



Determinants Of Women's Digital Financial Usage: Evidence From A UTAUT- Based Generational Analysis

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Abstract: Digital financial inclusion becomes one of the most vital aspects for the economic empowerment of women in developing countries. In this study, the UTAUT framework is used to explore the effect of performance expectancy (PE), effort expectancy (EE), facilitating conditions (FC), social influence (SI), and perceived risk (PR) on digital financial adoption by women from Generation Z, Millennials, and Generation X. The findings from this study using PLS-SEM, MICOM, and Multi-Group Analysis (MGA) indicate that PE, EE, FC, and SI positively affect the usage behavior of digital finance, whereas PR has a negative effect. There are few differences between generations, where FC differs significantly between Gen Z and Gen X women.

Keywords: Digital Financial Inclusion • Women • UTAUT • Generational Differences • PLS-SEM • Multi-Group Analysis

Introduction

Digital technologies have significantly enhanced financial inclusion by improving access, affordability, and usability of formal financial services (Asongu et al 2021). Digital financial inclusion is now recognized as an important driver of sustainable development, poverty reduction, and women's economic empowerment (Ali et al 2020). But digital financial literacy and the ability to safely and effectively utilize digital financial technologies are needed to enable meaningful participation in digital finance, beyond access (Choung et al 2023). Digital financial inclusion enhances financial behavior and has positive outcomes on women and younger users, however, substantial gender, geographic and generational disparities remain as a result of gaps in financial and digital capabilities (Batsaikhan & Demertzis 2018). The topic of generational differences has gained more and more academic interest in the field of digital finance research. Although mobile banking has gained momentum in adoption among the Gen Y and Gen Z (Sharma et al 2024), it has been shown that the core adoption drivers, including perceived usefulness, and ease of use, are still

very similar between cohorts, with slight differences in priorities (Abu Daqar et al 2020; Rajpal & Manglani, 2024; Srivastava et al., 2024). Besides, extensive empirical evidence challenges the importance of generational differences, suggesting that cohort-based disparities can be comparatively quite small when structural and situational variables are taken into account (Stelling 2023; Ersoz et al 2020). These insights imply that demographic segmentation might not be the sole reason behind the digital financial behavior. In the research of technology adoption, UTAUT-based variables performance expectancy(PE), effort expectancy (EE), facilitating conditions(FC), and social influence(SI) have always stood out in predicting FinTech and digital payment adoption (Loke et al 2025; Alkhwalidi 2025). The involvement of the digital economy also confirms that the mechanisms of technology adoption have a stronger mediating role in the outcomes of inclusion compared to demographic characteristics (Vyas & Jain 2021). Inclusive finance was also found to be enhanced through structural technological enablers, such as artificial intelligence, which decreases information asymmetry and enhances the



management of risks (Mhlanga 2020). Existing research highlights the importance of usability, perceived value, and institutional support in digital financial engagement, but limited studies focus specifically on women within a unified technology acceptance framework. Moreover, evidence on the moderating role of generational differences remains inconclusive. Therefore, this study applies the UTAUT model with generational multi-group analysis to examine whether structural technology factors influence women's digital financial behaviour more strongly than demographic segmentation.

Literature Review

The concept of digital financial inclusion (DFI) is increasingly becoming a key component in the pursuit of inclusive economic development. An example is that cross-country evidence demonstrates that financial inclusion differs significantly both across and within countries; this depends upon the demographic, institutional and economic environments (Demirguc-Kunt & Klapper 2013). In the case of emerging economies, policy initiatives are aimed at technological development and institutional support to lower the barriers to financial inclusion. Digital transformation also enhances the stability of banks and contributes to the realization of finance-related Sustainable Development Goals (Sodokin et al 2022; Yap et al 2023). DFI improves rural consumption and drives economic growth at the macro-level (Zhang et al 2024), and helps to reduce poverty (Peng & Mao 2023). Technological infrastructure is fundamental to reinforcing the inclusion. Increased digital payment ecosystems and online banking cover a wide spectrum of access to formal financial services (Naumenkova et al., 2019; Dianda et al., 2025). As it is in line with views of technology acceptance, PE, FC, and SI have a significant impact on adopting digital financial services, and trust is a reinforcing factor (Loke et al 2025). These results reveal that factors based on structure and usability tend to override

simple demographic segmentation as a determining factor of digital financial behavior. Capability-based determinants also form the meaningful outcomes of incorporation. Financial literacy increases the use of FinTechs and financial inclusion among Millennials (Sharma et al 2025) and boosts digital financial inclusion by mediating the digital operations (Kanungo 2025). The use of social media to support digital financial literacy enhances the results of financial inclusion (Al-Shami et al 2024), and financial awareness boosts the acceptance of digital financial services in digitally transforming economies (Al-Okaily et al 2023). Financial literacy and digital payments tend to determine the trends in financial management among younger generations (Barus et al 2024), yet the differences in financial behavior are often moderate, but not high between the generations (Tiwari & Yadav n.d.). These studies highlight that digital skills and cognitive readiness are as important as technological access in digital finance adoption.

Younger generations are becoming digital and transforming the way financial decisions are made (Pintér et al 2021), and Generation Z and Millennials are more likely to use FinTechs with a high intention, mainly due to trust and perceived ease of use (Abu Daqar et al., 2020). The adoption of mobile banking research also demonstrates a relatively similar behavioral pattern between Generations Y and Z, although there are differences in the choice of the usage patterns (Sharma et al 2024). In addition, the differences in digital competence are often a manifestation of structural inequalities, but not necessarily of generational identity (Lissitsa 2025). Although much research has been conducted on digital financial inclusion, few studies focus on digital financial use by women in the context of integrated UTAUT framework with generational analysis. Current research also raises doubts about the degree of generational differences on digital financial practices because users' financial practices may be affected by the usability and



structural aspects in the same way in different generations. Accordingly, more studies are required to establish if there is a meaningful difference in the extent of digital financial services adoption when using demographic segmentation.

Conceptual Framework and Hypothesis Development

This study uses the Unified Theory of Acceptance and Use of Technology (UTAUT) as the conceptual framework to explain women's digital financial usage through performance expectancy, effort expectancy, facilitating conditions, and social influence (Loke et al 2025; Abu Daqar et al 2020). These constructs, in digital financial services reflect both functional and behavioral aspects of adoption decision. Previous empirical studies indicate that technology-related and structural determinants are more important than demographic segmentation in influencing digital financial engagement (Agárdi & Alt 2024; Correia et al 2025). This paper, thus, builds on the UTAUT model by introducing perceived risk and considering generational cohort as a moderating variable to gain a clearer understanding of differences in digital financial adoption among women.

Effort Expectancy and Digital Financial Inclusion

EE is a measure of the comfort level related to the use of a given technology (Venkatesh et al., 2003). Effort expectancy is a crucial factor in the UTAUT model regarding digital financial adoption and highlights the ease of use and usability. Reducing barriers to access, such as cognitive, technical and digital literacy, can foster greater regularity in the adoption of digital financial services by women. Thus, it can be hypothesized that the effort expectancy will have a positive effect on the use of digital finances.

H1: Effort expectancy positively influences women's digital financial inclusion.

1.1 Facilitating Conditions and Digital Financial Inclusion

The conditions of facilitation are the technical and organizational support available to ensure

the effective use of digital systems (Venkatesh et al 2003). Eliminating structural barriers to access, such as the availability of smartphones, internet connectivity, digital devices and institutional support, can greatly improve the uptake of digital financial services by women. Hence, the enabling conditions should have a positive impact on the use of digital finance.

H2: Facilitating conditions positively influence women's digital financial inclusion.

1.2 Performance Expectancy and Digital Financial Inclusion

PE is the stage whereby people would be convinced that the use of a technology will improve their performance (Venkatesh et al 2003). It is always observed as one of the most powerful predictors of technology adoption. Empirical studies have demonstrated that PE plays a crucial role in behavioral intention in internet banking (Rahi et al 2019) and the use of mobile payments (Do Nam Hung et al 2019). When users feel that they are getting better convenience, better service, better transaction efficiency, and better economic performance, they will tend to embrace the use of digital financial services. Hence, we postulate the hypothesis as follows:

H3: Performance expectancy positively influences women's digital financial inclusion.

3.4 Perceived Risk and Digital Financial Inclusion

Perceived risk, such as the risk of fraud, privacy risks, financial risk, and psychological insecurity can lower people's trust in digital financial services and deter adoption. The risks identified are regarded as significant obstacles, especially for older users, and can have a negative impact on women's digital financial engagement. Therefore, the perceived risk would be expected to have a negative impact on digital financial adoption.

H4: Perceived risk negatively influences women's digital financial inclusion.

3.5 Social Influence and Digital Financial Inclusion

Social influence refers to the extent to which people would believe that those who matter to them think that they should use a particular



technology (Venkatesh et al 2003). Social factors, such as peer behavior, family support and social norms, affect technology uptake. In the digital finance space, more social support and empowerment can help motivate women to use digital financial services (Moussaïd et al 2013). Hence, it can be expected that social influence has a positive impact on using digital financials.

H5: Social influence positively influences women's digital financial inclusion.

3.6 Generational Moderation

According to Generational Cohort Theory, individuals born within the same period have similar socio-cultural experiences, which make them react similarly in relation to technological uptake. The younger generations, like Millennials and Generation Z, are more technologically savvy and exposed (Van Ittersum et al 2006; Barooah et al 2018; Urahn

2016). As such, generational cohort is a moderating variable in the connection between UTAUT variables and DFI. Hence, based on the previous literature these hypothesis are develop for moderating variable:

H6: The effect of effort expectancy on digital financial inclusion is likely to vary across generational cohorts.

H7: The effect of facilitating conditions on digital financial inclusion is likely to vary across generational cohorts.

H8: The effect of performance expectancy on digital financial inclusion is likely to vary across generational cohorts.

H9: The effect of perceived risk on digital financial inclusion is likely to vary across generational cohorts.

H10: The effect of social influence on digital financial inclusion is likely to vary across generational cohorts.

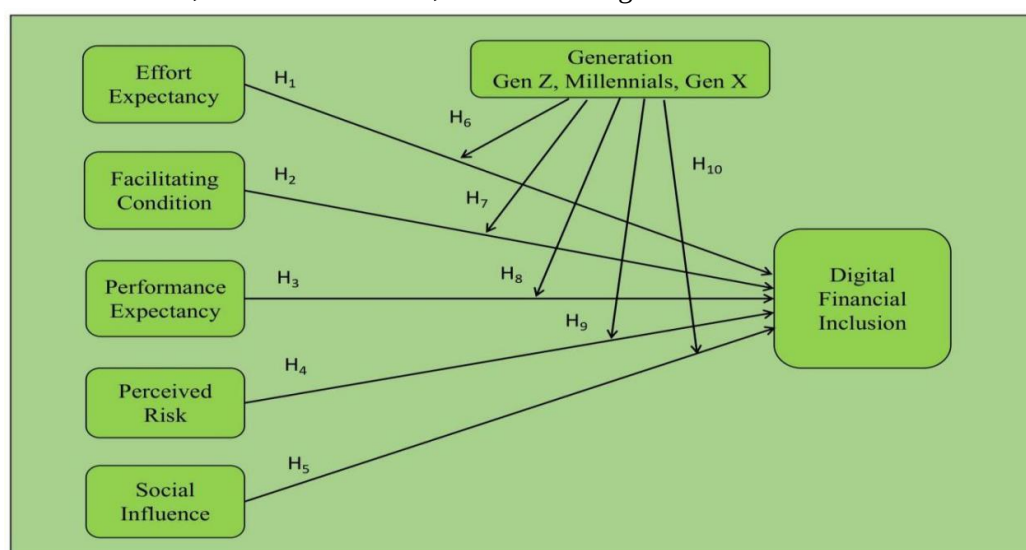


Fig.1: Conceptual Framework

Research Methodology

The research methodology presents the overall strategy that will be adopted for investigating the factors that influence digital financial service use by women in a systematic manner. The field of technology adoption places great emphasis on quantitative methodologies because of their capacity for objective measurement and empirical support of the theory (Loke et al 2025; Agárdi and Alt 2024). This is due to the nature of behavioral phenomena, as well as the need to measure the

moderating effect on different generations of people. In this regard, this research will adopt a systematic research methodology that will involve measurement and structural modeling using PLS-SEM.

Research Design and Method

The study used a quantitative cross-sectional design to examine factors influencing women's digital financial inclusion based on the UTAUT framework with generational cohorts as a moderator. Data were collected



from women respondents through online and offline structured questionnaires using purposive sampling. After data screening and validation, 300 valid responses were retained for analysis. PLS-SEM with SmartPLS was employed to analyze complex relationships and predictive outcomes. Reliability and validity of the measurement model were assessed through standard statistical tests, while bootstrapping with 5,000 resamples tested the structural relationships. Model quality was evaluated using R^2 , f^2 , Q^2 , and SRMR. Measurement invariance was confirmed through MICOM, followed by MGA to compare results across Gen Z, Millennials, and Gen X.

Research Analysis:

The proposed UTAUT-based structural model was tested using PLS-SEM as shown in Fig 2.

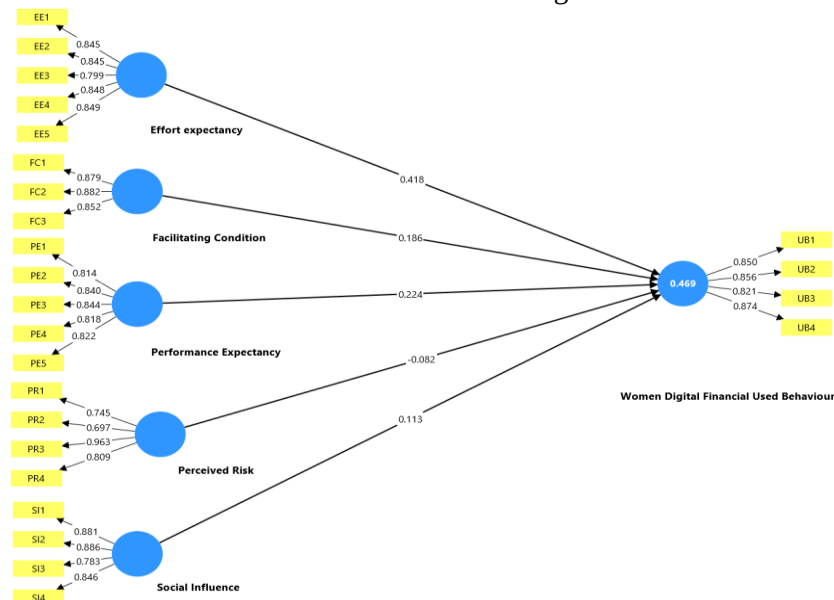


Fig. 2: Structural Model (PLS-SEM)

The model shows the correlations among the following; EE, PE, FC, SI, PR, and DFI of women. Based on the conventional methodologies of analysis, the evaluation was done in two phases: first, the measurement model was evaluated on the basis of reliability and validity and then the structural model was tested to test the hypothesized relationships.

Measurement Model Results

The measurement model was tested to determine reliability and validity. As shown in Table 1, the indicator loadings were between 0.697 and 0.963 with almost all of them being

Data Description

The final sample consisted of 300 female respondents (80 Generation X, 100 Millennials and 120 Gen Z). For moderation analysis the generational groups were classified by year of birth. The number of cases is higher than the minimum suggested for PLS-SEM, and thus, there is sufficient statistical power with stable parameter estimates. The extent to which women have access to digital financial services, including mobile banking, digital wallets and online payments, was used as an indicative measure of digital financial inclusion. Overall, the data were fairly representative of the generations and robust enough for multi-group structural analysis.

more than the recommended threshold of 0.70 which means that there was sufficient indicator reliability. PR3 showed a slight loading (0.697), but it was not discarded because the values of composite reliability and AVE were above the acceptable range, which demonstrated the construct stability. Internal consistency reliability was established with Cronbach alpha values ranging between 0.841 and 0.893 and composite reliability values of 0.882 to 0.921, which is above the 0.70 threshold. (see Table 1). Convergent validity was achieved as the AVE values were in the



range of 0.655 to 0.758, which is above the recommended value of 0.50. VIF was used to test multi-collinearity and all the values were less than 3 (Table 1), which means that there were no collinearity issues. In general, the

measurement model has a good level of reliability and convergent validity, which justifies its appropriateness in structural analysis.

Table 1: Measurement Model Variable Analysis

Variable	Items	loadings	VIF	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Effort Expectancy	EE1<-EE	0.845	2.214	0.893	0.921	0.701
	EE2 <-EE	0.845	2.314			
	EE3 <- EE	0.799	1.942			
	EE4 <- EE	0.848	2.314			
	EE5 <- EE	0.849	2.373			
Facilitating Condition	FC1 <- FC	0.879	1.999	0.841	0.904	0.758
	FC2 <- FC	0.882	2.045			
	FC3 <- FC	0.852	1.93			
Performance Expectancy	PE1 <- PE	0.814	1.994	0.885	0.916	0.685
	PE2 <- PE	0.84	2.169			
	PE3 <- PE	0.844	2.253			
	PE4 <- PE	0.818	2.096			
	PE5 <- PE	0.822	2.031			
Perceived Risk	PR1 <- PR	0.745	2.24	0.868	0.882	0.655
	PR3 <- PR	0.697	1.851			
	PR4 <- PR	0.963	2.118			
	PR5 <- PR	0.809	2.162			
Social Influence	SI1 <- SI	0.881	2.557	0.872	0.912	0.722
	SI2 <- SI	0.886	2.503			
	SI3 <- SI	0.783	1.834			
	SI4 <- SI	0.846	1.986			
Used Behaviour of Digital Financial Inclusion	UB1 <- UB	0.85	2.132	0.872	0.913	0.723

Discriminant Validity: The HTMT ratio and the Fornell-Larcker criterion were used to check for discriminant validity. The discriminant validity was satisfactory as the HTMT values were below the recommended threshold of 0.85 (Table 2) with values ranging from 0.071 to 0.673. Likewise, the

square root of AVE for each construct was higher than their correlations with other constructs, which meets the Fornell–Larcker criterion (Table 3). The results presented herein validate measurement model as different constructs were found to measure different conceptual dimensions.

Table 2: Discriminant Validity, Heterotrait-monotrait ratio (HTMT)

HTMT	EE	FC	PE	PR	SI	UB
EE						
FC	0.407					
PE	0.454	0.411				
PR	0.166	0.128	0.218			
SI	0.316	0.346	0.319	0.257		
UB	0.673	0.51	0.541	0.071	0.376	

Table 3: Discriminant Validity, Fornell Larcker Criterion

FORNELL LARCKER	EE	FC	PE	PR	SI	UB
EE	0.837					
FC	0.358	0.871				
PE	0.407	0.356	0.828			
PR	0.156	0.123	0.175	0.81		



SI	0.283	0.295	0.283	0.201	0.85	
UB	0.595	0.438	0.478	0.068	0.333	0.851

Structural Model

The R^2 of the structural model was 0.469 for the digital financial usage and the Q^2 was 0.453, which shows that the structural model is predictive relevant. The results of effort expectancy analysis showed that effort expectancy had the greatest effect ($f^2 = 0.252$), the other factors (facilitating conditions, performance expectancy, and social influence)

had smaller effects. The contribution of perceived risk was negligible (Table 4). The model fit was good (SRMR = 0.046) indicating that the model was a satisfactory fit with empirical data (Table 5).

On the whole, the results prove that the proposed model shows good explanatory power, high predictive relevance, and good structural fit.

Table 4: Structural Model Evaluation through R^2 , f^2 and Q^2 Statistics

	Original sample (O) R^2	Q^2 predict	f^2	Original sample (O)
UB	0.469	0.453	EE -> UB	0.252
			FC -> UB	0.051
			PE -> UB	0.072
			PR -> UB	0.012
			SI -> UB	0.02

Table 5: Model Fit Assessment (SRMR)

	Original sample (O)	Sample mean (M)	95%	99%
Saturated model	0.046	0.046	0.089	0.11
Estimated model	0.046	0.046	0.089	0.11

Testing the study hypothesis

The structural results highly support the proposed UTAUT-based framework. As shown in the (Table 6), there is a positive effect of effort expectancy on digital financial usage among women is the most significant ($\beta = 0.418$, $p < 0.001$), then performance expectancy ($\beta = 0.224$, $p < 0.001$) and facilitating

conditions ($\beta=0.186, p<0.001$), which proves the importance of usability, perceived benefits, and structure support Another statistically significant yet relatively small effect is that of social influence (0.113 , $p = 0.011$). Conversely, perceived risk does not show a major effect ($= -0.082$, $p = 0.255$), which indicates that the effect of functional and accessibility determinants on

the development of digital financial participation in women outweighs the effect of risk in the same context. Multi-Group Analysis (MGA) reveals strong cross-generational consistency in women's digital financial behaviour. Effort expectancy, performance expectancy, social influence, and perceived risk show no significant differences among Gen Z, Millennials, and Gen X, indicating similar technology adoption patterns across generations. Only facilitating conditions differ significantly between Gen Z and Gen X ($p = 0.039$), reflecting variation in sensitivity to infrastructural support. Overall, women's digital financial behaviour is driven more by universal usability factors than by demographic differences.

Table 6: Result of Hypothesis Testing for the Structural Model (Direct Effect)

Hypothesis	Path	β (Original Sample)	T-value	p-value	Decision
H1	EE $\rightarrow$ DFI	0.418	8.615	0	Supported
H2	FC $\rightarrow$ DFI	0.186	3.758	0	Supported
H3	PE $\rightarrow$ DFI	0.224	4.14	0	Supported
H4	PR $\rightarrow$ DFI	- 0.082	1.15	0.255	Not Supported



H5	SI → DFI	0.113	2.531	0.011	Supported
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Table 7: Multigroup Analysis (MGA) – Generational Moderation Effect

Hypothesis	Path	Gen Z Vs Millennials (p)	Gen Z Vs Gen X (p)	Millennials vs Gen X (p)	Moderation Result
H6	EE → DFI	0.072	0.255	0.324	Not Supported
H7	FC → DFI	0.212	0.039	0.694	Partially Supported
H8	PE → DFI	0.999	0.953	0.955	Not Supported
H9	PR → DFI	0.479	0.73	0.242	Not Supported
H10	SI → DFI	0.934	0.597	0.656	Not Supported

Discussion and Conclusion

The present study was based on the UTAUT theory and investigated the digital financial use of women as a moderator, generation. The results reveal the effort expectancy to be the strongest prediction factor, pointing to the ease of use as the most important factor for the adoption. The other factors of perceived risk, social influence and performance expectancy and facilitating conditions have significant positive impacts on digital financial inclusion, and facilitating conditions has a smaller impact with perceived risk demonstrating little effect. They are seen to be very similar for all generations (Gen Z, Millennials, and Gen X) in multi-group analysis, showing that usability and structural support are more significant than demographic factors in driving women's financial inclusion in digital environments.

Limitation

This study has some limitations, including its cross-sectional design, reliance on self-reported data, and focus on broad generational groups without exploring socio-cultural differences in detail. Future studies may use longitudinal approaches and include factors such as digital trust and financial literacy to improve explanatory power. Despite these limitations, the study provides valuable empirical and theoretical insights into women's digital financial usage.

Recommendation

The results have several key policy, financial and digital service provider implications in the area of digital financial inclusion for women.

Usability can be improved with simple interfaces, vernacular language choices and user-friendly designs; these will greatly facilitate uptake. The importance of the digital infrastructure, internet access, financial awareness programs and institutional support are also highlighted by strong facilitating conditions. The differences between generations were small and so might be more effective than targeting by age to promote digital literacy and accessibility. While perceived risk had a limited effect, it is still critical to good cyber security practices, as well as having effective grievance processes to ensure trust and sustained participation.

Future Implication

Longitudinal and mixed method studies can be used in future research to gain a deeper understanding of women's digital financial practices over time. Additional studies may explore other factors including digital, financial, digital trust, cyber security awareness, and socio-cultural differences in various regions and regulatory environments to further enhance the explanatory and generalizable aspects of the model.

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