



Mobile Phone Technology, Agency Banking Services, Online Banking Services and Financial Inclusion of Small and Medium Enterprises in Kenya

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The study sought to examine the effect of mobile phone technology, agency banking services and online banking services on financial inclusion of Small and Medium Enterprises in Kenya. This study originates from the Doctoral dissertation of the first author where the co-authors served as supervisors. Technology Acceptance Model and Asymmetric Information Theory were adopted. The study adopted explanatory research design. The top 100 Small Medium Enterprises in Kenya constitute the target population and the sample size was 200 based on purposive sampling

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technique and simple random sampling where two respondents were picked from each Small Medium Enterprises of interest. Multiple regression technique was used for the analysis of data. A response rate of 81.5 percent was achieved. Primary data was used which was collected using a questionnaire. The study used multiple regression analysis. It was established that mobile phone technology and agency banking services had insignificant effect on financial inclusion of small and medium enterprises in Kenya. The study found that online banking services had significant effect on financial inclusion of small and medium enterprises in Kenya. The study recommends that business managers should capitalize on the underlying benefits of online banking by fully utilizing and exploring its various services. Online banking services should be supported and enhanced by the government in view of its importance in fostering financial service accessibility which in turn improves financial inclusion. Further studies can evaluate the effect of mobile phone technology and agency banking services on financial inclusion of small and medium enterprises in Kenya based on a different methodology.

Keywords: Mobile phone technology; agency banking services; online banking services; financial inclusion.

1. INTRODUCTION

Information and Communication Technology (ICT) adoption in several countries has facilitated increased level of financial inclusion. Financial inclusion encompasses providing financial services at affordable rates that cut across accessibility of loans, facilities for remittances, payments, insurance as well as savings services from the formal financial sector for those that seem excluded [1]. Advancements in the financial sector of the global economy remain important and needed conditions towards attaining sustainable socio-economic development [2]. The fast innovative world of finance and emerging technology have combined to make lending finances be critical sector of small and medium enterprises (SMEs) a much sought-after issue. According to Gomber, Kauffman, Parker and Weber [3], the emerging fintechs have made life easier for SMEs seeking financing options or searching for best avenues of getting finances for their business.

The combination of high technology applications and ease of running the technology underneath such applications continue to prompt SMEs into adopting the fintechs [4]. Financial inclusion is regarded as an avenue through which services in the financial sector are provided at affordable or relatively low cost across individuals as well as businesses regardless of their business sizes and net worth [5,6]. It helps in promoting equality by broadening the financial system while helping in the overall economic development through poverty reduction especially with regard to the underprivileged population [2].

Small and Medium Enterprises in Kenya play an important role towards the attainment of the big

four agendas with respect to the country's vision 2030. Considered as the backbone of the economy, SMEs in Kenya provide more than 50% of its total employment as well as above 80% employment growth in the previous decade [7]. They are notably earmarked to convert the country into a developed middle-income nation as key growth drivers by providing standard life across people by the year 2030 [8]. Despite this implication, it is documented that three out of every five SMEs do not survive the first year of operations and 80% of those which operate past the first year collapse before the fifth year [7].

1.1 Problem Statement

Notably, lack of funds stands as key obstacle hindering SMEs and this stands as one of the most widely documented challenge facing MSMEs across economies [9]. Based on estimations, after establishment, within three years about 70% of small businesses shut down [10]. Otar [11] documented that only between the range of 45.4 to 51% of these businesses operate (survive) beyond 5 year duration with just 1 in 3 operating beyond a 10 year period which is largely due to inadequate capital. This category of businesses has very low likelihood of financial access which in turn affects productivity rate and growth, hence leading to their closure [12].

Financial inclusion notably performs a key role for SMEs since it is recognized as an economic actor for alleviating poverty as well as achieving sustainable growth by policymakers. However, higher financing obstacles are being faced by SMEs as compared to larger firms [13]. FinTech being one of the emerging technologies with

regards to financial innovations has fuelled financial access for businesses [5]. This is as the benefit of financial access via FinTech alongside its usage has attracted several customers [14]. Despite the accrued benefit of the financial system in being a key factor of the socio-economic development of any country, the case of Kenya is different as several individuals are lacking accessibility to formal credit facilities as this has remained a challenge especially for small businesses [13]. This has dominated discussions among businesses and policy makers. In line with this, the study sought to examine the effect of mobile phone technology, agency banking services and online banking services on financial inclusion of Small and Medium enterprises in Kenya.

1.2 Purpose of the Study

The study aimed to examine the effect of mobile phone technology, agency banking services and online banking services on financial inclusion of Small and Medium enterprises in Kenya.

Specifically, the study sought to:

- i. Assess the effect of mobile phone technology on financial inclusion of Small and Medium enterprises in Kenya.
- ii. Establish the effect of agency banking services on financial inclusion of Small and Medium enterprises in Kenya.
- iii. Examine the effect of online banking services on financial inclusion of Small and Medium enterprises in Kenya.

1.3 Research Hypotheses

The study tested the following hypotheses:

H₀₁: Mobile phone technology has no significant effect on financial inclusion of Small and Medium Enterprises in Kenya.

H₀₂: Agency banking services have no significant effect on financial inclusion of Small and Medium Enterprises in Kenya.

H₀₃: Online banking services have no significant effect on financial inclusion of Small and Medium Enterprises in Kenya.

2. LITERATURE REVIEW

2.1 Theoretical Literature Review

In examining the effect of mobile phone technology, agency banking services and online banking services on financial inclusion, Technology Acceptance Model and Asymmetric Information Theory were adopted.

2.1.1 Technology acceptance model

Technology Acceptance Model was introduced by Davis in 1986 helps in providing insights on how organizations utilize technological advances in improving their internal operational efficiencies. The model is considered to be the most utilized hypothesis used to portray individuals' acknowledgment data framework [15]. The model initially comprised of four factors (helpfulness, simplicity, real framework employments and demeanour toward utilization), however, it subsequently constituted of only two factors which were outside factors and social expectation. New technology adoption in organizations is hinged on several attributes [16]. It is hinged on the intention of adopting and using new technology among individuals with underlying qualities such as its ease of use and the perception held by individuals towards this technology. The perceived usefulness as well as benefits which individuals derive from the use of technological systems determines the level of adoption [17]. This is largely dependent on the attitudes of customers, perceived usefulness and ease of use of the new technology [18].

In view of technology acceptance, TAM is a commonly and widely applied model. Notably, this is accompanied by some underlying factors which provide explanations to the dynamism with regards to the supposed ease of use as well as utility [19]. As postulated by Schepers and Wetzels [20], the major aspects of this model relate to subjective norms, facilitating situations as well as and self-efficacy. External factors vary factors investigations and present personal capacities. As such, perceived ease of use is encompassed by the view of how much work an individual thinks is needed in the application or use of technology [21]. The TAM model further demonstrates how SMEs can incorporate modern technologies in carrying about business transactions. This is through the utilization of financial technology by SMEs in monetary transactions which in turn leads to safe, quick, as well as more accessible cash transactions.

Mobile phone and other financial technologies are adopted and accepted due to the underlying benefits and usefulness attributed to them [22]. Mobile phone technologies and other financial technology means are utilized by SMEs due to their capacity and potential of increasing their boundaries while bringing about simplicity in the handling of business activities. This theory brings

out the value of SMEs adopting financial technology which includes but not limited to improving access to credit facilities, ease of payments as well as savings options for its users. Technology Acceptance Model is recognized in view of the usefulness of financial technology to several individuals and businesses with regards to accessing financial services. The several benefits attributed to financial technology include savings, credits as well as payment processes. The TAM model is relevant to this study in that it provides more insights on financial technology and financial inclusion relationship which is influenced by the general acceptability of these technologies. The various financial technologies such as mobile phone technology, agency banking and internet banking offer several financial services which in turn increase the level of financial inclusion especially to the underserving population which are isolated by the traditional financial institutions.

2.1.2 Asymmetric information theory

Asymmetric Information Theory was propounded by Akerlof in 1970. Information asymmetry entails a situation whereby one of the parties in a financial contract is seemingly better informed with regards to the subject matter than the other party. Asymmetric information may bring about issues of moral hazard and adverse selection [23]. In view of this theory, in a financial contract where a party has superior information on specific items, such individual (group) is likely to have better negotiations to the disadvantage of the counterpart. The individual having less knowledge regarding the specific item of concern is notably not in a situation to make optimal decisions with respect to the underlying contract [24].

Moral hazard and adverse selection arise due to information asymmetry among financial service providers and customers. Moral hazard relates to the uncertainty that party to financial transactions may provide incorrect (misleading) information regarding assets, credit capacity, and property to be insured, this is a financial services in view of financial inclusion also cut across insurance services. Adverse selection arises in cases whereby financial institutions cannot identify the level of risks attributed to customers. As a result of information asymmetry, SMEs experience challenges as regards to financial inclusion [25]. Financial institutions notably rely on and expect accurate information regarding customers or borrowers, the projects the funds are being

sourced for and in the case of insurance cover, the property to be insured [24]. Small and Medium Enterprises experience difficulties in acquire external capital due to underlying information asymmetry. This is as certain agents have access to certain information while some do not have access to the same information (Edvos, Andy, Sara & Stephen, 2017).

Lending to SMEs is further challenged by lack of knowledge; hence the underlying information gaps between financial institutions and borrowers. This restricts start-ups and already existing businesses from acquiring external funding [25]. External financing concerns stand as the major issues for SMEs [26]. In view of this study, the adoption of this theory emanates from the fact that it provides insights on the issues regarding the financial inclusion of SMEs. Access to financial services which cut across external financing and insurance services has been a barrier for SMEs since the financial institutions offering the services experience challenges in acquiring the needed information about a customer, this further limits the maximum utilization of financial technology, hence the exclusion of SMEs. Similarly, financial services providers and customers tend to conceal vital information regarding lending and borrowing as well as other financial services agreements.

2.2 Empirical Literature Review

Lotto [27] examined the role of agency banking towards promotion of financial inclusion with focus on Tanzania. It specifically sought to evaluate the leverage which agency banking provides towards the promotion of financial inclusion in Tanzania. Based on a descriptive analysis, primary data was used which was sourced from the outlets of bank agents in Dar es Salaam. Analytical findings obtained from the study indicate that agency banking has contributed in simplifying banking services through the reduction of distance taken by customers before reaching service points. The study found that costs associated to agency banking are lower than those of traditional banking services. The study concluded that greater geographical coverage offer through agency banking strongly promotes financial inclusion as financial services are within the reach of people. Hence, reducing the travelling costs and time taken at bank branches through long queues. In overall, the study contributes to literature as it provides evidence of how agency

banking practices has resulted to increased financial inclusion in Tanzania.

Malek, Mohtar and Ariffin [28] assessed the factors affecting agent characteristics effectiveness with respect to the performance of financial inclusion. The banks owned by the Government of Malaysia were considered and data was sourced through the use of a survey questionnaire where the employees dealing with agents directly were the respondents of the study. The study had a sample of 100 employees from three departments across the Malaysian Government-Owned banks. Data was based on primary data with questionnaires. Data analysis was done using correlation technique. The outcome of the study indicates that the agent experiences stand as the most contributory factor towards financial inclusion performance. Agent experience positively affect agent characteristic on bank performances. In view of the findings, it is suggested that the changes in the background of agents and experience of the agents should be taken into consideration by the agent recruitment department. It was discovered that the agent characteristics had significant influence on financial performance, as such, the criteria for selecting agents ought to be more controlled and specific to the agencies of government which are engaged in the process.

Kemboi [29] analysed the impact of financial technology on the financial performances in commercial banks context in Kenya. While anchoring on technology acceptance model and financial intermediation theory, the 43 commercial banks in Kenya were covered. Financial technology was indicated through mobile, agency and internet banking. The dependent variable was financial performance while the control variables were management efficiency, capital adequacy and size of the bank. Descriptive research design was relied upon by the study as the whole 43 commercial banks were utilized for analysis. The quantitative and qualitative secondary data used for the study was gathered from annual reports from CBK's website. Analysis of the gathered data was performed using descriptive and regression analyses. The results showed that all the three variables have significant positive effect on financial performance. The study recommended efficient use of financial technology to improve the commercial banks' financial performance.

Lubis, Dalimunthe and Situmeang [30] evaluated financial technology effects on the financial inclusion of the people of North Sumatra in

Indonesia. Technology acceptance model underpinned the research variables. Casual research design was used and financial technology was modelled to predict financial inclusion. The total sample size for analysis was 100 respondents sampled using convenience (non-probability sampling) technique and convenience sampling technique. Primary data was adopted by the study sourced through questionnaires. In addition, secondary data was also utilized sourced through publications, books and journals. Analysis of the data gathered was carried out using descriptive analysis and multiple regression analysis and findings reveal that financial technology has significant positive effect on financial inclusion of the people of North Sumatra.

Ajaya [3] studied the impact of financial technology on the financial performance of the banking industry in Kenya. The evaluation was underpinned by financial intermediation theory, diffusion of innovation theory and technology acceptance model. Financial technology proxied as mobile banking, ATMs, agency banking and internet banking while the dependent variable was financial performance proxied as ROA. Descriptive research design was adopted by the study as it relied upon secondary source of data collected from KNBS and CBK websites. The target population was the whole banking industry and not specific to individual banks. Using descriptive statistics and multiple regression model on the SPSS platform, it was reported that internet banking has strong effect on financial performance while mobile banking, ATMs and agency banking has insignificant positive effect on financial performance.

Hussein [32] examined the role of financial technology on financial inclusion in Egypt. The independent variables include mobile money account, use of internet and mobile account while financial inclusion was predicted. The control variables utilized by the study include country, employability, educational level, gender, income, and age. Secondary data was sourced from the World Bank 2017 Global Findex Database. The Global Findex database contains information about the population of 143 counties which includes various financial inclusion variables such as information on financial services, accounts and other demographic information. The study targeted only nine (9) countries which are Saudi Arabia, Tanzania, Kenya, Egypt, Kuwait, United Arab Emirates, Jordan, Ethiopia and Bahrain and a target

population of the entire civilian non-institutionalized individuals aged 15 and above which resulted to 9084 civilians. Analysis was done based on descriptive statistical analysis followed by multiple logistic regression. From the analysis of the study, it was gathered that mobile money account, use of account and mobile account have a significant effect on financial inclusion. The study concludes that the use of internet and mobile services has the lowest penetration in Egypt. The study further recommended that government of Egypt should concentrate on employing competent personnel that can oversee the delivery of digital financial products and also sensitize its citizens on financial literacy and privacy regulations.

Mokaya [33] conducted a study to determine whether or not financial technology impacts the financial performance in Kenya of Tier II banking institutions. Financial technology which is the independent variable was proxied as automated teller machine, online banking and mobile banking were modelled to affect financial performance proxied as return on assets. The study utilized descriptive casual research design and optimism research design. The target population comprised of nine (9) Tier II banks based on census. Secondary data was collected for 2015 and 2019 periods. Descriptive analysis, regression analysis and correlation analysis were used and findings showed that automated teller machine, online banking and mobile banking all have strong effects towards financial performance. The study concluded that Tier II banks will not only improve their financial performance through implementing financial technology services but also gain competitive advantage among their competitors.

Salim [34] analyzed the impact of financial technology in supporting financial inclusion in Zimbabwe. The independent variables were distance, income level, high cost, financial literacy, technology and product which were measures of financial technology. The theoretical perspective was supported by journal, books and other library documents. Descriptive research technique was used through the use of a qualitative approach. Data was sourced through literatures, electronic documents and texts and written documents. Data was also collected through the conduction of interviews and observation. Financial technology had significant influences towards financial inclusion. The findings of the study revealed that demographic features have a significant effect on financial

inclusion due to the fact that areas having high large population level enjoy higher financial services access than areas with low population size which are the rural and remote areas which thus negates financial inclusion in those areas. The study recommends increased financial technology services in rural centres so as to increase the rate of financial inclusion.

Usman [35] studied the effect of financial technology on financial inclusion in Nigeria. ATMs, internet banking and point of sales devices were considered and financial inclusion measured as number of bankable populations. Descriptive research design was employed and 2010 to 2018 periods was used. The target population of the study was all the financial banks operating in Nigeria. Secondary data was utilized as obtained from statistical bulletins of Central Bank of Nigeria (CBN) 2018 while descriptive and multiple regression analysis. Point of sales has significant strong positive effect on financial inclusion. Internet banking and automated teller machines have insignificant positive effect on financial inclusion. The study recommended that the government should introduce internet banking, automated teller machines and point of sales devices to rural areas and also conduct programs that will enlighten the people on the importance of financial technology so as to achieve financial inclusion.

Wayne, Soetan, Bajepade and Mogaji [36] determined the influence of financial technology on financial inclusion in Nigeria specifically in the banking industry. Financial technology was described in the form of unstructured supplementary data services, mobile applications, third-party payment apps and mobile banking technology. The study was carried out from a theoretical perspective in which the importance of accessibility of internet services, customer's technology acceptance and increased bank branches can help facilitate the adoption of financial technology which in turns accelerates financial inclusion. The study noted that there were areas in Nigeria which were excluded from financial technology services and thus recommended that financial organizations especially commercial banks to establish branches in rural areas and also educate the people about the various function fintech services offer such as the mobile applications, automated teller machines and also security issues associated with the services.

Agelyne and Musau [37] sought to assess financial technology effect on financial inclusion with regards to SMEs situated in Kabati market Kitui County (Kenya). The study noted that the increasing level of financial accessibility to individuals and organizations is attributed to the successful launching of financial technology services and financial institutions. Theories which include Theory of Asymmetric Information, Pecking Order Theory (POT), Relationship Lending Theory (RLT), Technology Acceptance Model (TAM) as well as Financial Intermediation Theory were used. Primary data was sourced through questionnaires from SMEs in Kabati market. Empirical results indicate that financial technology significantly affects SMEs' financial inclusion. It was recommended that FinTech strategies which include M-pesa services, Agency banking, Money Lending Apps and online banking should be promoted and supported by the government since they contribute in facilitating the offer of faster financial services. These financial technology strategies further provide employment avenues in areas which are not covered or patronised by traditional financial institutions.

Adiga, Adigwe, Okonkwo and Ogbonna [38] examined the influence of financial technology on financial performance with focus on the banking sector of Nigeria. Financial performance was operationalized as interest income, return on assets, non-interest income and return on equity and predicted by financial technology. Technology acceptance model was used to underpin the study variables. Ex-post facto research design and deposit money banks in Nigeria were covered. The analysis was done using Auto Regressive Distributed Lag (ARDL) method. The analysis report revealed that financial technology has significant impact on ROA, non-interest income and return on equity but an insignificant effect on interest income. The study however, stated an inconclusive effect of financial technology on financial performances of the DMBs in Nigeria. In conclusion the study recommended the usage of financial technology by the deposit money banks.

Goswami, Sharma and Chouhan [39] investigated the effect of financial technology on financial inclusion in Rural India. The independent variables were behavior intention, social influence, effort expectancy, motivation, perceived risk, performance expectancy, habit, facilitating conditions, agent trust, usability, service charges, perceived ease of use, service

trust, fintech use for financial inclusion and perceived usefulness. The target population for the study include entrepreneurs and ordinary users of mobile money. Sampling of the respondents was done using stratified judgmental sampling technique which produced a total of 6050 respondents. The sample was selected in the following six (6) rural geographical locations in India; Hariyana, Madhyapradesh, Uttar Pradesh, Punjab, Rajasthan and Maharastra. Data collection was done using structured questionnaire which was subjected to validity and reliability test using a pilot test and Cronbach-Alpha internal consistency test. Analysis was conducted using Explanatory Factor Analysis (EFA), Structural Equation Model (SEM) and Path Analysis. The results of the analysis established that perceived risk, social influence, effort expectancy, facilitating conditions, social influence, habits and performance expectancy have a significant positive effect on financial inclusion. It was recommended that financial organizations provide mobile and digital services to rural communities at low cost but with maximum benefits.

3. METHODOLOGY

The study adopted explanatory research design. Explanatory research design becomes more appropriate for the study as it sought to evaluate the effect of mobile phone technology, agency banking services and online banking services on financial inclusion of Small and Medium Enterprises in Kenya. The study considered the top 100 SMEs in Kenya which constitute the target population of the study. The choice of top 100 SMEs in Kenya is attributed to their ease of accessibility and as such, the study was based on this ranking. The ranking was by www.tuko.co.ke on list of SMEs in Kenya: top companies to watch out for in 2021. The study applied purposive sampling technique where the top 100 SMEs formed the sample of the study. As such, purposive sampling technique was adopted since this was in view of the perception and judgement of the researcher. Simple random sampling was also applied in selecting two respondents from each SME of interest. The choice of two respondents from each of the SME was to address the possible occurrence of a situation whereby a respondent in a firm does not adequately or truthfully fill the questionnaire. Multiple regression analysis was used where financial inclusion was expressed as a function of

mobile phone technology, agency banking services and online banking services.

$$FI = \beta_0 + \beta_1MPT + \beta_2ABS + \beta_3OBS + \epsilon$$

Where:

- FI = Financial Inclusion
- MPT = Mobile Phone Technology
- ABS = Agency Banking Services
- OBS = Online Banking Services
- β_0 = Constant
- β_1 to β_3 = Regression Coefficients
- ϵ = Error Term

4. RESULTS AND DISCUSSION

4.1 Inferential Analysis

The inferential analysis was based on the model summary, analysis of variance and the multiple regression analysis as contained in Table 1, Table 2 and Table 3.

4.1.1 Model summary

The model summary depicts the predictive powers of the predictor variables, hence the strength of the statistical model as presented in Table 1.

The financial technology and financial inclusion are positively correlated amongst SMEs in Kenya, as shown by the R value of 0.478. The R-square of 0.229 demonstrates that only 22.9% of the variability in the financial inclusion of SMEs in Nairobi city was explained by mobile phone technology, agency banking services and online banking services. This indicates that the individual factors account for 22.9% of changes in SME financial inclusion. Therefore, the explanatory variables included do not explain 77.1% of the variation in the dependent variable.

Despite the relatively low R square value, the results still hold significant implications for policy making. Bala [40] indicated that just because the R squared is low does not imply lack of importance and noted that in social sciences it is impossible to include all the relevant variables which provide explanations of an outcome, hence, the possibility of obtaining a low R square. Vrdoljak, [41] noted that a low R-squared does not imply the negation of importance of significant variable(s). This is as statistical significant variables are applied the same way in interpreting relationships even when a low R-squared is established and the coefficients similarly have the same interpretation, hence there are no reasons to discount such results. Notably, the coefficients for significant predictors are interpreted in this same manner irrespective of the value of the R-square.

4.1.2 Analysis of variance

The analysis of variance further indicates the importance of a model based on its significance level as well as F statistics. The outcome from the analysis of variance is documented in Table 2.

Table 2 displayed the analysis of variance. The F value showed whether or not the independent factors jointly have a significant effect on the dependent variable. F statistical value of 11.705 was shown. Findings also showed that the F value was statistically significant ($P < 0.001$) at the 5% level of significance. This indicates that financial inclusion of SMEs in Kenya is significantly affected by the combination of mobile phone technology, agency banking services, and online banking services. This indicates that all the explanatory factors taken together have a significant influence on financial inclusion of SMEs in Kenya.

Table 1. Model summary results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.478 ^a	.229	.209	.44025

a. Predictors: (Constant), Mobile Phone Technology, Agency Banking Services, Online Banking Services

Source: Survey Data (2023)

Table 2. Analysis of variance results

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9.075	4	2.269	11.705	$P < 0.001^b$

Residual	30.624	158	.194
Total	39.699	162	

a. Dependent Variable: Financial Inclusion

b. Predictors: (Constant), Mobile Phone Technology, Agency Banking Services, Online Banking Services

Source: Survey Data (2023)

Table 3. Multiple regression results

Model	Unstandardized Coefficients		Standardized Coefficients Beta	T	Sig.
	B	Std. Error			
(Constant)	1.681	.425		3.953	.000
Mobile Phone Technology	.017	.062	.020	.273	.785
Agency Banking Services	-.022	.060	-.027	-.372	.710
Online Banking Services	.247	.088	.216	2.798	.006

Source: Survey Data (2023)

4.1.3 Multiple regression analysis

The outcome depicted in Table 3 showed that mobile phone technology had positive and insignificant effect on financial inclusion of SMEs in Kenya. This is represented by a coefficient of 0.020 and p-value of 0.785 respectively. This implies that an increase in mobile phone technology would result in an increase in financial inclusion amongst SMEs in Kenya. Agency banking service further revealed an inverse and insignificant effect on financial inclusion of SMEs in Kenya. This is affirmed by a coefficient of -0.027 and p-value of 0.710. This depicts a situation of decreasing financial inclusion of the SMEs as agency banking services increases in Kenya. Furthermore, online banking service noted a positive and significant effect on financial inclusion amongst SMEs in Kenya. The outcome is noted with a coefficient of 0.216 and p-value of 0.006. The implication of the outcome is that, as online banking services increases, financial inclusion of SMEs in Kenya would increase as well.

4.2 Hypotheses Testing

4.2.1 Hypothesis one

In evaluating mobile phone technology effect on financial inclusion of small and medium enterprises in Kenya, the following hypothesis was formulated and tested:

H₀₁: Mobile phone technology has no significant effect on financial inclusion of Small and Medium Enterprises in Kenya.

The outcome in Table 3 indicates a p-value of 0.785 for the effect of mobile phone technology on financial inclusion of Small and Medium enterprises in Kenya. This notably implies non significance and as such, the study failed to reject the null hypothesis stating that mobile phone technology has no significant effect on financial inclusion of SMEs in Kenya. A coefficient 0.020 was also obtained which implies that an increase in mobile phone technology would result in an improvement in financial inclusion amongst SMEs in Kenya. Mobile banking transactions lead to improvements in financial inclusion of small and medium enterprises as indicated by the positive effect.

Despite increasing level of mobile phone technology leading to improvements in financial inclusion, it is not significant in the context of small and medium enterprises in Kenya. The insignificant effect of mobile phone technology on financial inclusion can be attributed to the costs associated to mobile phone services which include but not limited to transfer costs, withdrawal costs as well as interest charged on loans. Ajaya [31] similarly reported that mobile banking has insignificant positive effect on financial performance of the banking industry in Kenya. Abbott [42] found that the amount remitted and number of subscriptions had insignificant effect on credit usage by SMEs situated in Kisumu Central Business District.

Contrary to the findings of this study on mobile phone technology and financial inclusion nexus are the results of Hussein [33]. The previous study established that use of mobile money account has a significant effect on financial inclusion in Egypt. The study notably was focused on Egypt. Furthermore, Agelyne and Musau [37] in the context of Kabati Market Kitui County of Kenya reported that mobile phone (mpesa) services significantly financial inclusion of SMEs. Despite the study focusing on in Kabati Market Kitui County which falls under Kenya, the current study considered SMEs in Kenya as a whole. Hence, the possible explanation for the varying results across the studies.

4.2.2 Hypothesis two

Establishing the effect of agency banking services on financial inclusion of small and medium enterprises in Kenya was the second objective of the study.

H_{02} : Agency banking services have no significant effect on financial inclusion of Small and Medium Enterprises in Kenya.

Based on the empirical findings in Table 3, a p-value of 0.710 was established with regards to the effect of agency banking on financial inclusion of SMEs in Kenya. Consequently, the null hypothesis stating that agency banking services have no significant effect on financial inclusion of Small and Medium Enterprises in Kenya was not rejected. A coefficient of -0.027 was further established, hence depicting that financial inclusion of the SMEs decreases with increases in agency banking services. The negative and insignificant effect can be attributed to the fact that despite the perceived benefits of agency banking services, they are not without underlying limitations and/or restrictions. Notably, the respondents expressed neutrality to the statement that cost of business operations has reduced through the use of agency banking. The respondents were further neutral to the statement that they are able to pay our employees through agency banking.

The respondents neither agreed nor disagreed to the statement that they are able to open bank accounts through agency banking, hence eliminating the stress of going to the bank. Additionally, despite the advantage of flexibility attributed to agency banking, the respondents did not agree that through agency banking,

businesses are able to scale to larger levels due to its flexibility. Similar to the study findings on the effect of agency banking services on financial inclusion of SMEs in Kenya are those of Usman [35]. It was established that automated teller machines have insignificant positive effect on financial inclusion. Ajaya [31] similarly reported that agency banking has insignificant positive effect on financial performance of the banking industry in Kenya.

On the contrary, Lotto [27] while focusing on Tanzania reported that greater geographical coverage offer through agency banking strongly promotes financial inclusion. Similarly, Usman [35] in the context of Nigeria studied found that point of sales has significant strong positive effect on financial inclusion. The variations in the findings can be attributed to the different contexts of the studies as the two previous researches focused on Tanzania and Nigeria respectively. Different countries are characterized by varying social, cultural and economic characteristics which in turn can lead to unique outcome of studies.

4.2.3 Hypothesis three

The third specific objective of the study was to examine the effect of online banking services on financial inclusion of small and medium enterprises in Kenya. The study in turn formulated the following hypothesis:

H_{03} : Online banking services have no significant effect on financial inclusion of Small and Medium Enterprises in Kenya.

With respect to the effect of online banking services on financial inclusion of SMEs in Kenya, a p-value of 0.006 was established as documented in Table 3. The null hypothesis stating that online banking services have no significant effect on financial inclusion of Small and Medium Enterprises in Kenya was rejected. The outcome is underpinned by a coefficient of 0.216 which implies that online banking service registered a positive effect on financial inclusion amongst SMEs in Kenya. The implication of the outcome is that, as online banking services increases, financial inclusion of SMEs in Kenya would increase as well. Online banking services provide businesses with the ability to carrying of financial transactions with and outside the country, hence high level of flexibility.

The outcome of the study regarding online banking services and financial inclusion nexus are in line with those of existing empirical works. Durai and Stella [43] found that internet banking has strong impact on financial inclusion. Lubis et al. [30] established that financial technology has significant positive effect on financial inclusion of the people of North Sumatra. Ajaya [31] reported that internet banking has strong effect on financial performance of the banking industry in Kenya. Salim [34] documented that financial technology had significant influences towards financial inclusion financial inclusion in Zimbabwe. Agelyne and Musau [37] further reported that financial technology significantly affects financial inclusion with regards to SMEs situated in Kabati market Kitui County (Kenya).

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The study concluded that despite the positive nexus established, mobile phone technology is not a significant determinant of financial inclusion of small and medium enterprises in Kenya. Notably, the introduction of mobile money has contributed to more efficiency in business transactions by businesses. Through the utilization of mobile phone services, money transfer services between accounts are enhanced and subsequently financial accessibility. Through mobile phone saving services, businesses are encouraged to save for the future while also accessing additional funding, hence the positive nexus with financial inclusion.

It was concluded that agency banking services are not important in determining financial inclusion of SME in Kenya. Notably, agency banking does not necessarily provide services at lower rates apart from the mere cost of movement to the banking halls and other underlying costs of which there is an increased spread of bank branches (offices) across geographical regions. Despite the attributed benefits of flexibility, agency banking services do not significantly improve the financial accessibility of businesses, hence its lack of importance in increasing the financial inclusion of small and medium enterprises in Kenya.

It was subsequently concluded that online banking services are important in improving the financial inclusion of small and medium

enterprises in Kenya. The small and medium enterprises carry out transaction of funds through online banking which allows them to easily track transactions with their banks. As such, online banking is convenient especially when it comes to time spent as well as cost of transaction. Online banking services provide businesses with access to account balances, hence increasing financial inclusion of small and medium enterprises.

5.2 Policy Recommendations

The study established that only online banking services significantly predicted financial inclusion of small and medium enterprises in Kenya. Business managers should capitalize on the underlying benefits of online banking by fully utilizing and exploring its various services. Online banking services should be supported and enhanced by the government in view of its importance in fostering financial service accessibility which in turn improves financial inclusion. Additionally, financial services by service providers should further be provided through online banking services so as to fully explore the underlying benefits which it brings.

5.3 Suggestions for Further Studies

The study sought to evaluate the effect of mobile phone technology, agency banking services and online banking services on financial inclusion of small and medium enterprises in Kenya. Out of these variables, only online banking services had significant effect on financial inclusion of small and medium enterprises in Kenya. Further studies can evaluate the effect of mobile phone technology and agency banking services on financial inclusion of small and medium enterprises in Kenya based on a different methodology.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Melubo K, Musau S. Digital banking and financial inclusion of women enterprises in Narok County, Kenya. *International Journal of Current Aspects in Finance, Banking and Accounting*. 2020;2(1):28-41. Available:<https://doi.org/10.35942/ijcfa.v2i1.104>

2. Mouna A, Jarboui A. Understanding the link between government cashless policy, digital financial services and socio-demographic characteristics in the MENA countries. *International Journal of Sociology and Social Policy*. 2022; 42(5/6):416-433
3. Gomber P, Kauffman RJ, Parker C, Weber BW. On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services. *Journal of management information systems*. 2018;35(1):220-265.
4. Asmarani SC, Wijaya C. Effects of fintech on stock return: Evidence from retail banks listed in Indonesia stock exchange. *The Journal of Asian Finance, Economics, and Business*. 2020;7(7):95-104.
5. Demirgüç-Kunt A, Klapper L, Singer D, Van Oudheusden P. The global finindex database: measuring financial inclusion around the world. *World Bank Policy Research Working Paper No. 7255*; 2015.
6. Agelyne KM, Musau SM. Financial technology and financial inclusion of small and medium enterprises in Kabati Market Kitui County, Kenya. *International Journal of Academic Research in Business and Social Sciences*. 2021;11(4):362-377.
7. Ndung'u NP. Effect of fintech on growth of small and medium enterprises in Kiambu County, Kenya. *Masters Dissertation Submitted to KCA University*; 2020.
8. Kenya National Bureau of Statistics. *Micro, Small and Medium Establishment Survey Basic*. Nairobi: Kenya; 2016.
9. World Bank. *World Bank SME finance: Improving SMEs' access to finance and finding innovative solutions to unlock sources of capital*. The World Bank; 2019. Available:<https://www.worldbank.org/en/topic/sme/finance>
10. Douglas J, Douglas A, Muturi D, Ochieng J. An exploratory study of critical success factors for SMEs in Kenya. *Excellence in Services. Toulon Verona 20th International Conference, Verona (Italy)*; 2017.
11. Otar C. What percentage of small businesses fail—And how can you avoid being one of them? *Forbes*; 2018. Available:<https://www.forbes.com/sites/forbesfinancecouncil/2018/10/25/what-percentage-of-small-businesses-fail-and-how-can-you-avoid-being-one-of-them/>
12. Kimbio KF. Access to credit and growth of micro, small and medium-scale enterprises in Kenya. *Masters Project Submitted to University of Nairobi, Kenya*; 2020.
13. Kibicho N, Mungai J. Mobile banking adoption and financial credit accessibility in wote sub – county, Makueni County, Kenya. *International Journal of Current Aspects*. 2019;3(IV):65-79. Available:<https://doi.org/10.35942/ijcab.v3il.V.47>
14. Ntwiga DB. Can fintech shape the dynamics of consumer credit usage among the under banked? *Kenya Bankers Association, Centre for Research on Financial Markets and Policy. Working Paper Series*. 2019;34.
15. Lee Y, Kozar A, Lorsen T. The technology acceptance model: Past, present and future. *communications of the association of information system*. 2003;12(50):751–781.
16. Huang TH, Liu F, Chen LC, Tsai CC. The acceptance and impact of Google Classroom integrating into a clinical pathology course for nursing students: A technology acceptance model approach. *PloS one*. 2021;16(3):e0247819. Available:<https://doi.org/10.1371/journal.pone.0247819>
17. Rauniar R, Rawski G, Yang J, Johnson B. Technology acceptance model (TAM) and social media usage: an empirical study on Facebook. *Journal of Enterprise Information Management*. 2014;27(1): 6-30. Available:<https://doi.org/10.1108/JEIM-04-2012-0011>
18. Lule I, Omwansa TK, Waema TM. Application of technology acceptance model (TAM) in m-banking adoption in Kenya. *International Journal of Computing & ICT Research*. 2012;6(1):31-43.
19. Marangunić N, Granić A. Technology acceptance model: A literature review from 1986 to 2013. *Universal Access in the Information Society*. 2015;14(1):81-95.
20. Schepers J, Wetzels M. A meta-analysis of the technology acceptance model: Investigating subjective norm and moderation effects. *Information & Management*. 2007;44:90-103.
21. Scherer R, Siddiq F, Teo T. Becoming more specific: Measuring and modeling teachers' perceived usefulness of ICT in the context of teaching and learning. *Journal of Computers & Education*. 2015;88:202–214.

22. Mugalo PK. Effect of mobile phone technology on performance of micro and small-scale enterprises in Kakamega County. MBA Project Submitted to Kenya Methodist University; 2021.
23. Richard A. Information asymmetry, information precision and the cost of capital. *Review of Finance*. 2011;16(1):1-29.
24. Musau SM. Financial inclusion and stability of commercial Banks in Kenya. Ph.D Thesis. Nairobi: Kenyatta University; 2018.
25. Agelyne KM. Financial technology and financial inclusion of small and medium enterprises in Kabati Market Kitui County, Kenya. MBA Project Submitted to Kenyatta University; 2022.
26. Nafsigner J, Weicheng W. Determinants of start-up firms external financing. *Journal of Bank finance*. 2011;35:2282-2294.
27. Lotto J. The role of agency banking in promoting financial inclusion: descriptive analytical evidence from Tanzania; 2016.
28. Malek BA, Mohtar S, Ariffin AS. The factor that affects the effectiveness of agent banking characteristics on financial inclusion performance: A study from Malaysian government-owned banks in Negeri Sembilan. *Journal of Advanced Research in Business and Management Studies*. 2017;7(1):91-102.
29. Kemboi BJ. Effect of financial technology on the financial performance of commercial banks in Kenya. MBA Thesis, University of Nairobi; 2018.
30. Lubis A, Dalimunthe R, Situmeang C. Antecedents effect of financial inclusion for the people of North Sumatera. *Budapest International Research and Critics Institute Journal (BIRCI-Journal)*. 2019;2(4).
31. Ajaya P. Effect of financial technology on financial performance of the banking industry in Kenya. Masters Thesis, University of Nairobi; 2020.
32. Hussein H. The impact of financial technology on financial inclusion: The case of Egypt. *IOSR Journal of Economics and Finance (IOSR-JEF)*. 2020;11(6):35-51.
33. Mokaya BN. Effects of financial technologies on the financial performance of tier two banks in Kenya. Master Thesis, United States International University – Africa; 2020.
34. Salim F. Analysis of the role of financial technology in supporting the financial inclusion program. *Proceedings of the 2nd African International Conference on Industrial Engineering and Operations Management, Harare, Zimbabwe*; 2020.
35. Usman UM. The effect of financial technology on financial inclusion in Nigeria. BSc. Thesis, Baze University, Abuja; 2020.
36. Wayne T, Soetan TO, Bajepade G, Mogaji E. Technologies for financial inclusion in Nigeria. *Research Agenda Working Papers*. 2020;4:40–56.
37. Agelyne KM, Musau SM. Financial technology and financial inclusion of small and medium enterprises in Kabati Market Kitui County, Kenya. *International Journal of Academic Research in Business and Social Sciences*. 2021;11(4):362-377.
38. Adiga DL, Adigwe PK, Okonkwo VI, Ogbonna SK. Financial technology and the banking sector performance in Nigeria (2005 – 2020). *Discovery*. 2022; 58(316):349–360.
39. Goswami S, Sharma RB, Chouhan V. Impact of financial technology (FinTech) on financial inclusion (FI) in rural India. *Universal Journal of Accounting and Finance*. 2022;10(2):483–497.
40. Bala H. Re: Low R-squared?; 2018. Available:https://www.researchgate.net/post/Low_R-squared/5bcde0e511ec739dc37284ea/citation/download
41. Vrdoljak A. Re: Low R-squared?; 2022. Available:https://www.researchgate.net/post/Low_R-squared/62bdf0515589a7320a69928d/citation/download.
42. Abbott BO. Financial technology and credit usage among small and medium enterprises in Kisumu Central Business District, Kenya, *Journal of Finance and Accounting*. 2021;5(1):28-38.
43. Durai T, Stella G. Digital finance and its impact on financial inclusion. *Journal of Emerging Technologies and Innovative Research*. 2019;6(1):122–127.

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