Evaluating the Nexus between Digital Transformation and Financial Inclusion: A Fresh Insight from Small and Medium Enterprises in Kenya

Oliver Mukweyi Pyoko [a], Malgit Amos Akims [b*], Samuel Moragia Nyachae [a] and Levi Mbugua [c]

[a] California Miramar University San Diego, California, USA.
[b] Kenyatta University Nairobi, Kenya.
[c] Technical University of Kenya, Kenya.

Authors' contributions

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

Original Research Article

ABSTRACT

Small and medium enterprises are considered vital in Kenya due to the significant role which they carry out towards the attainment of the big four agendas with respect to the country's vision 2030. Despite this importance, these businesses continue to be financially excluded. Studies relating to digital transformation and financial inclusion are characterized by underlying research gaps cutting across conceptual, contextual to methodological gaps. As such, this study which originates from the Doctoral dissertation of the first author in which the co-authors served as supervisors sought to evaluate the nexus between digital transformation and financial inclusion of small and medium enterprises in Kenya. Diffusion Innovation Theory and Financial Intermediation Theory were utilized and explanatory research design was adopted. The top 100 small medium enterprises in Kenya

constituted the target population and the sample size was 200 based on purposive sampling and simple random sampling techniques where two respondents were picked from each of the Small Medium Enterprises of interest. A response rate of 81.5 percent was achieved through the use of questionnaires. The study established a significant nexus between digital transformation and financial inclusion of small and medium enterprises in Kenya. Consequently, the study concluded that digital transformation is important in determining the financial inclusion of small and medium enterprises in Kenya. The study recommended that the management of small and medium enterprises should fully invest in digital transformation so as to maximize its underlying benefits of flexible financial services.

1. INTRODUCTION AND BACKGROUND

From the global perspective and notably emerging and developing economies, small and medium enterprises encounter challenges as they are financially excluded hence not able to access affordable financing. Over the years this situation has led to conventional banks as well as other financial institutions isolating and under-serving the Small and Medium Enterprises (SMEs) segments which are largely as a result of high risk perception, the lack of credit data as well as cost profile [1]. In the case where SMEs are constrained with respect to credit, their chances of growth and increased innovation are highly affected. Financial inclusion notably is aimed at ensuring that the unbanked population is incorporated and serviced by the formal financial sector for purposes of providing broader opportunities towards accessibility to financial services which cut across and notably not restricted to savings, payments, insurance, transfers and credit services. Financial inclusion importantly does not imply that everyone has to utilize the supply; neither does it mean that providers of financial services should ignore underlying risks as well as other associated costs in making decisions regarding financial services [2].

Digital finance in Africa was first developed through mobile money innovation which stands as the first phase. Its second phase is aimed at individual and business insurance, individual resource management as well as increase in access by SMEs to external finance. In the context of Sub-Saharan Africa, mobile money startups and M-pesa are considered as the next phase or emerging trend with regards to financial technology (Fintech Africa, 2018). The question of fintechs and SMEs linking up to ease lending is further complicated across the African region in which large data is still a problem for most countries [3]. Laws of transactions have also limited the application of the fintechs across the continent of Africa with fear of loss for wider coverage making the fintechs operate in very restrictive zones [4]. The African situation is also replicated locally in Kenya with the few fintechs that have emerged still struggling to establish a big lending base in the face of high demand from the SMEs [5].

The Kenyan experience through common applications such as M-Shwari and Tala have led to mixed results with SMEs improving their reception of funds while at the same time witnessing increasing failure rates. Misati, Kamau, Kipyegon and Wandaka [6] pointed out that there is increasing awareness of the fintechs but faced with challenges of trust and intentional defaults using communication platforms that are still struggling to break such defaults. Results across Kenya show that collaboration between the fintechs and major banks remains a challenging business given the rival nature of the two parties [7]. The instability of both the structure of SMEs and the fintech backgrounds has led to the increasing mistrust by both players and combined with the culture of traditional banking, fintechs are faced with a tough time in making their impact felt efficiently [8].

1.1 Statement of the Problem

Small and medium- enterprises pass through various stages in their life cycles which begin with the start-up, growth, maturity, renewal, rebirth or decline. Hence, the nature and level of their underlying needs of financing differ in view of these phases [9]. Kenya has over time embraced digital transformation and has to an extent experienced increased usage with respect to digital solutions across sectors such as communication, transport, commerce, finance and banking [10]. Despite the underlying potential socio-economic benefits attributed to

digital transformation with regards to increasing access towards financial services and in general financial inclusion to the unbanked population while allowing faster and easier transfers and payments, the application of these options remains limited in comparison with the traditional debt financing [11].

Despite these benefits, the small and medium enterprises continue to be financially excluded. This is as financial institutions sometimes view offering financial services to Small and Medium Enterprises to be less profitable even in the case where higher interest rates are charged so as to account for higher credit risk. Yoshino and Yamagami [12] hold the view that the absence of public information alongside inadequate quality as well as lower frequency of financial statements in some cases in comparison with larger enterprises individually and collectively contributes to the difficulty of banks assessing and monitoring the credit risks characterized by these SMEs.

Some studies such as Lotto [13], Malek, Mohtar and Ariffin [14], Durai and Stella [15], Lubis, Dalimunthe and Situmeang [16], Hussein [17], Salim [18], Abbott [10], Usman [19], Wayne, Soetan, Bajepade and Mogaji [20] Agelyne and Musau [1] and Goswami, Sharma and Chouhan [21] have been carried out on digital transformation and financial inclusion; however, these studies are characterized by underlying research gaps ranging from methodological (methods), contextual (context) and conceptual (concepts and variables) gaps. Other studies related to financial technology which include Kemboi [22], Ajaya [23], Mokaya [24] and Mugalo [25] and Adiga, Adigwe, Okonkwo and Ogbonna [26] were focused on financial performance as the outcome variable. The studies done with respect to digital transformation and financial inclusion were centred on other countries. Those studies focused on Kenya were focused on specific counties with some examining just the lending aspect of financial inclusion. These research gaps hence form a basis for this study as it sought to investigate the effect of digital transformation on financial inclusion of small and medium enterprises in Kenya.

1.2 Purpose of the Study

The study sought to evaluate the between digital transformation and financial inclusion of small and medium enterprises in Kenya.

2. LITERATURE REVIEW

2.1 Theoretical Literature Review

In evaluating the nexus between digital transformation and financial technology, the study adopted Diffusion Innovation Theory and Financial Intermediation Theory. The assertions emanating from these theories underpin digital transformation and financial inclusion relationship.

2.1.1 Diffusion Innovation theory

The diffusion innovation theory was propounded by American Theorist Everett Rogers in 1962 as the theory explained the innovation process and spread within a system. The diffusion of Innovation Theory focuses on the level by which new development is spreads, the way that new advancements are embraced and the reason to this embracement of the new advancements while exploring the factors which influence new data innovation development selection which cuts across individuals and business levels. The rationale behind diffusion innovation theory is based on the rapid emergence of innovation and new advancement especially technological advancements in various sectors of a country [27]. The theory explains the rate at which digital transformation evolves and spreads extensively. According to diffusion innovation theory, there are four elements associated with diffusion of innovation which are innovation, communication channel, social system and time.

The theory is categorized into various classifications summing up to five namely: early majority, innovators, early adopter's laggards as well as late majority. The innovation adopters are the primary and first category of people excited and willing to try out a particular innovation and are generally risk takers [28]. The early majority are individuals or corporations that rely on facts and evidence of an innovation's abilities before trying out a new innovation; however they do so before the average man. The laggards are conservative set of people that participate last in trying out an innovation, this set of people require constant persuasion before implementing an innovation. The early adopters are the set of people usually comfortable with innovations and technological advancements and are so comfortable implementing the innovation. The late majority are the set of people that are a bit indecisive about innovation implementation, and will only implement certain innovation based on majority acceptance and implementation rate

[29]. The diffusion innovation theory is useful for determining digital transformation phase and also for providing insight on the various types of adopters of digital transformation.

2.1.2 Financial Intermediation Theory

Financial Intermediation Theory was introduced by Diamond in 1984. While analyzing the financial intermediation role of financial institutions, the theory provides postulations of how banking institutions serve as financial intermediaries for borrowers and depositors. Financial institutions carry out various activities and are often regarded as the middlemen in connecting lenders and borrowers in the financial industry [30]. The financial intermediary role of financial institutions is based on the surplus income of individuals, households and firms which are usually saved with financial institutions in form of deposit in which the financial institutions then use to offer credit services to borrowers and also utilize it for investment purposes.

The rationale of financial intermediation theory is that financial technology services provide people with higher accessibility to financial services offered by financial intermediaries thereby facilitating financial inclusion and enhancing performance of different sectors in a country [25]. The theory postulates that financial institutions helps to control deficit and surplus spending in addition to offering financial services and managing risks of different investments. Therefore, they create economics of scale, access credit worthiness of borrowers and risks involved with various investment opportunities [31].

2.2 Empirical Literature Review

Durai and Stella [15] investigated how digital financial services impact financial inclusion. Digital financial services which is the independent variable was measured as credit card, internet banking, debit card, mobile applications and mobile banking while financial inclusion was the dependent variable measured as usability, affordability, convenience, adaptability, low service charge, security, user friendly, online monthly statement, internet connection and accurate timing. Primary data was adopted for the study collected through structured Likert scale questionnaires which was subjected to Cronbach-Alpha test to ascertain its validity and reliability. Analysis of variance (ANOVA) was conducted. The results of the analysis indicated that credit card, internet banking, debit card, mobile applications and mobile banking all have strong impact on financial inclusion. The study further stated that although digital financial services comes up challenges such as low affordability for low income earners, data breaching, fraud, however, it is essential for every individual to embrace it.

Ndung'u [32] determined Fintech effect on SMEs Growth in Kiambu County, Kenya. Specifically, the research aimed at examining mobile money, digital lending and online banking effects on growth of SME's in Kiambu County. The relationship between financial technology and growth was underpinned by Unified Theory of Acceptance and use of technology, Technology Acceptance theory, Technology, organization and Environment theory and Diffusion innovation Theory. While adopting descriptive research design, 4897 licensed SMEs based Business Register of 2018 operating in Kiambu County formed the target population and 356 SMEs made up the sample size as derived from stratified random sampling. Primary data was used based on questionnaires which were self-administered. Descriptive, correlation and inferential analysis were performed. The study found that relationship between financial technology and growth of SMEs to be positive and significant. The study attributed 16% of SME rate of growth to digital lending, mobile money and online banking. It was recommended that the increase in adoption mobile money services should be maximized by financial institutions so as to establish collaborations with mobile phone services providers with a view of providing flexible financial services to customers or business owners.

Abbott [10] evaluated the effect of financial Technology on credit usage across SMEs situated in Kisumu Central Business District. Digital credit consumers over the years have been experiencing difficulties which cut across late repayment and loan default as a result of lack of transparency in loan repayment period as well as high interest rates charged. In view of this, the investigation aimed at addressing the issue of financial technology with regards to the usage of credit across SMEs. Descriptive research design was adopted while targeting all the 6,688 SMEs which are registered and operating in the Kisumu CBD within the period 2020. Out of this, the study settled for a sample size of 100 SMEs and primary data was through questionnaires. Afterwards, both descriptive and

inferential analyses were conducted and the outcome revealed that volume of requested credit from digital lenders significantly affects the usage of credit. Also, number of available fintech agents/branches was reported to be key credit usage determinants across these SMEs. On the other hand, it was found that the amount remitted and number of subscriptions had insignificant effect on credit usage. The study recommended the use of financial technology by the SMEs for purposes of enhancing the level of credit usage in business operations.

Mugalo [25] analyzed mobile phone (technology) effect on performance of MSSE. Mobile phone savings facilities, mobile phone credit facilities, mobile phone internet facilities and mobile phone payment facilities constituted the independent variables, hence the specific objectives while performance was he outcome variable. Causal-effect research design was adopted where the MSEs in Kakamega County (which apply mobile phone technology) were targeted. Based on stratified sampling technique as per sub-county, 399 participants were used. Data was collected through structured questionnaires and both descriptive and multiple regression analyses were applied. Based on the analysis of data, it was concluded that mobile phone internet facilities and mobile phone saving facilities both significantly affect the performance of enterprises in the micro and small-scale category. In view of the results, it was recommended that owners of micro and small-scale enterprises as well the senior managers of these enterprises in Kakamega County should focus on investing additional resources so as to enhance both mobile phone internet facilities and mobile phone saving facilities since this will significantly improve their firms' performances.

3. RESEARCH METHODOLOGY

The study adopted explanatory research design. Explanatory research design was appropriate for the study since the focus was examining the effect of digital transformation 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 analysis of data was based on the following regression model:

$$FI = \beta_0 + \beta DT + \varepsilon$$

Where:
FI = Financial Inclusion
DT = Digital Transformation
β_0 = Constant
β = Regression Coefficient
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 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 variable, 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 Kenya was explained by digital transformation.

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 indicates whether or not the independent variable has a significant effect on the dependent variable. F statistical value of 11.705 was obtained. Findings indicate that the F value was statistically significant ($P<0.001$) at the 5% level of significance. This indicates that financial inclusion of small and medium enterprises in Kenya is significantly affected by digital transformation.

Table 1. Model Summary Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.478[a]	.229	.209	.44025
a. Predictor: (Constant), Digital Transformation				

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. Predictor: (Constant), Digital Transformation						

Source: Survey Data (2023)

Table 3. Regression results

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.681	.425		3.953	.000
	Digital Transformation	.357	.078	.353	4.551	$P<.001$

Source: Survey Data (2023)

4.1.3 Regression analysis

The regression analysis was used to ascertain the significance and direction of the relationship between digital transformation and financial inclusion of small and medium enterprises in Kenya. The results of the regression analysis are documented in Table 3.

4.2 Interpretation of Findings

The outcome in Table 3 indicates that digital transformation has a positive relationship with financial inclusion of SMEs in Kenya which is supported by a coefficient of 0.353. Consequently, an increase in digital transformation would amount to rising financial inclusion amongst small and medium enterprises in Kenya. The P-value $P<0.001$ implies significance, hence, it was established that the relationship between digital transformation and financial inclusion of SMEs in Kenya is significant. The findings of the study on digital transformation and financial inclusion nexus are supported by previous empirical literature. Durai and Stella [15] indicated that credit card, internet banking, debit card, mobile applications and mobile banking all have strong impact on financial inclusion. Ndung'u [32] found that the relationship between financial technology and growth of SMEs is positive and significant. Abbott [10] reported that the volume of requested credit from digital lenders significantly affects the usage of credit. Also, the number of available fintech agents/branches was reported to be key credit usage determinants across these SMEs.

5. CONCLUSION, POLICY RECOMMENDA-TIONS AND SUGGESTIONS FOR FURTHER STUDIES

The study established a significant relationship between digital transformation and financial inclusion of small and medium enterprises in Kenya. This is as the higher the utilization of digital transformation, the higher the level of financial inclusion of small and medium enterprises in Kenya. Consequently, it was concluded that digital transformation is important in determining the financial inclusion of small and medium enterprises in Kenya.

It is recommended that the management of small and medium enterprises should fully invest in digital transformation so as to maximize its underlying benefits of flexible financial services, hence in turn improving the financial inclusion of these firms. This is as higher level of financial inclusion will translate into improved financial performance of small and medium enterprises in Kenya.

Having evaluated the nexus between digital transformation and financial inclusion of small and medium enterprises in Kenya, further studies can explore how digital transformation affects financial performance. This can be done based on county specific small and medium enterprises as well as for Kenya as a whole.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. 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.
2. Hannig A, Jansen S. Financial inclusion and financial stability: Current Policy Issues. ADBI Working Paper 259. Tokyo: Asian Development Bank Institute; 2010. Available:http://www.adbi.org/working-paper/2010/12/21/4272.financial.inclusion.stability.policy.issues/
3. Awotunde JB, Adeniyi EA, Ogundokun RO, Ayo FE. Application of big data with fintech in financial services. In fintech with artificial intelligence, big data, and blockchain. Springer, Singapore. 2021; 107-132.
4. Saiedi E, Mohammadi A, Broström A, Shafi K. Distrust in banks and fintech participation: The case of peer-to-peer lending. Entrepreneurship Theory and Practice. 2020;1042258720958020.
5. Suri T, Bharadwaj P, Jack W. Fintech and household resilience to shocks: Evidence from digital loans in Kenya. Journal of Development Economics. 2021;153: 102697.
6. Misati RN, Kamau A, Kipyegon L, Wandaka L. Is The evolution of fintech/digital financial services complementary to bank performance in Kenya. In 8th Annual Banking Research Conference; 2019.
7. Ntwiga DB. Technical efficiency in the Kenyan banking sector: Influence of fintech and banks collaboration. Journal of Finance and Economics. 2020;8(1):13-22.
8. Kipsang B. Effect of debt recovery strategies on loan performance of fintech companies in Kenya. (Doctoral dissertation, United States International University-Africa); 2020.
9. OECD. Enhancing SME access to diversified financing instruments. Discussion Paper for Plenary Session 2, 2018 SME Ministerial Conference., Mexico City, Mexico; 22-23 February 2018.
10. 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.
11. Nemoto N, Koreen M. Digital innovation can improve financial access for SMEs. SME Policy Faced With Development of Financial Technology G20 Japan. 2019;1: 1-11.
12. Yoshino N, Yamagami H. Monetary Economics: Practice and Theory. Keio University Press (in Japanese); 2017.
13. Lotto J. The role of agency banking in promoting financial inclusion: Descriptive analytical evidence from Tanzania; 2016.
14. 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.
15. Durai T, Stella G. Digital Finance and its Impact on Financial Inclusion. Journal of Emerging Technologies and Innovative Research. 2019;6(1):122– 27
16. 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)
17. 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
18. 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, December. 2020;7-10.
19. Usman UM. The effect of financial technology on financial inclusion in Nigeria. BSc. Thesis, Baze University, Abuja; 2020.

20. Wayne T, Soetan TO, Bajepade G, Mogaji E. Technologies for financial inclusion in Nigeria. Research Agenda Working Papers. 2020;4:40–56.

21. 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

22. Kemboi BJ. Effect of financial technology on the financial performance of commercial banks in Kenya. MBA Thesis, University of Nairobi; 2018.

23. Ajaya P. Effect of financial technology on financial performance of the banking industry in Kenya. Masters Thesis, University of Nairobi; 2020.

24. Mokaya BN. Effects of financial technologies on the financial performance f tier two banks in Kenya. Master Thesis, United States International University – Africa; 2020.

25. 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.

26. 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.

27. Oliveira T, Martins MF. Literature review of information technology adoption models at firm level". The Electronic Journal Information Systems Evaluation. 2011; 14(1):110-121.
Available:www.ejise.com

28. Light PC. Sustaining Innovations. San Francisco: Jossey-Bass; 1998.

29. Rogers EM. Diffusion of Innovations (5th Ed.). New York: Free Press; 2003.

30. Akims MA. Fundamental risk factors and profitability of commercial banks in Nigeria. Doctoral Dissertation, Kenyatta University; 2020.

31. Andries AM. Theories regarding financial intermediation and financial intermediaries. A survey fascicle of the faculty of economics and public administration. 2009;9,2(10):254–261

32. Ndung'u NP. Effect of fintech on growth of small and medium enterprises In Kiambu County, Kenya. Masters Dissertation Submitted to KCA University; 2020.

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/109259