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Article

The Policies, Practices and Challenges of Digital Financial Inclusion for Sustainable Development: The Case of Developing Economy

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Abstract: Globally, over 1.4 billion adult people remain unbanked. This worrisome phenomenon was exacerbated by the outbreak of the COVID-19 pandemic, which further created a new dimension of inequality in accessing financial services. Digital financial inclusion promises to be an effective tool for addressing this socioeconomic ill and propelling economic development. Given the limited studies on the subject in the context of the developing economies, it is imperative to understand the existing policies, practices, and barriers to digital financial inclusion in the developing economies so as to provide cutting-edge interventions for redress. It is against this background that this study seeks to address the following research questions: (1) What is the state of digital financial inclusion in the developing economy? (2) What are the policies and practices regarding digital financial inclusion in the developing economy? (3) What are the barriers to digital financial inclusion and innovative interventions for redress? Findings reveal that about 44% of the adult population in developing countries does not have access to financial services, with only a few countries that have made significant progress and gains through policy and practice such as mobile financial services, mobile money interoperability, native connectivity, human capital development, and digitalization of public services for digital financial inclusion. The findings also identify challenges and implications with recommendations, which are discussed in detail in the paper.

Keywords: digital financial inclusion; policy; practices; challenges; developing economy; Africa

1. Introduction

Most nations throughout the globe have chosen financial inclusion and entrepreneurial development as effective instruments and panaceas for addressing socioeconomic ills such as inequality of opportunities and, for that matter, achieving Sustainable Development Goals 1, 2, and 8, which aim to reduce poverty and hunger and create wealth and jobs [1, 2]. The outbreak of the COVID-19 pandemic and its exacerbated socioeconomic effects have spiced up the global urgency for digital financial inclusion as an antidote to this social challenge [3, 4]. Digital financial inclusion is defined as delivering or providing basic financial services to marginalized and excluded members of society, usually enabled through digital devices or tools. These marginalized groups of people include women, the poor, the informal sector, and other disadvantaged members of society which constitute over 1.4 billion people that remain unbanked globally [5, 6].

Women are one of the most marginalized groups in society and are victims of inequality of opportunities [7]. This was confirmed in a report by the Ref. [8] that the gender gap in financial inclusion is another pressing problem that requires attention. The report documented that women are 12% less likely to own a mobile phone and 35% less likely to have access to the internet as compared to their male counterparts. Traditionally, women are not expected to work outside the home or be given an equal stake in household budgets. Women in developing countries often lack the digital assets, collateral, networks, and even financial services that enable them to get access to

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financial resources for businesses. Another significant problem that affects women is the agency issue. In addition to the challenges and lack of access to digital devices and funds, women are often not permitted to use or own digital tools as compared to their male counterparts. According to the United Nations, these digital limitations often come from fathers, brothers, in-laws, and sometimes community members who believe that women should not have access to a telephone or bank account. Another factor contributing to the exclusion of women from the financial market is policy. Ref. [3] documented that about 115 economies across the globe prohibit women from establishing enterprises compared to their male counterparts. whereas about 167 countries have at least functional barriers that exclude women from certain economic opportunities. The pandemic and its related movement restrictions made access to traditional financial services a nightmare. For instance, approximately 40 million individuals in Latin America became bankrupt as a result of the outbreak of COVID-19, of whom the majority were women [3].

The poor in society are another marginalized group that was hardest hit by financial exclusion, especially during the COVID-19 pandemic. The poor, including the elderly, do not have basic digital tools to participate in or receive financial services and are often among the unbanked in society due to being classified as the riskiest by many financial service providers. The progress in financial inclusion over the past decade has enabled governments to provide aid to the impoverished; however, the COVID-19 crisis presents major setbacks and opportunities. For instance, while the pandemic and its related lockdown regulations and mobility restrictions led to an increase in digital financial inclusion, some microfinance institutions and other credit-issuing organizations are experiencing an increase in non-performing loans, which hinders their ability to provide more credit to pull the poor away from the negative effects of the pandemic [3].

Businesses in the informal sector are often turned away from accessing financial services due to their informational nature, despite being a key player in a country's economic development. The informal economy employs over 60% of the working population globally and over 85% in Africa. This sector is not seen by financial service providers as unattractive and unworthy of credit facilities and other financial products. Given the present economic crisis caused by the COVID-19 epidemic, digital technology is crucial since it allows businesses to reach more customers and supply their goods over longer periods of time without requiring them to visit their locations. The government has provided enough funds to larger firms, in comparison to smaller firms, to address the effect of the COVID-19 pandemic on profitability and sustainability. Small firms, which often have greater financing needs, have suffered as a result of the preference given to larger corporations. Companies like Checkers that are able to adopt ICT as they transition from physical to online technology are helping consumers avoid the potential for oversupply and the resulting loss of revenue that would result from it. As a result, many SMMEs struggle to satisfy expansion needs because their owners lack the business and ICT skills necessary for survival and sustainability [9, 10, 11, 12].

Given the limited studies on the subject, the depth of exclusion exacerbated by COVID-19 above, and the importance of digital financial inclusion as a cardinal tool for addressing socioeconomic ills and overall development, it is imperative to understand the existing policies, practices, and barriers to digital financial inclusion in the developing economies so as to provide cutting-edge interventions for redress. It is against this background that this study seeks to address the following research questions: (1) What is the state of digital financial inclusion in the developing economy? (2) What are the policies and practices regarding digital financial inclusion in the developing economy? (3) What are the barriers to digital financial inclusion and innovative interventions for redress? This study is important because, its findings contributes significantly on the knowledge of digital financial inclusion and the policies and practices that that drive it. The findings with the recommendation helps shape innovative digital intervention towards bringing marginalized groups into the net of digital financial services, which is important for the growth of country's economy through development of a saving culture among semi-urban, rural populations and the formerly unbanked population. Additionally, skilled members from marginalised groups may be empowered via increased access to financial services, which in turn can have a greater effect on the formulation and execution of other development programs. Recommendations on new forms

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of financial innovation may help reduce transaction costs, encouraging private sector participation in international development, and financial inclusion can increase the efficiency with which the government pays social safety net payments. Lastly, the in-depth knowledge of financial inclusion policies and practices gained from this study will establish the direction for future research and discourse on the subject.

2. Literature Review

The World Bank [13] defined digital financial inclusion as the "deployment of cost-saving digital means to reach currently financially excluded and underserved populations with a range of formal financial services suited to their needs that are responsibly delivered at a cost affordable to customers and sustainable for providers". Digital financial inclusion (DFI) has four major components, as follows: (1) Digital transactional platforms help customers send and receive transaction data and link to a bank or non-bank authorized to store electronic value. They allow consumers to make or receive payments and transfers as well as store value electronically. (2) Devices utilized by the customers can be either digital information-transmitting tools (such as mobile phones) or physical objects (such as payment cards) that link to a digital device, such as a point-of-sale (POS) terminal. (3) Retail agents that allow customers to change cash into electronically stored value (also known as "cash-in") and convert stored value back into cash through a digital device linked to communications infrastructure ("cash-out"). (4) Additional financial services via the digital transactional platform: credit, savings, insurance, and even securities may be made available by banks and non-banks to the underserved and financially excluded, often using digital data to target consumers and manage risk. Deploying information communication technologies does not only help in providing financial access to the marginalised groups but also help improve corporate governance, , provide much better returns than non-credit card-based loans, business output [14], returns on credit cards and the overall performance of the bank sector [15, 16, 17], reduce the level of corruption in the society [18], economic growth [19] and achieving sustainable development goal [1].

Financial services no longer restrict traditional financial sectors like banking, savings, and the stock market, thanks to the continual advancement of digital technology. The evolution of digital money has become an unstoppable trend and a major subject of academic research throughout the world. Even though digital finance is still very much in its initial stages of development, experts have been seeking to undertake a study on its implications, extensions, facilitators, effects, and effects. Moreover, those that assess digital financial development and investigate the impact of digital finance are viewed as the broadest and most complete among this research. To mention a few, Deloitte's Global FinTech Hub Index, the Academy of Internet Finance of Zhejiang University's FinTech Development Index (FDI), and the Institute of Digital Finance at Peking University's Peking University Digital Financial Inclusion Index of China (PKU-DFIIC) Several indicators (Deloitte's Global FinTech Hub Index, the Academy of Internet Finance of Zhejiang University's FinTech Development Index (FDI), and the Institute of Digital Finance at Peking University's Peking University Digital Financial Inclusion Index of China (PKU-DFIIC)) assess the regional growth of digital finance from many angles, including industry development, consumer size, digital infrastructure, and so forth.

The existing literature on the impact of digital finance broadly falls into two categories: macro and micro. From a macro perspective, research has found that mobile banking has a positive impact on traditional finance growth, economic expansion, and wealth distribution equality in both urban and rural areas [20]. Most previous evidence on the influence of digital finance on individuals, SMEs, household financial demand, household consumption, and resident entrepreneurship has concentrated on the micro-level, implying that electronic finance might improve the advantage for these long-tail consumers [21, 22]. Additionally, a limited number of scholars have studied the link between digital finance and financial efficiency using a qualitative method. The majority of them argue that digital finance can help SMEs overcome geographic barriers and enhance economic efficiency by altering how customers access and fund financial services and expanding access to a

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wider choice of funding channels. Furthermore, it is worth noting that financial organization is intimately linked to the cost of financial services, and cost reductions are frequently attributed to increases in financial efficiency. Other studies looked at how digital finance affects financial stability (Luo, Luo, & Liv, 2022). The success and growth of digital financial services for inclusivity depend on the policy environment, practices of DFI, and strategic actions that address potential barriers. There is a paucity of literature focusing on the policy, practices, and challenges of DFI and its potential implications.

According to Ref. [23], developing countries such as those in Africa have witnessed some of the most drastic developments in financial services today, with new products and conveyance methods reaching the financially denied and disadvantaged. In the last several years, no area on the planet with discernible digital financial services (DFS) has given more to financial inclusion than Africa. Africa leads in mobile money accounts, with 20.9 percent of the adult population, compared to 4.2 percent in South Asia, 5.3 percent in Latin America and the Caribbean, and 4.4 percent internationally, according to the 2017 Global Findex data. In 2017, 34.4 percent of sub-Saharan African adults issued or received digital payments, up from 26.9% in 2014. This proliferation now encompasses a wide range of financial services, including insurance, cross-border transfers, credit, and savings, in addition to account possession and simple transactional usage. New competitors, including mobile network operators (MNOs), FinTech, and other third-party agents, are leveraging the proliferation of digital and mobile streams to lower costs and make financial services more suitable and attainable to customers while drifting away from unprotected cash-based transactions. Customers may also trade modest sums using DFS, which is not available with standard banking services. Several empirical and anecdotal studies [24, 25, 26, 27, 28] established that digital financial inclusion is a requisite precursor for achieving inclusive sustainable development.

Based on the reviews of extant literature, there is paucity of studies focusing on the policies, practices and barriers to digital financial inclusion in the context of developing economies. This study is therefore important to provide deeper understanding of the policies and practices adopted by the developing economies on the digital financial drive and barriers to digital financial inclusion so as to identify cutting-edge interventions for redress.

3. Methods

This study is based on secondary data from desktop research (that is, research methods that involve the use of existing data, data obtained from surveys already carried out, material published in reports, and similar documents that are available in public libraries and websites, among others). Secondary data or information is the type of data gathering method that is conducted without the need for data gathering; in other words, it is a research method that includes compiling existing data sources from various channels. In the context of this section, the word "field survey" is broadened to cover all non-field survey information sources. To perform this study, the researchers used some of the sources of published information concerning the phenomenon of digital financial inclusion: journals, books, newspapers, websites, government documents, and other forms of secondary data. In this study, articles, government records, and websites like the World Bank were used. Government statistics are extremely valuable and rely on the source of secondary data. The World Bank Group is one of the world's greatest providers of finance and information for developing countries, and its data is publicly available.

Moreover, data was collected on the policies and practices of digital financial inclusion and challenges in developing economies, such as those in Africa, using a visual presentation of graphs and statistics. Descriptive statistics as well as the presentation of graphs were used to critically assess the data and information and also analyze the results. The data presented was also synthesised narratively according to the theme of the research objective.

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4. Findings

4.1. The State of Digital Financial Inclusion in Developing Economy?

Digital transformation has resulted in changes in the financial services industry and enhanced access to and utilization of financial services due to rapid technical breakthroughs such as artificial intelligence, the internet, and cloud technology, among others. Sub-Saharan Africa's developing financial industry, in collaboration with banks, governments, and other organizations, has established a digital payments ecosystem. The Ecocash system in Zimbabwe is used as an example by the academics. A well-publicized success story, implying that the network processed over US$78.4 billion in 2019, increasing financial inclusion from 32 percent to almost 90 percent. As a result, financial, economic, and social inclusiveness have improved.

The outbreak of the COVID-19 pandemic in 2020 has increased the importance of innovation in financial services. First, limits on migration and the shutdown of bank offices in several countries have underlined the necessity of digital payment services and electronic banking. Furthermore, many SMEs in poor nations continue to pay staff salaries with cash and checks. Nevertheless, e-wallets may readily be used for such reasons in order to assist the unbanked population, which is highly reliant on cash. In Jordan, for instance, the government suggested that citizens use digital wallets to pay their wages and make purchases. The Central Bank of Jordan (CBJ) has authorized seven different telecommunications and payment service companies to supply these wallets [29]. To encourage digital payment service suppliers and retailers to embrace digital payments, the CBJ introduced Mobile Money for Resilience (MM4R) (COVID-19 Response Challenge Fund) (CBJ, 2020). One service provider in the nation reported a 300% rise in digital wallet account applications during the initial month of the crisis. These initiatives resulted in a considerable rise in transaction volume (over 36.5 million JOD), and the number of newly enrolled wallets exceeded 190,000 between the end of March and the end of April 2020. Additionally, the government said that roaming groups will be sent around the country to instruct individuals on how to use digital wallets, emphasizing the significance of financial literacy in deciding the viability of such operations.

An inclusive financial sector is seen as critical for the growth and development of economies in all nations throughout the world, as it facilitates access to, availability of, and usage of financial services by all members of the population. Population groupings include the banked, underbanked, and financially excluded, as well as individuals of all genders. Sustainable Development Goal 5 (SDG5), which emphasizes the necessity of tackling gender equality, is made possible through financial inclusion. According to Ref. [30] women and girls are still marginalized, defenseless, and disadvantaged. They are regarded as lacking economic, financial, and societal independence, indicating a gender discrepancy in African financial inclusion. Notwithstanding the fourth industrial revolution making advances in Africa, women are still struggling to attain digital financial inclusion in countries such as Kenya, Lesotho, Ghana, Namibia, South Africa, and Zimbabwe.

In the past few decades, African countries' ability to access monetary services has grown dramatically. Individuals and organizations are receiving a growing amount of financial services, notably credit. Modern technologies like mobile currency have, however, contributed to improving the availability of financial services, including savings and remittance options. Nevertheless, until recently, very little was known concerning the banking industry's reach—the extent to which vulnerable populations such as the poor, women, and young are barred from official banking firms in Africa and elsewhere. In recent years, technology improvements such as mobile money, innovation, and the development of new distribution channels such as "mobile branches" or banking services using third-party agents have played a significant role in increasing access to finance in Africa. Mobile money, for example, has had the most widespread success in Africa, where 14% of people reported using mobile money in the previous 12 months.

Although people who do not possess an official bank account may lack the assurance and trust that such a relationship provides, they regularly employ sophisticated strategies to control their

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everyday finances and make future plans. A growing number of Africans are resorting to new funding options readily accessible through mobile phone use. The fast growth of mobile money, commonly known as "branchless banking," has allowed millions of people who are ordinarily prohibited from using mainstream banking applications to perform monetary transactions cheaply, safely, and reliably. In Sub-Saharan Africa, 16% of individuals estimate utilizing mobile devices to pay invoices or send or receive funds across the preceding 12 months (in Africa, 14% of adults used digital payments in the prior 12 months) and about 44% of the adult population in the developing economy is unbanked [31, 32]. In Kenya, where M-Pesa was initially commercially available in 2007, 68% of adults utilize digital payments. Likewise, in Sudan, mobile money was utilized by more than 50% of individuals. And over 35% of adults in East Africa indicate utilizing mobile money. North Africa is one of the regions with low mobile money use (with the exception of Algeria, where 44% of people report using a mobile device to pay expenses or send or receive money), which might be attributed to governmental restrictions put on mobile money carriers and banks. Adults use mobile money at a rate of barely 3%. In all other locations, the proportion of adults utilizing mobile money is a little less than 6% [33].

In recent history, increasing digital banking services have caught the attention of various stakeholders (particularly politicians and scholars) as a method for achieving financial engagement. Particularly, digital payment channels, Internet-enabled remittance service systems, and the use of smartphone technology have all made banking firms more accessible. Promotion and utilization of digital services may have an impact on and shape everyday financial activities, which may play a role in a society's economic progress. Financial inclusion looks to be a potentially revolutionary force in many developing nations, with the ability to reduce poverty and provide a more financially inclusive society. Although financial inclusion is frequently seen as a critical component of development, Bangladesh continues to lag in ensuring financial institutions' access to a broader environment. The World Bank Group (WBG) designated Bangladesh as one of twenty-five nations where 73% of the world's economically disadvantaged people reside under the Universal Financial Access framework (UFA). A recent Financial Inclusion Insights (FII) study on Bangladesh found that 47% of the population is economically included via digital payments (17%), banking (5%), and non-bank financial firms (23%). It also finds that fewer than one-third of women (32%), compared to 56% of men, complete payment systems [34].

Moreover, the country has witnessed significant development in the MFS market, accounting for more than 8% of all registered mobile money accounts worldwide. MFS has proven and revolutionized digital finance in Bangladesh, which is the eighth largest payment country in the world. While all of these MFS are supplied by private and commercial banks, the government has launched an effort called Nagad in collaboration with the Bangladesh Post Office to deliver digital financial services. Furthermore, MFS providers play a critical role in minimizing the economic impact of the COVID-19 outbreak in Bangladesh. In April 2020, MFS operators opened approximately 0.3 million additional accounts to disperse the government's catalyst package for export-oriented companies. From March 20 to April 20, 2020, 163,924 people gave more than TK 50 million to various charity organizations via bKash. The COVID-19 pandemic has necessitated the closure of countless smaller companies, causing unprecedented disturbance to young businesses ranging from stores to road hawkers who use the MFS for everyday transactions and transfer funds to support their loved ones who reside in rural areas [34].

In West Africa, very few countries (such as Nigeria and Ghana) make significant progress in DFI. For instance, in Nigeria, the banked population increased steadily from 30 percent in 2010 to 32.5 percent, 36 percent, and 38.3 percent in 2012, 2014, and 2016. Between 2010 (6.3 percent) and 2016 (10.3 percent), the number of institutions, which includes microfinance banks, insurance firms, retirement funds, and related service providers, increased. However, the informal sector (NGOs and financial cooperatives) fell from 17.4 percent in 2010 to 9.8 percent in 2016. This demonstrated that, as anticipated in the strategy, more Nigerians are already accessing formal banking services [35].

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According to the ACI Worldwide Report (2022), in 2021, the Nigerian country reported 3.7 billion real-time transactions, placing it sixth in the world's most advanced real-time financial markets, below India, China, Brazil, Thailand, and South Korea. The broad use of innovative digital and real-time payment technologies enabled Nigeria to generate an additional US$3.2 billion worth of economic production in 2021, or 0.67% of the nation's GDP. Real-time transactions are expected to reach 8.8 billion per year by 2026, representing an 18.6% 5-year compound annual growth rate (CAGR). This would generate an additional US$6 billion in GDP in 2026, approximately 1.01% of the nation's GDP, putting Nigeria in fourth place among the world's nations reaping the full economic advantages of real-time transactions. Nigeria is quickly becoming a model for effective digital transformation of the economic growth of the country throughout Africa. Nigerians are now expecting better speeds, more simplicity, and current thinking from financial institutions, thanks to the COVID-19 epidemic. While cash is still commonly utilized, the trend toward digital and real-time financial transactions demonstrates government authorities' achievement in supporting rapid development in digital transparency, especially transactions. Moreover, according to the 2020 Access to Financial Institutions in Nigeria Survey, half (45%) of Nigeria's adult population uses banking institutions, while 33 percent uses informal banking services, including savings organizations, village organizations, and cooperatives. About 64.7% and 38.9% of people possess and utilize a mobile in Nigeria and Ghana, respectively.

According to Ref. [36] given the challenges caused by COVID-19, this accelerated push toward digitalization of the banking system may bring an unanticipated gain for digital banking inclusion. Digital banking (especially mobile money) has previously been demonstrated to be a critical component of financial inclusion in developing nations. Due to the outbreak, the quick surge in demand for fintech services by authorities, companies, and the general public is projected to enhance opportunities for digital channels to promote global financial inclusion. When provided responsibly and sustainably within a well-regulated framework, digital economic inclusion promotes growth and accelerates achievement toward the Sustainable Development Goals (SDGs). Nonetheless, the problem is that achieving the SDGs to eliminate penury throughout nations would require global effort and partnership, whether from developed or developing countries. Young people in industrialized nations have over 90% access to and use of critical financial products, including internet banking. Meanwhile, people who may be inadequate to access digital financial services, such as rural dwellers, the impoverished, and the elderly, will hinder progress toward digital financial inclusion and, as a result, may fall short of meeting the SDGs by 2030. Digital financial inclusion has the potential to be critical in minimizing the economic and social consequences of the current COVID-19 crisis. Increasing low-income households' and small businesses' financial access may also contribute to a more inclusive financial recovery. Such opportunities, therefore, ought not to be underestimated because the epidemic could exacerbate forgoing concerns about economic prohibition and introduce new hazards to the use of digital banking services.

Under the banner of "digital Bangladesh," the government of Bangladesh (GoB) has adopted digital policies such as native connectivity, human capital development, and the digitalization of public services. To speed the growth of electronic frameworks for the promotion of public and financial services, a variety of online enterprises have formed in collaboration with international aid operations (such as UNDP and USAID) governed by the Public-Private Partnership (PPP) framework. One of the notable government projects to assure financial services is the Digital Financial Service (DFS) Lab+. DFS Lab+ is a cooperative project launched by Bangladesh Bank (BB), the country's central bank, to create and increase digital financial inclusion. DFS Lab + provides various suggestions for digital financial inclusion, such as launching 'rural e-commerce' projects, strategies for behavior modification conversations and financial literacy, and reforming legal and regulatory frameworks. There are over fifty-seven financial institutions in the nation, with about 10,000 branches. However, because the majority of bank clients reside in cities, these banking systems are more valuable to people in cities than to individuals in rural regions. Mobile Financial Services (MFS) were developed in 2011 to guarantee that financial services reach the

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underprivileged in rural regions. Furthermore, the overall MFS market in Bangladesh was estimated to be worth 15 billion BDT, with bKash (owned by Brac Bank) holding 75% of the market share, followed by Rocket at 18% (Naima & Aziz, 2020).

It is hardly surprising that Kenya, where electronic banking initially gained traction, would have the highest score in contactless transactions. Kenya has begun the development of its second generation of official digital remittances standards, which builds on and aspires to expand the previous one. In 2014, new legislation encouraged interoperability and introduced a new type of digital operator of mobile networks. Both initiatives promote a more competitive industry in order to offset Safaricom's market dominance with its MPesa mobile payment service. Kenya, on the other hand, does poorly in terms of consumer protection, particularly market behavior regulation. It lacks specialized financial consumer rights legislation and regulation. However, authorities are striving to implement systematic interest rate disclosure standards that will allow customers to compare rates more readily across organizations.

Adoption of financial products revolves around time. Figure 1 shows the adoption of financial products by country. Adoption of a payment product is described as the possession of a private transactional account in which users may save, receive, and utilize money (for example, preloaded cards, digital payment accounts, and current accounts). Payment use is separated into two categories: payment inflows and payment outflows. Utilization of inflows relates to the usage of payment systems to receive wages, state assistance, and remittances in non-cash ways. The use of payments services for outflows relates to the usage of payments services for cashless expenditures (e.g., retail purchases, bill payments) and cashless transfers.

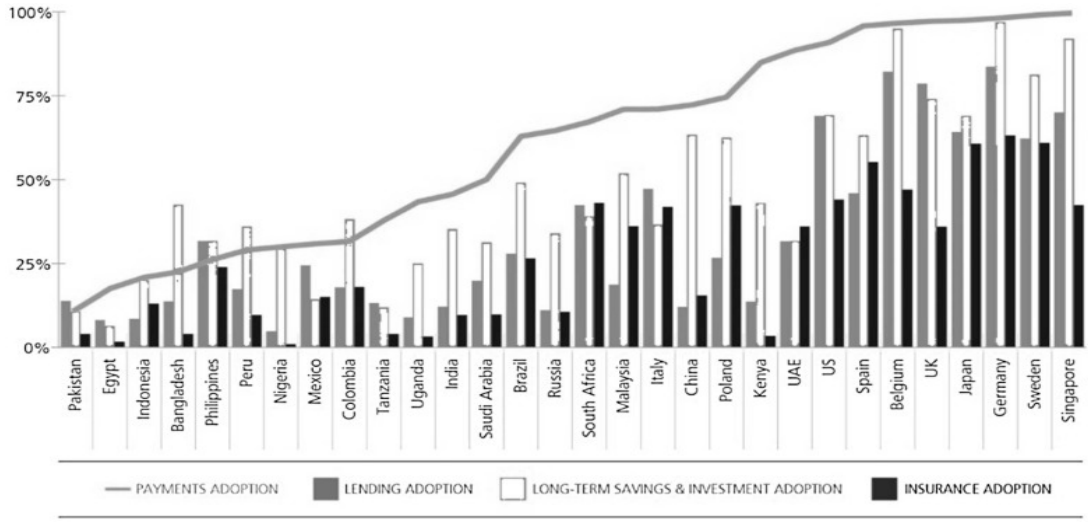

Figure 1. Adoption of financial products by country. Sources: Arun, & Kamath (2015).

Figure 1 shows that the performance of the developing economy is relatively low in terms of payment adoption, lending adoption, long-term adoption, and insurance adoption. This has implications for digital financial inclusion, especially for the unbanked. Payments' product penetration outpaces other product uptake in all nations, indicating that transactions are the best access point for promoting worldwide financial inclusion. For instance, several people in each of these nations only possess a payment product (for example, at least 40% of adults in Kenya and approximately 20% in the United States). Rising payment product acceptance promotes the acceptance of payment services as the initial financial instrument as product acceptance increases over time. Some nations with very minimal adoption rates, such as Peru, Colombia, and Bangladesh, have generated more headway in payments by offering a savings option via microfinance institutions (MFIs). However, even within these nations, the savings account is a fictitious payment instrument since it is often the sole account in which individuals save money and make regular withdrawals to make payments. Additionally, as these nations progress, they will be required to focus on actual payment solutions that permit non-cash payments, similar to other

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nations. While adopting a payment product is in the preliminary stage, some use is likely to follow. Obtaining the product is often motivated by a particular payment requirement (e.g., receiving a salary), and the consumer is likely to utilize the product to solve that need at the very least. The remittance product could also function as a gateway for users to embrace other items. Moreover, digital remittance transactions can reveal valuable information about consumers (for example, creditworthiness) and allow suppliers to offer additional goods. All those other items entail remittances and the utilization of effective digital payment channels in order to enhance the economics both for customers and suppliers. A greater association between remittance product usage (acceptance) and lending, prolonged savings and investment, and insurance product uptake across the nations studied supports this view.

Four stages of financial inclusion progression based on adoption are documented in Figure 2. Countries seem to move through four phases. Considering that remittances are the best way to get started with financial inclusion, the above four phases are defined by the extent of payment product usage. The first stage is the early days. This level marks the start of the process. Acceptance of a remittance product is lower than 50% in all nations, while consumption of other goods is often quite low (below 25%). Bangladesh, Peru, and Colombia are ahead of their rivals in terms of savings due to their MFI concentration. Second, transitioning—Payment's usage begins to break through at this level, with more than 50% perforation. In a number of countries, usage of one or even more products is gaining pace and starting to catch up to remittances adoption (for example, prolonged savings and investments in China, credit in Italy). Third, ready payments: At this level, remittances adoption has reached a crucial bulk adoption threshold (over 75%). Countries are anticipated to be prepared in terms of payments (for example, infrastructure) to permit elevated stages of some additional items. Developed levels differ per product and thus are determined by the previous levels of consumption in the thirty nations, which are described as more than 60% for loans, more than 70% for prolonged savings or investments, and more than 45% for insurance. This is normal performance, with loans progressing and investments and insurance reaching completion. Last and most advanced: remittance adoption is widespread at this point, and consumption of all other items is likely to progress. Sweden, Germany, and Belgium exhibit this predictable behavior, whereas Singapore and Japan are extremely nearby. The United Kingdom is ahead in financing and prolonged savings and investments but behind in insurance. This might be due to market-specific variables, which should be looked into further.

Furthermore, the reason for adoption should be stated explicitly. Product implementation is a critical first step toward monetary incorporation, but usage and the extent of utilization are equally crucial. As previously specified, the utilization of remittance products can, however, help people adopt and use additional new products. Nevertheless, adoption does not necessarily result in utilization, and not every individual who owns a payment product uses it for capital flows. Usage must be actively promoted. In all nations studied, the adult population that utilizes a remittances product to receive anything of their capital flows is lower than the number of adults that own a remittances product. The disparity varies by country.

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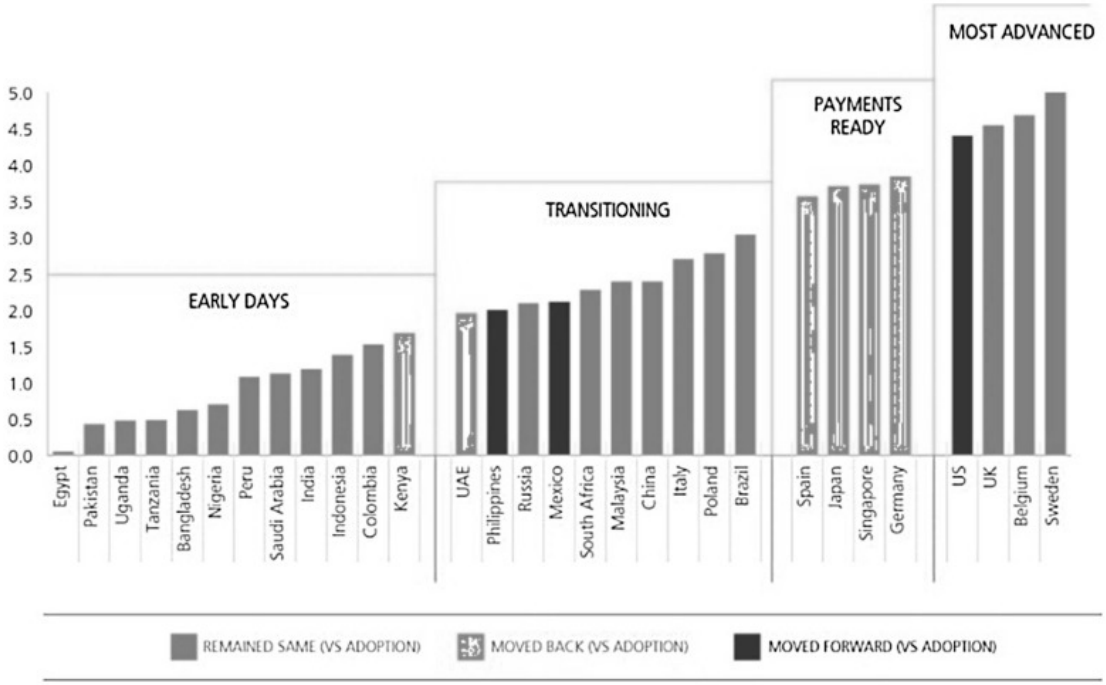

Figure 3. 4 Stages of financial inclusion progression based on adoption. Sources: Arun, & Kamath (2015).

Figure 3 shows the proportion of adults owning mobile money accounts, ATM usage, mobile banking, and Internet banking. The figure shows that Tanzania has the highest proportion of adults with accounts for mobile money (51% among the 11 SADC countries), followed by Zimbabwe (45%). Mauritius, South Africa, Malawi, Mozambique, Madagascar, the DRC, Swaziland, Zambia, and Botswana are the regions with the fewest people. Tanzania leads among these nations because 83% of its adult population who own smart phones have a mobile-money account. This appears to indicate that the advancement of mobile money services necessitates both the progress of mobile telecommunication infrastructure and the availability of mobile money services. Digital financial technology has significant benefits. The advancement of automation has drastically altered the simplicity with which monetary services can be obtained. The introduction of automated teller machines (ATMs) has streamlined 24-hour access to banking accounts, which has been extremely beneficial to consumers of financial products because clients continue to receive bank services after working hours, when banks are closed. Furthermore, banks have launched banking applications and internet banking in order to further change how customers manage their bank accounts. Mobile and online banking are the next generation of ATMs because they allow customers to reach their financial transactions at whatever time and from any location, providing them with both time and place liberty. Moreover, with digital finance, the consumer can obtain banking services even without requiring a bank account. In what could be considered a search for even more simple and quick forms to transact, the smartphone has significantly reinvented the ecosystem of banking delivery services in Africa with a special niche that has tried to complement consumers' preferences. As a result, when an innovative technology is introduced, it is critical to understand the level of customer satisfaction. In terms of consumer preference for utilizing Tanzanian mobile monetary services programs, 6 in 10 consumers were satisfied with electronic remittances in terms of cost, whereas around 4 in 10 customers assigned electronic remittance benefits to being overpriced or not delivering value for money [37].

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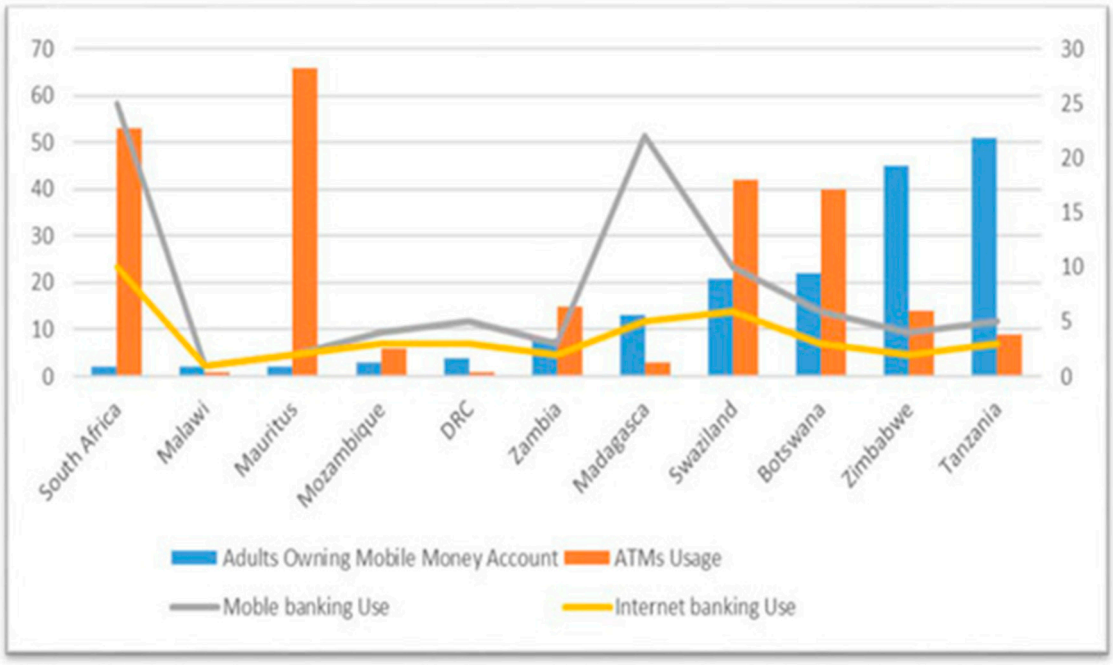

Figure 3. Mobile Money, ATMs Usage, Mobile banking, and Internet banking in 2013. Sources: Lotto, (2018).

4.2. What are the challenges to the inclusion of digital finance in Africa?

According to Ref. [38], despite the advantageous effects of financial inclusion, there are certain challenges and debates in the policymaking arena. These disputes are related to difficulties that policymakers face on a daily basis, and they also explain why various nations have diverse financial inclusion approaches. The discussion of the most important challenges is below.

(a) Lack of digital infrastructure and services: One major barrier to digital applications in the developing world, particularly in Africa, is a lack of digital infrastructure, including network connections to digital devices as well as software and applications. For example, it has been recorded that more than half of the world's population does not have access to a network [39].

Furthermore, unlike in the developed world, there is a significant barrier to establishing high-speed connections in areas where network connections have been expanded [40].

(b) The "inactive users of financial services' problem: The inactive user problem is one developing issue in policy debates about financial inclusion. When united, individuals become either engaged or inactive consumers of banking services in the official financial system. Even when enormous effort is expended to integrate the excluded into the financial sector, these individuals may opt to become passive consumers of financial goods and services after a period of time. People open formal accounts but refuse to obtain card payments; they do not even maintain deposits in their official accounts, and they do not conduct financial transactions from their official accounts. They only use their official accounts to earn income and do not use them to transfer money to others. These inactive consumers provide a new dilemma for policymakers since the financial inactivity they generate diminishes the amount of financial transactions, income to financial institutions, and tax revenue to the government, all of which have an impact on economic production.

(c) Lack of cooperation by banks: Another concern is that financial firms may refuse to collaborate with policymakers aiming to promote financial inclusion using banks. Before engaging in financial inclusion programs, banks will often do internal cost-benefit studies. Banks may be hesitant to engage in financial inclusion programs if the expense outweighs the benefit, particularly if the government is reluctant to pay the cost to banks. In nations with both private and state-owned banks, private-sector banks may be hesitant to engage in financial inclusion programs because they

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believe the government would utilize its own public-sector banks to fulfill its financial inclusion goals. Although bank regulators oblige all banks to engage in the country's financial inclusion program, many banks tend to utilize government cash and enable the use of their banking facilities to meet the program's objectives. In other circumstances, private-sector banks may only engage in the public economic inclusion program during the first two years before withdrawing gradually owing to mounting expenses and sustainability difficulties, similar to the scenario in India. In India, the government established the Pradhan Mantri Jan-Dhan Yojana (PMJDY) as the country's financial inclusivity framework. Commercial and government banks had a great number of Jan Dhan account recipients within the first two years, but during the third and fourth years, the number of Jan Dhan account recipients decreased dramatically for private-sector banks.

(d) Difficulty in identifying the excluded population: When excluded individuals of the community are not recognized, the identification challenge of financial inclusion emerges. Even though researchers do not have complete information about which members of the general public are rejected from the formal financial sector, it can be challenging to precisely identify the excluded population and even harder to depend on the results of studies for which the methodologies and hypotheses are unknown. Financial inclusion studies are frequently confounded by the procedures, assumptions, methodologies, and other unobservable characteristics used to determine the 'excluded members of society' in the sample size of the many studies.

(e) Lack of coordinated efforts (public-private partnership): In most emerging countries, particularly in Africa, there is a significant lack of coordinated effort by government, business, research institutions, and civil society groups to promote social and economic inclusion and equality. For example, when internet service providers (ISPs) enable greater access to the internet for many people but do not provide relevant government agencies with oversight of these service providers' activities, the result can be greater control by the ISPs rather than digital empowerment and inclusion. Similarly, the absence of checks and balances among enterprises that benefit from economies of scale may result in a market monopoly that is often characterized by inefficiency owing to a lack of competition [40].

(f) Lack of digital skills: Lack of digital literacy in Africa makes it difficult for people to effectively use modern technologies and provide value in the ICT or internet space. Physical internet connectivity is a must, but Shenglin et al. (2017) argue that one of the biggest obstacles to fully participating in the digital economy is a lack of skills. For instance, fewer than half of internet users in Africa have the most recent skills necessary to keep up with the rapidly evolving digital landscape. It is important to note that it is challenging to fully use digital technology without the right education and skill development.

Implications for Policy Consideration

The study's conclusions have important policy implications for numerous governments, legislators, and financial sector players, as well as other developmental institutions and organizations that include the World Bank, African Development Bank, and United Nations Development Programme. Over the last several years, the international policy group has increasingly adopted accessibility to financial benefits as a goal for the finance industry and overall economic growth. The G-20 originally committed to promoting a monetary inclusion strategy around 2008, and the Global Partnership for Financial Inclusion was formed in 2010 to advance this aim. The establishment of the Alliance for Financial Inclusion (AFI) in 2008 as a mutual exchange organization for authorities from emerging economies The AFI established the Maya Declaration procedure, by virtue of which countries make explicit state pledges to financial intermediation. Several countries throughout the world have established economic inclusion programs as a consequence of these international events as well as other local reasons.

Furthermore, the availability of extensive cell phone service and smart phone access suggests that a growing number of financially banned individuals may be able to obtain access to financial services online. Given this, ongoing initiatives to improve ICT infrastructure effectiveness, dependability, and security might go a long way toward increasing financial inclusion in the

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African region. With all this, the World Bank and African Development Bank may provide monetary and technical assistance to the country's numerous financial firms in adapting and adopting these computerized methods of making financial services more accessible and inexpensive to all. This is also expected to increase the amount of financial inclusion in the district, improving wellbeing. Overall, while efforts are made to enhance access to banking services inside the African region, management of financial organizations should pay close attention to overhead expenses to ensure that financial institution earnings are not significantly impacted [41].

Some financial innovations might be used in the fiscal sector to enhance the effectiveness of the state-citizen relationship. Effective revenue collection and the provision of public services and social expenditures have long been difficulties in many African countries. Estimates imply that digitizing government payments might generate around 1% of GDP for most nations. If successfully enforced, there are positive benefits in tax system and compliance, social program targeting, and public monetary management from more widely leveraging current transaction data and merging it with private details. Smart contracts, which are meant to ease, monitor, or enforce contract negotiations or performance, may potentially improve public procurement. As with present fiscal operations, efficient systems will need safeguards to preserve privacy while minimizing the creation of new avenues for fraud and evasion. Additionally, according to [42], digital currencies, if widely embraced, may have far-reaching ramifications for the financial industry. Some digital currencies and other kinds of digital money have been proposed to potentially replace existing currencies. The three main economic functions of money have been frequently mentioned in the economic literature: (1) medium of exchange; (2) unit of account; and (3) store of value. Private-sector cryptocurrency transactions differ in numerous ways and, for the time being, struggle to completely fulfill monetary functions, owing in part to volatile prices. Furthermore, they offer significant dangers as vehicles for laundering money, terrorism funding, tax avoidance, fraud, and other bank fraud. Contrary to the private sector issuing a digital currency, state production would meet the three monetary functions and might further assist public policy objectives, including financial inclusion, privacy, and consumer safety, while also providing a degree of anonymity in transactions. Even so, there are negatives to a digital currency to consider, such as dangers to financial solvency and stability, along with worries from central banks about the ramifications of widespread use of digital currencies and how it may affect monetary policy execution.

FinTech requires investment in both hard and soft infrastructure to create and serve a fast-increasing digital generation. Physical infrastructure refers to the requirement for enterprises to invest in internet connections and electricity in order to benefit from technological advancements. Soft infrastructure refers to the requirement for legislation to promote a good corporate climate as well as talent investment. Allocating resources for these projects would require many trade-offs for policymakers in sub-Saharan Africa. Predictions for physical infrastructure investment are already enormous and demanding, but growing levels of government debt limit the possibility of public funding. Addressing the country's substantial existing hard infrastructure deficit would necessitate thinking about how to collaborate with the private sector to offer finance or service delivery for the suitable provision of energy and internet access. Additionally, soft infrastructure investment must manage the perpetual competition between incredibly rapid innovation and slower-moving policy. There is a trade-off between stimulating, or at least encouraging, fast development, which has significant potential economic rewards, and making the effort to detect and control the risks that come with it using supervision and regulation to maintain financial integrity and stability.

Furthermore, the extraordinary adoption of mobile payment services in the African region, as well as the technology's capacity to expand into an extensively employed means of transaction, is generating worries about the implications for the implementation of monetary policy. Various African central banks use traditional reserve money schemes to manage inflation through monetary objectives. In these nations, assuming the rate of growth of the multiplier effect as well as the speed of movement are constant, targeting saved money pegs inflation (or at least predicts it). Also, it is unclear how electronic banking affects the money multiplier and financial velocity. In theory, any digital payment balances are fully supported by funds deposited in a financial institution by the

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mobile financial service provider; therefore, no additional money is produced. Financial institutions can utilize this extra cash to boost lending, which creates new money, but this is not different from how banks handle deposits [43]. Mobile money services can also assist the financially excluded population in gaining access to certain other financial services, resulting in increased financial inclusion and a beneficial influence on the money multiplier.

Ref. [44] examined the influence of M-Pesa on the performance of East African monetary aggregates, concluding that the monetary policy implications of digital payments have thus far been minimal in Kenya, Tanzania, and Uganda. They have demonstrated that M-Pesa velocity increases over time, which indicates that users are increasingly likely to utilize the platform as a transactional vehicle. Nonetheless, they did also propose that advancements and innovations in this domain might accelerate the expansion of mobile money to the point where it has monetary policy consequences. It was additionally decided that mobile money had no impact on the implementation of monetary policy in Kenya since the country's (rapid) financial development had not generated fundamental adjustments in the prolonged money-demand relationship. Furthermore, [45] discovered a link between the volatility of money demand in Tanzania following the launch of mobile money and the money's velocity. Ref. [46] discovered only preliminary support that mobile money may impose some decreasing inflationary pressure in Uganda.

Moreover, according [42], an investigation was conducted concerning the determination of whether or not mobile money affects the monetary policy surrounding the main East African economies, utilizing a powerful stochastic general equilibrium approach. Despite the fact that mobile money challenges the traditional money targeting methodologies employed by various national banks throughout the region, these authors discovered that the impact of smartphone money is anticipated to be favorable and enhance the effectiveness of monetary policy execution.

6. Conclusion

Digital financial inclusion promises to be an effective tool for addressing the socioeconomic ills, providing digital financial services to the unbanked (marginalised members of the society) and propelling economic development. Given the limited studies and incomplete understanding on the subject for this study seeks to provide deeper understanding of the policies and practices adopted by the developing economies on the digital financial drive and barriers to digital financial inclusion so as to identify cutting-edge interventions for redress. Our findings reveal that about 44% of the adult population in developing countries does not access financial services, with only a few that have made significant progress and gains through policy and practice, such as mobile financial services, mobile money interoperability, native connectivity, human capital development, and digitalization of public services, as well as digital financial inclusion. Findings also reveal challenges such as a lack of pragmatic digital policy on the part of government, infrastructure challenges, the "inactive users of financial services' problem, a lack of cooperation by banks, difficulty in identifying the excluded population, a lack of effective public-private partnership, poor consumer protection, and low digital financial literacy as barriers to digital financial inclusion. This has the implication of exacerbating the existing socioeconomic ills of the majority of the excluded groups. Decisive and urgent policy is therefore very critical to arrest this financial exclusion phenomenon especially in the marginalised groups so as to foster holistic development. Policies to address the above challenges, including infrastructure provision, digital training, and universal access to digital financial services through public-private partnerships, are recommended. Additionally, mobile network operators and commercial banks should be more creative and introduce tailored digital financial services, such as mobile credit, mobile insurance products, and digital saving wallets, beyond mobile money transfers. This will promote the financial sector's adoption of digital financial services by the underprivileged and disenfranchised.

Limitation

The analysis in this paper focuses on providing a deeper understanding of the policies and practices adopted by the developing economies on the digital financial drive and barriers to digital

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financial inclusion so as to identify cutting-edge interventions for redress. Doing so, the authors acknowledge the unavailability of data on each developing country to do a case-by-case analysis. Also, due to the qualitative nature of the topic, no rigorous statistical analysis was done. However, the authors ensured proper scrutiny of the extracted data and information in the study and provided an objective assessment in line with the purpose of the study.

Ethical considerations: This article followed all ethical standards for research without direct contact with human or animal subjects.

Research Data Policy and Data Availability Statements: The authors confirm that the analysis in this paper is based on secondary data, which is cited under each figure, and the full source is provided in the reference list in the manuscript.

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