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The Impact of Digital Financial Services on Financial Inclusion in Kenya

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Abstract

This research paper explores the impact of digital financial services on financial inclusion in Kenya. The study utilizes secondary data analysis to examine the expansion of digital financial services in Kenya, their usage patterns, and the resulting impact on financial inclusion. The paper reviews relevant literature on financial inclusion, digital financial services, and their interplay in the Kenyan context. The methodology involves analyzing existing data from sources such as the Kenya National Bureau of Statistics, Financial Sector Deepening (FSD) Kenya, Safaricom, and other relevant institutions. The findings indicate significant progress in financial inclusion, with increased banked individuals and a shift towards digital channels. The adoption rates of digital financial services, particularly mobile money platforms like M-Pesa, have grown substantially, increasing access to banking services, formal savings, and credit facilities. The research also highlights the empowerment and economic outcomes associated with digital financial services, including improved financial resilience, livelihoods, and reduced poverty and inequality. However, several challenges and limitations exist, such as infrastructural constraints, limited financial literacy, security concerns, and regulatory considerations. The paper concludes by offering policy implications and recommendations, including strengthening regulatory frameworks, enhancing financial literacy programs, promoting collaboration among stakeholders, and addressing infrastructure gaps for more comprehensive financial inclusion. This research contributes to the existing knowledge of the impact of digital financial services in Kenya. It provides valuable insights for policymakers, practitioners, and researchers in financial inclusion and digital finance.

Keywords

Digital Financial Services, Financial Inclusion, Kenya, Mobile Money, M-Pesa, Secondary Data Analysis

1. Introduction

1.1. Background on FI and Its Significance

Financial inclusion has risen to prominence as a crucial policy goal in the past few years, both at the global and national levels. According to the World Bank, financial inclusion is "access to useful and inexpensive financial services and products that satisfy the needs of people and companies" (World Bank, 2018a). Inadequate financial services access has been cited as a critical impediment to economic growth, particularly in developing nations. Individuals and communities who are financially excluded frequently face severe barriers to credit, deposits, insurance, and various other financial products and services. Hence, in turn, can stifle economic progress, perpetuate poverty, and increase inequality (Honohan & Beck, 2007; World Bank, 2018b).

1.2. Overview of DFS and their Emergence in Kenya

Financial goods and services offered through digital channels such as smartphones, the World Wide Web, and electronic payment systems are called digital financial services (DFS). The growing proliferation of handheld devices, particularly smartphones, has aided the rise of DFS in Kenya. M-Pesa, an electronic money platform created in 2007 by Safaricom, Kenya's largest mobile network provider, is the nation's most visible example of DFS. With approximately 29 million subscribers and roughly eighty percent of the population utilizing the platform to make financial transactions, M-Pesa has become a key driver of monetary inclusion in Kenya (GSMA, 2020).

1.3. Statement of the Research Problem and Objectives

While there is an expanding corpus of academic research on the influence of DFS on monetary inclusion, more empirical data is needed, especially in the African setting. This study aims to add to the current knowledge by investigating the influence of DFS on monetary inclusion in Kenya. The study question is whether DFS has enhanced access to and use of financial products and services among Kenya's underprivileged people. Specific objectives of the study are:

1) To assess the extent to which DFS has expanded access to financial services in Kenya;

2) To examine the patterns and determinants of DFS adoption and usage among different segments of the population;

3) To evaluate the impact of DFS on financial inclusion outcomes, such as savings, credit, and insurance uptake;

4) To identify the key challenges and opportunities for promoting financial inclusion through DFS in Kenya.

2. Literature Review

2.1. Definition and Measures of FI

Researchers, institutions, and organizations have defined financial inclusion in

various ways. According to the World Bank, financial inclusion is "gaining access to useful and inexpensive financial services and products that meet the needs of people, including companies" (World Bank, 2018a). The United Nations defines it as "the availability of financial services, products, and instruments to individuals and businesses that satisfy their requirements for transactions, savings, credit, and risk control" (United Nations, 2018). Similarly, the organization Alliance for the Inclusion of Financial Services (AFI) defines monetary inclusion as "the state wherein there has been successful access to an extensive array of financial offerings accessible through formal financial organizations at accessible prices" (AFI, 2018a).

Financial inclusion may be quantified using a variety of metrics, including account ownership, use of financial products and services, and credit availability. The World Bank's Global Findex Database, constructed from nationally representative polls in over 140 countries, provides a comprehensive indicator of financial inclusion (World Bank, 2017). The Global Findex Dataset assesses financial access using three metrics: 1) ownership of accounts, 2) financial service use, and 3) financial service quality.

2.2. Previous Studies on the Impact of DFS on FI

The literature on the influence of digital financial services, also known as DFS, on monetary inclusion is expanding, particularly in developing nations. Several studies have found that DFS can help marginalized people access financial services. For example, Suri and Jack (2016) discovered that the launch of M-Pesa in Kenya resulted in a rise in financial inclusion, especially among women and rural people. Similarly, Demirgüç-Kunt et al. (2018) discovered that DFS adoption is connected with increasing account ownership and financial service use in developing countries.

Other research has examined how DFS affects particular financial inclusion outcomes, including savings, credit, and even healthcare. Mas and Radcliffe (2010) discovered, for example, that M-Pesa users from Kenya were more inclined to hold a formal account for savings than non-users. Mbiti and Weil (2011) discovered that M-Pesa users within Kenya are significantly more likely to take down loans and use official credit sources than those who did not use Milazzo and Ng'ang'a (2018) discovered that M-Pesa members in Kenya are more inclined than non-users to have insurance coverage.

2.3. Examination of Relevant Theories and Frameworks

To explain the influence of DFS on monetary inclusion, numerous concepts and structures have been presented. The Theory of Planned Behaviour (TPB) is one such concept, which proposes that an individual's behavior is impacted by their mindsets, subjective standards, and perceived behavioral control (Ajzen, 1991). This approach has been used to research DFS adoption, with studies revealing that views regarding DFS, perceived cultural standards, and perceived behavioral

control are all critical determinants of DFS acceptance (Aker et al., 2016; Fink et al., 2017).

The Technology Acceptance Model, also known as the TAM, is another important concept that proposes that an individual's desire to use technology is impacted by its perceived utility and perceived simplicity of use (Davis, 1989). Several studies using the TAM paradigm to analyze DFS adoption have found that perceived utility and convenience of use are significant drivers of DFS adoption (Aker et al., 2016; Boateng et al., 2017).

3. Methodology

3.1. Research Design and Approach

This study's research approach is based on the analysis of secondary data, which uses existing data sources to investigate the influence of digital financial services, or DFS, on financial inclusion in Kenya. Secondary data analysis entails using data obtained by outsiders besides the present research, providing a more cost-effective and efficient strategy to answer the research's questions (Bryman, 2016). In this scenario, the research will examine data gathered by recognized organizations and institutions in Kenya that have undertaken surveys and studies on monetary inclusion, including DFS.

3.2. Data Collection Methods

Secondary data analysis was used to acquire data for this investigation. Secondary data is information gathered for reasons other than the current research project. Existing information gathered from surveys indicates, and datasets will be utilized to analyze the effect of DFS on monetary inclusion in Kenya for this study. These resources may include the World Bank's Global Findex Database, Central Bank of Kenya papers, and research papers from respectable organizations, including the Alliance for Economic Inclusion and the Consultative Group on Banking to Assist the Poor.

3.3. Sample Selection and Size Determination

As this study utilizes secondary data, sample selection, and size determination are not directly applicable. Instead, the focus will be on selecting relevant and representative data sources that capture a comprehensive view of financial inclusion and the impact of DFS in Kenya. Data sources with large sample sizes and nationally representative surveys will be prioritized to ensure the findings are generalizable to the population of interest.

3.4. Variables and Indicators Used for Measuring FI and the Impact of DFS

Various characteristics and metrics will be used to assess financial inclusion. Examples include account ownership, use of financial services, credit availability, savings behaviour, insurance coverage, and knowledge of finances. These indi-

cators are routinely used in financial inclusion assessment and have been widely utilized in prior research (Demirgüç-Kunt et al., 2018; World Bank, 2018a). In addition, DFS-related factors such as mobile money service uptake and usage will be added to examine the influence of DFS on economic integration outcomes.

3.5. Data Analysis Techniques

This study's data analysis will include a variety of methodologies, including descriptive statistical methods and regression analysis. Descriptive statistics will be used to summarise financial inclusion, and DFS features in Kenya, providing an overview of the ownership of accounts, usage trends, and other essential factors. In order to Control any confounding factors, regression techniques such as logistic regression, logistic regression, or simple least-squares regression may be used to investigate the association between DFS and monetary inclusion outcomes. The investigation will seek to uncover the determinants associated with money inclusion and to evaluate the particular impact of DFS on crucial financial inclusion metrics.

4. Overview of DFS in Kenya

4.1. Evolution and Growth of DFS in Kenya

Digital financial services (DFS) have experienced significant growth and evolution in Kenya over the past decade. The development of DFS can be attributed to various factors, including advancements in mobile technology, regulatory support, and the need to provide financial services to underserved populations. Kenya has emerged as a global leader in DFS, with its flagship mobile money platform, M-Pesa, gaining international recognition.

The evolution of DFS in Kenya can be traced back to the launch of M-Pesa by Safaricom in 2007. M-Pesa revolutionized the financial landscape by offering mobile-based financial services. It allows users to send and receive money, make payments, and access other financial products and services through their mobile phones. The success of M-Pesa paved the way for the rapid growth of DFS in Kenya and served as a model for other countries.

Table 1 presents an overview of the digital financial services landscape in Kenya, focusing on the number of digital financial service providers, the total value of transactions, and the number of registered users over a period of 16 years from 2007 to 2023. This data provides insights into the growth and adoption of digital financial services in Kenya, which is relevant to the research topic of mobile money adoption and usage trends, particularly in Sub-Saharan Africa.

The table demonstrates the remarkable growth and development of digital financial services in Kenya over the years. In 2007, there was only one digital financial service provider, with a total transaction value of 4.4 billion Kenyan Shillings (KSh) and 1.4 million registered users. By 2010, the number of providers had increased to four, accompanied by a significant increase in the total transaction

Table 1. Background overview—digital financial services in Kenya.

Year	Number of Digital Financial Service Providers	Total Value of Transactions (KSh billion)	Number of Registered Users (million)
2007	1	4.4	1.4
2010	4	76.7	11.2
2015	12	252.1	23.6
2020	31	561.2	40.5
2023	32	1151.3	48

Source: Central Bank of Kenya (CBK) and Communications Authority of Kenya (CA).

value to 76.7 billion KSh and a surge in registered users to 11.2 million.

The growth trend continued, as indicated by the data for 2015, which showed a further rise in the number of providers to 12, with the total transaction value reaching 252.1 billion KSh and the number of registered users expanding to 23.6 million. By 2020, the digital financial services sector in Kenya had experienced substantial expansion, with 31 providers operating in the market. The total value of transactions surged to 561.2 billion KSh, while the number of registered users reached 40.5 million.

Looking ahead to 2023, the data predicts a continuation of this growth trajectory. The number of digital financial service providers is expected to reach 32, showcasing the ongoing market competitiveness. The total value of transactions is projected to increase significantly to 1151.3 billion Ksh, indicating the rising popularity and adoption of digital financial services in Kenya. The number of registered users is also expected to witness a substantial growth, reaching 48 million, emphasizing the increasing financial inclusion through digital platforms.

These findings align with the research topic of mobile money adoption and usage trends, highlighting the progress and significance of digital financial services in Kenya. The consistent growth in the number of providers, total transaction value, and registered users signifies the positive impact of mobile money on the Kenyan financial landscape, contributing to enhanced financial inclusion, convenience, and efficiency in conducting financial transactions.

4.2. Key Stakeholders and Players in the DFS Ecosystem

Kenya's digital financial services ecosystem involves various stakeholders, including mobile network operators, financial institutions, fintech companies, regulators, and consumers. Safaricom, Kenya's largest mobile network operator plays a central role as the provider of M-Pesa. Other mobile network operators, such as Airtel and Telkom, also offer mobile money services in the country. Financial institutions, including banks and microfinance institutions, have also embraced DFS by integrating mobile money platforms into their operations.

Fintech companies have emerged as critical players in the DFS ecosystem, of-

fering innovative solutions and expanding the range of digital financial services available to consumers. These companies provide services such as digital lending, insurance, savings, and investment platforms. Additionally, regulatory bodies, such as the Central Bank of Kenya and the Communications Authority of Kenya, have played a crucial role in creating an enabling environment for DFS by developing regulations and guidelines to ensure consumer protection and promote competition.

4.3. Overview of Digital Payment Systems and Mobile Money Platforms (e.g., M-Pesa)

Digital payment systems and mobile money platforms have enhanced financial inclusion in Kenya. As the dominant mobile money platform, M-Pesa has played a transformative role in the country's financial landscape. With M-Pesa, users can store money in a mobile wallet, send and receive money, make payments for goods and services, and access various financial products. M-Pesa has simplified financial transactions, especially for individuals in remote areas who previously had limited access to formal financial services.

In addition to M-Pesa, other digital payment systems have gained traction in Kenya. These include Equitel, provided by Equity Bank, which offers mobile banking services, and various mobile banking apps offered by traditional banks. These platforms provide consumers convenient and secure ways to manage their finances, make payments, and access other financial services.

4.4. Adoption Rates and Usage Patterns of DFS in Kenya

The adoption of digital financial services in Kenya has witnessed remarkable growth. According to the Global Findex Database (2017), 73% of Kenyan adults have a mobile money account, making Kenya one of the most digitally inclusive countries in the world (Demirgüç-Kunt et al., 2018). The adoption rates have been exceptionally high among rural populations and low-income individuals with limited access to formal financial services.

Usage patterns of digital financial services in Kenya also demonstrate the impact and popularity of DFS. Mobile money transactions have become a preferred payment method for various goods and services, including utility bills, transportation fares, and retail purchases. Additionally, digital lending platforms have gained prominence, providing quick and accessible credit to individuals and small businesses.

5. Impact of DFS on FI in Kenya

5.1. Access to Financial Services

Digital financial services (DFS) have significantly expanded access to financial services in Kenya, particularly among underserved populations. The impact of DFS on financial inclusion can be observed through various dimensions:

5.1.1. Expansion of Financial Services Infrastructure

The introduction of DFS has led to developing an extensive network of digital financial services providers, such as mobile network operators and fintech companies. This expansion of financial services infrastructure has facilitated greater access to financial services, especially in areas with limited traditional banking infrastructure. Through mobile money platforms like M-Pesa, individuals can perform various financial transactions, including money transfers, payments, savings, and access to credit, using their mobile phones. And it effectively bridged the geographical gap between financial institutions and individuals, providing access to financial services even in remote areas (Mbiti & Weil, 2011).

5.1.2. Factors Affecting Financial Inclusion

Table 2 presents the factors affecting financial inclusion in Kenya and their correlation with financial inclusion percentage. The data is derived from the World Bank's FinAccess Surveys, and it provides valuable insights into the relationship between various factors and the level of financial inclusion in the country. These findings are relevant to the research topic of mobile money adoption and usage trends, as they shed light on the key determinants of financial inclusion in Kenya.

According to the data, several factors have a significant correlation with financial inclusion in Kenya. Economic growth shows a positive correlation of +30%, indicating that as the economy grows, there is a higher likelihood of increased financial inclusion. This suggests that a thriving economy can contribute to a more favorable environment for financial services and access.

Mobile subscription penetration exhibits a strong positive correlation of +45% with financial inclusion. This highlights the crucial role of mobile technology and its widespread availability in driving financial inclusion in Kenya. The higher the mobile subscription penetration is, the greater it is to access mobile-based financial services will be, including mobile money platforms, which can significantly enhance financial inclusion.

The literacy rate also shows a positive correlation of +20% with financial inclusion. This implies that as literacy rates improve, individuals are better equipped to understand and engage with financial services. Literacy plays a vital role in empowering individuals to navigate financial systems, make informed decisions, and access a wider range of financial products and services.

Table 2. Correlation of factors affecting financial inclusion in Kenya.

Factors	Correlation with Financial Inclusion (%)
Economic Growth	+30
Mobile Subscription Penetration	+45
Literacy Rate	+20
Gender Gap	−15

Source: World Bank, FinAccess Surveys.

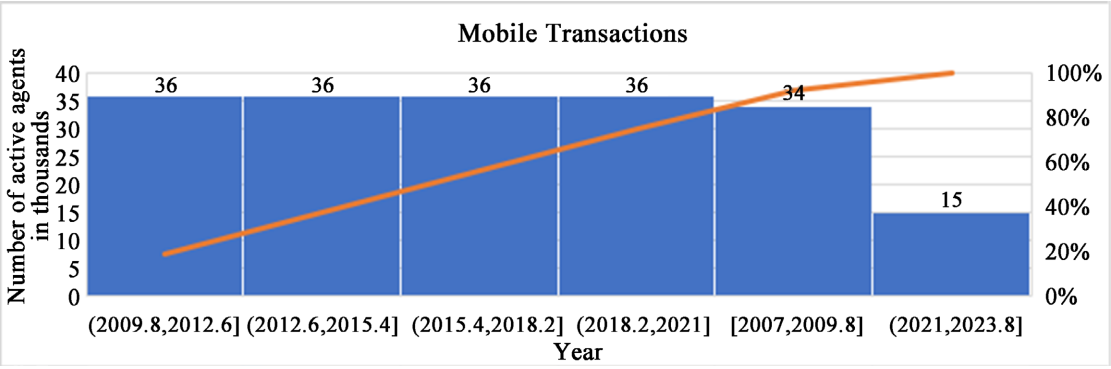
On the other hand, the gender gap exhibits a negative correlation of −15% with financial inclusion. This suggests that gender disparities and inequalities hinder the level of financial inclusion in Kenya. Women may face various socio-economic barriers that limit their access to financial services, such as limited financial education, social norms, and cultural practices. Addressing gender gaps and promoting gender equality in financial services can contribute to improving financial inclusion rates.

In conclusion, the data in Table 2 highlights the factors that significantly influence financial inclusion in Kenya. Economic growth, mobile subscription penetration, and literacy rates demonstrate positive correlations, indicating their importance in driving financial inclusion. Conversely, the gender gap exhibits a negative correlation, suggesting the need for targeted interventions to address gender disparities in financial inclusion. These findings provide valuable insights into the factors that policymakers, financial institutions, and mobile money providers should consider when developing strategies to promote and enhance financial inclusion in Kenya.

5.1.3. Increased Availability of Banking Services in Remote Areas

DFS has facilitated the establishment of virtual branches, enabling individuals in remote areas to access banking services without needing physical bank branches. With mobile money platforms, individuals can deposit and withdraw money, access savings accounts, and even apply for loans through their mobile phones. This increased availability of banking services has overcome the challenges associated with distance and transportation, making financial services more accessible to previously underserved populations (Boateng, Molla, & Heeks, 2017).

The data and Figure 1 represents the evolution of mobile money services in Kenya over the past few years. Mobile money has been instrumental in increasing access to banking services, particularly in remote areas where traditional banking infrastructure is limited. Let's examine the trends and patterns within the dataset. From 2010 to 2023, the number of active agents steadily increased, reaching a peak of 323,613 in February 2023. This indicates a growing network of individuals and organizations providing mobile money services, which contributes



Source: World bank data, GSM World Report.

Figure 1. Increased volume of Mobile Transactions since 2008 to 2023.

to the increased availability of banking services. The total registered mobile money accounts also saw a consistent rise, with the highest number recorded in March 2023 at 73.72 million. This demonstrates the increased adoption of mobile money as a preferred banking method among Kenyan citizens. The significant growth in registered accounts reflects the expanded accessibility of financial services, enabling more people, including those in remote areas, to participate in the formal economy.

Moreover, the volume and value of agent cash in cash-out transactions provide insights into the scale of financial transactions facilitated through mobile money. Over time, both the volume and value of cash-in and cash-out transactions have increased, indicating a growing acceptance of mobile money services for various financial activities. For example, in March 2023, the total volume of cash-in and cash-out transactions reached 204.83 million, while the value of these transactions amounted to KSh 645.8 billion. These upward trends in mobile money adoption, active agents, registered accounts, and transaction volume and value suggest that the increased availability of banking services in remote areas of Kenya has been effective. Mobile money has bridged the gap between underserved populations and formal financial services, allowing individuals to make transactions, access credit, save money, and participate in the digital economy. Overall, the data supports the notion that mobile money services have played a vital role in extending banking services to remote areas, empowering individuals and communities by providing them with financial tools and resources.

5.1.4. Reduction in Barriers to Entry for Underserved Populations

DFS has also contributed to reducing the barriers to entry faced by underserved populations in accessing financial services. Traditionally, these populations may have encountered obstacles such as a lack of identification documents, high account opening fees, or stringent loan eligibility criteria. With DFS, the registration process is often simplified, requiring only a mobile phone and essential identification, making it easier for individuals to open accounts and access financial services. Also empowered previously excluded individuals, including people with low incomes, women, and rural populations, to engage in formal financial transactions and benefit from the associated services (Suri & Jack, 2016).

5.2. Usage and Utilization of Financial Services

Digital financial services (DFS) have significantly influenced the usage and utilization of financial services in Kenya, bringing about notable changes in transaction patterns, access to savings and credit facilities, and digital platforms for insurance and investment purposes. The detailed data for a further and wider understanding is presented below in **Figure 2**, **Figure 3** and **Table 3** in following section.

5.2.1. Increased Frequency and Volume of Transactions

DFS, particularly mobile money platforms like M-Pesa, have facilitated a substantial

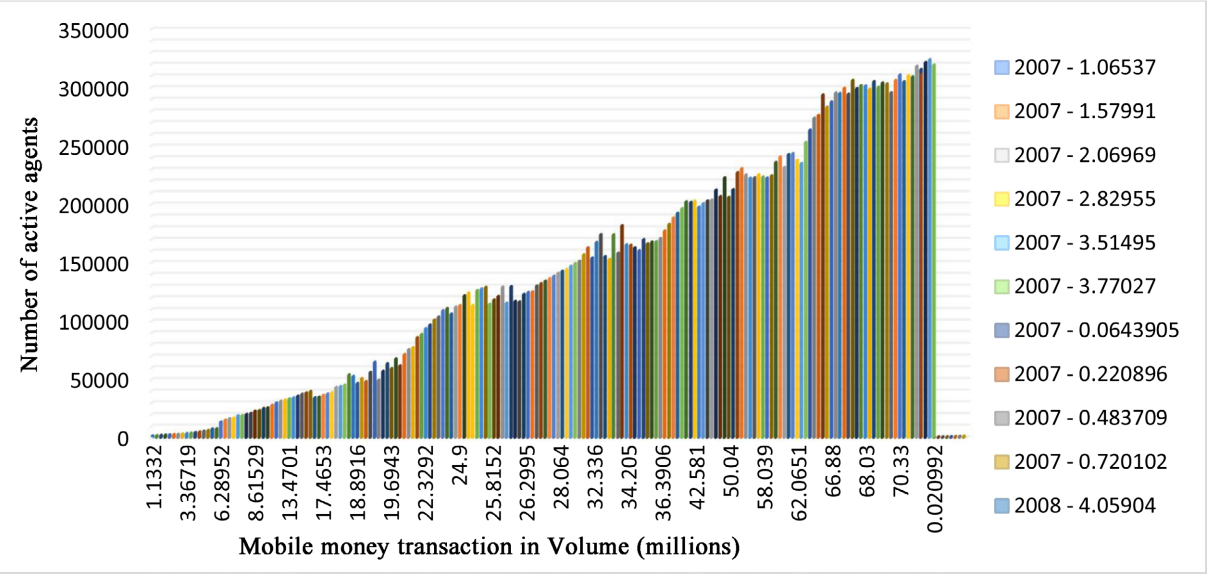


Figure 2. Growth of Mobile Money Agents vs Mobile Money Transaction in Kenya since 2007.

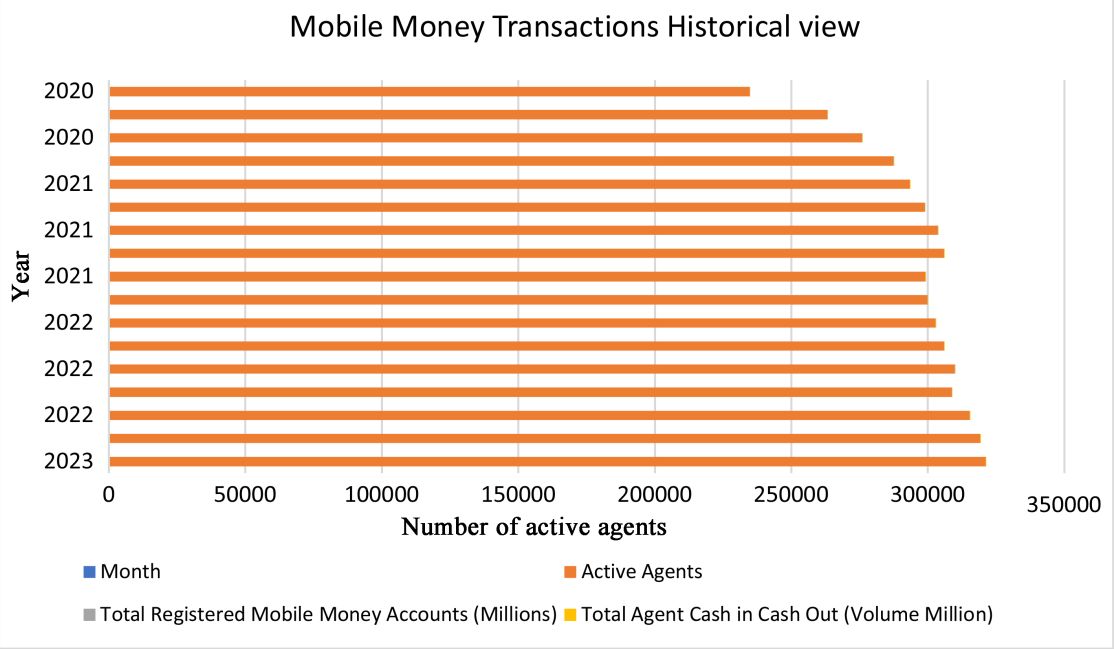


Figure 3. Growth of Mobile Money Agents vs Mobile Money Transaction in Kenya since 2007.

increase in the frequency and volume of financial transactions in Kenya. Individuals can now conveniently transfer money, pay for goods and services, and conduct other financial transactions using mobile phones. In addition led to a shift from cash-based to digital transactions, contributing to increased efficiency and transparency in financial dealings (CGAP, 2018). The ease and convenience of using DFS have encouraged individuals to engage in more frequent financial transactions, thereby promoting financial inclusion.

Table 4 presents the performance of mobile payments in terms of various indicators from 2020 to 2023. The table includes data on mobile money agents,

Table 3. Mobile Money Transaction and Mobile Registered Money accounts.

Year	Month	Active Agents	Total Registered Mobile Money Accounts (Millions)	Total Agent Cash in Cash Out (Volume Million)	Total Agent Cash in Cash Out (Value KSh billions)
2023	March	321,149	73.72	204.83	645.8
2023	February	323,613	74.04	184.82	578.09
2023	January	319,079	74.41	198.31	589.3
2022	December	317,983	73.12	207.01	708.06
2022	November	315,240	73.22	190.46	639.84
2022	October	311,957	73.22	196.93	646.5
2022	September	308,799	71.67	189.7	674.47
2022	August	310,450	70.06	184.81	677.36
2022	July	309,856	71.58	194.77	722.52
2022	June	304,693	70.33	186.2	665.09
2022	May	305,830	70.03	192.95	692.62
2022	April	295,237	68.72	188.24	663.53
2022	March	302,837	68.62	195.82	664.31
2022	February	301,108	67.94	171.39	568.71
2022	January	299,860	68.28	181.85	585.82
2021	December	298,272	68.03	189.8	622.14
2021	November	299,053	67.15	185.98	600.97
2021	October	295,105	66.88	190.06	618.14
2021	September	305,831	67.7	180.85	585.38
2021	August	304,822	68.09	184.51	586.52
2021	July	303,718	68.54	184	587.98
2021	June	301,457	67.78	175.83	532.63
2021	May	298,883	67.77	180.76	536.69
2021	April	294,706	67.11	173.35	502.22
2021	March	293,403	65.93	182.29	537.75
2021	February	294,111	67.16	164.2	567.99
2021	January	287,410	66.59	173.91	590.36
2020	December	282,929	66.01	181.37	605.69
2020	November	275,960	65.7662	170.028	526.806
2020	October	273,531	65.255	174.106	528.904
2020	September	263,200	64.0304	163.342	483.215
2020	August	252,703	62.7834	163.207	473.522
2020	July	234,747	62.0651	157.755	450.981

Continued

2020	June	237,637	61.7261	143.14	392.172
2020	May	243,118	60.2432	135.932	357.37
2020	April	242,275	59.4282	124.994	307.991
2020	March	240,261	58.7131	150.687	364.511
2020	February	235,543	58.6665	148.53	350.481
2020	January	231,292	59.1672	150.204	371.9
2019	December	224,108	58.3613	154.99	382.93
2019	November	222,211	58.039	153.056	359.261
2019	October	223,176	56.293	156.11	366.901
2019	September	224,959	55.7004	151.224	365.908
2019	August	222,479	54.7751	151.828	368.504
2019	July	222,087	53.887	152.979	366.386
2019	June	222,484	46.8005	149.727	346.847
2019	May	224,825	52.1958	153.257	364.254
2019	April	230,220	52.0478	155.796	360.216
2019	March	226,957	50.36	161.38	368.39
2019	February	212,252	50.04	144.49	328.15
2019	January	201,336	40.2953	154.243	368.017
2018	December	205,745	47.6943	155.774	367.766
2018	November	206,312	46.2334	153.15	343.866
2018	October	211,961	45.4371	155.16	343.225
2018	September	203,359	44.2723	145.988	327.663
2018	August	202,627	43.5588	149.517	348.912
2018	July	200,227	42.613	143.087	332.352
2018	June	197,286	42.581	137.412	317.671
2018	May	202,387	41.729	140.954	328.97
2018	April	201,795	40.2881	142.056	312.999
2018	March	196,002	39.34	147.52	337.11
2018	February	192,117	38.4185	132.297	300.852
2018	January	188,029	37.8418	136.658	322.984
2017	December	182,472	37.3868	139.934	332.622
2017	November	176,986	36.3906	131.738	298.957
2017	October	170,389	36.0008	134.198	299.018
2017	September	167,775	35.537	128.457	300.917
2017	August	167,353	35.333	120.645	286.341

Continued

2017	July	169,480	34.578	128.105	308.893
2017	June	165,109	34.178	125.897	299.789
2017	May	164,674	34.205	132.455	315.448
2017	April	160,076	34.286	128.885	297.437
2017	March	157,855	33.919	133.336	320.18
2017	February	154,908	33.291	117.495	279.386
2017	January	152,547	33.343	122.03	299.486
2016	December	165,908	34.957	126.349	316.773
2016	November	162,441	34.281	120.932	291.227
2016	October	181,456	34.037	122.45	292.092
2016	September	173,731	33.435	112.586	284.055
2016	August	173,774	32.757	114.156	297.229
2016	July	167,072	32.336	110.514	281.854
2016	June	162,465	31.386	106.342	270.973
2016	May	156,349	31.296	107.821	277.94
2016	April	153,762	31.438	105.506	269.82
2016	March	150,987	30.696	107.855	273.585
2016	February	148,982	29.489	100.983	257.185
2016	January	146,710	29.0976	95.52	242.372
2015	December	143,946	28.6447	107.44	267.068
2015	November	142,386	28.064	101.33	236.372
2015	October	140,612	27.537	102.75	255.808
2015	September	138,131	27.312	96.32	247.506
2015	August	136,042	27.0497	94.12	248.154
2015	July	133,989	26.7382	93.9985	238.864
2015	June	131,761	26.5028	90.6686	227.921
2015	May	129,735	26.4645	89.9024	230.152
2015	April	129,218	26.1392	84.9056	213.746
2015	March	128,591	25.6902	90.3477	231.836
2015	February	127,187	25.4556	80.7405	208.132
2015	January	125,826	25.3972	81.6534	210.54
2014	December	123,703	25.2492	85.6071	225.549
2014	November	121,419	24.9465	80.9984	203.239
2014	October	128,706	25.996	82.8925	210.277
2014	September	124,179	26.2995	78.1748	206.341

Continued

2014	August	124,708	26.333	78.8987	206.72
2014	July	122,462	26.2265	77.4651	200.992
2014	June	120,781	25.9284	74.0288	189.911
2014	May	117,807	25.8152	74.5472	198.131
2014	April	116,581	26.1399	72.0955	186.664
2014	March	116,196	26.208	73.9817	192.695
2014	February	115,015	26.1164	65.5934	172.797
2014	January	114,107	25.7568	67.0519	178.478
2013	December	113,130	25.3263	69.1378	182.495
2013	November	112,947	24.9	68.7	175.22
2013	October	111,697	24.43	68.27	175.29
2013	September	110,432	23.97	63.43	165.59
2013	August	108,559	23.87	64.71	168.1
2013	July	105,669	24.27	62.71	162.76
2013	June	103,165	23.75	60.03	152.5
2013	May	100,584	23.47	60.34	158.77
2013	April	96,319	23.0185	55.9993	142.609
2013	March	93,211	22.3292	52.3949	134.446
2013	February	88,393	21.8024	53.4683	141.126
2013	January	85,548	21.4181	53.4068	142.653
2012	December	76,912	21.06	55.96	150.16
2012	November	75,226	20.25	53.56	138.99
2012	October	70,972	20.02	51.89	137.68
2012	September	67,301	19.71	48.94	130.69
2012	August	64,439	19.38	49.7	131.38
2012	July	63,165	19.58	49.35	129.28
2012	June	61,313	19.7956	47.8763	124.02
2012	May	59,057	19.6943	47.9655	128.403
2012	April	56,717	19.53	44.35	117.36
2012	March	55,726	19.2393	45.757	126.093
2012	February	53,685	18.7921	41.7805	116.691
2012	January	52,315	18.834	40.2449	114.06
2011	December	50,471	19.191	41.7075	118.08
2011	November	49,091	19.46	41.1769	112.332
2011	October	47,874	19.2097	40.55	109.119

Continued

2011	September	46,234	18.8916	39.2139	108.615
2011	August	44,762	18.6128	39.2993	107.424
2011	July	43,577	18.3082	37.9763	99.7104
2011	June	42,840	18.1469	35.8222	92.6437
2011	May	38,485	17.9239	35.3457	94.3724
2011	April	37,309	17.7573	32.4254	86.0877
2011	March	36,198	17.4653	32.7301	88.9966
2011	February	34,572	16.8928	28.5462	76.3366
2011	January	33,968	16.6901	28.2047	75.4328
2010	December	39,449	16.4463	29.1183	75.8654
2010	November	38,201	16.075	30.0386	70.2727
2010	October	37,009	15.7346	31.3186	71.7947
2010	September	35,373	15.2239	29.4457	68.5062
2010	August	33,864	14.5893	26.8233	61.531
2010	July	32,974	13.4701	26.915	61.7728
2010	June	31,902	10.9147	25.0338	58.0993
2010	May	31,036	10.4928	24.6984	58.0795
2010	April	29,570	10.2026	22.6933	51.8136
2010	March	27,622	9.97211	24.0758	56.1167
2010	February	25,394	9.67495	20.8087	49.9055
2010	January	24,850	9.4767	20.0767	48.4625
2009	December	23,012	8.88258	21.6891	52.3417
2009	November	22,476	8.61529	19.975	47.4656
2009	October	20,631	8.36803	19.92	48.6365
2009	September	19,803	8.01624	18.3703	45.3683
2009	August	18,780	7.7141	17.0104	40.6787
2009	July	18,504	7.42641	16.8986	40.3374
2009	June	16,641	7.19062	15.9846	38.1756
2009	May	16,029	6.8427	15.0488	36.8062
2009	April	14,790	6.53192	13.7796	34.0201
2009	March	13,358	6.28952	13.5541	33.8202
2009	February	7512	5.81602	11.0793	28.6863
2009	January	7304	5.47828	10.1906	27.0749
2008	December	6104	5.08247	10.2051	26.99
2008	November	5399	4.75139	8.56681	21.7

Continued

2008	October	4781	4.42028	8.30365	21.6007
2008	September	4230	4.14304	7.15191	19.2699
2008	August	3761	3.72618	6.34241	16.7563
2008	July	3378	3.36719	5.39108	14.0171
2008	June	3011	3.03852	4.20144	10.9172
2008	May	2770	2.71813	4.02127	10.9042
2008	April	2606	2.37346	3.07289	8.38964
2008	March	2329	2.07553	2.3975	6.74745
2008	February	2067	1.82153	1.7399	5.21979
2008	January	1812	1.5891	1.34683	4.05904
2007	December	1582	1.34527	1.2741	3.77027
2007	November	1379	1.1332	1.22174	3.51495
2007	October	1196	0.875962	0.958908	2.82955
2007	September	960	0.635761	0.669689	2.06969
2007	August	819	0.432555	0.516239	1.57991
2007	July	681	0.268499	0.354298	1.06537
2007	June	527	0.175652	0.233661	0.720102
2007	May	447	0.107733	0.15	0.483709
2007	April	362	0.054944	0.07	0.220896
2007	March	307	0.020992	0.021714	0.0643905

Source: Worldbank, Central Bank of Kenya.

Table 4. Mobile payments performace.

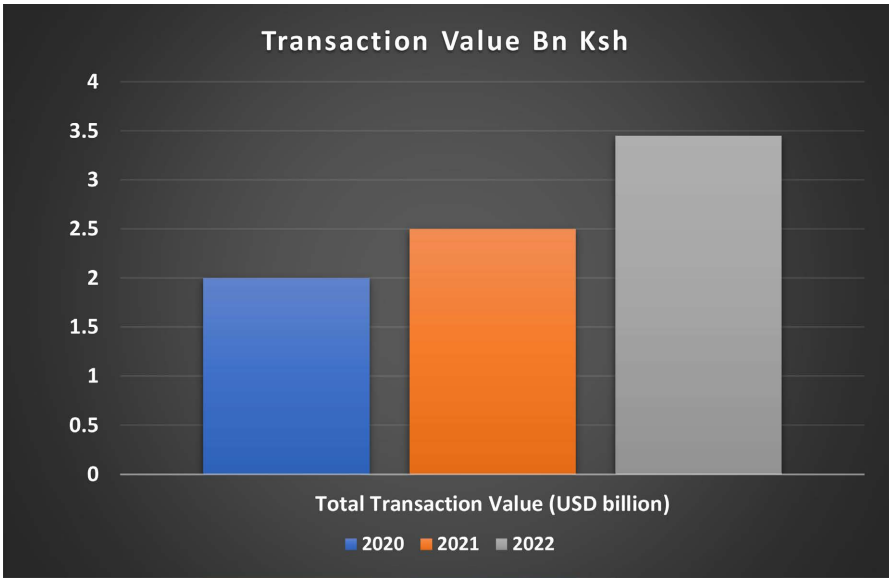
Mobile payments performance 2020-2023												
	Mobile money agents	30 Day active customers Mn	Person to Person (P2P) Transfers		Pay Bill Payments		Till number Payments		Transfer from bank accounts to Mobile wallets		Transfers from Mobile wallets to bank accounts	
			Volumn Mn	Value, Ksh Bn	Volumn Mn	Value, Ksh Bn	Volumn Mn	Value, Ksh Bn	Volumn Mn	Value, Ksh Bn	Volumn Mn	Value, Ksh Bn
Jan-20	231292	22.1	141	221	100	106	32	58	13	102	4	39
Dec-23	317983	33.0	221	436	371	623	187	166	61	389	66	507

Source: Central Bank of Kenya.

30-day active customers, person-to-person (P2P) transfers, Pay Bill payments, Till number payments, transfers from bank accounts to mobile wallets, and transfers from mobile wallets to bank accounts. In January 2020, there were 231,292 mobile money agents. The table also provides the volume and value of transactions for each category. For example, there were 141 million P2P trans-

fers with a value of Ksh billion. Pay Bill payments amounted to 100 million transactions valued at Ksh billion. Till number payments accounted for 32 million transactions with a value of Ksh billion. Transfer from bank accounts to mobile wallets had a volume of 13 million transactions worth Ksh billion, while transfers from mobile wallets to bank accounts totaled 102 million transactions valued at Ksh billion.

By December 2023, the number of mobile money agents increased to 317,983. The table shows the growth in all transaction categories over this period. For instance, the volume and value of P2P transfers, Pay Bill payments, Till number payments, and transfers between mobile wallets and bank accounts all increased significantly. This table provides an overview of the performance and growth of mobile payments in terms of transaction volume and value over the specified period. The data is also illustrated in Figure 4.



Source: Central Bank of Kenya.

Figure 4. Transactions Value in USD (Bn).

5.2.2. Access to Formal Savings and Credit Facilities

Digital financial services have expanded access to formal savings and credit facilities for individuals previously excluded from the traditional banking system. Through mobile money platforms, individuals can now open and manage savings accounts digitally, providing a secure and accessible avenue to save their money (McKenna & McKay, 2015). Additionally, DFS has facilitated the emergence of digital lending platforms, enabling individuals and small businesses to access credit quickly and conveniently. Also allowed previously unbanked or underbanked individuals to overcome financial constraints and invest in income-generating activities (Ng'weno, 2018).

5.2.3. Use of DFS for Insurance and Investment Purposes

DFS has also facilitated using digital platforms for insurance and investment

purposes. Individuals can now access insurance products, such as microinsurance, through mobile money platforms, providing a safety net against unexpected events (Mas, 2014). Furthermore, digital investment platforms have emerged, allowing individuals to invest in various financial instruments, such as mutual funds or stocks, through mobile phones. These platforms offer affordable and accessible investment opportunities, enabling individuals to grow their wealth and participate in the formal financial sector (Bouhdaoui & Asongu, 2019).

5.3. Empowerment and Economic Outcomes

Digital financial services (DFS) have had a transformative impact on the empowerment and economic outcomes of individuals and communities in Kenya. Through improved financial resilience, increased livelihood opportunities, and reduced poverty and inequality, DFS have played a vital role in fostering inclusive economic growth.

5.3.1. Enhanced Financial Resilience and Risk Management

DFS has enabled individuals to build and maintain greater financial resilience by providing access to tools for risk management. Mobile money platforms, for instance, offer convenient and secure ways to save money, allowing individuals to accumulate funds for unforeseen emergencies or future expenses (Demirgüç-Kunt et al., 2018). This access to formal financial services enhances the ability to plan for and respond to financial shocks, ultimately contributing to improved financial well-being and stability.

5.3.2. Improved Livelihoods and Income Generation Opportunities

DFS has opened up new avenues for income generation and entrepreneurship, particularly for individuals previously excluded from formal financial systems. With access to digital financial services, individuals can receive and make payments for goods and services more efficiently, expanding their business networks and markets (CGAP, 2017). Additionally, DFS has facilitated access to credit, allowing individuals to invest in income-generating activities and expand their businesses (Mas, 2016). This increased access to financial resources has led to improved livelihoods and more significant economic opportunities for individuals and communities.

5.3.3. Reduction in Poverty and Inequality

The adoption of DFS has been associated with a reduction in poverty and inequality in Kenya. Access to digital financial services has empowered individuals to move away from informal and cash-based economies, enabling them to participate more fully in formal financial systems (Mbiti & Weil, 2011). Formalizing financial activities promotes economic inclusion and helps bridge the gap between the rich and the poor. Moreover, DFS has been particularly impactful for marginalized groups, such as women and rural populations, who have historically faced barriers to financial inclusion (Suri & Jack, 2016). By providing them

with equal access to financial services and opportunities, DFS contributes to a more equitable society. The increased number of transactions is presented in Table 5. Similarly, the contribution to Kenyan economy via remittances inflows is presented in Table 6, which is also a major source to elevate the economy and in reduction of poverty in the country.

Table 5 provides information on mobile money transactions in Kenya for the years 2021 and 2022. It includes data on the total transaction value in Kenyan Shillings (KES trillion), the number of active agents, and the number of mobile money accounts in millions. In 2021, the total transaction value reached 6.4 trillion KES, with 298,272 active agents and 68.03 million mobile money accounts. The following year, in 2022, the total transaction value increased to 7.9 trillion KES, with 317,983 active agents and 73.12 million mobile money accounts. These figures indicate the growth and usage of mobile money services in Kenya, with an increase in both transaction value and the number of active agents and accounts.

Table 6 presents data on remittances inflows in Kenya, including actual, previous, highest, and lowest values, as well as the dates covered. The figures are measured in USD thousands on a monthly frequency. The actual remittances inflows in Kenya ranged from 25,154.00 USD thousand to 356,980.47 USD thousand between the years 2004 and 2023. The previous value recorded was 309,172.70 USD thousand, while the highest value reached 363,581.66 USD thousand. This table provides insights into the trends and fluctuations in remittances inflows to Kenya over time, showcasing the varying amounts received from abroad on a monthly basis.

The research aims to understand the growth and impact of mobile money services, particularly in Sub-Saharan Africa, and their role in facilitating cashless transactions and financial inclusion. The analysis encompasses various metrics, including transaction values, number of agents and accounts, use cases, remittances, interoperable transactions, savings accounts, revenue diversification, and global market trends.

Table 5. Mobile money transactions in Kenya.

Year	Total Transaction Value (KES trillion)	Number of Active Agents	Number of Mobile Money Accounts (million)
2021	6.4	298,272	68.03
2022	7.9	317,983	73.12

Source: Central Bank of Kenya.

Table 6. Remittances inflows in Kenya.

Actual	Previous	Highest	Lowest	Dates	Unit	Frequency
356,980.47	309,172.70	363,581.66	25,154.00	2004-2023	USD Thousand	Monthly

Source: Central Bank of Kenya.

Regional Insights: Sub-Saharan Africa emerges as a significant driver of mobile money growth, with active accounts and registered agents experiencing substantial increases. West Africa, in particular, has shown impressive adoption and usage rates, with active accounts growing by 25% and registered accounts growing by 21% between 2021 and 2022. Mobile money services in Latin America and the Caribbean have also seen a significant increase in activity, reflecting the region's historically high activity rates.

Table 7 provides a comparison of access to financial services in Kenya between 2010 and 2020. The table presents the percentages of the population that fall into different categories based on their access to financial services. In 2010, only 23.3% of the population had a bank account, while in 2020, this percentage increased to 55.1%. This indicates a significant improvement in banking accessibility over the decade. The use of non-bank formal channels, such as Savings and Credit Cooperative Organizations (SACCOs) and Microfinance Institutions (MFIs), also saw an increase from 7.4% in 2010 to 27.4% in 2020, reflecting a growing reliance on these financial service providers. On the other hand, the use of informal channels, such as borrowing from friends or family, decreased from 30.6% in 2010 to 12.7% in 2020, suggesting a shift towards more formal financial services. The percentage of the population excluded from any financial services significantly dropped from 38.7% in 2010 to 4.8% in 2020, indicating a notable increase in financial inclusion within the country.

Table 8 focuses on the usage of digital financial services in Kenya, specifically highlighting the adoption of various mobile-based services. In 2015, there were 24 million M-PESA users in Kenya, representing approximately 53% of the population. By 2020, the number of M-PESA users increased to 38 million, accounting

Table 7. Access to financial services in Kenya (2010 vs. 2020).

Financial Service	2010 (%)	2020 (%)
Banked (have a bank account)	23.3	55.1
Use of non-bank formal channels (e.g., SACCOs, MFIs)	7.4	27.4
Use of informal channels (e.g., champs, friends/family)	30.6	12.7
Excluded (no access to any financial services)	38.7	4.8

Source: Financial Sector Deepening (FSD) Kenya, FinAccess Surveys 2010 and 2020.

Table 8. Digital financial services usage in Kenya.

Indicator	2015	2020
M-PESA Users (millions)	24	38
Percentage of population using M-PESA	53%	79%
M-Shwari Users (millions)	12	18
M-KOPA Users (millions)	-	10

Source: Safaricom, M-KOPA, and internal data analysis.

for around 79% of the population. This demonstrates a substantial growth in the utilization of M-PESA, a popular mobile money service in the country. The table also mentions the number of users for other digital financial services. In 2015, there were 12 million users of M-Shwari, a mobile banking platform, which increased to 18 million by 2020. Additionally, M-KOPA, a service that offers pay-as-you-go solar energy solutions, gained 10 million users during this period. These figures illustrate the significant expansion of digital financial services and their increasing popularity among Kenyan citizens.

6. Challenges and Limitations

6.1. Infrastructural and Technological Challenges

One of the significant challenges faced in implementing and utilizing digital financial services (DFS) in Kenya is the infrastructural and technological limitations. Despite substantial progress in expanding financial services infrastructure, areas still have limited access to reliable connectivity and electricity, particularly in rural and remote regions (GSMA, 2019). Insufficient network coverage and unstable internet connectivity can hinder the seamless operation of DFS platforms and limit their accessibility to the population (ITU, 2019). These infrastructural challenges pose obstacles to the widespread adoption and usage of digital financial services, particularly for individuals residing in underserved areas.

6.2. Limited Financial Literacy and Digital Skills

Another challenge in promoting financial inclusion through DFS in Kenya is the population's limited financial literacy and digital skills. Many individuals, especially those from low-income and marginalized communities, may lack the necessary knowledge and understanding of digital financial services, making it difficult for them to utilize and benefit from these services fully. Studies have highlighted the importance of financial literacy in empowering individuals to make informed financial decisions and engage effectively with digital financial platforms (Demirgüç-Kunt et al., 2018). Therefore, addressing the gaps in financial literacy and providing digital skills training programs are crucial to enhance the uptake and usage of DFS among all population segments.

6.3. Security and Privacy Concerns

The increasing reliance on digital financial services also brings forth concerns related to security and privacy. Users may worry about their personal and financial information safety when conducting transactions through digital platforms. Instances of fraud, identity theft, and cyber-attacks can erode trust and hinder the adoption of DFS. Therefore, ensuring robust security measures, data protection protocols, and building trust among users are essential for the sustainable growth of digital financial services (Hughes, Lonie, & Goldfajn, 2014).

6.4. Regulatory and Policy Considerations

Regulatory and policy considerations are crucial in shaping the landscape of digital financial services and financial inclusion in Kenya. While a supportive regulatory framework is necessary to encourage innovation and competition, it must also address consumer protection, risk management, and anti-money laundering measures (World Bank, 2019). Balancing the need for regulation with fostering an enabling environment for DFS providers is a crucial challenge policymakers face. Inadequate or unclear regulations can hinder the growth of DFS and pose risks to consumers. Therefore, policymakers must continuously review and update regulations to keep pace with the evolving digital financial landscape and ensure a balance between innovation and consumer protection.

7. Policy Implications and Recommendations

7.1. Strengthening Regulatory Frameworks for DFS

For improvement of the impact of digital financial services (DFS) on financial inclusion in Kenya, it is crucial to strengthen the regulatory frameworks that govern these services. And it involves ensuring clear and supportive regulations that promote innovation, protect consumers, and foster a competitive environment (Demirgüç-Kunt et al., 2018). Regulators should collaborate with industry players to develop appropriate guidelines and standards, addressing customer protection, data privacy, and interoperability among different DFS platforms (CGAP, 2017). By creating an enabling regulatory environment, policymakers can promote the responsible growth of DFS and foster trust among users.

7.2. Enhancing Financial Literacy and Digital Skills Training Programs

To fully harness the benefits of DFS, the population needs to enhance financial literacy and digital skills. Many individuals, especially those from underserved communities, may lack the knowledge and skills to effectively use digital financial services (World Bank, 2019). Government and private sector stakeholders should invest in comprehensive financial literacy programs that educate individuals on the benefits, risks, and functionalities of DFS (Hughes et al., 2014). Additionally, providing training programs on digital skills and mobile technology usage will empower individuals to confidently navigate and utilize DFS platforms (FSD Kenya, 2019). By improving financial literacy and digital skills, individuals can make informed decisions, mitigate risks, and fully access the benefits of digital financial services.

7.3. Promoting Collaboration among Stakeholders

Collaboration among stakeholders is vital for successfully implementing and adopting digital financial services. Policymakers, regulators, financial institutions, mobile network operators, and other relevant stakeholders should collaborate to create an ecosystem supporting interoperability and innovation in DFS

(CGAP, 2016). This collaboration can help address infrastructure, standardization, and interoperability challenges among different DFS platforms, ensuring seamless and affordable access to financial services for all (Demirgüç-Kunt et al., 2018). Moreover, partnerships between financial institutions and mobile network operators can facilitate the integration of DFS into existing banking systems, expanding the reach and impact of digital financial services (Suri & Jack, 2016).

7.4. Addressing Infrastructure Gaps and Promoting Affordable Connectivity

To fully leverage the potential of DFS, it is crucial to address infrastructure gaps and promote affordable connectivity in Kenya. Access to reliable and affordable internet connectivity is essential for individuals to access and utilize digital financial services (GSMA, 2019). Policymakers should prioritize investments in expanding internet coverage, particularly in rural and underserved areas (ITU, 2019). Additionally, efforts should be made to promote affordable mobile devices and data plans to ensure that individuals can afford to access and use DFS platforms (World Bank, 2020). By addressing infrastructure gaps and promoting affordable connectivity, policymakers can enable more individuals to benefit from the advantages of digital financial services and foster greater financial inclusion.

8. Conclusions

8.1. Summary of Key Findings

This research has explored the impact of digital financial services (DFS) on financial inclusion in Kenya through secondary data analysis. The findings reveal several significant outcomes of DFS adoption in the country. Firstly, DFS has expanded access to financial services by improving the infrastructure and making banking services available even in remote areas. Secondly, there has been an increase in the usage and utilization of financial services, with individuals conducting more frequent and higher volume transactions. Moreover, DFS has facilitated access to formal savings and credit facilities, enabling individuals to save, borrow, and invest through digital platforms. Lastly, DFS has contributed to empowerment and economic outcomes by enhancing financial resilience, improving livelihoods, and reducing poverty and inequality.

8.2. Contributions to the Existing Knowledge

This study has contributed to the existing knowledge on the impact of DFS on financial inclusion in Kenya. Analyzing secondary data, it has provided empirical evidence of the positive effects of DFS adoption. The findings support previous studies that highlight the role of DFS in expanding access to financial services, promoting usage and utilization, and empowering individuals economically. This research consolidates the understanding of the transformative poten-

tial of DFS and provides a comprehensive assessment of their impact on financial inclusion in Kenya.

8.3. Implications for Policymakers and Practitioners

The findings of this study have important implications for policymakers and practitioners in the field of financial inclusion. Firstly, policymakers should focus on strengthening regulatory frameworks for DFS, ensuring clear guidelines that balance innovation and consumer protection. Creating an enabling environment that fosters competition, trust, and interoperability among DFS providers is essential. Secondly, there is a need for enhanced financial literacy and digital skills training programs to enable individuals to benefit from DFS fully. Policymakers and practitioners should invest in educational initiatives that promote financial literacy and empower individuals to navigate and utilize digital financial services effectively. Additionally, collaboration among stakeholders, including regulators, financial institutions, and mobile network operators, is crucial to address challenges and promote the interoperability of DFS platforms.

8.4. Recommendations for Future Research

While this study provides valuable insights into the impact of DFS on financial inclusion in Kenya, several areas warrant further research. Firstly, future studies can delve deeper into how DFS contributes to financial resilience and risk management. Understanding the factors that enable individuals to leverage DFS for financial security effectively would provide valuable insights for policymakers and practitioners. Additionally, more research is needed to explore the long-term effects of DFS adoption on livelihoods and income generation. Also would involve examining the sustainability of income-generating activities facilitated by DFS and their contribution to poverty reduction. Furthermore, future research can investigate the potential challenges and opportunities associated with adopting emerging digital financial technologies, such as blockchain and digital currencies, in promoting financial inclusion in Kenya.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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List of Terminologies and Abbreviations

Financial Inclusion—The extent to which individuals and businesses have access to and can effectively use financial services to meet their needs.

Digital Financial Services (DFS)—Financial services delivered through digital channels such as mobile phones, the internet, and other electronic devices.

M-Pesa—A mobile money platform widely used in Kenya, allowing users to deposit, withdraw, transfer money, and make payments using their mobile phones.

SACCOs—Savings and Credit Cooperative Organizations, which are member-owned financial cooperatives that provide savings and credit services.

MFIs—Microfinance Institutions, organizations that provide financial services, including small loans, to low-income individuals and entrepreneurs.

Chamas—Informal savings and investment groups in Kenya, where members contribute regular amounts and take turns receiving lump sum payouts.

Financial Literacy—The knowledge and understanding of financial concepts, products, and services that enables individuals to make informed financial decisions.

GDP—Gross Domestic Product, a measure of the total value of goods and services produced in a country over a specific period.

Poverty Line—The income threshold below which individuals or households are considered to be living in poverty.

Gender Gap—The disparity between males and females in terms of access to and usage of financial services and opportunities.

CBK—Central Bank of Kenya, the central bank responsible for formulating and implementing monetary policy in Kenya.

CA—Communications Authority of Kenya, the regulatory authority for the communications sector in Kenya.

FSD Kenya—Financial Sector Deepening Kenya, an organization that promotes financial inclusion and development in Kenya.

World Bank—An international financial institution that provides loans and grants to the governments of developing countries for development projects.

FinAccess Surveys—Surveys conducted in Kenya to assess and measure financial inclusion and usage of financial services among the population.

Appendix

Table A1. Background overview—digital financial services in Kenya.

Year	Number of Digital Financial Service Providers	Total Value of Transactions (KSh billion)	Number of Registered Users (million)
2007	1	4.4	1.4
2010	4	76.7	11.2
2015	12	252.1	23.6
2020	31	561.2	40.5
2023	32	1151.3	48

Source: Central Bank of Kenya (CBK) and Communications Authority of Kenya (CA).

Table A2. Factors affecting financial inclusion in Kenya.

Factors	Correlation with Financial Inclusion (%)
Economic Growth	+30
Mobile Subscription Penetration	+45
Literacy Rate	+20
Gender Gap	−15

Source: World Bank, FinAccess Surveys.

Table A3. Comparison of financial inclusion (% of adults) in Kenya and neighboring countries.

Country	Year: 2010	Year: 2015	Year: 2020
Kenya	41	65	82
Uganda	34	49	59
Tanzania	37	56	68
Rwanda	29	52	72

Source: FinAccess Surveys and World Bank.

Table A4. User demographics of digital financial services in Kenya.

% Population—Age Group	% Usage
21 - 30	25%
31 - 40	35%
41 - 50	17%
51 - 60	10%
Above 60	3%

Source: Safaricom, M-KOPA, and internal data analysis.

Table A5. Demographic overview of Kenya.

Age Group	Population (%)
0 - 14	39.0
15 - 24	20.0
25 - 54	34.0
55 - 64	4.0
65+	3.0

Source: Kenya National Bureau of Statistics (KNBS).

Table A6. Access to financial services in Kenya (2010 vs. 2020).

Financial Service	2010 (%)	2020 (%)
Banked (have a bank account)	23.3	55.1
Use of non-bank formal channels (e.g., SACCOs, MFIs)	7.4	27.4
Use of informal channels (e.g., champs, friends/family)	30.6	12.7
Excluded (no access to any financial services)	38.7	4.8

Source: Financial Sector Deepening (FSD) Kenya, FinAccess Surveys 2010 and 2020.

Table A7. Digital financial services usage in Kenya.

Indicator	2015	2020
M-PESA Users (millions)	24	38
Percentage of population using M-PESA	53%	79%
M-Shwari Users (millions)	12	18
M-KOPA Users (millions)	-	10

Source: Safaricom, M-KOPA, and internal data analysis.

Table A8. Mobile payments 2007-2023.

Year	Month	Active Agents	Total Registered Mobile Money Accounts (Millions)	Total Agent Cash in Cash Out (Volume Million)	Total Agent Cash in Cash Out (Value KSh billions)
2023	March	321,149	73.72	204.83	645.8
2023	February	323,613	74.04	184.82	578.09
2023	January	319,079	74.41	198.31	589.3
2022	December	317,983	73.12	207.01	708.06
2022	November	315,240	73.22	190.46	639.84
2022	October	311,957	73.22	196.93	646.5
2022	September	308,799	71.67	189.7	674.47
2022	August	310,450	70.06	184.81	677.36

Continued

2022	July	309,856	71.58	194.77	722.52
2022	June	304,693	70.33	186.2	665.09
2022	May	305,830	70.03	192.95	692.62
2022	April	295,237	68.72	188.24	663.53
2022	March	302,837	68.62	195.82	664.31
2022	February	301,108	67.94	171.39	568.71
2022	January	299,860	68.28	181.85	585.82
2021	December	298,272	68.03	189.8	622.14
2021	November	299,053	67.15	185.98	600.97
2021	October	295,105	66.88	190.06	618.14
2021	September	305,831	67.7	180.85	585.38
2021	August	304,822	68.09	184.51	586.52
2021	July	303,718	68.54	184	587.98
2021	June	301,457	67.78	175.83	532.63
2021	May	298,883	67.77	180.76	536.69
2021	April	294,706	67.11	173.35	502.22
2021	March	293,403	65.93	182.29	537.75
2021	February	294,111	67.16	164.2	567.99
2021	January	287,410	66.59	173.91	590.36
2020	December	282,929	66.01	181.37	605.69
2020	November	275,960	65.7662	170.028	526.806
2020	October	273,531	65.255	174.106	528.904
2020	September	263,200	64.0304	163.342	483.215
2020	August	252,703	62.7834	163.207	473.522
2020	July	234,747	62.0651	157.755	450.981
2020	June	237,637	61.7261	143.14	392.172
2020	May	243,118	60.2432	135.932	357.37
2020	April	242,275	59.4282	124.994	307.991
2020	March	240,261	58.7131	150.687	364.511
2020	February	235,543	58.6665	148.53	350.481
2020	January	231,292	59.1672	150.204	371.9
2019	December	224,108	58.3613	154.99	382.93
2019	November	222,211	58.039	153.056	359.261
2019	October	223,176	56.293	156.11	366.901
2019	September	224,959	55.7004	151.224	365.908

Continued

2019	August	222,479	54.7751	151.828	368.504
2019	July	222,087	53.887	152.979	366.386
2019	June	222,484	46.8005	149.727	346.847
2019	May	224,825	52.1958	153.257	364.254
2019	April	230,220	52.0478	155.796	360.216
2019	March	226,957	50.36	161.38	368.39
2019	February	212,252	50.04	144.49	328.15
2019	January	201,336	40.2953	154.243	368.017
2018	December	205,745	47.6943	155.774	367.766
2018	November	206,312	46.2334	153.15	343.866
2018	October	211,961	45.4371	155.16	343.225
2018	September	203,359	44.2723	145.988	327.663
2018	August	202,627	43.5588	149.517	348.912
2018	July	200,227	42.613	143.087	332.352
2018	June	197,286	42.581	137.412	317.671
2018	May	202,387	41.729	140.954	328.97
2018	April	201,795	40.2881	142.056	312.999
2018	March	196,002	39.34	147.52	337.11
2018	February	192,117	38.4185	132.297	300.852
2018	January	188,029	37.8418	136.658	322.984
2017	December	182,472	37.3868	139.934	332.622
2017	November	176,986	36.3906	131.738	298.957
2017	October	170,389	36.0008	134.198	299.018
2017	September	167,775	35.537	128.457	300.917
2017	August	167,353	35.333	120.645	286.341
2017	July	169,480	34.578	128.105	308.893
2017	June	165,109	34.178	125.897	299.789
2017	May	164,674	34.205	132.455	315.448
2017	April	160,076	34.286	128.885	297.437
2017	March	157,855	33.919	133.336	320.18
2017	February	154,908	33.291	117.495	279.386
2017	January	152,547	33.343	122.03	299.486
2016	December	165,908	34.957	126.349	316.773
2016	November	162,441	34.281	120.932	291.227
2016	October	181,456	34.037	122.45	292.092

Continued

2016	September	173,731	33.435	112.586	284.055
2016	August	173,774	32.757	114.156	297.229
2016	July	167,072	32.336	110.514	281.854
2016	June	162,465	31.386	106.342	270.973
2016	May	156,349	31.296	107.821	277.94
2016	April	153,762	31.438	105.506	269.82
2016	March	150,987	30.696	107.855	273.585
2016	February	148,982	29.489	100.983	257.185
2016	January	146,710	29.0976	95.52	242.372
2015	December	143,946	28.6447	107.44	267.068
2015	November	142,386	28.064	101.33	236.372
2015	October	140,612	27.537	102.75	255.808
2015	September	138,131	27.312	96.32	247.506
2015	August	136,042	27.0497	94.12	248.154
2015	July	133,989	26.7382	93.9985	238.864
2015	June	131,761	26.5028	90.6686	227.921
2015	May	129,735	26.4645	89.9024	230.152
2015	April	129,218	26.1392	84.9056	213.746
2015	March	128,591	25.6902	90.3477	231.836
2015	February	127,187	25.4556	80.7405	208.132
2015	January	125,826	25.3972	81.6534	210.54
2014	December	123,703	25.2492	85.6071	225.549
2014	November	121,419	24.9465	80.9984	203.239
2014	October	128,706	25.996	82.8925	210.277
2014	September	124,179	26.2995	78.1748	206.341
2014	August	124,708	26.333	78.8987	206.72
2014	July	122,462	26.2265	77.4651	200.992
2014	June	120,781	25.9284	74.0288	189.911
2014	May	117,807	25.8152	74.5472	198.131
2014	April	116,581	26.1399	72.0955	186.664
2014	March	116,196	26.208	73.9817	192.695
2014	February	115,015	26.1164	65.5934	172.797
2014	January	114,107	25.7568	67.0519	178.478
2013	December	113,130	25.3263	69.1378	182.495
2013	November	112,947	24.9	68.7	175.22

Continued

2013	October	111,697	24.43	68.27	175.29
2013	September	110,432	23.97	63.43	165.59
2013	August	108,559	23.87	64.71	168.1
2013	July	105,669	24.27	62.71	162.76
2013	June	103,165	23.75	60.03	152.5
2013	May	100,584	23.47	60.34	158.77
2013	April	96,319	23.0185	55.9993	142.609
2013	March	93,211	22.3292	52.3949	134.446
2013	February	88,393	21.8024	53.4683	141.126
2013	January	85,548	21.4181	53.4068	142.653
2012	December	76,912	21.06	55.96	150.16
2012	November	75,226	20.25	53.56	138.99
2012	October	70,972	20.02	51.89	137.68
2012	September	67,301	19.71	48.94	130.69
2012	August	64,439	19.38	49.7	131.38
2012	July	63,165	19.58	49.35	129.28
2012	June	61,313	19.7956	47.8763	124.02
2012	May	59,057	19.6943	47.9655	128.403
2012	April	56,717	19.53	44.35	117.36
2012	March	55,726	19.2393	45.757	126.093
2012	February	53,685	18.7921	41.7805	116.691
2012	January	52,315	18.834	40.2449	114.06
2011	December	50,471	19.191	41.7075	118.08
2011	November	49,091	19.46	41.1769	112.332
2011	October	47,874	19.2097	40.55	109.119
2011	September	46,234	18.8916	39.2139	108.615
2011	August	44,762	18.6128	39.2993	107.424
2011	July	43,577	18.3082	37.9763	99.7104
2011	June	42,840	18.1469	35.8222	92.6437
2011	May	38,485	17.9239	35.3457	94.3724
2011	April	37,309	17.7573	32.4254	86.0877
2011	March	36,198	17.4653	32.7301	88.9966
2011	February	34,572	16.8928	28.5462	76.3366
2011	January	33,968	16.6901	28.2047	75.4328
2010	December	39,449	16.4463	29.1183	75.8654

Continued

2010	November	38,201	16.075	30.0386	70.2727
2010	October	37,009	15.7346	31.3186	71.7947
2010	September	35,373	15.2239	29.4457	68.5062
2010	August	33,864	14.5893	26.8233	61.531
2010	July	32,974	13.4701	26.915	61.7728
2010	June	31,902	10.9147	25.0338	58.0993
2010	May	31,036	10.4928	24.6984	58.0795
2010	April	29,570	10.2026	22.6933	51.8136
2010	March	27,622	9.97211	24.0758	56.1167
2010	February	25,394	9.67495	20.8087	49.9055
2010	January	24,850	9.4767	20.0767	48.4625
2009	December	23,012	8.88258	21.6891	52.3417
2009	November	22,476	8.61529	19.975	47.4656
2009	October	20,631	8.36803	19.92	48.6365
2009	September	19,803	8.01624	18.3703	45.3683
2009	August	18,780	7.7141	17.0104	40.6787
2009	July	18,504	7.42641	16.8986	40.3374
2009	June	16,641	7.19062	15.9846	38.1756
2009	May	16,029	6.8427	15.0488	36.8062
2009	April	14,790	6.53192	13.7796	34.0201
2009	March	13,358	6.28952	13.5541	33.8202
2009	February	7512	5.81602	11.0793	28.6863
2009	January	7304	5.47828	10.1906	27.0749
2008	December	6104	5.08247	10.2051	26.99
2008	November	5399	4.75139	8.56681	21.7
2008	October	4781	4.42028	8.30365	21.6007
2008	September	4230	4.14304	7.15191	19.2699
2008	August	3761	3.72618	6.34241	16.7563
2008	July	3378	3.36719	5.39108	14.0171
2008	June	3011	3.03852	4.20144	10.9172
2008	May	2770	2.71813	4.02127	10.9042
2008	April	2606	2.37346	3.07289	8.38964
2008	March	2329	2.07553	2.3975	6.74745
2008	February	2067	1.82153	1.7399	5.21979
2008	January	1812	1.5891	1.34683	4.05904

Continued

2007	December	1582	1.34527	1.2741	3.77027
2007	November	1379	1.1332	1.22174	3.51495
2007	October	1196	0.875962	0.958908	2.82955
2007	September	960	0.635761	0.669689	2.06969
2007	August	819	0.432555	0.516239	1.57991
2007	July	681	0.268499	0.354298	1.06537
2007	June	527	0.175652	0.233661	0.720102
2007	May	447	0.107733	0.15	0.483709
2007	April	362	0.054944	0.07	0.220896
2007	March	307	0.020992	0.021714	0.0643905