are likely to be suboptimal for DeFi adoption. Segmented strategies can ensure that outreach and product design meet various groups' needs. For example, for older potential users, emphasizing security, reliability, and the ability to integrate DeFi with more familiar financial services might alleviate their concerns. For less educated or less tech-savvy groups, partnerships with community organizations to provide basic digital financial literacy workshops could pave the way for comfortable DeFi usage. Our finding that education moderates adoption suggests that simply educating people about DeFi (not just in the technical sense, but in terms of how to use it safely and prudently) could convert more hesitant individuals into users. Regulators and policymakers might also take note: by supporting sandbox programs or pilot projects that introduce DeFi solutions to underprivileged communities with proper guidance, they can both observe the impact on financial inclusion and simultaneously refine consumer protection measures.
5. ***Bridge the Gap Between Early Adopters and the Majority:*** Innovators have led the initial charge, but for DeFi to drive meaningful social change in finance, it must appeal to the early majority and beyond. This could mean incorporating familiar elements into DeFi platforms, such as providing customer support akin to a bank's helpline or designing interfaces that resemble the online banking apps people already use. Collaboration between traditional financial institutions and DeFi projects might also build trust and facilitate knowledge transfer. If a reputable bank or payment service provider dips a toe into DeFi (for instance, by offering a stablecoin wallet or using a decentralized protocol in the backend of their services), their customers might be more willing to try it under that trusted brand umbrella. While such partnerships walk a fine line (since DeFi's ethos is about bypassing traditional institutions), a hybrid approach during this transitional phase could help skeptical users gain exposure to decentralized finance in a more familiar, controlled manner.

In conclusion, decentralized finance stands at the intersection of technology and society. Its promise is to reshape financial systems into more open, accessible, and user-empowered forms. Whether this promise is fully realized will depend not only on technical advancements but also on recognizing and engaging the human factors that drive adoption. Our study contributes to this understanding by highlighting how usefulness, ease of use, social context, and user traits collectively influence DeFi adoption, and by emphasizing that these influences are filtered through the lens of culture and demographics. By addressing both the technological and the social dimensions—making DeFi platforms simpler, educating users, fostering trust within communities, and tailoring approaches for different groups—stakeholders can accelerate the responsible growth of DeFi. Such efforts will help ensure that DeFi evolves not as a fringe innovation for the few, but as a transformative movement in finance that benefits the many, aligning with broader goals of cultural inclusion and social change in the digital age.

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