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Financial inclusion of the informal sector through FinTech: what perspective does the Diffusion of Innovation offer?

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Abstract: This study explores the determinants of FinTech services adoption among informal workers using the Diffusion of Innovation theory as an analytical framework. The objective is to understand how the perceived characteristics of innovation – relative advantage, compatibility, complexity, trialability, and observability – influence the intention to adopt these innovative financial services. A sample of 367 unbanked individuals working in the informal sector was studied to assess their perceptions and intention to adopt FinTech services. The results show that relative advantage, compatibility, perceived complexity, and observability play a significant role in the intention to adopt, while trialability does not have a significant impact. The conclusions of this study suggest recommendations to promote financial inclusion through FinTech, including awareness campaigns, simplifying the use of services, improving digital literacy, and specific educational initiatives. These efforts can facilitate the economic integration of informal workers into the formal financial system, thereby contributing to broader and more equitable financial inclusion.

Keywords: Financial Inclusion; FinTech; Informal Sector; Diffusion of Innovation; Technological Adoption.

JEL Classification: *G21; O33; O16; D83; L31*

1. Introduction

Financial inclusion for marginalized populations, particularly those operating in the informal sector, remains a persistent challenge for many developing countries. These individuals, often excluded from traditional financial services, face significant barriers to accessing essential financial tools that could improve their economic and social well-being. FinTech has emerged as a potential solution to bridge this gap by offering innovative, accessible financial services tailored to the needs of unbanked users. Through technologies such as mobile payments, microfinance platforms, and financial management tools, FinTech has the potential to transform how unbanked populations interact with the financial system. However, the adoption of FinTech by the informal sector is not automatic and depends on various factors influencing the perception and acceptance of these new technologies. The Diffusion of Innovation theory, developed by Everett Rogers, provides a relevant analytical framework to understand these dynamics.

This theory posits that the adoption of an innovation is influenced by five main characteristics: relative advantage, compatibility, complexity, trialability, and observability. Relative advantage refers to the perceived benefits of the innovation compared to existing solutions. Compatibility measures how well the innovation aligns with the values, experiences, and needs of potential adopters. Complexity evaluates how easily the innovation can be understood and used. Trialability allows potential users to test the innovation before fully committing, thereby reducing uncertainties. Finally, observability concerns the visibility of the results and benefits of the innovation to others. Using this theory as an analytical tool, this study aims to explore how these characteristics of FinTech influence the intention to adopt among informal workers. By examining these factors, we aim to identify the levers that can be activated to promote financial inclusion through FinTech in this segment of the population. The objective is to provide policy and strategic recommendations to maximize the impact of financial technologies and facilitate the economic integration of informal workers into the formal financial system.

2. Literature review

The importance of FinTech is underscored by various studies that highlight its positive impact on financial inclusion and the transformation of financial sectors. Mehrotra and Nadhanael (2016) explore the relationship between financial inclusion and monetary policy in emerging Asia. They demonstrate that financial inclusion facilitated by FinTech solutions enhances the effectiveness of monetary policy and financial stability. They argue that digital financial inclusion can strengthen the overall

economic resilience of emerging markets, a point echoed in the work of Bongomin et al. (2018). The latter examined the effects of financial technology on financial inclusion in Africa and concluded that FinTech improves access to financial services for unbanked and low-income populations, thereby reducing transaction costs and supporting economic development. However, they identify several challenges to this adoption, including regulatory uncertainty, cybersecurity risks, and the constraints of legacy infrastructures. Their conclusions align with those of Beck et al. (2018), who studied the impacts of mobile financial services on business productivity. They found that the use of mobile money services enhances transaction security and cash flow management while increasing the likelihood of obtaining trade credits, thus contributing to financial inclusion.

Ng and Kwok (2017) highlight the growing importance of FinTech, emphasizing how it has fostered the development of innovative financial products and the modernization of existing financial services. This evolution has led to greater efficiency and reduced costs for consumers and businesses while enhancing financial inclusion. Additionally, the adoption of advanced technologies, such as cloud-based systems, has enabled financial institutions to remain competitive in the face of changing customer expectations. Haddad and Hornuf (2019) complement this perspective by analyzing the economic and technological determinants that favor the formation of FinTech startups. They find that well-developed economies and the availability of venture capital play an important role in this development, while advanced technological infrastructure and a skilled workforce positively impact this emerging market. FinTech startups also benefit from the fragility of the traditional financial sector by offering innovative alternatives, thereby attracting customers wary of conventional financial institutions.

Thakor (2019) integrates these observations into traditional banking theory, explaining that FinTech innovations reduce search and verification costs and improve information transmission, thus facilitating the disintermediation of financial services. He highlights FinTech's ability to make financial services more accessible and secure, decreasing dependence on traditional intermediaries. Concurrently, Chen et al. (2019) demonstrate that the use of machine learning to identify FinTech patents shows that these innovations enhance the efficiency and accessibility of financial services through technologies such as cybersecurity, mobile transactions, and blockchain. These technologies secure transactions and improve predictive analysis, offering substantial benefits to consumers and businesses. The transformation of financial services through technological innovation and the growth of FinTech companies reduce the cost of access to financial services. Philippon (2016) underscores this duality, asserting that innovation allows for better efficiency and accessibility, thereby opening up opportunities for transformation.

Focusing on the specific benefits of FinTech innovations, Jagtiani and Lemieux (2018) analyze the use of alternative data by FinTech lenders to assess borrowers' credit, revealing that this approach allows for the service of market segments traditionally neglected by conventional banks. The use of sophisticated algorithms improves financial inclusivity and offers faster and more accurate lending services. D'Acunto et al. (2019) find that FinTech innovations enable greater portfolio diversification and reduce behavioral biases in investment decision-making. This technology makes financial services more accessible and affordable, thereby enhancing users' financial autonomy. In a complementary analysis, D'Acunto and Rossi (2020) confirm that FinTech innovations improve investment management by reducing judgment errors and offering more personalized and accessible financial advice, demonstrating the importance of FinTech technologies in reducing behavioral biases and improving financial services.

Aron (2018) provides a complementary perspective by describing how mobile money services increase access to credit through the generation of data on user habits and credit history, thereby reducing information asymmetries and improving transparency. This improvement in credit access is particularly beneficial in areas where access to traditional financial services is limited, thus supporting financial inclusion. Evans (2018) also explored the link between internet access, mobile phones, and financial inclusion in Africa, revealing that increased access to these digital technologies significantly improves financial inclusion, especially among poor and rural populations.

Furthermore, Kouame and Kedir (2020) examined the use of mobile money and found that it leads to a greater likelihood of self-employment or entrepreneurship, particularly among women. Their research highlights the potential of FinTech to improve productive investments and entrepreneurial behavior among the unbanked while identifying challenges such as growing concerns over cybersecurity and data protection. Asongu and Boateng (2018) noted encouraging developments with the expansion of financial inclusion through mobile money accounts in Africa, emphasizing that while financial inclusion is not an end in itself, it must lead to poverty reduction to be truly effective.

The importance of FinTech in the financial inclusion of the informal sector is documented by several studies that highlight its positive effects as well as the challenges to overcome. Overcoming these obstacles could lead to enhanced financial stability and greater access to credit and savings products for those engaged in informal work. Klapper (2017) highlights that the transition from cash to digital payments enhances productivity and profitability, making business transactions more secure and less costly, thereby increasing the opportunity costs of remaining in the informal sector. This transition can lead to more reliable and traceable income streams, enabling better financial

planning and access to formal financial services for individuals working in the informal economy.

3. METHODOLOGY

A. Model and Data

Rogers' Diffusion of Innovation Theory (1995) is a powerful theoretical framework for understanding and analyzing the adoption of financial technologies, also known as FinTech. This theory is particularly appropriate for studying FinTech because of its ability to break down the adoption process into distinct phases. Rogers describes the adoption of innovations in five phases: innovators, early adopters, early majority, late majority, and laggards. This model is relevant for analyzing how FinTech has spread across different layers of the population, especially in regions like Africa where access to traditional financial services is limited. The inverted U-curve helps predict and manage the various stages of technological adoption, providing a structured framework for studying the dynamics of FinTech adoption. Rogers' theory is also useful for identifying the success factors in FinTech adoption. The diffusion of innovation identifies five key characteristics that influence the adoption of an innovation: relative advantage, compatibility, complexity, trialability, and observability. These criteria can help understand why certain FinTech technologies are adopted more quickly than others, depending on their ability to meet users' needs and integrate easily into their existing practices.

Furthermore, the diffusion of innovation theory provides a framework for understanding the obstacles to FinTech adoption. The perceived complexity of new technologies can be a barrier to their adoption, particularly in populations with low digital literacy. Trialability, or the ability to test a technology before fully adopting it, is an important factor that can encourage adoption, especially in emerging markets. Finally, observability, or the extent to which the results of the innovation are visible and understandable to potential users, plays a crucial role in the diffusion of FinTech technologies. The hypotheses derived from this theory are as follows:

H1: Perceived relative advantage of FinTech services increases intention to adopt it.

H2: Perceived compatibility of FinTech services increases intention to adopt it.

H3: Lower perceived complexity of FinTech services increases intention to adopt it.

H4: The possibility of testing FinTech services increases the intention to adopt it.

H5: High observability of FinTech services increases intention to adopt it.

The sample for this study includes 367 unbanked individuals working in the informal sector, who show an interest in adopting FinTech products. These individuals, often excluded from traditional financial systems, represent a diverse population comprised of small traders, artisans, self-employed workers, and members of microcredit groups. The selection of this target population is based on the potential of FinTech to overcome barriers to financial inclusion, especially for those operating outside formal institutional frameworks. The selected individuals for this study primarily reside in urban and semi-urban areas, where the literacy level is relatively higher. This geographic criterion is important to maximize the impact of awareness and education initiatives, given that the understanding and acceptance of FinTech technologies largely depend on individuals' ability to assimilate new information. Consequently, awareness workshops are organized to inform these populations about the benefits of FinTech. These workshops aim to explain basic concepts in an accessible and engaging manner, addressing literacy issues and knowledge gaps regarding financial products.

Collaboration with local associations and NGOs plays a central role in identifying and engaging participants. These organizations, having already gained access and a certain level of trust within the target groups, facilitate the dissemination of information and encourage participation in the awareness workshops. This partnership also ensures a more personalized and relevant approach, addressing the specific needs of individuals in the informal sector. The econometric model used is a Probit regression model specified as follows:

$$\Phi^{-1}\big(P(INTAi = 1)\big) = \beta 0 + \beta 1.AVREi + \beta 2.COMPi + \beta 3.COMXi + \beta 4.ESAYi + \beta 5.OBSVi + \beta 6.EDUCi + \beta 7.AGEi + \beta 8.GENDi + \beta 9.SMRTi + \epsilon i$$

The intention to adopt FinTech services (INTAi) is the binary dependent variable, where INTAi = 1 if the individual intends to adopt FinTech services and INTAi = 0 otherwise. The main variables are based on the Diffusion of Innovation theory and were evaluated using a Likert scale from 1 to 7. The control variables account for sociodemographic and technological characteristics. AVRE - Relative Advantage represents the perception of the benefits of FinTech services compared to traditional financial services. This includes aspects such as convenience, transaction speed, and reduced costs. To measure this variable, the following items were evaluated: FinTech services are more convenient than traditional financial services, transactions via FinTech are faster than those via traditional financial services, and the costs of using FinTech services are lower compared to traditional financial services.

COMP - Compatibility measures the compatibility of FinTech services with the values, experiences, and needs of potential users. The items used for this measure are as follows: FinTech services are compatible with my personal values, FinTech services correspond to my past experiences with financial services, and FinTech services

meet my current financial needs well. COMX - Complexity evaluates the ease with which customers can understand and use FinTech services. High complexity can hinder adoption, while an intuitive user interface can facilitate it. The items to be evaluated include: FinTech services seem easy to understand, the user interface of FinTech platforms appears simple to use, and it seems that little training is required to use FinTech services. ESAY - Trialability measures the possibility for customers to test FinTech services before committing to their use. Free trials or demonstrations can reduce uncertainties and encourage adoption. The following items are used: I would be interested in the possibility of trying FinTech services for free, the availability of demonstrations of FinTech services would be useful for me, and I would feel more confident after trying FinTech services.

OBSV - Observability measures the visibility of the results and benefits of FinTech services to potential users. Testimonials, reviews, and public demonstrations increase observability and encourage adoption. The items to be evaluated are: FinTech user testimonials seem convincing, FinTech service reviews and ratings are visible and useful, and public demonstrations of FinTech services are effective in showing their benefits. The control variables include: EDUC - Education Level: The education level of individuals. AGE - Age: The age of individuals is considered to analyze the differences in adoption based on age. GEND - Gender: The gender of individuals, coded 1 for male and 0 for female, is taken into account to examine the impact of gender differences on the adoption of FinTech services. SMRT - Smartphone Ownership: The possession of a smartphone, coded 1 if the individual owns one and 0 otherwise, is included to assess how access to mobile technology influences the adoption of FinTech services. The table below presents the main variables of your model with their descriptions and the expected direction of correlation:

Table 1: Hypotheses, and expected correlation direction

Variable	Description	Expected Correlation Direction
AVRE	Entrepreneur's experience	Positive (+)
COMP	Company's competitiveness	Positive (+)
COMX	Entrepreneur's management skills	Positive (+)
ESAY	Ease of access to resources	Positive (+)
OBSV	Peer observation	Positive (+)
EDUC	Entrepreneur's education level	Positive (+)

B. Choosing the Probit Method

The choice of the Probit model for this study is justified by the binary nature of the dependent variable, which is the intention to adopt FinTech services (INTAi). This variable takes the value of 1 if the individual intends to adopt FinTech services and 0 otherwise. The Probit model is particularly relevant here due to several intrinsic advantages. First, the Probit model assumes that the errors follow a cumulative normal distribution (CDF), which is often more realistic for modeling probabilities in contexts where adoption decisions depend on multiple psychological and contextual factors. Furthermore, the normal distribution of errors allows the Probit model to provide more accurate probability estimates, especially in cases where the values of the independent variable are extreme. This feature is important for adoption decisions of innovative technologies like FinTech services, where behaviors can vary significantly based on individual perceptions and experiences.

Additionally, the Probit model allows for the modeling of latent variables underlying binary decisions. This capability is particularly relevant in the context of FinTech adoption, where unobservable factors strongly influence behaviors. For example, perceptions of relative advantage, compatibility, perceived complexity, trialability, and observability of FinTech services are critical variables that may not be directly measurable but significantly impact the adoption decision. While the Logit model is also a commonly used option for binary variables, it relies on a logistic distribution of errors. The choice between Probit and Logit often depends on the preference for a normal or logistic distribution. In this study, the normal distribution of the Probit model is preferred for its ability to handle extreme values and provide more robust results. Moreover, using a linear regression model for a binary variable could result in probability predictions outside the [0, 1] interval, which would be inappropriate. Probit and Logit models solve this problem by restricting predictions to the correct interval.

C. Robustness Analysis

Table 2 presents the results of the Ramsey RESET specification test for evaluating omitted variables in the Probit model. This test is used to check whether the model is correctly specified by testing the inclusion of the squares of the fitted values as omitted variables. The results show a t-statistic of 1.5385 with 356 degrees of freedom, and an F-statistic of 2.3668 with (1, 356) degrees of freedom. The probability associated with these statistics is 0.1248, indicating that the null hypothesis that there are no significant omitted variables cannot be rejected at the conventional significance level. Furthermore, the likelihood ratio is 2.4319 with 1 degree of freedom, and a probability of 0.1189, reinforcing the conclusion that the Probit model is not significantly misspecified. Overall, these results suggest that the variables included in the Probit model are sufficient and that there are no omitted variables.

Table 2: Ramsey RESET Test

Specification: INTA C AVRE COMP COMX ESAY OBSV EDUC AGE GEND SMRT
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.538456	356	0.1248
F-statistic	2.366846	(1, 356)	0.1248
Likelihood ratio	2.431904	1	0.1189

Source: authors

Table 3 presents the analysis of coefficients and variance inflation factors (VIF) to evaluate multicollinearity in the model. The VIF analysis results for the Probit model reveal that multicollinearity is not a significant issue. All "Centered VIF" values are below 10, indicating an absence

of severe multicollinearity. This means that the explanatory variables are not highly correlated with each other, thus allowing for reliable coefficient estimates. This low collinearity reinforces the validity of the results obtained from the Probit model, ensuring that the coefficients can be interpreted without major bias due to redundant information between variables.

Table 3 : Variance Inflation Factors

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.005603	27.92892	NA
AVRE	0.002579	4.175715	1.049042
COMP	0.002482	4.194492	1.025072
COMX	0.002529	4.222830	1.013996
ESAY	0.002483	4.230897	1.020266
OBSV	0.002529	3.856508	1.011590
EDUC	0.002353	4.098531	1.026796
AGE	0.002653	4.563896	1.028915
GEND	0.002677	4.327234	1.060881
SMRT	0.002360	4.342574	1.022513

Figure 1 presents the confidence ellipses for the model coefficients. These ellipses are used to visualize the relationships between pairs of coefficients and identify potential collinearity between them. If the ellipses are narrow and elongated, this may indicate a strong correlation between the corresponding variables. The analysis of the confidence ellipses in this figure shows that most ellipses are relatively circular, suggesting weak correlations between pairs of variables. This corroborates the previous VIF results, indicating low multicollinearity in the model. Consequently, the estimated coefficients can be considered reliable and interpretable, without significant bias due to collinearity among the explanatory variables.

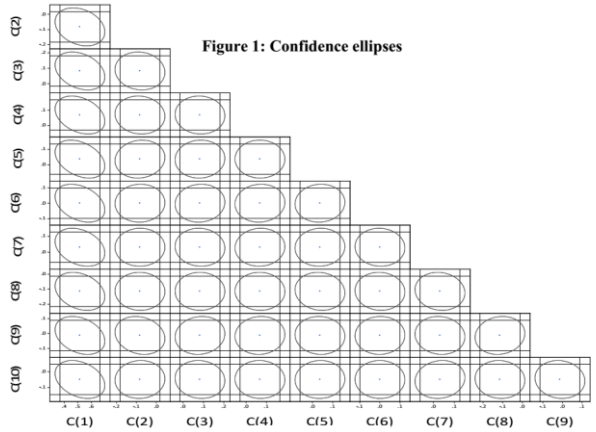


Figure 1: Confidence ellipses

Source: authors

Table 4 presents the results of the Breusch-Pagan-Godfrey heteroscedasticity test applied to the regression. This test is used to detect the presence of heteroscedasticity, which refers to non-constant error variance, in the model. The results show an F-statistic of 0.6933 with an associated probability of 0.7150, indicating that the null hypothesis of homoscedasticity cannot be rejected. Similarly, the Obs*R-squared statistic is 6.3043 with a probability of 0.7091, and the Scaled explained SS is 2.9998 with a probability of 0.9643. All these probabilities are well above the conventional significance threshold of 0.05, suggesting that the hypothesis of homoscedasticity is not rejected. Therefore, the errors in this model can be considered to have constant variance, thereby reinforcing the validity of the coefficient estimates in the model.

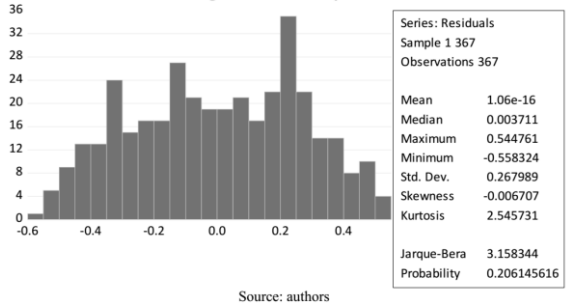
Table 4: Heteroskedasticity Test: Breusch-Pagan-Godfrey

Statistic	Value	Probability
F-statistic	0.693299	0.7150
Obs*R-squared	6.304289	0.7091
Scaled explained SS	2.999799	0.9643

Source: authors

The figure presents the results of the Jarque-Bera (JB) normality test applied to the regression residuals. The Jarque-Bera test evaluates whether the residuals follow a normal distribution, based on the values of skewness and kurtosis. The results show a Jarque-Bera statistic of 3.1583 with an associated probability of 0.2061. The mean of the residuals is extremely close to zero (1.06e-16), the median is 0.0037, and the standard deviation is 0.2679. The skewness is -0.0067, close to zero, indicating a symmetric distribution. The kurtosis is 2.5457, relatively close to 3, the expected value for a normal distribution. The probability associated with the Jarque-Bera statistic (0.2061) is well above the conventional significance threshold of 0.05, indicating that the null hypothesis that the residuals follow a normal distribution cannot be rejected. Thus, the residuals of the Probit model follow a normal distribution.

Figure 2: JB Normality Test



Source: authors

Figure 3 presents the results of the COVRATIO test, which is used to assess the influence of each observation on the coefficient estimates in the Probit model. The COVRATIO measures the change in the volume of the confidence ellipsoid of the regression coefficients when a particular observation is omitted. Values of COVRATIO close to 1 indicate that the omitted observation does not have a significant influence on the coefficient estimates. In this figure, the majority of COVRATIO values are very close to 1, suggesting that most observations do not have a disproportionate influence on the model results. A few values are slightly distant from 1, but they do not appear to deviate significantly from the rest of the observations.

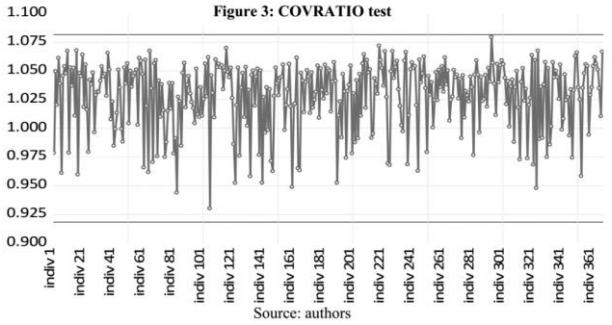


Figure 3: COVRATIO test
Source: authors

4. Results and Discussion

A. Results

The use of the Probit model is justified due to the binary nature of the dependent variable (the intention to adopt FinTech services, INTAi, taking the value 1 or 0). This model assumes a cumulative normal distribution of errors, allowing for probability estimates in contexts where decisions are influenced by psychological and contextual factors. Additionally, it effectively models latent variables underlying binary decisions, such as the perception of relative advantages and the compatibility of FinTech services. The robustness of the model has been verified through several tests: the Ramsey RESET specification test confirmed the absence of significant omitted variables, the Breusch-Pagan-Godfrey heteroscedasticity test showed constant error variance, the VIF analysis revealed no severe multicollinearity, and the Jarque-Bera normality test confirmed that the residuals follow a normal distribution, thus ensuring the reliability of the estimates. The regression results are presented in Table 5.

Table 5: Probit regression results

Variable	Coefficient	Std, Error	z-Statistic	Prob,
C	***11,62588	4,36684	2,66231	0,00810
AVRE	**4,89292	2,23179	2,19237	0,02898
COMP	*1,42442	0,83908	1,69761	0,09043
COMX	***3,21664	1,22756	2,62034	0,00915
ESAY	-1,82819	3,22885	-0,56621	0,57160
OBSV	***2,25806	0,82913	2,72340	0,00677
EDUC	***2,54968	0,93128	2,73782	0,00649
AGE	*-4,19096	2,23443	-1,87563	0,06150
GEND	1,04113	5,23274	0,19897	0,84240
SMRT	***16,77882	6,22542	2,69521	0,00736

*** significant at 1%; ** significant at 5%; * significant at 10%.
Source: authors

Relative Advantage (AVRE) is significant at the 5% level with a probability of 0.0290. This validates hypothesis H1, suggesting that the perception of relative advantages of FinTech services compared to traditional financial services increases the intention to adopt these services. This adoption could enhance financial inclusion by making financial services more attractive to informal workers. Perceived Compatibility (COMP) is significant at the 10% level with a probability of 0.0904, supporting hypothesis H2. This indicates that the compatibility of FinTech services with the values and needs of potential users is a positive determinant of adoption. Thus, better alignment between FinTech services and the expectations of individuals in the informal sector can promote their financial inclusion. Perceived Complexity (COMX) is significant at the 1% level with a probability of 0.0092, validating hypothesis H3. A perception of lower complexity in FinTech services is associated with an increased intention to adopt them. This underscores the importance of designing simple user interfaces to encourage adoption and, consequently, financial inclusion.

Trialability (ESAY) is not significant with a probability of 0.5716, which does not support hypothesis H4. The ability to test FinTech services does not appear to significantly influence the intention to adopt, suggesting that other factors are more critical for financial inclusion. Observability (OBSV) is significant at the 1% level with a probability of 0.0068, validating hypothesis H5. High observability of FinTech services increases the intention to adopt, indicating that visibility and user testimonials can play an important role in the acceptance and financial inclusion of informal workers. Education Level (EDUC) is significant at the 1% level with a probability of 0.0065, showing that education has a positive impact on the adoption of FinTech services. This suggests that educational initiatives may be essential for promoting financial inclusion in the informal sector.

Age (AGE) is significant at the 10% level with a probability of 0.0615, indicating a negative effect on the intention to adopt FinTech services. This implies that strategies to encourage financial inclusion should consider generational differences and possibly tailor approaches for older populations. Gender (GEND) is not significant with a probability of 0.8424, showing that gender does not have a significant effect on the adoption of FinTech services. This suggests that FinTech-based financial inclusion initiatives can be equally effective for both men and women in the informal sector. Finally, Smartphone Ownership (SMRT) is significant at the 1% level with a probability of 0.0074, indicating that owning a smartphone positively influences the adoption of FinTech services. This highlights the importance of access to mobile technology for financial inclusion.

B. Discussion

Policymakers and FinTech operators should implement awareness campaigns that highlight the advantages of FinTech services over traditional financial services. By emphasizing convenience, transaction speed, and cost reduction, these campaigns can encourage broader adoption of FinTech services among informal workers. The diffusion of this innovation can significantly improve financial inclusion by making financial services more accessible and attractive to this population. Furthermore, policies should encourage the development of FinTech services that are compatible with the values, experiences, and specific needs of individuals in the informal sector. This could include needs assessments to better understand

their expectations and tailor FinTech offerings accordingly. Ensuring that the services provided are relevant and effectively meet users' requirements would facilitate their integration into the formal financial system.

Simplifying the use of FinTech services is also important. Policymakers can encourage FinTech providers to design intuitive user interfaces and offer simplified training to help informal workers use these technologies without difficulty. This can also include initiatives to increase digital literacy, enabling individuals to navigate FinTech services more easily. By facilitating access to mobile technologies, policymakers can reduce technological entry barriers for informal workers, for instance, through subsidies or financing programs for smartphone purchases. The observability of positive outcomes from FinTech services should be improved. Strategies to increase the visibility of the successes and real benefits of FinTech users should include testimonials, case studies, and public demonstrations. Making the benefits tangible and visible can accelerate the diffusion of FinTech innovation, as informal sector individuals would be more likely to adopt these services upon seeing their peers benefit.

Education also plays a central role in the adoption of FinTech services. Policies should therefore include educational initiatives aimed at improving the financial literacy of individuals in the informal sector. Specific training programs could be developed to raise awareness of the benefits and use of FinTechs, thereby reducing barriers to adoption and enhancing financial inclusion. Thus, the results of this study suggest that targeted strategies to improve perceptions of advantages, compatibility, simplicity, and visibility of FinTech services, along with educational initiatives and access to mobile technology, can significantly promote financial inclusion in the informal sector. The diffusion of FinTech innovation must be supported by policies aimed at making these services accessible, understandable, and aligned with the needs of informal workers, thereby facilitating their transition to the formal financial system.

CONCLUSION

The results of this study highlight the key determinants of FinTech service adoption among informal workers, using the Diffusion of Innovation theory as an analytical framework. The analysis reveals that perceived characteristics of innovation, such as relative advantage, compatibility, complexity, trialability, and observability, play a significant role in the intention to adopt FinTech services. Awareness campaigns that emphasize the relative advantages of FinTech services over traditional financial services can significantly encourage adoption among the unbanked populations. Similarly, the development of services compatible with the values and specific needs of potential users in the informal sector is essential to ensure broader and more effective adoption.

Simplifying the use of FinTech services and improving digital literacy are key factors in overcoming adoption barriers. Policymakers should encourage FinTech providers to design intuitive interfaces and offer training adapted to users' capabilities. By facilitating access to mobile technologies, policymakers can also reduce technological entry barriers for informal workers. Enhancing the observability of positive outcomes from FinTech services through testimonials and public demonstrations can build trust and accelerate adoption. Finally, financial education plays a central role in the adoption of FinTech, and specific educational initiatives are necessary to raise awareness about the benefits and use of FinTech services. Therefore, policies and strategies targeting these levers can significantly promote financial inclusion in the informal sector. By supporting the diffusion of FinTech innovation, we can aim for broader, more equitable, and sustainable financial inclusion in Morocco.

REFERENCES

[1] Aron, J. (2018). Mobile money and the economy: A review of the evidence. The World Bank Research Observer, 33(2), 135-188.

[2] Asongu, S., & Boateng, B. (2018). Introduction to special issue: Mobile technologies and inclusive development in Africa. Journal of African Business, 19(2), 297-301.

[3] Bongomin, E., Ntayi, J. M., Munene, J. C., & Nabeta, I. N. (2018). Mobile money and financial inclusion in Sub-Saharan Africa: the moderating role of social networks. Journal of African Business, 19(3), 361-384.

[4] Chen, M.A., Wu, Q., & Yang, B. (2019). How valuable is FinTech innovation? The Review of Financial Studies, 32, 2062-2106.

[5] D'Acunto, F., Prabhala, N., & Rossi, A. G. (2019). The promises and pitfalls of robo-advising. The Review of Financial Studies, 32, 1983–2020.

[6] Evans, O. (2018). Connecting the unconnected: Internet access and mobile phone usage in Sub-Saharan Africa. Development Policy Review, 36(3), 293-310.

[7] Haddad, C., & Hornuf, L. (2019). The emergence of the global fintech market: economic and technological determinants. Small Business Economics, 53, 81-105.

[8] Jagtiani, J., & Lemieux, C. (2018). Do fintech lenders penetrate areas that are underserved by traditional banks? Journal of Economics and Business, 100, 43-54.

[9] Klapper, L., 2017. Measuring Financial Inclusion and Fintech Revolution. The Global Findex Database, pp. 1-32.

[10] Kouame, E., & Kedir, A. M. (2020). Disruptive financial technology (FinTech) and entrepreneurship in Burkina Faso. Disruptive technologies, innovation and development in Africa, 171-186.

[11] Mehrotra, A., & Nadhanael, G. V. (2016). Financial inclusion and monetary policy in emerging Asia. In R. Rajan (Ed.), Financial Inclusion in Asia: Issues and Policy Concerns (pp. 93-127).

[12] Ng, A.W., & Kwok, B.K.B. (2017). Emergence of Fintech and cybersecurity in a global financial centre. Journal of Financial Regulation and Compliance, 25(4), 422-434.

[13] Philippon, T. (2016). The FinTech opportunity. Working paper, National Bureau of Economic Research.

[14] Rogers Everett, M. (1995). Diffusion of innovations. New York, 12.

[15] Rossi, A. G., & Utkus, S. P. (2020). The needs and wants in financial advice: Human versus robo-advising. Available at SSRN 3759041.

[16] Thakor, A. V. (2019). Fintech and banking: What do we know? Journal of Financial Intermediation, 41, 100833.