Financial Technology and Performance of Small and Medium Enterprises: Evidence from Dar es Salaam City, Tanzania

*Joseph Christonsia Peter
Assistant Lecturer, Tanzania Institute of Accountancy, Mtwara Campus
Email: munuo410@gmail.com
*Corresponding author: email munuo410@gmail.com

Dr Ephraim Stephen Nnunduma
Lecturer, Tanzania Institute of Accountancy, Mtwara Campus
Email: nnundumae@gmail.com

Abstract

The purpose of the study was to analyse the effects of financial technology (Fintech) on the performance of Small and Medium Enterprises (SMEs). An explanatory research design was conducted in Dar es Salaam City, Tanzania. The study population was 2,867 SMEs located in two administrative districts of Dar es Salaam City namely, Temeke and Kinondoni Municipalities. The quantitative study used a sample size of 300 randomly selected SMEs. Descriptive statistics and linear multiple regressions were used to analyze the collected data. The descriptive findings show that the adoption and use of digital banking, mobile money services, and peer-to-peer lending is extremely high compared with crowdfunding. However, SMEs owners/managers were not sure about the adoption and use of crowd investing. In the case of regression model, the findings indicate that four predictors; digital banking, crowdfunding, peer-to-peer lending and mobile money services have a positive and statistically significant impact on SMEs performance. Based on the findings the study concludes that Fintechs are beneficial to SMEs performance. Therefore, the study recommends that SMEs should enhance the use of these Fintech platforms for the effective funding of their business.

Keywords: *Fintech; Digital Banking; Crowd Funding, Crowd Investing; Small and Medium Enterprises*

1.0   INTRODUCTION

The expansion of new technological capabilities has been of tremendous assistance to the economic system all over the world. It is anticipated that traditional financial institutions will combine with technological advancements as the digital economy continues to expand (Khiewngwamdee & Yan, 2019). The digital economy makes use of financial technology (Fintech) to serve everyone on the planet (Adimabua, 2015; Pengfei, et al, 2017; Silver et al., 2019; Wolff,

2021). Financial technologies are reshaping deposits, withdrawals, payments, insurance, borrowing, and financial management (Kadam & Memon, 2023).

Globally, widespread digitalization in financial services started in the 1990s with the advances in internet technology (Salam et al., 2018; Macha & Massawe, 2023). At the turn of the 21st century, the use of digital loans, mobile wallets, payment applications, and online banking by financial institutions made it possible for those institutions to provide a wide variety of financial services (Cham, 2018; Macha & Massawe, 2023). The current Fintech 4th industrial revolution has influenced tremendous changes that affect the way and means by which financial products and services are provided and how consumers are served (Basdekis et al., 2022). According to a report that was published by PricewaterhouseCoopers (PWC) in 2019, it was anticipated that there would be a 52% increase in the global adoption of Fintech by 2021/2022. This has led to an increase in the number of transactions from 3.8 trillion USD in 2018 to 15.12 trillion USD in 2024 (Statista, 2024). Thus, with Fintech financial services, many economies become more diverse, competitive, affordable, efficient, and all-inclusive.

At present, Fintech has become a crucial tool in business payment and loan acquisition, which offers users a reliable electronic financial platform that influences online transactions (John, 2018). The most notable Fintech includes mobile money services, credit and debit cards, internet banking, online lending platforms such as peer-to-peer and crowdfunding and investment (Mushtaq, Gull, & Usman, 2021; Mrindoko, 2022). Mobile money services are regarded as the most essential means for simple, cheap and speedy transactions (Amos-Abanyie, 2019; Chiemo, 2020). Due to growth of Fintech the transaction costs of loan processing on both lender and borrower has been reduced tremendously, making online lending platforms much more cheaper (Abbasi, 2021). Thus, the growth of Artificial Intelligence (AI) and the interconnectivity in personal data such as cloud data storage, financial institutions can use Fintech in ways that can eliminate information asymmetry and thus lessen the need for collateral from borrowers (Feyen, Frost, Gambacorta, Natarajan & Saa, 2021).

The International Finance Corporation [IFC] (2017) estimates that 40% of formal SMEs in developing countries are underfinanced. The Middle East and North Africa account for 87% and 88% of SMEs that are underfinanced (World Bank, 2019a). East Asia and the Pacific account for 46%, Latin America and the Caribbean 23%, and Central Asia 15% (Madan, 2020). In Sub-Saharan Africa (SSA) SMEs struggle to secure financial resources, which is considered the most serious obstacle that can put a significant damper on SMEs' ability to conduct

business and make investments (Quartey et al., 2017; Disse & Sommer, 2020). About 60% of SMEs are seriously underfinanced in SSA (Brixiová, 2020).

In 2007 there were only 30 active Fintech startup companies operating in SSA, which as of 2018, had multiplied to 262 active Fintech companies operating in the region (Sy, Maino, Massara, Perez-Saiz & Sharma, 2019). Mobile money has dominated Fintech in SSA, especially in the East African region where over half of the 763 million registered accounts in SSA in 2022 are from. East Africa has also been the region recording the highest volume of transactions (GSMA, 2023; Taylor 2023). Of the 390 million mobile money accounts in East Africa, 115 million are active accounts (Taylor, 2023).

Tanzania like other SSA countries has made significant advancements in Fintech over the course of the last decade. The country has also made some notable financial system reforms and policy changes to allow for adoption, implementation and growth of Fintech in the economy (Disse & Sommer, 2020; Domingo, Arnold & Apiko, 2023). Among others is the enactment of ICT policy of 2003 that fast tracked the adoption and use of mobile phone technology, which is the foundation of Fintech. As a result, more than 35 million people or more than 40% of the population own an active mobile money account (Osakwe et al., 2023; Roessler & Walsh, 2023), and Fintech transactions have increased from 3.2 billion in 2019 to 3.75 billion in 2021, which amounts to 101.87 trillion TZS and 137.22 trillion TZS respectively (Osakwe et al., 2023). Though a significant number of newly established Fintech companies fail at infancy, still a great number of Fintech companies have recently entered the market and they are projected to increase in the future as the market expands (Alnes, 2017; BFA Global, 2017; Penteriani & Fichers, 2023).

Likewise, commercial banks have adopted and implemented Fintech, an action which has revolutionised the banking industry and made banking services all-inclusive via the internet or digital banking (Ouma, Odongo, & Were, 2017; Banna et al., 2022). Through Fintech, financial institutions provide a broader range of financial services to both individual customers and commercial clients such as SMEs. Bierer, Breaul, Cameron et al. (2021) put that SMEs can now make payments, withdrawals, loan processing, investment, deposits and savings without going to a bank branch. Thus, there is widespread adoption and use of Fintech in the country. Empirical researches in Tanzania (Bank of Tanzania, 2019; Disse & Sommer, 2020; Were, Odongo & Israel, 2021; Mrindoko, 2022; Macha & Massawe, 2023) have reported that Fintech has helpful outcome on the overall performance of SMEs. Likewise, studies elsewhere (Talom & Tengeh, 2019; Winarto, 2020; Candraningrat et al., 2021) show that Fintech exerts a

significant and beneficial influence on the capital growth and asset value of SMEs.

Despite the significant role that Fintech plays in improving SMEs' access to finance, the vast majority still struggle with dwindling performance, and many startup SMEs do not graduate to the next level. According to World Bank (2015), only three out of every five startup SMEs are able to survive the first five months to one year after their establishment, and of those that are able to survive that long, 80% fail by the fifth year. Since financing is considered as the main blockade for SMEs' performance in developing countries including Tanzania, the widespread adoption of Fintech would be expected to enhance the general performance of SMEs. According to Mrindoko (2022), Fintechs possess positive and significant impact on performance of Tanzanian SMEs. However, John et al. (2018), Nkwabi and Mboya (2019) and Mrindoko (2022) have reported that performance of SMEs in Tanzania is not impressive, and they are still confronted with financing challenges.

Therefore, the purpose of this study was to investigate the extent that which SMEs have adopted Fintech in terms of digital banking, crowdfunding, peer-to-peer lending, mobile money services and crowd investing, and analyses the impact of Fintech on the overall performance of SMEs in Dar es Salaam, Tanzania.

1.1 Theoretical Framework
1.1.1 Mobile Wallet Theory
Mobile Wallet Theory explains a model of financial technology based on the mobile financial devices and gadgets, especially mobile phones and credit and debit cards. Mobile Wallet Theory explains how a model of Fintech is being operated, applied and used to promote financial transactions by individuals and firms (Salonen, 2017). The theory of mobile wallet corresponds to this research because it explains the fact that Fintech instruments are similar to the wallet in the pocket of individuals, which people move with everywhere (Mrindoko, 2022). That means SMEs can access financial services wherever they are and anytime they want, paying affordable cost at their convenience, whilst saving time of going to the bank and move around with large sums of money, which also increases risk of being robbed. This gives SMEs plenty of time to concentrate with other productive activities, which might increase SME profitability. As such, the theory is used to determine whether there was positive and significant association between digital banking and SMEs' performance, whether crowdfunding had positive and significant association with SMEs' performance and whether there was direct and significant link between peer-to-peer lending

and SMEs' performance. Though Wallet theory has linked Fintech and SMEs' performance, it cannot explain whether the Fintech is accepted by the SMEs as useful technology or not. Hence, another theory is needed to clearly explain the usefulness and acceptance of Fintech by SMEs. The best model is the Technology Acceptance Model (TAM), and hence for this purpose TAM is adopted.

1.2   Technological Acceptance Model

The Technological Acceptance Model was utilized as a directing framework throughout the course of this research. The technology acceptance model (TAM) is a theory that was developed by Davis in the field of information systems in 1989. This theory seeks to explain how users of new technological systems come to accept and employ those systems. There are two aspects of a new technology that, according to the Technological Acceptance Model (TAM), determine whether or not consumers will adopt it. The first factor is how people feel about the technology's potential applications, and the second factor is how people feel about the technology's usability. According to Davis (1989), this ideology places a significant amount of emphasis on the process by which end users adopt new technologies. TAM comprises a number of fundamental components, the most important of which are perceived usefulness (PU), behavioral intention (BI), attitude toward use (ATU), and perceived ease of use (PEU).

When making a prediction about someone's actual use, Davis (1989) suggests that the BI is the most important factor to take into consideration as a starting point. TAM model was used to guide this study because it has shown to be the most effective in directing the adoption and use of Fintech in SMEs as technology is perceived to be useful and easy to use. Currently, SMEs have widely adopted financial technology as a means to get finance through loans and to manage their financial issues (Lontchi et al., 2023; Jawarneh, Shawer & Shariah, 2023). Moreover, in prior studies on the topic of technology adoption, the TAM model has been in the forefront (Otieno, 2015; Ateik, Bardai, and Alzubi, 2020; Mrindoko, 2022). As a consequence of this, the theory is utilized to analyze how the performance of manufacturing SMEs is influenced by Fintech. Furthermore, the theory determined whether there was direct and significant link between mobile money services and SMEs' performance and whether there was positive and significant association with SMEs' performance. This theory was relevant to this study since it highlighted why SMEs should adopt financial technologies to ensure their financial profitability.

2.0   METHODOLOGY

This research employed quantitative approach under explanatory design which allows for relationship testing (Creswell, 2014). The study's decision to employ

a quantitative methodology was motivated by the need to comprehend the link between SMEs performance and mobile money services, online banking, and digital lending. Thus, employing a quantitative technique resulted in the creation of a quantitative relationship between the variables. The descriptive design was selected because it can accommodate quantitative research methods (Kothari, 2019). Thus, the descriptive design was able to fulfill the purpose of this study to describe the level of Fintech adoption among SMEs and analyses the impact of Fintech on the performance of SMEs.

This study was conducted in Dar es Salaam City in Tanzania. Dar es Salaam City was selected because it is the commercial centre of the country and thus where most SMEs are located (Mollel, 2015; Nkwabi & Fallon, 2020; Lunogelo et al, 2021). It is estimated that there are 2867 SMEs in the City (Kenya Climate Innovation Centre, 2020). Specifically, the proposed study is intended to take place in two districts of Temeke and Kinondoni. These districts have been chosen purposively due to high presence of SMEs compared to other districts in the region (Sutton & Olomi, 2012). The respondents were selected using simple random sampling methods from a population of 2867 SMEs. The sample size was approximated using scientific reasoning regarding to the necessity of multiple regression model. Montgomery, Peck and Vining (2012) and Cargnelutti-Filho & Toebee (2020) stipulated that regression models produce strong predictions if sample size is greater than 200. As a result, a total of 300 SMEs was randomly selected from the list of registered SMEs using a random number generator. From every selected SME, the manager/owner was the unit of enquiry. All 300 questionnaires that were distributed were judged usable, and hence utilised for data analysis.

The data was collected using a structured questionnaire. The questions were in five-point Likert scale in order to measure the extent SMEs have adopted Fintech, and gauge its impact on performance of SMEs. During data collection the researcher distributed the prepared self-administered questionnaire to the respondents and collected it in 15-30 minutes after being filled. The questionnaire was designed to be self-explanatory. The aim of the study was explained to respondents and a request to participate in the study was forwarded by the researcher and upon respondent's consent to participate, the questionnaire was given to respondents to be filled.

The Statistical Package for the Social Sciences (SPSS), a statistical software application, was used to examine and analyze the data. This study adopted descriptive statistical analysis and multiple linear regression model. Through descriptive statistics, this application was used to estimate measures of central

tendency and dispersion. Descriptive statistics was used to map the extent of Fintech adoption by SMEs. Regarding multiple linear regression model, it was used to estimate the impact of Fintech on performance of SMEs. According to Tranmer, Murphy, Elliot and Pampaka (2020), multiple linear regression model is best in predicting the value of a dependent variable based on the values of two or more independent variables.

Multiple linear regression model in equation (1) was utilised to estimate the regression coefficients for digital banking, crowd funding, peer-to-peer lending, mobile money services, and crowd investing on SME performance.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

Where;
Y = SME Performance (percentage change in savings amount)
β_0 = Intercept (Constant)
β_1 = Regression Coefficient of digital banking,
β_2 = Regression Coefficient of crowdfunding,
β_3 = Regression Coefficient of peer-to-peer lending,
β_4 = Regression Coefficient of mobile money services
β_5 = Regression Coefficient of crowd investing
X_1 = Digital Banking
X_2 = Crowdfunding
X_3 = Peer-to-peer lending
X_4 = Mobile money services
X_5 = Crowd investing
ε = Error term for the model

3.0   FINDINGS AND DISCUSSION

Table 1 shows Cronbach's alpha values for items digital banking, crowdfunding, P2P lending, mobile money services and crowd investing were 0.834, 0.793, 0.841, 0.819 and 0.765 respectively. As a result, all constructs had Cronbach's alpha values greater than the required minimum of 0.70. This implies that the study data collection instrument was reliable, and as a result, the data acquired were as well.

Table 1: Reliability based on Cronbach's Alpha Coefficient (N=300)

S/No.	Construct	No. Items	Cronbach's alpha coefficient
1	Digital banking	6	.834
2	Crowdfunding	8	.793
3	Peer-to-peer (P2P) lending	7	.841
4	Mobile money services	7	.819
5	Crowd investing	6	.765

The findings in Table 2 show that, mean scores of digital banking (M=4.61, SD=.69369; range 2-5), peer-to-peer lending (M=4.69, SD=.97652; range 2-5) and mobile money services (M=4.06, SD=.76238; range 2-5) indicate that SMEs owners/managers strongly agree that they use Fintech to access different financial services online, and for financial management of their firms. These findings signify that SMEs had largely agreed that they have adopted and do use Fintech to enhance their financial performance. Thus, the adoption and use of Fintech among SMEs in Tanzania is higher especially on digital banking, peer-to-peer lending and mobile money services. The findings corroborate with Bank of Tanzania (2019), Talom and Tengeh (2019), Winarto (2020), Disse & Sommer, 2020; Were et al. (2021), Candraningrat et al. (2021), Mrindoko (2022) and Macha and Massawe (2023) who found that financial technologies are highly used by SMEs to access capital, conveniently make financial transactions and manage their financial matters, and has helpful outcome on the overall performance of SMEs.

Table 2: Mean, Range and Standard Deviation of Fintech Adoption by SME (N=300)

Item	Min	Max	Mean	Std. Dev.
Digital Banking	2	5	4.61	.69369
Crowd funding	1	4	3.22	1.08231
P2P Lending	2	5	4.69	.97652
Mobile Money Services	2	5	4.06	.76238
Crowd Investing	1	4	2.96	1.20869

Table 2 also shows that variable crowd funding has scored a mean of 3.22 (SD=1.08231; range 1-5), which signifies that SMEs owners/managers agreed to have adopted and use Fintech for financial acquisition and management. The lower deviation suggests that significant number of SMEs adopt and use Fintech for funding from a large number of people via online platforms. Given that a large number of surveyed SMEs ranged between 1-3 years since establishment, crowd funding as reported by Tanzanian Startup Association [TSA] and Capital Markets and Securities Authority [CMSA] (2023) is the most suitable funding option for startups and young enterprises. Regarding crowd investing, the mean of 2.96 and standard deviation of 1.20869 means that SMEs owners and managers were neutral on the adoption and use of Fintech for crowd investment. The slight high standard deviation confirms that a significant number of SMEs do not use Fintech for investment purposes. The findings contradict with many empirical literature that crowd investing is popular among SMEs (Grundy & Ohmer, 2016; Kukk, 2022).

The outcome variable was SMEs' financial performance, and five predictors, namely digital banking, crowd funding, peer-to-peer lending, mobile money services and crowd investing were investigated. According to the results of the multiple regressions in Table 4, the correlation (R=0.94) between the predictors and the outcome variable is a very high correlation (94%), and it means that Fintech reliably predicts SMEs' performance. The R-Square value of 0.883 indicates that 88.3% of variation in SMEs' performance is caused by Fintech (digital banking, crowd funding, P2P lending, mobile money services and crowd investing). Thus, 11.7% of the variation of SMEs' performance is caused by factors other than the predictors included in this model. Since Adjusted R Square 88.1% is greater than 33%, the effect of Fintech on SMEs' performance is strong (Ghozali & Latan, 2015) in this regression model. The fact that the difference between R-squared and Adjusted R Square is small (=.002) signifies that the model fits well to the data.

Table 3: Multiple Regression Summary (N=300)

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.940	0.883	0.881	0.27588

Source: Research Findings (2024)

Multiple Regression Coefficients

Furthermore, in this study, hypothesis testing was conducted to confirm impact of Fintech on SMEs performance among SMEs owners/managers in Dar es Salaam City. From the analysis of model:

$Y = \beta0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \varepsilon$

Then;

SMEs Performance = $\alpha+\beta1(DB) +\beta2(CF) +\beta3(P2P) + \beta3(MMS) + \beta3(CI)_{+}\varepsilon$

Therefore;

SMEs Performance= 0.005 + 0.450DB + 2.907CF + 0.344P2P + 0.229MMS + 0.192CI + 0.101

The results in Table 3 show estimation of the impact of digital banking on SMEs' performance was ($\beta=5.983$, t=59.239, p (.000) <0.05). Therefore, this study rejected hypothesis *H_1: There is no positive and significant association between digital banking and SMEs' performance*. These results conclude that digital banking had a significant positive impact on SMEs' performance. Similar to the findings of this study Moran (2020), Chen (2020) and Iyke-Ofoedu, Joanes and Chinedu (2022) found positive impacts of digital banking on SMEs' performance. Similarly, the impact of crowdfunding on SMEs' performance was positive and statistically significant ($\beta=4.236$, t=9.540, p (.000) <0.05). Accordingly, *H_2: Crowdfunding has no positive and significant association*

with SMEs' performance was rejected. This finding concludes that increase in adoption and use of crowd funding increases SMEs' performance in Dar es Salaam City. Similar to the findings of this study (Cox and Nguyen (2018), Abdeldayem and Aldulaini (2021), Kazaure et al., 2021 and Rijanto (2022) found positive impacts of crowd funding on SMEs' performance.

Table 4: Multiple Regression Coefficients (N=300)

Variable	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	0.005	0.101		0.052	0.959
Digital banking (DB)	0.450	0.041	0.411	10.970	0.000
Crowd funding (CF)	2.907	.344	.369	8.442	.001
P2P Lending (P2P)	0.344	0.040	0.363	8.713	0.000
Mobile money services	0.229	0.034	0.235	6.674	0.000
Crowd investing	0.192	.233	.071	.823	.509

Source: Research Findings (2024)

Furthermore, the result of the impact of peer-to-peer lending on SMEs' performance in Dar es Salaam City was (β=2.907, t=8.442, p (.001) <0.05). This finding signifies that P2P lending had a statistically significant and positive impact on SMEs' performance. Thus, the hypothesis *H₃: There is no direct and significant link between peer-to-peer lending and SMEs' performance* was rejected. Similarly, Rosavin et al, 2019; Coakley and Huang, 2021; Cumming and Hornuf, 2022) and Kukk (2022) found positive impact of P2P lending and SMEs performance. In addition, there is a direct relationship between mobile money services and SMEs' performance in Dar es Salaam City (β=2.907, t=8.442, p (.001) <0.05). This finding signifies that mobile money services had a statistically significant and positive impact on SMEs' performance. Thus, the hypothesis *H₄: There is no direct and significant link between mobile money services and SMEs' performance* was rejected. The finding corroborate with Islam, Muzi and Meza (2018), Lorenz and Pommet (2021) and Mrindoko (2022) that mobile money services influences SMEs' performance.

On the contrary, the findings in Table 5 illustrate a positive effect but statistically not significant of crowd investing on SMEs' performance (β=.192, t= .823, p (.509)>0.05). Therefore, hypothesis *H₅: crowd investing has no positive and significant association with SMEs' performance* was accepted. This means that the ability of crowd investing does not add a meaningful explanation regarding SMEs' performance. This is because there is no substantial evidence to confirm if the relationship between crowd investing and SMEs' performance exists. Though we lack evidence to show connection between crowd investing and

SMEs' performance, literature has acknowledged that crowd investing has positive impact on SME's performance (Grundy & Ohmer, 2016; Eldridge, Nisar & Torchia, 2021; Kukk, 2022).

4.0 CONCLUSION AND RECOMMENDATIONS

Empirically, this study has proved that crowd funding is an important determinant of SMEs' performance. Peer-to-peer lending platforms offer an improved level of access to finance to SMEs through micro-credits. A wide range of SMEs secure micro-credits from lending digital platforms. The credits are useful for boosting business operations and hence improve the level of profitability. The use of mobile money for facilitating business transactions such as sales, purchases and money transfer smoothen the business operations for the SMEs. This in turn enhances the sales level and profitability of the businesses.

Based on the findings this study recommends to SMEs to enhance the use of mobile money services for their businesses. Since SMEs are striving to get better performance for their business operations, it is important that they make use of mobile money services for sales, purchases, bill payments and savings. This will make their business operations convenient and smooth. Moreover, SMEs are recommended to enhance the use of digital banking for their business operations. Furthermore, it is recommended that SMEs use the available digital lending opportunities such as crowd funding and P2P lending platforms to access credits.

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