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Abstract

This study examined the money transfer service, mobile loan service, remittance service and how they contribute to the financial inclusion in Musanze district. The study used a descriptive research design to investigate the relationship between digital financial services and financial inclusion Musanze district, Rwanda. This study adopted a mixed approach, as both quantitative and qualitative techniques were used. The population of the study were adult inhabitants of Musanze District, i.e., those with a national identity card, which is a prerequisite for opening a mobile money account. The primary data were collected using questionnaire and interview guides. The questionnaire findings on the first specific objective gave a mean score was 4.04 (std = 1.069) indicating that the respondents highly agreed that money transfer services contribute to financial inclusion and with very low divergence. On the second objective, the overall mean was 3.94 (std=1.00) showing that there was general agreement among respondents on the fact that mobile loan services contribute to financial inclusion. On the third specific objective, an overall mean of 4.24 (std=0.82) was obtained indicating that most of the respondents agreed that remittance services contribute to financial inclusion. The regression was fairly fit with an $R^2 = 0.597$, implying that digital financial services, namely money transfer services, mobile loan services, and remittance services increase financial inclusion in Rwanda by 59.7%. As per the ANOVA analysis, the regression model ($F = 186.821$, $p = 0.001$) was proved to be statistically significant since the p-value was less than the 5% threshold. All the three null hypotheses were rejected at 5% level of significance. This implied that money transfer services, mobile loan services, and remittance services significantly contribute to financial inclusion in Rwanda. From the interview session, the respondents unanimously agreed that digital financial services (DFS) like money transfer, mobile loans, and remittances are the primary drivers of financial inclusion in Musanze District by decentralizing services and creating jobs for agents. Most emphasized the role of mobile money and banking agents in bringing services closer, increasing usage through easy access, although income was cited as a key factor for transacting. Financial literacy and low, seasonal incomes from agriculture were identified as major barriers, with people reluctant to join formal finance due to a cash-at-home mindset and financial inactivity when income is low. The study recommends that mobile financial service providers should enhance the security of their platforms and improve customer support to attract more users. The study also recommends that the regulatory bodies to provide guidelines and rules to be used in the use of telephones as tools for financial services.

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Keywords: *Contribution, digital, financial services and financial inclusion, Rwanda*

1.0 Introduction

Financial inclusion (FI) is defined as the process of ensuring that individuals, households, and businesses have adequate access to formal financial services and products such as transactions, credit cards, payments, savings, and insurance which should thereafter be delivered in a sustainable way (Singh & Singh Kondan, 2011). There is evidence showing that inclusive financial markets reduce rates of poverty and inequality by enabling individuals and households to manage consumption and payments, get loans from bank, and enjoy insurance coverage (Mader, 2018). Furthermore, financial inclusion engineers the creation of new innovative companies and the expansion of existing ones, promoting job creation that eventually contributes to national savings (Ajide, 2020). Based on a sample of 62 countries over the period from 2001 to 2012, Rizwan and Bruneau (2019) assess the role of information and communication technologies (ICT) in extending financial inclusion, poverty reduction, and income inequality. Based on the authors' results, ICTs increase financial inclusion, boost economic growth, and reduce poverty and inequality.

Financial inclusion leads to economic empowerment and active participation in the financial system of youth, women, and other groups of people previously excluded (Hendriks, 2019; Siddik, 2017). Agyemang-Badu et al. (2018), for example, show that financial inclusion decreases poverty and income inequality in Africa, and thus they encourage implementing policies and programs to empower the formal financial inclusion of the poor. In a recent study, Koomson et al. (2020) have found that a boost in financial inclusion reduces the poverty of Ghanaian households, especially those headed by women, and prevents them from being exposed to poverty in the future. According to Access to Finance Rwanda (AFR), the use of technology in the financial sector has made it possible for a considerable number of financial products and services to be accessible via mobile phones, internet banking, and other digital channels which, consequently, promote inclusive access and usage of financial services.

Through its 2020 DFS Thematic report, Access to Finance Rwanda found that, in 2020, around 66% of the total adult population in Rwanda (7.1 million) were digitally included, an increase from 46% in 2016. This is mainly driven by easy mobile money access and usage (91%) as well as access and usage of electronic services from banks (9%). The penetration of mobile money was estimated at 60% in 2020 up from 39% in 2016. From a gender standpoint, there is still a 9% gap, where 71% of men are digitally included compared to only 62% of women. Moreover, the analysis shows that digital exclusion has reduced by 20% moving from 54% in 2016 to 34% in 2020. DFS exclusion is high in rural areas versus urban areas at (43% and 7% respectively). This is generally due to the lack of awareness and access to digital tools by people in rural areas. According to the AFR's DFS thematic report, in 2020, electronic services (e-wallet services) were offered by both commercial banks and mobile money operators at 94% and 85% respectively. In 2020, around 30% of Rwandans used DFS to facilitate payments; a significant usage boost from only 19% in 2016.

COVID-19 came as a game changer. With many countries installing draconian measures such as lockdowns to limit the propagation of the virus, the usage of DFS surged significantly. According to the World Bank, COVID-19 boosted the adoption of digital financial services whereby 40% of adults in developing economies made a digital merchant payment using a card, phone, or the internet, and more than one-third of adults in developing economies who paid a utility bill directly from an account did so for the first time after the start of the pandemic

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(FINDEX REPORT 2021). The same report (FINDEX) emphasizes that mobile money has become key in driving financial inclusion in sub-Saharan Africa with more women now owning a mobile money account to be used for payments, saving, and borrowing.

Rwanda was no exception to the DFS usage boost. With the first total lockdown being implemented in late March 2020, usage of digital financial platforms such as mobile money rocketed. In its recent annual report, the National Bank of Rwanda showed that the number of mobile money agents increased from 111,422 in June 2020 to 146,930 in June 2022 representing a 32% increase. According to the same report, active mobile payment subscribers increased by 12% from 4,915,320 in 2020 to 5,528,109 in 2022. (BNR, 2021-2022 Annual Report). With the ever-increasing number of mobile payment subscribers, we need to assess the impact of these digital financial services on financial inclusion. There is a need to understand how easy access to DFS promotes the usage and access of financial services by all, regardless of their economic status, gender, or geographic location. According to the AFR, the gap between urban and rural populations is big. This suggests that DFS inclusion is still lacking in rural areas which is also visible regarding the DFS access broken down to provinces. Similarly, DFS inclusion is connected to education. The higher the education level, the higher the access to the DFS (AFR's DFS Thematic report, 2020).

According to the World Bank, the share of adults globally with a financial account increased from 51% to 76%. In developing countries, account ownership rose by 30%, making the total account ownership for adults in developing economies up to 71 percent. Digitalization was key to that increase, as millions of adults opted to open accounts and started using them. (Global Findex, 2021). According to the 2020 FinScope Rwanda Survey, Financial inclusion in Rwanda stands at 93%. The FinScope Rwanda Survey's aim is to show the financial inclusion levels; define the landscape of access; identify the drivers of, and barriers to financial access; analyze the past trends or changes and provide further information on new opportunities to boost financial inclusion. As per the same report, financial inclusion increased from 89% in 2016, 72% in 2012 and 48% in 2008 (AFR, 2020). The northern province has the lowest percentage of the financially included population (53%), compared to Kigali (95%), Eastern province (65%), Western province (56%), and Southern province (55%), there is a need to understand what factors could be driving financial exclusion in this part of the country. Furthermore, the financial inclusion level stands at 60% in Musanze district (AFR's DFS Thematic report, 2020).

1.1 Statement of the Problem

The ultimate target of policies and strategies promoting financial inclusion is to achieve inclusive usage and access to formal financial services and products. As per the Government's National Strategy of Transformation (NST-1), the goal is to achieve 100 percent financial inclusion by 2024. Households and firms should not only open bank or mobile money accounts, but should enjoy all financial services such as saving, borrowing, money transfer, and buying insurance. Although the financial inclusion has generally improved nationwide mostly because of digital financial services, there is a clear difference between Kigali and other regions of the country (as shown above). The Northern Province comes last with 55% financially included population. Musanze district is the northern district with the highest Financial Inclusion rate estimated at 60% (AFR's DFS Thematic report 2020). There is a need to assess why this part of the country lags in financial inclusion, despite hosting the country's second biggest city, i.e.,

Musanze. The researcher has chosen to understand how the digital financial services contribute to achieving financial inclusion in Musanze district.

1.2 Hypotheses of the Study

The research employed the following null hypotheses.

- i. H₀₁: There is no significant contribution of money transfer services to financial inclusion in Musanze district.
- ii. H₀₂: There is no significant contribution of mobile loan services to financial inclusion in Musanze district.
- iii. H₀₃: There is no significant contribution of remittance services to financial inclusion in Musanze district.

2.0 Literature Review

2.1 Theoretical Review

Theories of financial inclusion offer a foundation of principles upon which the practice of financial inclusion is built. These theories also enable the identification of anomalous patterns in the practice of financial inclusion, which would prompt additional studies to clarify the reasons for unanticipated deviations in practice. (Ozili, 2020).

Public good theory of financial inclusion

The theory argues that formal financial services (DFS included) are a public good and should be provided to everyone for the benefit of all. Access to finance should be unrestricted for everyone. By becoming a public good, access to formal financial services to one individual does not minimize its availability to others. This means that all can be brought into the formal financial sector, and everyone will be better off (Ozili, 2020). The public good theory of financial inclusion suggests that everyone will benefit from financial inclusion; the government will subsidize the cost of service and will therefore promote FI. However, there are three demerits too. Firstly, treating the provision of formal financial services to citizens as a public good does not solve the original cause of financial exclusion. Secondly, treating the provision of formal financial services to citizens as a public good will imply that the government subsidizes the cost of providing formal financial services to citizens which would be very costly. When the provision of formal financial services is treated as a public good, the level of financial inclusion may become unsustainable in the long term (Ozili, 2020).

Financial literacy theory of financial inclusion

The theory states that financial literacy will increase people's will to join the formal financial sector. Financial literacy will push people to seek formal financial services wherever they can find it (Ozili, 2020). Further, financial literacy is key in enabling the financially excluded people to finally access formal financial services, including the digital financial services. The financial literacy theory of financial inclusion has some merits: financial literacy promotes financial services awareness among people, and people can take advantage of other benefits such as saving, and investment, ... Finally, governments with limited public funds, or limited tax revenue may prefer to use financial literacy to cheaply educate the population about financial services and their benefits. The disadvantage of the theory is that it only solves the 'willingness' not 'capacity' to join the formal financial sector, where capacity is measured as having the funds which can be used to perform one or more financial transactions.

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The Private money theory of financial inclusion

The question of who should fund financial inclusion expenses for the people – is an important question. Some think public funds (taxpayers' money) should be used to fund financial inclusion programs (Marshall, 2004). Others feel that the private sector should have that responsibility since it is the capitalists that have contributed to increasing the income inequality gap between the poor and the rich (Mohiuddin, 2015). There are also ideas suggesting that financial inclusion programs should be jointly funded through the public-private partnership (PPP) (Dashi et al, 2013; Cobb et al, 2016). The private money theory of financial inclusion states that financial inclusion programs should be privately funded (e.g. shareholders' equity capital) because private funders will require higher accountability, high efficiency in the utilization of the funds, and that the targeted people belong to the financially excluded population (Ozili, 2020). The theory's merits: shorter approval time to obtain the funds, participation through equity ownership or by donations, private funders can exert greater pressure on private contractors to deliver quickly. Some demerits of the theory are as follows. The cost of raising private funds may be too high, using private money can increase private interests to the detriment of the poor and excluded population. Moreover, the government might not have full control over the privately created FI infrastructure due to partial or full private ownership.

2.2 Empirical Review

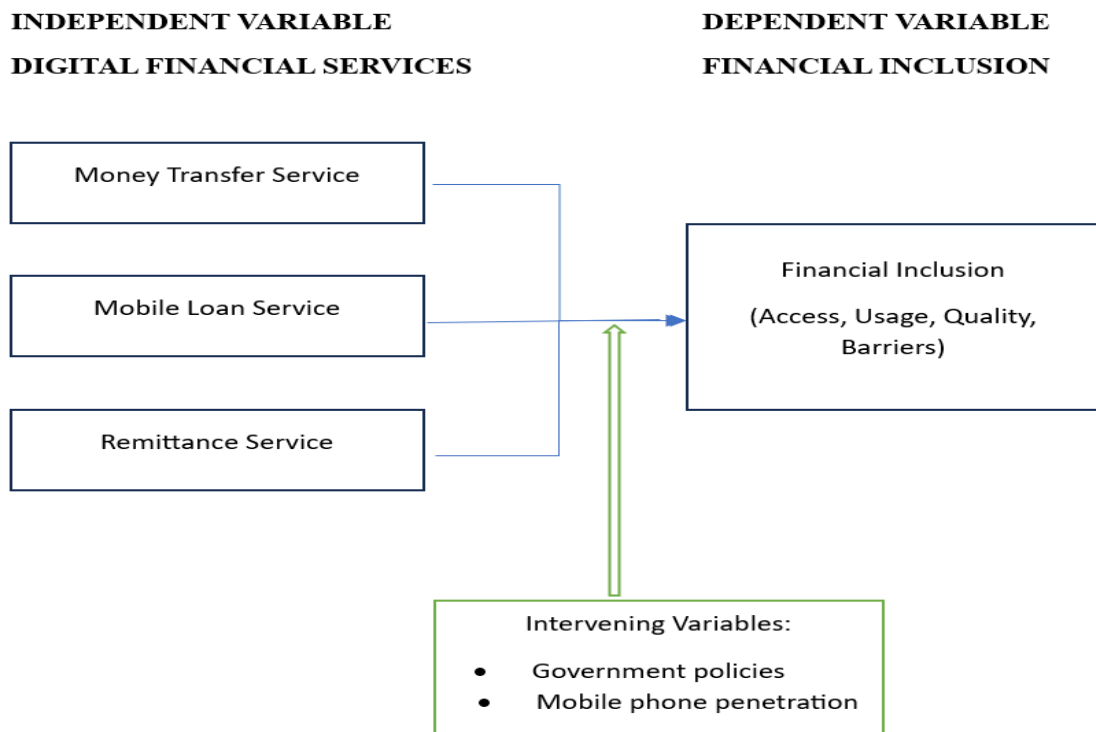
Peer-to-peer money transfers allow individuals to send money instantly to other mobile money users, even in remote areas. Mobile money services function as substitutes for traditional banking, with mobile phones serving as the transactional medium and mobile money accounts acting as bank accounts. These services include fund transfers, utility bill payments, school tuition payments, phone credit purchases, and cash deposits. Mobile money transactions are gradually replacing cash transactions (P. K. Senyo et al., 2021). Traditional banks often hesitate to invest in infrastructure for cash deposits and withdrawals due to high transaction costs and the perceived lack of profitability from servicing poor clients (Kendall et al., 2011). In contrast, mobile money agents, small businesses acting as cash-in and cash-out terminals, have significantly boosted financial inclusion in developing countries (Senyo et al., 2021). Financial inclusion has several benefits, such as increasing income-generating capacities and reducing poverty, particularly among women who have transitioned from farming to small businesses (Demirgüç-Kunt et al., 2020).

Mobile microloan services offer unbanked individuals the ability to obtain small loans without the need for bank visits or extensive documentation. Users can apply for loans via their phones and receive funds in their mobile wallets swiftly (Senyo et al., 2021). This development allows banks to collaborate with traditional Susu organizations to establish credit histories for making microloans accessible. Historically, unbanked individuals faced challenges in securing loans from traditional banks due to stringent documentation and collateral requirements. However, with mobile money, even residents in remote areas can access microloans easily. The availability of credit, savings, and financial risk management are essential components of financial inclusion. Mobile loans range from personal loans provided by banks via mobile apps to services like Safaricom's M-PESA and MTN MoMo, allowing users with active accounts to secure small loans with short repayment terms.

The rapid growth of mobile money services in emerging and developing economies has facilitated new methods for households and businesses to make payments, save, and send remittances. This has particularly benefited rural households and informal sector firms by enhancing risk-sharing capabilities (Patnam & Yao, 2020). Varghese and Viswanathan (2018) highlighted that remittance platforms offer migrants simple and affordable services, addressing challenges in opening bank accounts. Remittances significantly contribute to countries' foreign exchange earnings and GDP growth while improving the economic welfare of migrants' families (Muhammad et al., 2019). The increased use of financial products and services leads to higher savings, lending, payment transactions, and remittances, serving as indicators of financial inclusion (Shapoval et al., 2021). Real-time remittance transactions via mobile money platforms encourage savings and prompt repayment behaviors (Kendall et al., 2011). When unbanked households utilize formal financial services, remittances can enhance financial inclusion and promote financial development through loanable funds for the private sector (Inoue & Hamori, 2016).

2.3 Conceptual Framework

The conceptual framework of this research is made by independent variables which are money transfer services, mobile loan services, and remittance services. It also presents the dependent variable which is financial inclusion to be measured by usage, barriers, access, and quality. Below is a visual representation of the relationship between independent and dependent variables.



Source: Researcher's conceptualization

Figure 1: Conceptual Framework

3.0 Research Methodology

A research design involves setting parameters for collecting and analyzing data to align with research goals economically (Kothari, 2004). This study used a descriptive and correlational design to examine financial inclusion through digital financial services in Musanze district, with a population of 476,522 according to the Rwanda Population and Housing Census (RPHC). Using Sloven’s formula, 400 individuals were sampled, with questionnaires distributed proportionally across the district’s 15 sectors. Primary data was gathered via questionnaires and interviews, while secondary data came from existing sources. The questionnaire covered demographics, digital financial services knowledge, and financial inclusion opinions, measured using a Likert scale. Structured interviews were also used. Reliability was tested with Cronbach’s alpha. Data analysis involved descriptive and inferential statistics using SPSS V21.0, examining percentages, means, standard deviations, correlations, and regression coefficients. Thematic analysis was employed to identify and analyze patterns in qualitative data (Braun & Clarke, 2006). Ethical considerations included voluntary participation, informed consent, anonymity, confidentiality, and minimizing potential harm. Out of 400 questionnaires, 378 were returned.

4.0 Findings

This section presents the overall analysis that was the concern of the researcher. It therefore presents the findings regarding the general objective, where the main idea was to find out the contribution of digital financial services on promoting the financial inclusion in Rwanda.

Table 1: Correlation between MTN Services and Financial Inclusion in Rwanda

		Financial Inclusion	Money Transfer	Mobile loan services	Remittances
Financial Inclusion	Pearson Correlation	1.000			
	Sig. (2-tailed)				
	N	378			
Money transfer service	Pearson Correlation	.719**	1.000		
	Sig. (2-tailed)	0.000			
	N	378	378		
Mobile loan service	Pearson Correlation	.528**	.399**	1.000	
	Sig. (2-tailed)	0.000	0.000		
	N	378	378	378	
Remittance service	Pearson Correlation	.475**	.384**		1.000
	Sig. (2-tailed)	0.000	0.000		
	N	378	378	378	378

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Primary data, 2023

As shown in Table 1, all the indicators' variables, namely money transfer services ($r = 0.719$, $p = 0.000$), mobile loan services ($r = 0.528$, $p = 0.000$), and remittance services ($r = 0.475$, $p = 0.000$) were all found to have positive and significant correlation with financial inclusion since their respective p-values were less than 5%. However, their levels of correlation were different, with money transfer services having the highest, followed by mobile loan services.

Table 2: Regression Model Summary for Digital Financial Services

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.774 ^a	0.600	0.597	1.996

a. Predictors: (Constant), Remittances, Money Transfer services, Mobile loan services

Source: Primary data, 2023

Table 2 shows the summary of the regression model for the digital financial services identified in this study on financial inclusion. About these findings, the regression model was fit with a positive $R^2 = 0.597$, implying that the digital financial services namely mobile transfer services, mobile loan services, and remittance services increase financial inclusion in Rwanda by about 60%.

Table 3: Analysis of Variance (ANOVA) for MTN Services and Financial Inclusion

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	2233.474	3	744.491	186.821	<.001 ^b
	Residual	1490.412	374	3.985		
	Total	3723.886	377			

a. Dependent Variable: Financial Inclusion

b. Predictors: (Constant), Remittances, Money transfer services, Mobile loan services

Source: Primary data, 2023

Table 3 provides further analysis in relation to the regression model for the digital financial services on financial inclusion. As per the findings based on the ANOVA analysis, the regression model was statistically significant since the p-value was less than 5% threshold. This implies that there is strong evidence against the null hypotheses.

Table 4: Regression Coefficient Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.700	1.122		-2.406	0.017
	Money transfer services	0.412	0.026	0.576	15.708	0.000
	Mobile loan services	0.118	0.020	0.228	5.808	0.000
	Remittance services	0.091	0.026	0.137	3.520	0.000

a. Dependent Variable: Financial Inclusion

Source: Primary data, 2023

For the mobile transfer services, a regression coefficient ($\beta_1 = 0.412, p = 0.000$) was found indicating a statistical significance. This explained that for every unit increase in mobile transfer services resulted in an increase of 0.412 on financial inclusion in Musanze District.

Regarding mobile loan services, the regression ($\beta_2 = 0.118, p = 0.000$) coefficient was positive statistically significant. This explained that for every unit increase in mobile transfer services resulted in an increase of 0.118 on financial inclusion in Musanze District. For remittance services increase ($\beta_2 = 0.091, p = 0.000$), both showed positive and significant contribution to financial inclusion. This explained that for every unit increase in mobile transfer services resulted in an increase of 0.091 on financial inclusion in Musanze District. Therefore, regression coefficients were statistically significant since p-values were less than 5% threshold.

Table 5: Summary of results for the hypotheses testing.

Null Hypotheses	β	P-value	Conclusion
H0 ₁ : Money transfer service has no significant contribution financial inclusion promotion in Musanze	0.412	0.000	Rejected
H0 ₂ : Mobile loan service has no significant contribution on financial inclusion promotion in Musanze.	0.118	0.000	Rejected
H0 ₃ : Remittance service has no significant contribution on the promotion of Rwanda financial inclusion agenda	0.091	0.000	Rejected

Source: Primary data, 2023

As per the findings, all null hypotheses were rejected due to the fact that p-values obtained were less than 5% threshold.

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Qualitative data analysis

After the transcription of the interviews conducted with the leaders of companies/organizations that provide digital financial services and contribute to financial inclusion in Musanze, the researcher proceeded with data analysis using the thematic analysis method. Regarding access to financial services in Musanze, the respondents were generally positive. The main reason being the decentralization of services through the deployment of a big number mobile money/mobile banking agents across all sectors of Musanze, as well as innovative solutions such as phone applications and remote services via USSD codes. In the respondents' views, the usage of financial services is generally good. The vast area covered by mobile money/mobile banking agents and their importance especially in places where the formal banking infrastructure is not available have easy for anyone who wants to deposit, withdraw funds from their mobile money or bank accounts. The quality of financial services is generally good in the respondents' view but with a few exceptions. According to another respondent from telecom, "The quality of digital financial services is fair, and there is a big room for improvement. One of the areas of focus should be in distribution, where some people need to make long journeys to access financial services such as cash in, cash out, or bill payment. With an increased distribution footprint by all DFS providers in Musanze, the quality of DFSs will be better.

5.0 Summary of key findings

The correlation between money transfer services and financial inclusion stood at 0.719, showing a very strong relationship between the two variables. The regression coefficient for money transfer service stood at 0.412 ($p = 0.000$), implying that money transfer service contributes to financial inclusion by 41.2%. Thus, the rejection of the earlier null hypothesis that money transfer service does not have a significant contribution to financial inclusion. The correlation between mobile loan services and financial inclusion stood at 0.528, testifying a strong relationship between the two variables. The regression coefficient for money transfer service stood at 0.118 ($p = 0.000$), implying that money transfer service contributes to financial inclusion by 11.8%. Thus, the rejection of the earlier null hypothesis that mobile loan service does not have a significant contribution to financial inclusion. The correlation between remittance service and financial inclusion stood at 0.475, showing a positive relationship between the two variables. The regression coefficient for money transfer service stood at 0.091 ($p = 0.000$), implying that remittance service contributes to financial inclusion by 9.1%. Thus, the rejection of the earlier null hypothesis that money transfer service does not have a significant contribution to financial inclusion. Through interviews with leaders of financial service providers in Musanze, the researcher was able to collect important information regarding the contribution of Digital Financial services to financial inclusion where they confirmed that people can access digital financial services wherever they are in Musanze. Respondents also affirmed that usage of digital financial services is good since people use their mobile money wallets to deposit, withdraw, save, borrow, or send money to their loved ones. It was found that the quality of financial services has been improving over time. Finally, the respondents agreed that the contribution of digital financial services to financial inclusion is clear.

6.0 Conclusion

The study concludes that the use of mobile phone can be a channel to increase the financial inclusion in a country. The mobile phone has increasingly become a tool that is not only used for calling and sending messages, but also as a tool used by individuals and organizations to make financial operations such as money transfers, bill, tuition payments, purchasing airtime, and depositing money. Such access to financial services has pushed the providers to invest in platforms such as mobile apps, online banking, etc. to increase the financial inclusion and onboard the financially excluded people. Through decentralization of their services, financial service providers would not only make it for people to access, use financial services, but it would be an opportunity to create a source of income especially for the vast number of agents that earn commissions after facilitating these services, but for the people developing applications used by fintech customers. Mobile financial services have increasingly expanded across emerging and developing economies and enabled new ways through which households and firms can conduct payments, save, and send remittances. Remittances transferred by citizens working in foreign countries across different countries, represent a considerable percentage of countries' foreign exchange earnings and GDP growth, and contribute significantly to the economic improvement of their home countries. In addition, because the mobile money platform provides real-time remittance transactions and feedback, it can help build trust and promote savings and repayment behavior.

7.0 Recommendations

Financial services providers should increase their investments in fintech digital solutions such as mobile applications to reach as many people as possible. However, these platforms should be very secure, user-friendly, and reliable with very limited downtime. Remote customer support is still very low, and users will need to have their wrong transfer quickly reversed for example. Without quick and effective customer support, the customers would end up avoiding using these platforms because they are afraid to lose their money in case of a transaction to a wrong recipient. The study also recommends that the regulatory bodies like National Bank of Rwanda (BNR) and Rwanda Utilities Regulatory Authority (RURA) to provide oversight roles to ensure that the fintech businesses are not charging a lot than what they should for their services, and that they are ensuring data privacy is strictly adhered to. Regulatory bodies should also work with the financial service providers to tackle the ever-increasing cases of fraudulent cases where people are conned online or via phone calls. In addition, the researcher acknowledges the contribution mobile phone ownership have on the financial inclusion in Rwanda. Hence, the researcher recommends that through Public Private Partnership, there should be a strategy to facilitate more people to own phones (preferably the smartphones). This can be possible through innovative approaches such as the 2020 Connect Rwanda campaign that brought both public and private institutions, as well as individuals to contribute to increasing smartphone penetration in Rwanda through pledges and commitments.

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