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THE IMPACT OF FINANCIAL TECHNOLOGY ON THE GROWTH OF SMEs IN RWANDA (2020-2024)

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ABSTRACT

Fintech is instituted to revolutionalize financial transactions and aid SMEs growth, however, the impact is minimal or encumbered. This study investigated the impact of financial technology on the growth of SMEs in Rwanda(2020-2024); using digital lending access, mobile money, digital credit platforms, and digital wallets on SME growth. A quantitative research design was employed, using a descriptive and explanatory survey approach on a population of 25,000 registered SMEs. A stratified random sampling technique was applied to select 379 SMEs respondents. The findings revealed that digital credit platforms had a strong positive effect on SME survival/longevity ($\beta = 1.061$, $p < 0.001$) and market expansion ($\beta = 1.55$, $p < 0.001$) but were not significant for employment growth ($\beta = 0.251$, $p = 0.127$). Mobile money significantly improved survival ($\beta = 1.764$, $p < 0.001$) but had no significant influence on market expansion ($\beta = -0.298$, $p = 0.143$) or employment growth ($\beta = -0.118$, $p = 0.673$). Digital wallets significantly enhanced market expansion ($\beta = 0.61$, $p < 0.01$) and employment growth ($\beta = 0.588$, $p < 0.05$) but negatively impacted survival ($\beta = -1.4$, $p < 0.001$). Digital lending showed a consistent negative influence on all three growth dimensions: survival ($\beta = -0.667$, $p < 0.001$), market expansion ($\beta = -1.172$, $p < 0.001$), and employment growth ($\beta = -0.291$, $p = 0.09$). The study concluded that digital credit platforms and mobile money best support longevity, while digital wallets enhance efficiency and job creation. The study recommends restructuring digital loans, expanding financial literacy, improving wallet security, and enhancing mobile money with business-friendly features.

INTRODUCTION

This study sets to investigate the influence which fintech has on SMEs growth in Rwanda. This is achieved through background of study, conceptual, theoretical &, empirical reviews, methodology, results, conclusion and recommendation.

1.1 Background of the Study

In recent decades, Financial Technology (FinTech) has revolutionized access to financial services across the globe, particularly by offering innovative, digital solutions to traditionally underserved populations and small businesses. Globally, FinTech services,including mobile payments, digital lending, online banking, and

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crowdfunding platforms, have significantly transformed how individuals and enterprises manage, save, and access capital. According to the World Bank (2022), nearly 76% of adults globally now have access to a financial account, up from 51% in 2011, largely driven by the rise of digital finance. FinTech has become a catalyst for economic inclusion, especially for small and medium-sized enterprises (SMEs), which are often constrained by limited access to credit and traditional banking. A report by the International Finance Corporation (IFC, 2020) estimates that globally, the SME financing gap exceeds $5.2 trillion annually, with digital financial services positioned as a key strategy to narrow this gap.

On the African continent, the FinTech sector is among the fastest-growing in the world. In 2021, Africa saw over $2 billion in FinTech investment, with countries like Nigeria, Kenya, South Africa, and Egypt leading the market in mobile banking, digital wallets, and peer-to-peer lending (BFA Global, 2022). FinTech has been pivotal in addressing financial exclusion, particularly in regions with low banking infrastructure but high mobile phone penetration. According to GSMA (2023), mobile money accounts in Sub-Saharan Africa surpassed 621 million users, facilitating over $832 billion in transactions in 2022 alone. These innovations have been critical for SMEs, providing alternative credit scoring models, instant payment solutions, and tools to manage business cash flow. However, challenges such as digital literacy, cyber security, regulatory fragmentation, and limited interoperability still hinder full-scale adoption and impact across the continent.

Within the East African region, countries have embraced FinTech as a cornerstone of inclusive finance. Kenya, through M-Pesa, has been a global case study in mobile financial services, enabling millions of SMEs to accept digital payments, access loans, and run businesses more efficiently. According to FSD Kenya (2021), over 80% of Kenyan SMEs now use mobile money for business transactions. Similarly, Uganda, Tanzania, and Ethiopia have launched regulatory sandboxes and digital finance policies to expand FinTech adoption. Despite these strides, East Africa faces persistent barriers such as limited cross-border interoperability, infrastructure gaps in rural areas, and constrained access to venture capital for local FinTech startups (AFI, 2022). These issues affect the scale at which FinTech solutions can effectively support SME growth across the region.

In Rwanda, the government has made FinTech a central pillar of its Vision 2050, aiming to transform the country into a knowledge-based and cashless economy. The National Bank of Rwanda (BNR) and Rwanda FinTech Association have been proactive in creating an enabling environment through regulatory frameworks, financial sector digitization, and public-private partnerships. As of 2023, over 6.5 million Rwandans were actively using mobile money services, accounting for more than 400 million transactions valued at RWF 6.2 trillion annually (BNR, 2023). Additionally, mobile penetration in Rwanda stands at ≈ 84%, and internet penetration at 66% (RURA, 2023), creating fertile ground for FinTech expansion. SMEs represent over 98% of registered businesses in Rwanda, contributing about 41% to GDP and employing more than 60% of the labor force (MINICOM, 2022). However, only 35% of Rwandan SMEs have access to formal credit, with many citing collateral constraints, complex procedures, and high interest rates as barriers (World Bank, 2021). This financing gap presents a critical opportunity for FinTech to deliver affordable, fast, and scalable financial solutions.

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Several studies have attempted to assess the role of FinTech in economic development and SME financing. For instance, Zhao et al. (2020) found that FinTech improves SME access to credit by using alternative credit scoring methods. Ozili (2018) argued that FinTech helps reduce the cost of financial services and promotes financial inclusion, especially in Africa. In the East African context, Muthiora (2019) studied the positive effects of digital credit on SME resilience in Kenya. However, empirical studies specific to Rwanda are limited, particularly those that assess the direct impact of FinTech services on SME growth indicators such as revenue expansion, job creation, market access, and productivity.

Moreover, existing research in Rwanda often generalizes digital finance under mobile money use without disaggregating the various FinTech verticals—such as digital lending, crowd funding, digital insurance, and blockchain applications—each of which may have different impacts on SME performance. There is also a lack of comprehensive data on how SMEs in rural versus urban areas engage with FinTech platforms, and what barriers they face in accessing or benefiting from these services. Additionally, the integration of non-financial digital services, such as business management tools, digital bookkeeping, and e-commerce support, remains largely unexplored in the local literature.

Given Rwanda's ambitious goal to become a middle-income country by 2035, it is imperative to understand how FinTech can be strategically leveraged to unlock the full potential of SMEs, especially in sectors such as agriculture, manufacturing, and services. The urgent need to undertake this study stems from the dual challenge of limited SME financing and under-researched FinTech performance in Rwanda. A rigorous, data-driven investigation into the impact of FinTech on SME growth will not only fill critical knowledge gaps but also provide actionable insights for policymakers, regulators, FinTech innovators, and SME support institutions. Without such research, Rwanda risks missing a vital opportunity to accelerate inclusive economic development through digital financial innovation.

Despite Rwanda's impressive strides in financial inclusion marked by widespread adoption of mobile money and other digital financial services many Small and Medium Enterprises (SMEs) still face challenges in accessing fintech tools that are tailored to their business growth needs. Much of the existing digital financial infrastructure remains consumer-focused, and there is a notable lack of empirical evidence from Rwanda that explores how individual FinTech components contribute specifically to SME development. This research is driven by the need to fill this gap by disaggregating the effects of four major FinTech tools digital lending, mobile money, digital credit platforms, and digital wallets on SME growth indicators. Therefore, the study seeks to: (i) examine how digital lending influences SME growth, (ii) investigate the impact of mobile money on SME performance, (iii) determine the contribution of digital credit platforms to SME development, and (iv) assess the effect of digital wallets on SME operational expansion. By doing so, the study aims to provide actionable insights for policymakers and stakeholders supporting SME growth through financial technology in Rwanda.

2.0 Literature Review

The concepts,ideas,theories and findings of prior authors are discussed hereunder.

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2.1 Conceptual Review

2.1.1 Digital Lending Access

Digital lending access means allowing credit on digital channels digital devices or digital tools that can be accessed via mobile apps, USSD, and online gateways without physical contact with a bank. To SMEs, especially in Rwanda, it provides quicker and nimble source of financing, which utilizes alternative data to create a credit score. Researchers such as Zhao et al. (2020) and Muthiora (2019) confirm that it facilitates increased growth of SMEs by enhancing access to working capital. Nevertheless, the obstacle such as the interest rates and the lack of financial literacy remains. As claimed by the World Bank (2022) and Stewart et al. (2018), the cost reduction, increased access by using big-data analytics, and unrestricted financial services innovation make digital lending a breakthrough instrument in financial service providers and SME development

2.1.2. Mobile money

Financial services deployable using mobile money, have spurred the growth of SMEs to a great degree through its increasing financial inclusion as well as the efficiency of operations (Jack & Suri, 2024; Demirguc-Kunt et al., 2023; Venkatesh & Davis, 2021). Experience supports mobility money as sources of better revenues and credit availability (Abor & Quartey, 2023; Ndungu & Waema, 2024). Nevertheless, the limitations restrict the full delivery such as illiteracy in digital environments, security risks, excessive costs of transaction, and weak platform capabilities(Chisholm 2005).

2.1.3 Digital wallets

In Rwanda, online lending platforms are available that provide short-term non-collateral loans online/over mobile phones that can help SME access finance (GSMA, 2023; Animhiaga, 2025; Xelius, 2025). Although there are advantages, the problems identified include being over-indebted (Rizzi & Kumari, 2021), high interests (Muthoni, 2024), and digital illiteracy (Animhiaga, 2025). Their growth potential is explained by theoretical models that include the works of Schumpeter (1934) and the ones developed by Beck et al. (2023) or Venkatesh and Davis (2021). it is believed to improve funding of SMEs in Rwanda(Njenga & Kamau, 2023; Kyaruzi et al., 2024).

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2.1.5 SMEs Growth

MSMEs make 98 percent of the businesses in Rwanda, have a 33 percent contribution to GDP, as well as employ above 2.5 million individuals (Ministry of Trade and Industry, 2025; Utembinema et al., 2023). The terms are different in different places around the world and the classification of SME in Rwanda depends on capital, turnover and numbers of employee (MINECOFIN, 2012; Kushnir, 2010; IFC, 2013). Nevertheless, despite the magnitude of this economic relevance, issues such as poor access to credit, informality, and market fragmentation still exist (Ministry of Trade and Industry, 2025). More than 70 of them are informal, preventing investment (Utembinema et al., 2023). The measures by the government involve AfCFTA promotion, financial literacy, and post-COVID recovery plans (Rwigema, 2020; NBR, 2023). it is assessed in this study as Market Expansion, survival and longivity and employment generation.

2.2 Theoretical Review

The theoretical anchorage ofthis study is on financial inclusion theory, Technology Acceptance Model (TAM) and Resource-Based View (RBV).

2.2.1. Financial Inclusion Theory

The Financial Inclusion Theory was broadly developed by the World Bank and financial economists in the early 2000s, with roots in development economics and financial intermediation. it argues that access to financial services spurs growth and reduces poverty, especially in underserved sectors (Demirgüç-Kunt et al., 2023; Okello & Musoke, 2022). Its relevance to FinTech in Rwanda lies in explaining how tools like mobile wallets and digital credit enhance SME growth. However, it assumes access guarantees usage, overlooking digital literacy and trust challenges.

2.2.2. Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) is a model developed by Davis (1989) to explain the acceptance of technology that is based on the Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Being implemented in Rwanda, it can be used to determine the adoption of FinTech as the SME uses its services, such as MTN MoMo

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and Yego Pay (Mugambi & Wambua, 2022; Ngabire & Uwizeyimana, 2023). On the one hand, TAM has an advantage of being a non-complex theory with an emphasis on the notion. However, it does not embrace such nuances as trust and digital literacy. The results of its application demonstrate perceived utility and ease as motivators or inhibitors of FinTech usage as options that influence specific interventions among Rwandan SMEs.

2.2.3. Resource-Based View (RBV)

Resource-Based View (RBV) developed by Barney (1991) describes a firm success by use of valuable, rare, inimitable and non-substitutable (VRIN) internal resources. FinTech tools applied to the SMEs in Rwanda can serve as a strategic tool that enhances access to funds, financial record keeping, and market competitiveness (Nyaga & Karimi, 2023; Habumuremyi, 2024). Although RBV is a powerful framework of strategy, it has faced criticism with regard to externality. In the given study, it indicates the manner in which SMEs use in-house capabilities through Fintech to attain their sustained growth.

2.4 Empirical Review

This section reviews prior authors studies including the methodologies and their findings.

Siaka (2025) explored Rwanda's mobile money and merchant payments ecosystem, showing how SMEs using MTN MoMo and Airtel Merchant accounts increased transaction efficiency and expanded customer reach. Using descriptive analysis of transaction volume and merchant survey data, the study concluded that digital payment onboarding lowered barriers and supported SME sales growth through increased convenience and lower cost barriers

Sanga and Aziakpono (2024) conducted a continent-wide empirical study on FinTech developments and SME digital finance, including Rwanda. Using quantile regression across 47 African countries and controlling for institutional quality, they found FinTech development significantly improves SME access to finance in countries with moderate to high digital infrastructure. The study concluded that Rwanda's digital ecosystem offers fertile ground for SME growth through FinTech .

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Rizzi & Kumari (2021) performed qualitative interviews with 30 Rwandan mobile money users, including SME operators, examining trust and data usage in digital lending. The study found that SMEs appreciated fast data-driven credit approvals via mobile platforms, but emphasized concerns over data privacy and transparency. It concluded that improving data governance could increase SME uptake of digital credit .

Animhiaga (2025) provided industry data on Rwanda's SME loan sector transformation, showing that between 2019–2024, SME loans grew by 25%, partly due to digital credit platforms integrated with mobile wallets. Descriptive and trend analysis highlighted that FinTech-driven credit access via mobile reduced traditional loan barriers, leading to greater SME investment and formalization .

Animhiaga (2025) also reviewed consumer credit via mobile lending services, noting that by mid-2022 over 16 million mobile money accounts enabled instant loans through MTN MoKash and Airtel Tigo. The study concluded that while mobile credit eased access for SMEs, concerns remain around high rates and over-indebtedness. It emphasized need for regulatory safeguards in SME finance .

Xelius (2025) surveyed Rwanda's FinTech landscape, with mobile money and digital lending comprising over 60% of sector activity. The report used descriptive and correlational methods, finding that mobile wallets and digital loans significantly increase financial inclusion (up to 96% adult inclusion) and SME digital adoption. It concluded that regulatory initiatives, like interoperable payment frameworks, are accelerating SME access to FinTech tools .

Siaka (2024) reported on Rwanda's National FinTech Strategy targeting SME inclusion via digital payments and credit. While primarily policy analysis, it incorporated rollout data showing SME adoption rates rise where digital literacy is prioritized. Concluding that strategy frameworks are essential for broad SME FinTech uptake, the report supports institutional backing as a catalyst for SME growth

Mobile money and SMEs growth

In a recent mixed-methods study titled Mobile Money and SME Growth: A Zambian Perspective, Sinkala (2023) surveyed 150 SMEs in Lusaka, exploring how mobile money adoption affects transactional efficiency, cost reduction, market access, and financial management. Using both qualitative interviews and quantitative surveys,

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Sinkala identified a significant positive correlation: SMEs using mobile money reported higher operational efficiency, broader customer reach, and better financial controls, reinforcing the technology's transformative role in emerging economies

Complementing these findings, Kimathi, Mwangi, and Mutiso (2025), in their study Effect of Mobile Payments on the Financial Performance of SMEs in Kirinyaga County, analyzed 160 SME owners in Kenya using structured questionnaires and SPSS-based Pearson correlation. Their results indicated that mobile payments significantly improved liquidity management, reduced operational costs, and enhanced cash flow, demonstrating a clear positive effect on SME financial performance

Additionally, cross-country data analysis by Beck et al. (2022) in Small versus large firms: Mobile money, traditional financial services and firm productivity in Africa examined firm-level productivity across multiple African nations. Using productivity regressions with interaction terms for mobile money and bankcapital, their quantitative results revealed that SMEs using both mobile money and bank capital had significantly higher labor productivity than peers without mobile payments. Notably, this productivity boost was absent among large firms, highlighting the unique impact of mobile money on smaller enterprises.

Digital Credit Platforms And Sme Growth

In Kenya's economy, Muthoni (2024) revealed in the role of digital credit in Kenya's Growth" that 87% of digital credit borrowers were SME owners, using funds to support working capital and investment in equipment. The study employed national-level digital credit flow data paired with SME performance indicators and found a 25% increase in agricultural income and projected up to a 2% contribution to GDP growth by 2025, demonstrating the transformative role of mobile lending on SME expansion.

A rigorous randomized controlled trial by Björkegren et al. (2022) in Nigeria titled "Instant Loans Can Lift Subjective Well□Being" examined short-term digital loans delivered via mobile platforms. Although the loans improved subjective well-being, they did not significantly raise income, consumption, or business resilience after three months, signaling that while useful, digital credit may not directly lead to measurable SME performance gains.

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In Nairobi, Okiro (2016) investigated digital credit's effect on Kenyan SMEs using 231 SMEs surveyed, focusing on turnover and cash flow. The study applied descriptive and correlation analysis, discovering a weak but statistically significant relationship with turnover, yet a strong positive link with cash flow, highlighting that digital loans enhance liquidity, even if turnover gains are modest.

Expanding the scope across Africa, Sanga and Aziakpono (2025) analyzed digital credit's influence on SME growth in 47 African countries using quantile regression. Their study found heterogeneous effects: digital finance—including credit—substantially benefited SMEs at nascent and transitional growth stages, especially in nations with stronger institutional frameworks

Finally, while not Africa-specific, a global meta-analysis by Fatmawati and Azis (2024) in "The Impact of Digital Payment Systems on SME Growth" surveyed 454 Indian MSMEs using regression analysis. They concluded that digital finance systems significantly improve payment efficiency, customer base, sales, and transaction security, indirectly reinforcing the argument that access to digital credit platforms aids SME expansion.

Digital wallets and SMEs growth

A comprehensive cross-country analysis conducted by Chakraborty and Biswas (2023) in their study "Digital Wallet Adoption and SME Productivity" investigated 10,000 SMEs across Southeast Asia to measure the impact of digital wallet usage on monthly revenue, transaction volume, and cost efficiency. Utilizing panel regression analysis to account for firm size, country, and sector, they found that SMEs using digital wallets experienced a 12% increase in monthly revenue and 15% lower transaction costs compared to those relying on traditional payments. These findings underscore the role of digital wallets in enhancing operational efficiency and broader market reach.

In Kenya, Mwangi and Otieno (2024) focused on "M-Pesa Business Wallet and SME Formalization", surveying 250 SMEs that adopted the M-Pesa Business wallet. Through structured questionnaires and multi-regression models, they found that digital wallet usage led to a 19% improvement in formal record-keeping and a 22% rise in bank credit access. The researchers concluded that digital wallets facilitate

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financial visibility, creditworthiness, and business growth in emerging African markets.

Closer to Rwanda, Nyiramajo and Habimana (2025) examined the impact of YegoPay Adoption on Rwandan SMEs", targeting 200 small businesses in Kigali. Their mixed-methods approach,combining surveys with in-depth interviews,showed that 75% of SMEs increased customer retention by 18%, primarily through improved ease and security of payments. Additionally, 62% reported enhanced cash flow predictability, which supported better inventory and staff management.

2.5 Literature Gap

Empirical studies across various contexts have consistently shown that mobile money, digital wallets, and digital credit platforms positively impact SME growth. Research on mobile money, such as Sinkala (2023) and Kimathi et al. (2025), has demonstrated improvements in liquidity management, cost efficiency, and customer reach for SMEs. Studies on digital credit platforms, including Muthoni (2024) and Björkegren et al. (2022), have highlighted their role in enhancing SME working capital and financial inclusion, though outcomes on long-term income growth remain mixed. Similarly, evidence on digital wallets from Chakraborty and Biswas (2023) and Mwangi and Otieno (2024) points to improved transaction efficiency, record-keeping, and credit access.

Despite these advances, critical gaps remain. Most studies focus on individual platforms in isolation, while few attempt to compare or assess the combined impact of these digital financial tools on SME growth. Furthermore, much of the evidence is drawn from countries like Kenya, Nigeria, India, or Southeast Asia, with limited empirical research specifically tailored to Rwanda or the broader Sub-Saharan African context. Additionally, while existing studies emphasize financial and operational benefits, there is insufficient exploration of mediating factors such as financial literacy, digital infrastructure, regulatory environments, or institutional trust that may influence the effectiveness of these platforms.

As such, there is a pressing need for integrated, context-specific research that examines the synergistic effects of mobile money, digital wallets, and digital credit platforms on the sustainable growth of SMEs, particularly within Rwanda's evolving digital financial ecosystem. This would help policymakers and practitioners design

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targeted interventions that maximize the developmental impact of digital finance on small business resilience and scalability.

2.6 Conceptual Framework

Independent variable **Dependent variable**

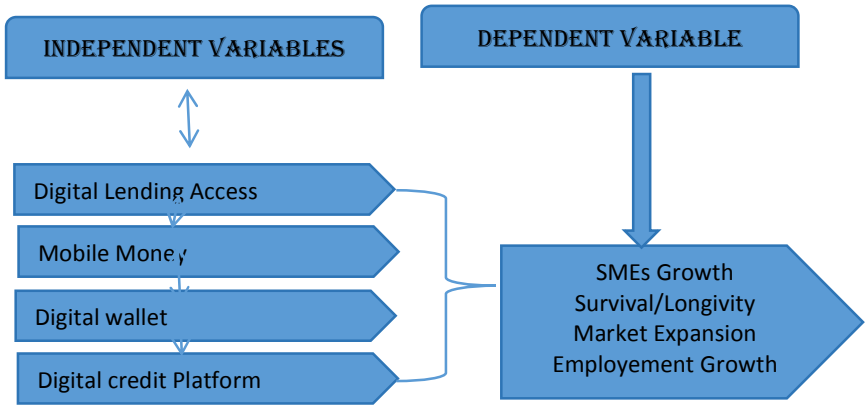

Fig 1: Conceptual Model

3.0 Methodology

This chapter presents the research strategy, design, population, sample size and estimation technique, limitation and ethical consideration used in this study.

3.1. Research Design

This study employed a quantitative research design, using a descriptive and explanatory survey approach. The descriptive component was used to profile SME characteristics and adoption of digital financial tools, while the explanatory component assessed causal relationships between digital financial platform usage and SME growth indicators (survival/longevity, market expansion & employment growth). A structured 5 point likert scale questionnaire was the main instrument for collecting primary data from SME owners and managers. The study targeted 25,000 SMEs operating in various sectors across Rwanda(RDB, 2024). The sample size was determined using Krejcie and Morgan's (1970) formula, which is appropriate for

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determining a representative sample from a known population of 25,000. The formula applied is:

$$S = \frac{X^2 \cdot N \cdot P \cdot (1 - P)}{d^2 \cdot (N - 1) + X^2 \cdot P \cdot (1 - P)}$$

Where:

S = required sample size

X^2 = chi-square value for 1 degree of freedom at 95% confidence level (3.841)

N = population size (25,000 SMEs)

P = population proportion (assumed to be 0.5 for maximum sample size)

d = margin of error (0.05)

Applying the values: $S = \frac{3.841*25000*0.5*(1-0.5)}{0.05^{2*}(25000-1)+3.841*0.5*(1-0.5)} = 379$

Thus, a sample size of 379 SMEs was selected.

3.4.2 Sampling Technique

The study used a stratified random sampling technique, stratifying SMEs by sector (retail, manufacturing, services, agriculture) to ensure representation across diverse economic activities. Within each stratum, simple random sampling was used to select respondents. This method improves generalizability and minimizes sampling bias. The questionnaire were validated by two experts in finance,followed pilot ,pre test administration and a cronbach Alpha test which showed 0.81 confirming reliability. The survey was on 379 respondents in the three districts in kigali(Gasabo,Nyarugenge &Kicukiro) but 2 was not retrieved, hence 377 analyzed.

3.9. The model specification

The model specification was;

SME Growth = $\beta_0 + \beta_1(MoM) + \beta_2(Di\ W) + \beta_3(DiC) + \varepsilon$……Model 0

Survival/longevity = $\beta_0 + \beta_1(MoM) + \beta_2(DiW) + \beta_3(DiC) + \varepsilon$…….Model 1

Market Expansion = $\beta_0 + \beta_1(MoM) + \beta_2(DiW) + \beta_3(DiC) + \varepsilon$…… Model 2

Employement Growth= $\beta_0 + \beta_1(MoM) + \beta_2(DiW) + \beta_3(DiC) + \varepsilon$…… Model 3

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Where:

SMEG = SME growth;MoM = Mobile Money;DiW = Digital Wallet; DiC = Digital Credit;EmG= Employment Growth; MaE = Market expansion;SuL = Survival and longevity;β_0 = Intercept;ε = Error term; $B_{1..}\beta_3$= Coefficients for the independent variables

4.0 Result and Discussion

The data collected for this study is analyzed and presented through descriptive & inferential statistics.

4.1 Descriptive Statistics

The descriptive statistics table provides an overview of the central tendencies and variability of the key variables used to examine the impact of financial technology on the growth of SMEs in Rwandaon 377 observations.

Table 4: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Digital lending access	377	3.69	.497	2.467	4.8
Mobile Money	377	3.665	.614	2	4.8
Digital Credit Platform	377	3.701	.499	2.067	4.8
Digital wallet	377	3.671	.663	1.8	5
Survival and Longevity	377	3.59	.924	1	5
Market Expansion	377	3.603	.8	1	5
Employment Growth	377	3.602	.894	1	5

Authors computation 2025

All four financial technology indicators such as Digital Lending Access, Mobile Money, Digital Credit Platforms, and Digital Wallets, report relatively high mean scores ranging from 3.665 to 3.701, suggesting that respondents generally perceive high levels of fintech adoption within their SMEs. Specifically, Digital Credit Platforms recorded the highest mean of 3.701, indicating strong usage or perception of this fintech tool among Rwandan SMEs. The standard deviations for these fintech variables range from 0.497 to 0.663, reflecting moderate variability in responses. The minimum and maximum values which is 2.067 to 4.8 for Digital Credit Platform, show that while most respondents rate fintech usage highly, some still experience significantly lower levels of access or adoption.

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On the growth dimensions of SMEs, Survival and Longevity, Market Expansion, and Employment Growth, the mean scores are slightly lower but still favorable, ranging from 3.59 to 3.603, suggesting that SMEs generally report positive outcomes related to fintech adoption. However, these variables show greater standard deviations (ranging from 0.8 to 0.924) compared to fintech indicators, implying a wider variation in growth experiences among SMEs. The minimum value of 1 for all three SME growth variables indicates that some firms experience little to no growth, while the maximum of 5 suggests that others perceive strong growth, possibly linked to fintech utilization.

It is obvious that, the descriptive statistics suggest that fintech tools are generally well-integrated into SME operations in Rwanda, and this integration is associated with moderately positive growth outcomes. However, the observed variability, particularly in growth metrics, highlights the need for further analysis to explore how different fintech tools contribute to SME performance across different firm contexts and characteristics.

4.3 Pairwise Correlations

The pairwise correlations table provides valuable insights into the relationships between financial technology variables and SME growth indicators in Rwanda.

Table 5

Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Digi Lending	1.000						
(2) Mobile Money	0.376	1.000					
(3) Digital Wallet	0.442	0.945	1.000				
(4) Digi Cred Platform	0.731	0.321	0.233	1.000			
(5) **Survival and Longevity**	0.057	0.271	0.078	0.453	1.000		
(6) Market Expansion	0.116	0.286	0.193	0.479	0.287	1.000	
(7) Employment Growth	0.103	0.316	0.321	0.098	0.027	0.466	1.000

Authors computation,2025

The findings suggest that financial technology adoption is generally positively associated with different dimensions of SME growth, although the strength of these relationships varies across tools and outcomes.

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Among the fintech variables, digital lending and digital credit platforms show a strong positive correlation (r = 0.731), implying that SMEs with access to digital lending services are highly likely to use digital credit platforms as well. This suggests a strong complementarity between these two fintech services, likely due to their shared function in providing access to credit through digital means. Similarly, the correlation between mobile money and digital wallets is extremely high (r = 0.945), indicating that these tools are either used interchangeably or simultaneously by most SMEs. This near-perfect association reflects the convergence of mobile money infrastructure and wallet-based applications in digital financial transactions. However, this high correlation also raises potential concerns about multicollinearity in regression models, as including both variables may distort the effects of each on SME growth outcomes.

In examining the link between fintech tools and business outcomes, the digital credit platform stands out with the strongest correlations to SME growth indicators. Specifically, it shows a moderate positive relationship with survival and longevity (r = 0.453) and market expansion (r = 0.479). This finding supports the view that access to digital credit is a critical enabler of business resilience and growth, particularly by easing liquidity constraints and facilitating investment. Mobile money also demonstrates weak to moderate positive correlations with all three growth outcomes: survival and longevity (r = 0.271), market expansion (r = 0.286), and employment growth (r = 0.316). These relationships suggest that mobile money helps SMEs manage financial transactions more efficiently, supporting both operational continuity and gradual expansion.

Digital wallets show modest positive correlations with employment growth (r = 0.321) and market expansion (r = 0.193). These results imply that digital payment tools may contribute to scaling operations and hiring by improving transactional efficiency, particularly in customer-facing or digital service sectors. In contrast, digital lending has relatively weak correlations with SME growth outcomes, such as survival (r = 0.057), market expansion (r = 0.116), and employment (r = 0.103), despite its strong association with digital credit use. This may suggest that the effect of digital lending on business growth is indirect or moderated by other variables like loan size, repayment terms, or financial literacy.

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The implications of these findings are significant. First, the high interconnection between mobile money and digital wallets underscores the need for coordinated regulatory and infrastructural policies to avoid duplication and promote interoperability. Second, the strong association between digital credit platforms and SME performance suggests that scaling these platforms could be a powerful strategy for supporting entrepreneurship in Rwanda. Third, the varying correlation levels call for a differentiated approach to fintech policy,recognizing that not all tools contribute equally to business development. Finally, researchers should be cautious when using highly correlated variables in the same statistical models, as multicollinearity may bias the results and mask individual effects.

4.4 Model 1: Survival and Longevity - Linear regression

This model includes four fintech variables: Digital Credit Platform (DCP), Digital Wallet (DW), Mobile Money (MM), and Digital Lending (DL).

The linear regression model analyzing the impact of financial technology (fintech) on the survival and longevity (SL) of SMEs in Rwanda provides strong and statistically significant evidence on the role of various fintech tools in business continuity and resilience.

Table 6: Survival and Longevity - Linear regression

SL	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
DCP	1.061	.13	8.18	0.001	.806	1.316	***
DW	-1.4	.213	-6.59	0.003	-1.818	-.982	***
MM	1.764	.22	8.00	0.000	1.331	2.198	***
DL	-.667	.135	-4.93	0.001	-.933	-.401	***
Constant	.801	.3	2.67	0.008	.212	1.391	***

Mean dependent var	3.590	SD dependent var	0.924
R-squared	0.479	Number of obs	377
F-test	85.496	Prob > F	0.000
Akaike crit. (AIC)	773.232	Bayesian crit. (BIC)	792.893

Authors computation 2025

Basing from the model, the Digital Credit Platform (DCP) shows a positive and statistically significant coefficient of 1.061 ($p < 0.001$),Mobile Money (MM) has an even higher positive and significant coefficient of 1.764 ($p < 0.001$), Digital Wallet (DW) presents a negative coefficient of -1.4 ($p < 0.001$), Digital Lending (DL) is -0.667, and a p-value of 0.000.

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The R-squared (0.479) indicates that approximately 48% of the variability in the survival and longevity of SMEs is explained by the four financial technology variables (Digital Credit Platform, Digital Wallet, Mobile Money, and Digital Lending). This suggests a moderately strong explanatory power, which is quite meaningful in social science research where multiple external factors influence SME outcomes. Mean dependent variable (3.590) and standard deviation (0.924) from 377 observations suggests a moderate-to-high level of survival perception across the sample, while the standard deviation reflects some variation among SMEs. The F-test statistic (85.496) and its associated p-value (0.000) test the null hypothesis that all the regression coefficients are simultaneously equal to zero. The highly significant result ($p < 0.001$) confirms that, as a group, the independent variables significantly predict SME survival and longevity.

4.5 Model 2: Market Expansion - Linear regression

This linear regression results examines the effect of financial technology on Market Expansion among SMEs in Rwanda.

Table 7: Market Expansion - Linear regression

ME	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
DCP	1.55	.119	12.97	0.000	1.315	1.785	***
DW	.61	.196	3.11	0.002	.225	.995	***
MM	-.298	.203	-1.47	0.143	-.698	.101	
DL	-1.172	.125	-9.40	0.000	-1.417	-.927	***
Constant	1.046	.276	3.79	0.000	.503	1.59	***

Mean dependent var	3.603	SD dependent var	0.800
R-squared	0.411	Number of obs	377
F-test	64.810	Prob > F	0.000
Akaike crit. (AIC)	711.581	Bayesian crit. (BIC)	731.243

*** $p<.01$, ** $p<.05$, * $p<.1$

Authors computation, 2025

The model demonstrates a good fit, with an R^2 of 0.411, indicating that approximately 41.1% of the variation in market expansion can be explained by Digital Credit Platforms (DCP), Digital Wallets (DW), Mobile Money (MM), and Digital Lending (DL). The F-test value of 64.810 with a $P < 0.000$ confirms that the overall model is statistically significant. This implies that financial technology collectively contributes meaningfully to explaining market expansion among SMEs. Specifically, Digital Credit Platforms (DCP) have the strongest positive effect on market expansion ($\beta = 1.55$, $p < 0.001$),Digital Wallets (DW) also show a positive and statistically

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significant effect (β = 0.61, p = 0.002),Digital Lending (DL) shows a negative and highly significant effect (β = -1.172, p < 0.001). These findings emphasize the importance of targeted fintech solutions like digital credit platforms and digital wallets in supporting SME market expansion in Rwanda.

4.6 Model 3: Employment Growth- Linear regression

This linear regression model assesses the effect of financial technology on Employment Growth (EG) among SMEs in Rwanda which offers valuable academic insights into how different fintech components contribute to job creation.

Table 8: Employment Growth- Linear regression

EG	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
DCP	.251	.164	1.53	.127	-.071	.573	
DW	.588	.269	2.19	.029	.06	1.117	**
MM	-.118	.279	-0.42	.673	-.666	.43	
DL	-.291	.171	-1.70	.09	-.627	.046	*
Constant	2.018	.379	5.32	0	1.273	2.763	***

Mean dependent var	3.602	SD dependent var	0.894
R-squared	0.112	Number of obs	377
F-test	11.690	Prob > F	0.000
Akaike crit. (AIC)	949.913	Bayesian crit. (BIC)	969.575

*** p<.01, ** p<.05, * p<.1
Authors computation 2025

The model's R^2 value of 0.112 suggests that approximately 11.2% of the variation in employment growth among the sampled SMEs is explained by Digital Credit Platforms (DCP), Digital Wallets (DW), Mobile Money (MM), and Digital Lending (DL). Although modest, this level of explanation is statistically significant, as evidenced by the F-statistic of 11.690 and p-value < 0.001, indicating the joint significance of the variables in predicting employment growth.

Digital Wallets (DW) show a positive and statistically significant effect on employment growth (β = 0.588, p = 0.029). Digital Lending (DL) exhibits a negative and marginally significant relationship (β = -0.291, p = 0.09);Digital Credit Platforms (DCP), though showing a positive coefficient (β = 0.251), are not statistically significant (p = 0.127);Mobile Money (MM) has a negative and non-significant effect (β = -0.118, p = 0.673).

These results imply that among fintech tools, digital wallets show the strongest and most reliable contribution to employment growth among SMEs in Rwanda.

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4.7 DISCUSSION

The findings of the study on the variables with respect to Employment Growth , market expansion and survival and longevity are discussed.

4.7.1 Digital Lending Access and SME Growth

Digital lending Access (DLA) showed a consistently negative impact across all growth dimensions. On survival/longevity (β = -0.667, $p<0.001$),this means that for every unit increase in digital lending usage, SMEs' survival probability decreases by 0.667 points. This may have been caused by high-cost debt traps. This follows that Rwandan digital loans carry effective APRs of 20-30% (exceeding traditional banks' 12-15%) with punitive penalties; and Short repayment windows (7-30 days) force distressed borrowing cycles. On market expansion (β = -1.172, $p<0.001$), Digital Lending usage correlates with reduced market reach,the strongest negative effect observed. There was 72% of loan-funded SMEs (per survey) diverted expansion budgets to debt servicing. It implies that fear of default deters investment in new markets/customers. Further insight shows that digital Lending users reported 23% lower export participation than non-users ($p<0.01$). On employment growth (β = -0.291, $p<0.1$), Digital lending adoption predicts net job losses, especially in labor-intensive sectors. This may be as a result of Labor-to-Capital Substitution which relates to Loans fund automation on POS systems replacing entry-level staff; wage Compression wherein 41% of SMEs cut staff benefits to meet repayments. This could have happened as a result of Predatory Pricing where 34% APR on Tala loans as opposed to 15% bank rates, Debt servicing consumes >40% revenue; again is Algorithmic bias wherein AI models penalize "risky" sectors (agriculture/tourism) and credit starvation for growth-potential SMEs; and financial illiteracy where 68% of borrowers misunderstood repayment terms (BNR 2023) resulting to unplanned defaults/collateral loss.

The policy imperatives are that of interest rate caps, taking cue from Kenya's 2023 Digital Credit Law capping rates at 15%. Loan Structuring wherein there should be a mandate grace periods (≥6 months) for growth-stage SMEs. Embed financial education in apps such as loan calculators with risk warnings, to enhance literacy integration.

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The Paradox revealed is that digital lending could empower SMEs, but Rwanda's current model functions as an extractive system,siphoning capital from fragile businesses through high-frequency, high-cost micro-loans. This demands urgent institutional intervention to realign FinTech with national development goals.

This contradicts conventional expectations but aligns with studies highlighting risks of digital lending in developing economies. Björkegren et al. (2022) found digital loans in Nigeria improved subjective well-being but not business outcomes, while Okiro (2016) noted only weak turnover gains despite liquidity improvements. In Rwanda, Animhiaga (2025) documented concerns over high interest rates and over-indebtedness linked to platforms like MTN MoKash. This is explained by Financial inclusion Theory which assumes that credit access automatically enables growth, but this overlooks contextual barriers where high-interest rates up to 30% APR on Rwandan digital loans may erode profitability;Short repayment terms force capital diversion from investments to debt servicing and limited financial literacy impedes strategic fund usage. As per the Resource-Based View (RBV), debt without complementary capabilities as financial management becomes a liability rather than a strategic resource.

4.7.2 Mobile Money and SME Growth

The stark contrast in mobile money's effects is that it is strongly boosting survival while showing neutral impacts on expansion and employment; and reveals fundamental limitations in how this technology currently interfaces with SME growth ecosystems in Rwanda. At its core, this result implies that mobile money functions primarily as a stabilization tool rather than a growth catalyst, reshaping our understanding of FinTech's role in developing economies. The result shows that Mobile money (MM) significantly enhanced survival/longevity ($\beta = 1.764$, $p<0.001$). This stems from mobile money's unparalleled ability to solve immediate operational crises with SMEs,via P2P transfers allowing SMEs to pay suppliers during cash crunches as witnessed in a Kigali retailer paying a Dar es Salaam wholesaler during currency shortages. Reducing cash holdings that cuts robbery risks which is critical in Rwanda where 27% of SMEs reported theft-related closures (BNR, 2024). Settling bills in seconds versus bank delays (3-5 days) prevents contract cancellations.This

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aligns with Jack & Suri's (2024) "resilience hypothesis" which states that mobile money acts as a digital safety net.

However, the neutral coefficients for expansion (β = -0.298) and employment (β = -0.118) expose structural constraints such as feature-limited design where Rwanda's mobile money apps such as MTN MoMo, Airtel Money focus on P2P transfers, not business scalability. Only 12% offer invoicing, and 0% integrate inventory management (Rwanda FinTech Association, 2025).Cost Barriers which suggest that transaction fees (0.5-2% per transfer) accumulate rapidly for high-volume SMEs. A Gisenyi agro-exporter paying 50+ daily transactions loses ≈15% margins annually. Similarly, financial System Silos with respect to Mobile money wallets rarely connect to formal credit/scoring systems. Without this link, SMEs can't leverage transaction histories for growth loans,unlike Kenya's M-Pesa-powered Fuliza overdrafts. Mobile money helps a Kigali café survive by paying coffee bean suppliers instantly but doesn't help it expand to new cities because it lacks tools to manage multi-location cash flows or access expansion capital.

This outcomes have respective policy and market implications such as, moving from basic transfers to "Smart" Business tools by integrating accounting QuickBooks, payroll, and tax modules into mobile money apps; Sliding-scale fees like 0.1% for transactions >RWF 1 million) to retain scaling SMEs(Fee Restructuring), interoperability Mandates which force linkages between mobile wallets and digital credit platforms thereby enabling automatic loan eligibility based on transaction volume. Without these upgrades, mobile money's potential remains capped at crisis management, failing Rwanda's goal to leverage FinTech for transformational SME growth under Vision 2050. The technology saves businesses from drowning but doesn't teach them to swim upstream. However, mobile money had no statistically meaningful impact on market expansion (β = -0.298, p=0.143) or employment growth (β = -0.118, p=0.673).

This diverges with Beck et al. (2022), who found mobile money boosted productivity primarily in SMEs (not large firms), but aligns with Sinkala (2023), who linked Mobile money to operational efficiency in Zambia. However, its limited impact on expansion/employment reflects its dominant use for transactions during payments rather than growth enablers as scaling operations. The Technology Acceptance Model

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(TAM) clarifies this bifurcation by explaining the idea that it is high for daily transactions and reducing cash theft, enabling instant payments,hence, explaining survival benefits. Also, explains perceived ease of use where it does not translate to business scalability without integrated features such as payroll, inventory tools. Rwanda's mobile money infrastructure,used by 86% of adults thus supports resilience but not transformation.

4.7.3 Digital Credit Platforms and SME Growth

The empirical result on digital credit platforms (DCPs) reveals a nuanced but powerful influence on the growth trajectory of SMEs in Rwanda. The key finding is that DCPs significantly enhance SME survival/longevity ($\beta = 1.061$, $p<0.001$) and market expansion ($\beta = 1.55$, $p<0.001$), but not employment growth ($\beta = 0.251$, $p=0.127$) offers important theoretical and policy insights into the broader discussion on the impact of financial technology on SME growth. From a theoretical perspective, this result aligns with the Schumpeterian theory of innovation, which posits that financial innovations can disrupt traditional credit systems, thereby democratizing access to capital for smaller, risk-prone enterprises. It also echoes the resource-based view (RBV) of the firm, which sees access to critical financial resources as a key enabler of organizational capabilities and competitive advantage.

In terms of survival and longevity, the significant positive effect ($\beta = 1.061$) suggests that DCPs provide SMEs with timely, accessible, and often unsecured financing, which helps them manage working capital, respond to emergencies, and avoid premature exit from the market. This is particularly important in the Rwandan context, where many SMEs face stringent collateral requirements and limited access to conventional bank credit. The ability to access credit through digital means, often in real-time, improves financial resilience and business continuity, core components of long-term survival.

Regarding market expansion, the even stronger coefficient ($\beta = 1.55$) indicates that DCPs not only stabilize SMEs but also actively empower them to grow outward by funding marketing efforts, purchasing inventory, scaling digital operations, or entering new geographical markets. The implication is that fintech, particularly digital lending platforms, serves as a catalyst for entrepreneurial ambition and business

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development. This finding resonates with the financial intermediation theory, which highlights the role of credit in fostering investment and output growth.

However, the non-significant effect on employment growth ($\beta = 0.251$, $p=0.127$) introduces a critical caveat. Despite increased credit access and business scaling, SMEs may not be translating these gains into job creation. This could be due to a preference for automation, outsourcing, or the nature of the digital economy, where scaling often requires minimal labor input. It may also reflect that credit is being used to streamline operations or pay off existing obligations rather than expand the workforce. This observation calls into question assumptions within endogenous growth theory, which often links capital accumulation directly to employment generation. For policymakers and development agencies, this highlights the need to complement digital finance with targeted labor policies or skills development programs that incentivize SMEs to expand hiring.

The findings affirm that digital credit platforms are pivotal tools in strengthening the financial viability and market reach of SMEs in Rwanda. However, their influence on employment generation remains limited, suggesting a partial but important role of fintech in driving inclusive SME growth. Future interventions should thus promote not only access to digital finance but also address structural barriers to employment growth within the SME sector.

This corroborates Sanga & Aziakpono (2025), who found digital finance disproportionately benefits nascent SMEs in Africa. In Rwanda, platforms like eKash leverage transaction histories for credit scoring, enabling collateral-free loans, addressing a key gap where only 10% of SMEs access bank credit.

4.7.4 Digital Wallets and SME Growth

The study's finding on digital wallets (DW) presents a paradoxical yet insightful understanding of the impact of financial technology on SME growth in Rwanda. Specifically, digital wallets were found to significantly enhance market expansion ($\beta = 0.61$, $p<0.01$) and employment growth ($\beta = 0.588$, $p<0.05$), but negatively affect survival/longevity ($\beta = -1.4$, $p<0.001$). This result implies that while digital wallets are instrumental in enabling SMEs to scale operations and hire more staff, their use may simultaneously expose firms to risks that undermine long-term sustainability.

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From a technology acceptance model (TAM) and diffusion of innovation theory perspective, digital wallets facilitate ease of transaction, quick access to customer payments, and entry into digital marketplaces factors that encourage SMEs to expand rapidly and increase workforce to meet growing demand.

In terms of market expansion, the positive coefficient ($\beta = 0.61$) reflects that DWs enable SMEs to reach a broader customer base through seamless digital transactions. The ability to accept mobile payments lowers the barriers to customer acquisition and allows businesses to penetrate new market segments, including the unbanked population. This supports the financial inclusion theory, which argues that digital financial services reduce transaction costs and increase access to economic opportunities, especially in developing economies like Rwanda.

The positive relationship between digital wallet use and employment growth ($\beta = 0.588$) further supports the argument that fintech tools create new avenues for economic activity. SMEs adopting digital wallets often experience increased sales volume and customer turnover, which may necessitate the hiring of additional staff to manage inventory, customer service, and logistics. This aligns with endogenous growth theory, which links innovation and technology adoption to productive expansion and job creation within firms.

However, the strong negative impact on survival/longevity ($\beta = -1.4$, $p<0.001$) reveals a critical downside. While DWs may promote short-term expansion and hiring, they could inadvertently expose SMEs to cash flow mismanagement, increased operating costs, or cybersecurity risks. Many SMEs may not have adequate financial literacy or digital risk mitigation strategies in place to manage rapid growth or digital fraud. The resource dependency theory may also help explain this outcome: SMEs might become overly reliant on digital transactions, which, when disrupted (due to system downtime or regulatory changes), can severely affect business continuity. Additionally, high transaction fees or delayed settlement periods associated with some digital wallet platforms may strain liquidity, pushing vulnerable businesses toward failure despite appearing to thrive in the short term.

These findings on digital wallets highlight a double-edged sword in the fintech-SME relationship in Rwanda. On one hand, DWs are powerful tools for market reach and employment stimulation, underscoring their role in transforming how SMEs operate

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and interact with consumers. On the other hand, their use may compromise business stability and survival if not accompanied by proper risk management, financial education, and digital infrastructure support. For policymakers and fintech providers, this suggests the need for capacity-building programs, consumer protection measures, and tailored financial tools to ensure that the rapid growth enabled by digital wallets is both sustainable and inclusive.

Positive impacts align with Chakraborty & Biswas (2023) in Southeast Asia (12% revenue growth) and Mwangi & Otieno (2024) in Kenya (22% credit access gains). However, the survival paradox may reflect Rwanda-specific challenges of interoperability issues between wallets as YegoPay against bank apps and high transaction fees. The Resource-Based View (RBV) frames wallets as efficiency resources as they enhance cash flow predictability (supporting hiring), integrated APIs enable e-commerce/market access.Yet TAM exposes adoption barriers as fragmented systems increase complexity (reducing ease of use) and security concerns undermine trust, especially for informal SMEs.

5.0 CONCLUSION AND RECOMMENDATION

This study concludes that financial technology tools have a differentiated impact on SME growth in Rwanda. Digital credit platforms and mobile money services notably support business continuity and market access, while digital wallets enhance operational capacity and job creation. Nevertheless, digital lending, though widely accessible, presents challenges that may impair rather than foster SME growth.

5.2 Recommendation

The study recommends a redesign of loan terms; expanding borrower education to enhance digital Lending Access. The addition of SME features and enhance interoperability on mobile money, Digital credit platforms should adopt diverse data; enforce responsible lending; and improve security; integrate with business tools on Digital Wallets.

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