

Kennesaw State University

DigitalCommons@Kennesaw State University

African Conference on Information Systems
and Technology

The 7th Annual ACIST Proceedings (2021)

Aug 26th, 12:00 AM - Aug 27th, 12:00 AM

Fintech Use, Digital Divide and Financial Inclusion

Solomon Odei-Appiah

Ghana Institute of Management and Public Administration, sodei-appiah@gimpa.edu.gh

Gamel Wiredu

Ghana Institute of Management and Public Administration, gwiredu@gimpa.edu.gh

Joseph Adjei

Ghana Institute of Management and Public Administration, gwiredu@gimpa.edu.gh

Follow this and additional works at: <https://digitalcommons.kennesaw.edu/acist>

Odei-Appiah, Solomon; Wiredu, Gamel; and Adjei, Joseph, "Fintech Use, Digital Divide and Financial Inclusion" (2021). *African Conference on Information Systems and Technology*. 11.
<https://digitalcommons.kennesaw.edu/acist/2021/allpapers/11>

This Event is brought to you for free and open access by the Conferences, Workshops, and Lectures at DigitalCommons@Kennesaw State University. It has been accepted for inclusion in African Conference on Information Systems and Technology by an authorized administrator of DigitalCommons@Kennesaw State University. For more information, please contact digitalcommons@kennesaw.edu.

Fintech Use, Digital Divide and Financial Inclusion

Solomon Odei-Appiah, Gamel Wiredu and Joseph Adjei

School of Technology, Ghana Institute of Management and Public Administration (GIMPA), Accra, Ghana.

sodei-appiah@gimpa.edu.gh

gwiredu@gimpa.edu.gh

jadjei@gimpa.edu.gh

Abstract

FinTech innovations enable the provision of financial services to many unbanked across the world by increasing access. The key role of FinTech to drive financial inclusion however suffers significant impediments including the digital divide. Nevertheless, there is paucity of elaborate theories on financial inclusion while extant literature on FinTech only identify factors that drive its acceptance and use with little attention to inhibitors such as the digital divide. Employing the unified theory of acceptance and use of technology (UTAUT2) and the model of digital inequality, this study investigates the impact of FinTech usage on financial inclusion amidst the digital divide. A structural equation modelling technique is applied to data collected from 282 respondents in a survey. The findings confirm the influence of performance expectancy and facilitating conditions on behavioural intentions as well as a positive influence of FinTech use on financial inclusion. The results also show that digital divide measured with access, resource and force moderate the use of FinTech. Significant theoretical contributions are made by the study and practical and policy implications are offered for deepening financial inclusion.

Keywords: FinTech; financial inclusion; digital divide; digital inequality; UTAUT2.

1.0 Introduction

Financial technology (FinTech) is an emerging and evolving innovation that provides and facilitates financial services through various mobile and computing devices, the Internet, and payment cards (Arner et al., 2015; Hinson et al., 2019; Manyika et al., 2016). Such payment system innovation amplified by the increasing digitalization in various aspects of society, and the changing consumer behavior that is outpacing the rate of innovation in traditional financial services. The transformational capabilities of FinTech innovation is disrupting the existing business structures, changing how individuals and organizations acquire products and services (Philippon, 2019). Thus, FinTech is increasingly being perceived as an incipient participatory tool in the financial inclusion agenda (Makina, 2019; Zetzsche et al., 2019).

The important role of FinTech in financial inclusion aspects of the United Nations' Sustainable Development Goals (SDGs) cannot be over emphasized. Zetzsche and colleagues (2019) assert that, by providing payment services, insurance services, long-term (project and firm) financing, and savings/investment products, FinTech could indeed contribute directly and indirectly to attainment of a number of the 17 SDGs. The importance of financial inclusion to achieving the SDGs has led to numerous studies and interesting findings. Nevertheless, there is paucity of elaborate theories on financial inclusion (Prabhakar, 2019). Moreover the few extant theories are not only inadequate and limited in explaining financial inclusion (Besley et al., 2020; Kumar, 2011), but are also ineffective for testing financial inclusion constructs in empirical modeling and critical discourse (Ozili, 2020).

There exist significant impediments that mitigate FinTech's contributions towards sustainable financial inclusion. Notable among such inhibitions are the digital divide and socio-economic status variances (Demirgüç-Kunt et al., 2017; French and Baduqui, 2019; Hinson et al., 2019). Though many studies on

FinTech identify several factors that drive its acceptance and use, those that incorporate inhibitors such as the effect of the digital divide is scarce (Al-Ajlouni & Al-Hakim, 2018; Hinson et al., 2019).

This study investigates the role of FinTech use in deepening financial inclusion in light of the digital divide by addressing the following questions; how does FinTech use impact financial inclusion?; how does the digital divide influence the use of FinTech, and what is the relationship between FinTech use and financial inclusion while being moderated by the digital divide? The unified theory of acceptance and use of technology (UTAUT2) will be used as a theoretical support for this study.

The remaining part of the work is in the following order. Sections 2.1 and 2.2 present the literature review on financial inclusion, the use of FinTech and the digital divide. Subsequently, we introduce the theoretical foundation and provide overviews of UTAUT2 and the digital inequality model in sections 2.3 and 2.4 respectively. The paper continues with the research model and hypotheses in section 3, methodology description at 4, analysis and results at 5, discussions and conclusion at 6 and 7 respectively.

2.0 Literature Review and Theoretical Foundation

2.1 Financial Inclusion, FinTech Use and the Digital Divide

According to the United Nations Development Programme, (2019), Financial inclusion is the ability of the broad society to have access to and use varieties of financial services which are provided appropriately and responsibly in an environment well regulated. Since FinTech is a rapidly evolving field, there is not much consensus on the best definition for the innovation. However, existing definitions provides a good perspective. For the purpose of this study, the definitions of Jagtiani & Lemieux, (2017) and that of the Financial Stability Board, (2017) will be adopted. FinTech in this study therefore denotes a variety of technology-enabled business models, processes, applications or products for providing financial services effectively (Financial Stability Board, 2017; Jagtiani & Lemieux, 2017).

The contribution of FinTech use to financial inclusion is threatened in many ways and the digital divide is a marked one (French & Baduqui, 2019; Hinson et al., 2019). The uneven access to and use of ICTs across geographies and demographics is the condition referred to as the digital divide (Otioma et al., 2019). Although ICT innovations provide economic and social life transformations, there are disparities in the access and use of these digital opportunities among populations. To the Organisation for Economic Cooperation and Development (OECD, 2001), the digital divide is “the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard to both their opportunities to access ICTs and to use the Internet for a wide variety of activities.”

Many studies indicate that adoption and use of FinTech is hindered by inadequate electrical or communications infrastructure and the lack of other resources in rural areas of most Sub-Saharan African countries (Adaba et al., 2019; Adetutu et al., 2019). Given the relative invisibility of digital infrastructures, its consequential exclusion of aspects of the population stands a great chance of going unnoticed. It is therefore imperative and critical that despite the touted potentials of FinTech use in many studies to deepen financial inclusion, how this feat can be achieved in light of the digital divide needs to be examined.

2.2 Prior Studies on FinTech and Financial Inclusion

Previous studies (for example, Chuang et al., 2016; Hu et al., 2019; Jünger & Mietzner, 2020) reveal that trust is very influential on FinTech’s acceptance and use. Reliability, transparency, user innovativeness and financial literacy (Hu et al., 2019; Jünger and Mietzner, 2020) as well as perceived usefulness and perceived ease of use (Chuang et al., 2016), have also shown significant influence on intention to adopt and use FinTech. Friedline et al., (2019) report that early adopters of FinTech are usually younger individuals who are tech-savvy, have higher income and are urban, and customers who are younger and wealthier are the greatest users of Fintech services. This is contrary to the claim by many literatures that FinTech use can influence growth among the underprivileged and financially underserved.

It therefore begs the question of how the use of FinTech can deepen financial inclusion especially among the unbanked people. Many studies on FinTech identify several factors that drive its use. Nonetheless, studies that incorporate inhibitors such as the effect of the digital divide are scarce in the FinTech nascent literature. Understanding adoption and use drivers is vital, however given that inhibitors are capable of preventing an innovation from being adopted and its use discontinued possibly leading to its ultimate extinction, it underscores the importance of understanding effects of inhibitors. Thus to provide a broader understanding, a study incorporating the effects of both drivers and inhibitors is necessary.

With regards to theories on financial inclusion, concerns have been raised about the marked lack of synergy between the academic and policy literatures (Prabhakar, 2019). It can be observed that elaborate theories on financial inclusion are scarce in both literatures. Extant financial inclusion theories (for example Kumar, 2011; Besley et al., 2020) provide important insights on different aspects of financial inclusion. However, aside not being empirical, they are quite limited in explaining the intricacies of financial inclusion. This is reiterated by Ozili, (2020) who refers to existing theories on financial inclusion as being mainly practical descriptions which do not directly address how their relative effectiveness could be tested and the financial inclusion constructs empirically modelled and used for critical discourse. To address this gap, the study employs the unified theory of acceptance and use of technology (UTAUT) as a theoretical lens to ascertain the impact of FinTech usage on financial inclusion amidst the digital divide.

2.3 Unified Theory of Acceptance and Use of Technology

To understand the acceptance and use of technology, (Venkatesh et al., 2003) developed the unified acceptance and use of technology (UTAUT). By combining eight prominent models from the literature on user acceptance, the theory was developed by synthesizing constructs from these models. The UTAUT model gradually attracted attention of researchers when it appeared and has been since used in exploring user acceptance of even Fintech related services such as mobile banking (Yu, 2012). The theory has also been applied and tested on several other technologies both for individual and organizational use (Baptista and Oliveira, 2015). Due to some limitations to UTAUT despite its high explanatory power, it had to be extended and adapted to the consumer context thereby developing UTAUT2 with three additional constructs namely price value, hedonic motivation and habit (Fig. 1).

2.4 Integrated Model of Digital Inequality

An integrated model was developed by Yu et al., (2018) to provide a more thorough understanding of the digital divide and its complexities. The conceptualizations, measurements and determinants of the digital divide had been addressed by scholars from the perspectives of different domains such as information science, library, communications, education, and many more. This had resulted in the digital divide literature consisting of disparate and divergent definitional approaches, research questions and prescriptions to that single phenomenon (Helbig et al., 2009; Hohlfeld et al., 2008). In responding to calls for applicable measures and integrative theories, the problem of fragmented constructs for the digital divide was seemingly addressed by Yu et al. (2018) when they identified from literature access, resource and force as the three major determinants. Therefore, when conceptualizing the digital divide, access, resource and force form the key substrates, hence their use for this study.

3. Research Model and Hypotheses

The unified theory of acceptance and use of technology (UTAUT2) is combined with moderators from the integrated model of digital inequality as the study's theoretical foundation (Fig. 1). The most complete model to predict information technology acceptance and use was considered to be UTAUT (Martins et al., 2014) until the appearance of UTAUT2. Comparably, UTAUT2 provides a more substantial improvement than its predecessor (Venkatesh et al., 2012) hence its use in this work. Given that the digital divide affects the way people use information systems, moderators from the integrated model of digital inequality are also adopted in the study as illustrated in figure 2.

3.1 Performance Expectancy (PE)

Performance expectancy refers to the benefits that users believe the use of a technology will yield in the performance of their daily activities (Venkatesh et al., 2012). It is hypothesized that:

H1. Performance expectancy (PE) influences users' behavioural intention (BI) to use FinTech.

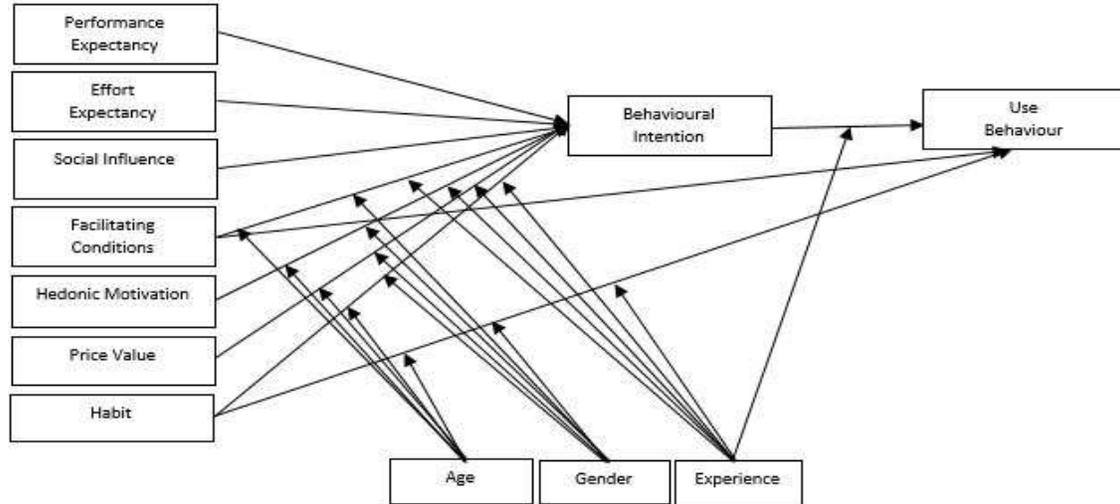


Figure 1: Unified theory of acceptance and use of technology (UTAUT2) model

3.2 Effort Expectancy (EE)

Effort expectancy describes the ease with which a technology can be used (Venkatesh et al., 2012). It is hypothesized that:

H2. Effort expectancy (PE) influences users' behavioural intention (BI) to use FinTech.

3.3 Social Influence (SI)

Social influence denotes how users consider that friends and family members as well as other important personalities expect them to use a technology (Venkatesh et al., 2012). It is hypothesized that:

H3. Social influence (SI) affects users' behavioural intention (BI) to use FinTech.

3.4 Facilitating Conditions (FC)

Facilitating conditions describe people's belief that the existence of technical infrastructures and related help will aid their use of a technology when necessary (Venkatesh et al., 2012). It is hypothesized that:

H4a. Facilitating Conditions (FC) influence users' behavioural intention (BI) to use FinTech

H4b. Facilitating Conditions (FC) influence users' actual use behaviour (UB) of FinTech

3.5 Hedonic Motivation (HM)

Hedonic motivation denotes how pleasurable it is to use a technology (Venkatesh et al., 2012). It is hypothesized that:

H5. Hedonic motivation (HM) influences users' behavioural intention (BI) to use FinTech.

3.6 Price Value (PV)

Price value describes how a user perceives cost-benefit in monetary terms of using a technology (Venkatesh et al., 2012). It is therefore hypothesized that:

H6. Price value (PV) influences users' behavioural intention (BI) to use FinTech.

3.7 Habit (HB)

The repetition of behaviour results in the automatic performance of certain actions that lead to the formation of habits (Baudier et al., 2020; Venkatesh et al., (2012)). It is hypothesized that:

H7a. Habit (HB) influences users' behavioural intention (BI) to use FinTech.

H7b. Habit (HB) influences users' actual use behaviour (UB) of FinTech.

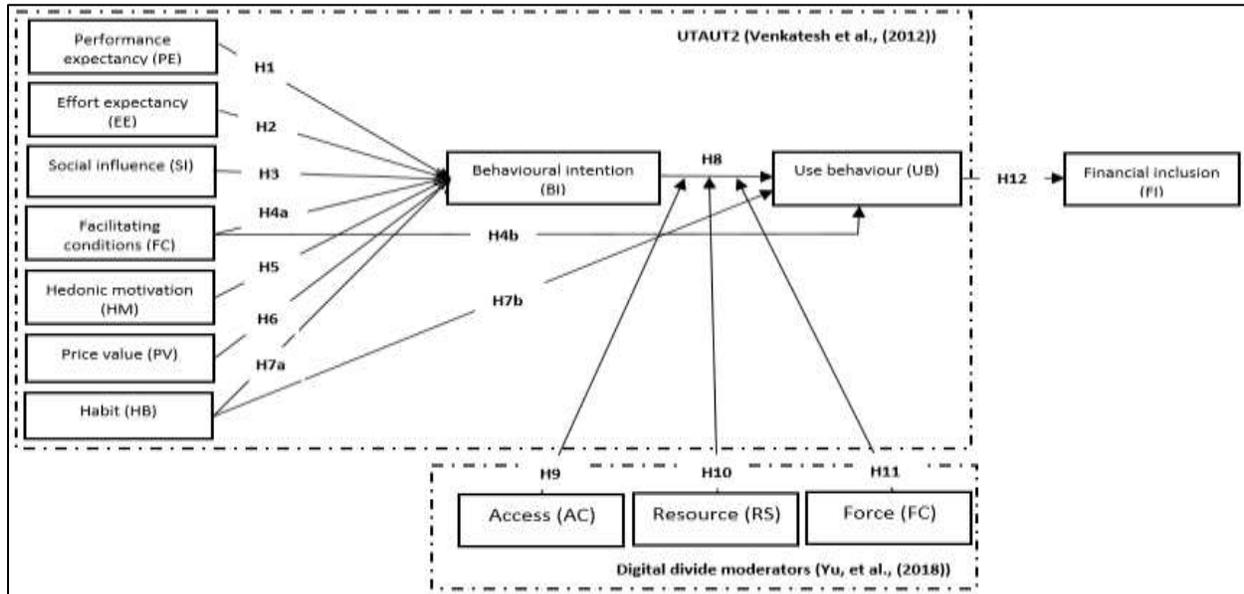


Figure 2: Research model

3.8 Behavioural Intention (BI)

Ajzen, (2002) describes behavioural intention as the likelihood for a particular behaviour to be performed by a user. Many studies such as Chopdar et al., (2018) and Macedo, (2017) have established that there is a relationship between behavioural intention and actual use which is positive. It is thus hypothesized that:

H8. Behavioural intention (BI) influences actual use behaviour (UB) of FinTech users.

3.9 Access (AC)

Access, which is one of the three determinants of the digital divide, refers to the overall ability of an individual to readily make use of particular ICTs in a given scenario (Thompson and Afzal, 2011; van Dijk, 2005). It is therefore hypothesized that:

H9. Access (AC) moderates behavioural intention (BI) on use behaviour (UB), in such a way that the relationship will be stronger among individuals with more access.

3.10 Resource (RS)

Resource as a theoretical construct describes the money, infrastructure, social networks, materials and other apparatuses in stock or supply which users can draw upon to realize their general use of technology. Lots of studies assert that resources such as household income have great impact on ICT use (Fuchs, 2009). Hence, it is hypothesized that:

H10. Resource (RS) moderates behavioural intention (BI) on use behaviour (UB), in such a way that the relationship will be stronger among individuals with more resources.

3.11 Forces (FC)

According to Hsieh et al., (2008) forces describe systems, stakeholder groups or institutions with the capabilities for perpetuating or alleviating digital inequality. These forces can be said to determine or be detrimental to the use of ICT (Yu et al., 2018). It is therefore hypothesized that:

H11. Forces (FC) moderate behavioural intention (BI) on use behaviour (UB), in such a way that the relationship will be stronger among individuals with stronger forces.

3.12 Financial Inclusion (FI)

Financial inclusion is the ability of the broad society to have access to and use varieties of financial services importantly among the population left out from the traditional financial system (Baber, 2019; Queralt et al., 2017). Many studies assert that the use of FinTech will positively impact financial inclusion (Demirgüç-Kunt et al., 2017; Jagtiani and Lemieux, 2017; Zetzsche et al., 2019). It is therefore hypothesized that:
H12. The use behaviour (UB) of FinTech users has an impact on financial inclusion (FI).

4.0 Research Methodology

The research context was Ghana, a middle-income country in Africa which was the first in sub-Saharan Africa and happens to be among the first countries on the continent to launch a cellular network (Coffie et al., 2020). Ghana is among the emerging fast-growing mobile money markets in sub-Saharan Africa (Senyo and Osabutey, 2020). Currently in Ghana, the FinTech market has dominance shared by mobile-based, online payments, card-based and other blockchain related third-party applications. Nevertheless, a large section of the Ghanaian population still remain unbanked and mostly use cash for performing transactions. The choice of Ghana as the research context is based on these unique characteristics of her population.

Data collection targeted the adult population that have the experience of using any FinTech product such as payments, mobile/online banking, crowdfunding, insurance, loans, etc. A questionnaire in English was developed with reference to the research model. Most of the items were adapted from previous studies except those of financial inclusion which were developed from the literature. Venkatesh et al., (2003) and Venkatesh et al., (2012) were the sources from which the UTAUT2 construct items and scales were adapted while those of the digital divide moderators were from Yu et al., (2018).

5.0 Data Analysis and Results

The data analysis followed a three step approach beginning with the descriptive analysis followed by the measurement model and the structural model analyses. Section 5.1 presents the descriptive analysis conducted using SPSS version 23. Structural equation modelling approach using AMOS version 23 together with the SPSS was employed for the measurement model and structural model analyses. The choice of AMOS for this part of the analysis was informed by its veracity for the technique (Chin, 1998). Sections 5.2 and 5.3 contain the results of the measurement and structural analysis respectively.

5.1 Descriptive Analysis

Five key attributes of the respondents were analyzed to understand their demographic characteristics. These are gender, age distribution, highest educational level, monthly income and experience with FinTech usage. The results indicate that with the gender groupings the sample is dominated by males (56.4%) and females (43.6%). Majority of the respondents in terms of age distribution are between the ages of 31 - 40 (51.1%) followed by 18 - 30 (24.5%), 41 - 50 (21.6%), and 1.4% each for 51 - 60 and above 60 years. The result is a clear indication that the sample has the dominance of young adults. First degree holders dominate respondents' educational characteristics with 47.5%, followed by post-graduate (31.9%), diploma/HND (16.7), Secondary/High School (2.1%) and certificate holders (1.8%). The gross monthly income of respondents is characterized by the dominance of those who earn between GH¢ 2001 - 3000 (31.6%) followed by GH¢ 1000 - 2000 (23.8%), and 3001 - 4000 (14.9%). While 12.1% of respondents earn above GH¢ 4000, 8.5% of them were reported as receivers of no income. In terms of experience with the use of FinTech, majority of respondents have over one year experience (93.6%) in usage. The rest are 6 - 12 months (4.6%), less than 3 months (1.1%) and lastly 3 - 6 months (0.7%).

5.2 Measurement Model

A confirmatory factor analysis was conducted to estimate how fit the model was with the data collected. Fornell & Larcker, (1981) suggest that before testing whether there are significant relationships in the structural model, the measurement model has to be tested for satisfactory levels of reliability and validity. Indicator and construct reliability, convergent validity as well as divergent validity were evaluated. A good fit was demonstrated by the measurement model given that most of the factor loadings exceeded the 0.7

threshold (Hair et al., 2013). Construct reliability was tested by calculating the composite reliability (CR) which according to Hair et al., (2013), a value of at least 0.7 indicates a good scale reliability. The CR for all constructs exceeded 0.7 except Facilitating Conditions, Price Value, Resource and Behavioural Intention which recorded values a little below 0.7. The construct reliability was further tested using Cronbach's alpha and all constructs recorded above 0.7 values indicating acceptable level of reliability (Straub, 1989). The criterion of average variance extracted (AVE) was used to test for convergent validity and all constructs having at least 0.5 AVE indicate a satisfactory level (Hair et al., 2013). To satisfy requirements for divergent validity, a construct's AVE must exceed the square of the corresponding inter-construct correlations or vice versa (Fornell & Larcker, 1981). The square root of the AVE in diagonal exceed values of the correlation between the constructs, which indicate satisfactory divergent validity by the constructs.

5.3 The Structural Model and Hypotheses Testing

Majority of the model-fit indices exceeded the acceptable thresholds: Chi Square/df = 2.823, RMSEA = 0.081, AGFI = 0.671, PCFI = 0.800, and PNFI = 0.750. The overall values provided evidence for the model's goodness-of-fit. From here the analysis proceeded to examine the path coefficients. Results for the causal paths properties namely standardized path coefficients (β), standard error and hypotheses are presented in Tables 1 and 2.

The model explains 63.1% of behavioural intention, 31.5% of use behaviour, and 10.2% of financial inclusion. Performance Expectancy, Facilitating Conditions and Habit, were found to have statistically significant impact on Behavioural Intention, and Facilitating Conditions and Habit also with significant impact on Use Behaviour, all with $p < 0.01$. Therefore hypotheses H1, H4a, H4b, H7a and H7b were supported. Behavioural Intention was found to have significant effect on Use Behaviour with Use Behaviour also impacting significantly on Financial Inclusion in support of hypotheses H8 and H12 respectively. Conversely, Effort Expectancy, Social Influence, Hedonic Motivation and Price Value did not have significant influence on Behavioural Intention and so hypotheses H2, H3, H5 and H6 were not supported (Table 1). The moderating effects of Access, Resource and Force were all found to have statistical significance with $p < 0.001$, thus hypotheses H9, H10 and H11 were supported (Table 2).

6.0 Discussions

6.1 Main Findings

This study examined financial inclusion antecedents with the use of FinTech amidst moderators of the digital divide. This was motivated by the paucity of empirical studies on FinTech use and its contributions to achieving financial inclusion, and how the use is affected by the digital divide. In consistence with prior research for example Chopdar et al., (2018) and Oliveira et al., (2016), results of the study indicate a significant influence of performance expectancy on behavioural intention to use FinTech. This is a confirmation suggesting that the use behaviour of FinTech is driven by its associated benefits. The results also indicate the significant influence of facilitating conditions on both behavioural intention and use behaviour of FinTech. This is similar to findings of Chopdar et al., (2018) and Macedo, (2017). Ownership of a mobile phone is the main facilitating condition for the use of most FinTech services and a lot of such services for example mobile money, does not require specialized skills. However, the same cannot be said of other FinTech services such as crowdfunding, wealth management, insurance, cryptocurrency, etc. The significant influence of habit on both behavioural intention and use behaviour is consistent with Baudier et al., (2020) and Chopdar et al., (2018). This result underscores the assumption that there is the higher likelihood of repeated use the more people use Fintech services. The influence of the three digital divide moderators on behavioural intention over use behaviour were validated by the model. In line with expectations access, resource and force had strong positive moderating effects on FinTech use (Haan, 2005; Yu et al., 2018).

Table 1: Summary of Hypotheses Testing Results

			Estimate	S.E.	C.R.	P	Label
Behavioural Intention	<---	Performance Exp.	.115	.033	3.479	***	Accepted
Behavioural Intention	<---	Effort Expectancy	-.002	.063	-.033	.973	Rejected
Behavioural Intention	<---	Social Influence	-.113	.064	-1.762	.078	Rejected
Behavioural Intention	<---	Facilitating Condition	.255	.094	2.701	.007	Accepted
Behavioural Intention	<---	Habit	.603	.072	8.387	***	Accepted
Behavioural Intention	<---	Hedonic Motivation.	.043	.065	.663	.507	Rejected
Behavioural Intention	<---	Price Value	.042	.078	.533	.594	Rejected
Use Behaviour	<---	Facilitating Condition	-.415	.089	-4.649	***	Accepted
Use Behaviour	<---	Habit	1.116	.165	6.763	***	Accepted
Use Behaviour	<---	Behavioural Intention	-.461	.195	-2.362	.018	Accepted
Financial Inclusion	<---	Use Behaviour	.145	.038	3.852	***	Accepted

Note: *** $p \leq 0.001$

Table 2: Summary of Moderation Effects

Moderator	Relationships	Estimate	S.E.	C.R.	P	Label
Access	UB <--- BI	.771	.160	4.825	***	Accepted
	UB <--- AC	.861	.146	5.884	***	
	UB <--- BI_AC	-.141	.039	-3.668	***	
Resource	UB <--- BI	.660	.141	4.670	***	Accepted
	UB <--- RS	.882	.153	5.762	***	
	UB <--- BI_RS	-.113	.040	-2.797	.005	
Force	UB <--- BI	.716	.140	5.098	***	Accepted
	UB <--- FS	1.238	.146	8.503	***	
	UB <--- BI_FS	-.156	.038	-4.117	***	

Note: *** $p \leq 0.001$

6.2 Additional Findings

On the contrary, the study did not confirm the influence of effort expectancy, social influence, hedonic motivation and price value on behavioural intention. Therefore hypotheses H2, H3, H5 and H6 were rejected. While the finding with effort expectancy is in consistence with Faria, (2012) and Zhou et al., (2010) it is not so with Carlsson et al., (2006) and Im et al., (2011). This finding can be as a result of the high level of mobile phone usage in Ghana. Thus users find using FinTech quite easy and get accustomed to it and so do not expect many problems. With the association of social influence and behavioural intention to use FinTech, there is consistence of the finding with studies like Kim et al., (2009) and Wang & Yi, (2012) but inconsistent with Macedo, (2017). It can thus be inferred that the opinions of significant people do not play much a role in decisions to use FinTech. The finding that hedonic motivation does not influence behavioural intention is in tandem with that of Oliveira et al., (2016) but inconsistent with Chopdar et al., (2018). Thus the inference that people see the use of FinTech as a serious endeavor rather than being fun.

6.3 Theoretical Implications

This study presented a theoretical model which is unique given that UTAUT2 of Venkatesh et al., (2012) was combined with digital divide moderators from Yu et al., (2018) in order to explain how FinTech usage impacts on financial inclusion. Addressing the research questions has led the study to also offer a lot of theoretical contributions. First of all our study extends the applicability of UTAUT2 given the paucity of studies that apply the UTAUT2 to study FinTech services. Our research model accounts for 63.1% predictive accuracy. This is an indication that the study makes a useful contribution to knowledge as compared to the widely-used TAM which often account for between 32% and 53% variance explained (Liébana-Cabanillas et al., 2019). Secondly, the integration of the two theories establishes that FinTech use

depends on both behavioural intentions and the effects of the digital divide. The study demonstrates uniquely how access, resource and force influence the use of FinTech.

6.4 Practical Implications for Policies

Some practical implications are also offered by the study. Performance expectancy among the factors is identified by the study as the most significant, an indication that users will continue using FinTech so far as it offers them needed benefits. This suggests that FinTech service providers can drive acceptance and use if they can redesign, refine and implement their services to cater for more financial needs of users. Findings of the study calls for development of policies to deepen financial inclusion. Habit which was found to be among the important factors suggests the need for policies that will seek to reinforce the use of FinTech services to drive financial inclusion.

The study further reveals that access, resource and force as pertain to the digital divide, play a significant role in the use of FinTech. It is indicative from the results that negative effects of the digital divide mitigate the use of FinTech and the opposite is true. To drive financial inclusion, it is paramount for government and public organizations to endeavor bridging the digital divide through the provision of very affordable/low-cost or free or digital services/devices to boost material access among different categories of people.

7.0 Conclusion

The study intended to investigate the use of FinTech services and its impact on financial inclusion albeit effects of the digital divide. Two theories, UAUT2 and the theory of digital inequality were integrated to develop and examine a unique research model. The results confirmed the influence of performance expectancy, facilitating conditions, habit and behavioural intentions on the use of FinTech services. More importantly, a new insight was offered by the results that the digital divide measured with access, resource and force moderated the use of FinTech. More importantly, the results also indicate the positive influence of FinTech use on financial inclusion. Few limitations affecting the study include the use of convenience sampling of FinTech users. Secondly, due to social idiosyncrasies, results of the study may not apply to the contexts of developed countries given that the research context is in an emerging economy which is Ghana. In order to strengthen generalizability of findings therefore, both developing and developed country contexts may be combined in future research.

8.0 References

- Adaba, G.B., Ayoung, D.A., Abbott, P., 2019. Exploring the contribution of mobile money to well-being from a capability perspective. *Electron. J. Inf. Syst. Dev. Ctries.* 85, e12079. <https://doi.org/10.1002/isd2.12079>
- Adetutu, M.O., Odusanya, K., Lalley, C., 2019. Broadband infrastructure, smartphone penetration and internet adoption: micro-spatial evidence from a developing country.
- Ajzen, I., 2002. Residual effects of past on later behavior: Habituation and reasoned action perspectives. *Personal. Soc. Psychol. Rev.* 6, 107–122.
- Al-Ajlouni, A., Al-Hakim, Dr.M.S., 2018. Financial Technology in Banking Industry: Challenges and Opportunities. *SSRN Electron. J.* <https://doi.org/10.2139/ssrn.3340363>
- Arner, D.W., Barberis, J.N., Buckley, R.P., 2015. The Evolution of Fintech: A New Post-Crisis Paradigm? *SSRN Electron. J.* <https://doi.org/10.2139/ssrn.2676553>

- Baber, H., 2019. Financial inclusion and FinTech: A comparative study of countries following Islamic finance and conventional finance. *Qual. Res. Financ. Mark.* 12, 24–42. <https://doi.org/10.1108/QRFM-12-2018-0131>
- Baptista, G., Oliveira, T., 2015. Understanding mobile banking: The unified theory of acceptance and use of technology combined with cultural moderators. *Comput. Hum. Behav.* 50, 418–430. <https://doi.org/10.1016/j.chb.2015.04.024>
- Baudier, P., Ammi, C., Deboeuf-Rouchon, M., 2020. Smart home: Highly-educated students' acceptance. *Technol. Forecast. Soc. Change* 153, 119355.
- Besley, T., Burchardi, K., Ghatak, M., 2020. The Gains from Financial Inclusion: Theory and a Quantitative Assessment 42.
- Carlsson, C., Carlsson, J., Hyvonen, K., Puhakainen, J., Walden, P., 2006. Adoption of mobile devices/services-searching for answers with the UTAUT, in: *Proceedings of the 39th Annual Hawaii International Conference on System Sciences (HICSS'06)*. IEEE, pp. 132a–132a.
- Chin, W.W., 1998. Commentary: Issues and opinion on structural equation modeling. JSTOR.
- Chopdar, P.K., Korfiatis, N., Sivakumar, V.J., Lytras, M.D., 2018. Mobile shopping apps adoption and perceived risks: A cross-country perspective utilizing the Unified Theory of Acceptance and Use of Technology. *Comput. Hum. Behav.* 86, 109–128.
- Chuang, L.-M., Liu, C.-C., Kao, H.-K., 2016. The Adoption of Fintech Service: TAM perspective 3, 15.
- Coffie, C.P.K., Zhao, H., Adjei Mensah, I., 2020. Panel econometric analysis on mobile payment transactions and traditional banks effort toward financial accessibility in Sub-Sahara Africa. *Sustainability* 12, 895.
- De Kerviler, G., Demoulin, N.T., Zidda, P., 2016. Adoption of in-store mobile payment: Are perceived risk and convenience the only drivers? *J. Retail. Consum. Serv.* 31, 334–344.
- Demirgüç-Kunt, A., Klapper, Leora, Singer, Dorothe, Ansar, Saniya, Hess, Jake, 2017. *The Global Findex Database 2017*. WBG 1–132.
- Donovan, K., 2012. Mobile money for financial inclusion. *Inf. Commun. Dev.* 61, 61–73.
- Faria, M.G., 2012. Mobile banking adoption: A novel model in the Portuguese context. Universidade Nova
- Financial Stability Board, F., 2017. *Financial Stability Implications from FinTech: Supervisory and Regulatory Issues that Merit Authorities' Attention* 65.
- Fornell, C., Larcker, D.F., 1981. Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* 18, 39–50.
- French, A.M., Baduqui, G., 2019. *The Digital Divide 2.0: Fintech versus traditional financial services*.
- Fuchs, C., 2009. The role of income inequality in a multivariate cross-national analysis of the digital divide. *Soc. Sci. Comput. Rev.* 27, 41–58.
- Haan, J.D., 2005. *A Multifaceted Dynamic Model of the Digital Divide* 24.

- Hair, J.F., Ringle, C.M., Sarstedt, M., 2013. Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance. *Long Range Plann.* 46, 1–12.
- Helbig, N., Gil-García, J.R., Ferro, E., 2009. Understanding the complexity of electronic government: Implications from the digital divide literature. *Gov. Inf. Q.* 26, 89–97.
- Hinson, R., Lensink, R., Mueller, A., 2019. Transforming agribusiness in developing countries: SDGs and the role of FinTech. *Curr. Opin. Environ. Sustain.* 41, 1–9. <https://doi.org/10.1016/j.cosust.2019.07.002>
- Hohlfeld, T.N., Ritzhaupt, A.D., Barron, A.E., Kemker, K., 2008. Examining the digital divide in K-12 public schools: Four-year trends for supporting ICT literacy in Florida. *Comput. Educ.* 51, 1648–1663. <https://doi.org/10.1016/j.compedu.2008.04.002>
- Hsieh, Rai, Keil, 2008. Understanding Digital Inequality: Comparing Continued Use Behavioral Models of the Socio-Economically Advantaged and Disadvantaged. *MIS Q.* 32, 97. <https://doi.org/10.2307/25148830>
- Hu, Z., Ding, S., Li, S., Chen, L., Yang, S., 2019. Adoption Intention of Fintech Services for Bank Users: An Empirical Examination with an Extended Technology Acceptance Model. *Symmetry* 11, 340. <https://doi.org/10.3390/sym11030340>
- Im, I., Hong, S., Kang, M.S., 2011. An international comparison of technology adoption: Testing the UTAUT model. *Inf. Manage.* 48, 1–8. <https://doi.org/10.1016/j.im.2010.09.001>
- Jagtiani, J., Lemieux, C., 2017. Fintech Lending: Financial Inclusion, Risk Pricing, and Alternative Information (SSRN Scholarly Paper No. ID 3005260). Social Science Research Network, Rochester, NY.
- Jünger, M., Mietzner, M., 2020. Banking goes digital: The adoption of FinTech services by German households. *Finance Res. Lett.* 34, 101260. <https://doi.org/10.1016/j.frl.2019.08.008>
- Kim, G., Shin, B., Lee, H.G., 2009. Understanding dynamics between initial trust and usage intentions of mobile banking. *Inf. Syst. J.* 19, 283–311.
- Kumar, D.B.P., 2011. Financial Exclusion: A Theoretical Approach.
- Liébana-Cabanillas, F., Molinillo, S., Ruiz-Montañez, M., 2019. To use or not to use, that is the question: Analysis of the determining factors for using NFC mobile payment systems in public transportation. *Technol. Forecast. Soc. Change* 139, 266–276.
- Macedo, I.M., 2017. Predicting the acceptance and use of information and communication technology by older adults: An empirical examination of the revised UTAUT2. *Comput. Hum. Behav.* 75, 935–948.
- Manyika, S Lund, M Singer, O White, C Berry, 2016. Digital Finance for All- Powering Inclusive Growth in Emerging Economies.pdf.
- OECD, D., 2001. Understanding the digital divide. Paris Organ. Econ. Coop. Dev.
- Oliveira, T., Thomas, M., Baptista, G., Campos, F., 2016. Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology. *Comput. Hum. Behav.* 61, 404–414.
- Otioma, C., Madureira, A.M., Martinez, J., 2019. Spatial analysis of urban digital divide in Kigali, Rwanda. *GeoJournal* 84, 719–741. <https://doi.org/10.1007/s10708-018-9882-3>
- Ozili, P.K., 2020. Theories of Financial Inclusion. *SSRN Electron. J.* <https://doi.org/10.2139/ssrn.3526548>

- Philippon, T., 2019. On fintech and financial inclusion. National Bureau of Economic Research.
- Prabhakar, R., 2019. Financial Inclusion: A Tale of Two Literatures. *Soc. Policy Soc.* 18, 37–50. <https://doi.org/10.1017/S1474746418000039>
- Queralt, J., Fu, J., Romano, M., 2017. Financial inclusion and the 2030 Agenda for Sustainable Development: a missed opportunity. *Enterp. Dev. Microfinance* 28, 200–211. <https://doi.org/10.3362/1755-1986.16-00037>
- Makina, D., 2019. The Potential of FinTech in Enabling Financial Inclusion, in: *Extending Financial Inclusion in Africa*. Elsevier, pp. 299–318. <https://doi.org/10.1016/B978-0-12-814164-9.00014-1>
- Senyo, P., Osabutey, E.L.C., 2020. Unearthing antecedents to financial inclusion through FinTech innovations. *Technovation* 98, 102155. <https://doi.org/10.1016/j.technovation.2020.102155>
- Straub, D.W., 1989. Validating instruments in MIS research. *MIS Q.* 147–169.
- Thompson, K.M., Afzal, W., 2011. A look at information access through physical, intellectual, and socio-cultural lenses. *OMNES J. Multicult. Soc.* 2, 22–42.
- United Nations Development Programme, 2019. Human development report 2019: beyond income, beyond averages, beyond today: inequalities in human development in the 21st century.
- van Dijk, J.A.G.M., 2005. *The Deepening Divide: Inequality in the Information Society*. Thousand Oaks, CA: Sage, 2005, 240 pp., ISBN 141290403X (paperback). *Mass Commun. Soc.* 11, 221–224. <https://doi.org/10.1080/15205430701528655>
- Venkatesh, Thong, Xu, 2012. Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Q.* 36, 157. <https://doi.org/10.2307/41410412>
- Venkatesh, Morris, Davis, Davis, 2003. User Acceptance of Information Technology: Toward a Unified View. *MIS Q.* 27, 425. <https://doi.org/10.2307/30036540>
- Wang, L., Yi, Y., 2012. The impact of use context on mobile payment acceptance: An empirical study in China, in: *Advances in Computer Science and Education*. Springer, pp. 293–299.
- Yu, B., Ndumu, A., Mon, L.M., Fan, Z., 2018. E-inclusion or digital divide: an integrated model of digital inequality. *J. Doc.* JD-10-2017-0148. <https://doi.org/10.1108/JD-10-2017-0148>
- Zetzsche, D.A., Buckley, R.P., Arner, D.W., 2019. FinTech for Financial Inclusion: Driving Sustainable Growth, in: Walker, J., Pekmezovic, A., Walker, G. (Eds.), *Sustainable Development Goals*. Wiley, pp. 177–203. <https://doi.org/10.1002/9781119541851.ch10>
- Zhou, T., Lu, Y., Wang, B., 2010. Integrating TTF and UTAUT to explain mobile banking user adoption. *Comput. Hum. Behav.* 26, 760–767