The pyrrhic victory of FinTech and its implications for achieving the Sustainable Development Goals: evidence from fieldwork in rural Zambia

Sydney Chikalipah

Department of Finance Tax, Faculty of Commerce, University of Cape Town, Cape Town, South Africa

Abstract

Purpose – This study investigates the possible effect of mobile money services, which forms part of FinTech, in achieving the Sustainable Development Goals (SDGs).

Design/methodology/approach – This study uses field data from the Chongwe district of Zambia. The data were collected in 2019.

Findings – The findings strongly suggest that (1) the factors that hinder access to credit and savings by the poor do not simply recede following the adoption of mobile money services and (2) that mobile money is not a silver bullet of ending financial exclusion but merely a tool which contributes to other financial inclusion strategies.

Practical implications – This study argues that mobile money is winning the battle but losing the war – implying that the service is mainly used to transfer funds (OTC transactions) among users.

Originality/value – This is the first study to have been conducted in Zambia to assess the possible contributing effect of FinTech (mobile money) on SDGs.

Keywords Financial inclusion, FinTech, Mobile money, Sustainable development goals, Zambia

Paper type Research paper

1. Introduction

Given the dispersed population in rural areas in Zambia, there are inadequate traditional banking services for the poor. Consequently, cash continues to be the preferred mode of transaction among Zambians. Geographical expansion of telecommunication services and the near-universal availability of mobile phones have significantly improved the access to financial services by the underserved poor people who are using the mobile money services, and they are predominantly used by those in the remote areas of Zambia. There are some main reasons why the unbanked are excluded from financial services in Zambia, which is either a voluntary exclusion or an involuntary exclusion: (1) the voluntary reasons have included religious causes, lack of trust, and where there is no need to use the financial services; and (2) the involuntary reasons comprise excessive transaction fees, lack of funds,

lack of financial services located in the vicinity, illiteracy, lack of documentation and a lack of financial identity (Chikalipah, 2017: Oxford Economics, 2019). A growing constellation of empirical studies provide evidence that indicates access to financial services, including mobile money services, has a significant role in meeting Sustainable Development Goals (Beck *et al.*, 2007; Ouma *et al.*, 2017; Asongu and Asongu, 2018; Kim *et al.*, 2018; Oxford Economics, 2019). However, we can ask the question, is mobile money really contributing to meet the United Nations Sustainable Development Goals (SDGs)?

From 2007, Kenya's M-Pesa system ("*M*" is for mobile, and "*pesa*" is Swahili for money) through Safaricom, a subsidiary of Vodafone, has brought mobile money to international prominence. Mobile money refers to financial services that can be accessed and used over the mobile phone. The service is predominately used by the unbanked poor people who are considered unprofitable by commercial banks (Villasenor, 2013). An individual with a mobile phone can set-up a mobile money account with the mobile network operator (MNO) and deposit cash in exchange for electronic money [1]. The electronic money can be saved, transferred to other users or withdrawn. Mobile money is part of a growing disruptive technology called FinTech – i.e. financial technology. Fintech is the application of technology to financial services. The mobile money technology helps overcome the institutional infrastructure deficiencies and operational cost structure of running brick-and-mortar traditional banks (Ferrata, 2019). In addition to that, mobile money users are not required to maintain a minimum balance or pay the monthly charges for maintaining a bank account, which is typical of conventional bank accounts. At the macro level, mobile money promotes cashless payments, which reduces the overdependency on cash and also allows the tracking of transactions (Lucini and Sharma, 2016).

Access to financial services is critical in enhancing inclusive socio-economic development and improving the well-being of the low-income households of Africa. Accumulating empirical evidence indicates that improved access to financial services, like saving, credit and payment facilities, can reduce poverty among the poor (Donovan, 2012). Over the last decade, the mobile money industry has proved to be a useful service in fighting financial exclusion in Africa and in Zambia in particular (Villasenor, 2013). The advent of mobile money has significantly improved access to financial services mainly by facilitating the transfer of funds between users. Nevertheless, millions of the adult population in Zambia still have no access to formal financial services, especially access to credit and savings facilities. This is mainly due to the fact that financial products and services offered by commercial banks in Zambia are not designed to be accessed by the poor. Despite that, Zambia is committed to the Maya Declaration, which ensures financial inclusion for those previously excluded. In addition, the national financial inclusion strategy for Zambia is to increase financial inclusion from 38% in 2017 to about 70% by 2022.

Currently, Sub-Saharan Africa (SSA) is the global leader in the use of mobile money. At the end of 2019, there were over 130 mobile money services with more than 145 million (90-day) active registered accounts (Pasti, 2019). Relatedly, over 60% of the adult population in SSA have a mobile money account. Zambia, in particular at the end of 2019, had over 4.5m mobile money accounts that were active against the total of approximately 17m registered accounts (UNCDF, 2019) [2]. The 4.5m active mobile money account represents about 24% of the adult population. The growing number of inactive accounts is mainly due to the astronomical increase in the number of active agents from about 13,000 in 2016 to over 48,000 in 2019. There is an agent per every 200 adults in Zambia. This upsurge in the number of mobile money agents demonstrates that users prefer sending money via agents as opposed to their own mobile money accounts (UNCDF, 2019). Figure 1(a) and 1(b) illustrate the growth in the number of mobile money transactions and transaction values from 2012 to 2019, respectively. Furthermore, by the end of 2019, over 550m mobile money transactions were processed, which generated over USD 3.5bn.

The motivations for undertaking this empirical scrutiny are threefold. First, in Zambia, the number of inactive mobile money accounts is growing, and this significantly affects the

attainment of SDGs. Second, Zambia is one of the countries with a rapidly growing population averaging about 3% per annum and currently is growing faster than the gross domestic product (GDP) growth rate. The long-term implication is that poverty is likely to persist, and will continue to impede any meaningful progress in meeting SDGs and reducing financial exclusion. Third, while considering the fact that the number of commercial banks in Zambia are scaling-down on branch networks, and for that reason, we view mobile money services as playing a crucial role in extending the financial services to the poor in Zambia, especially those who reside in rural peripherals.

The remainder of the paper is structured as follows. The next section highlights the channels in which FinTech and financial inclusion could contribute to achieving the UN SDGs. Thereafter, Section III reviews the empirical literature that focussed on financial inclusion, FinTech and SDGs. Section IV outlines the study area and data collection. In Section V the empirical results are presented and discussed. Section VI offers a summary and concluding remarks for this study.

2. Mobile money (Fintech) and SDGs

Evidently, the application of technologies in financial services is not new, but the advent of mobile money services represents a paradigm shift. Financial inclusion and FinTech are not in themselves the objectives of the UN SDGs. Yet, when we delve into the details of each of the targets of the SDGs, it is apparent that financial inclusion and FinTech play a significant role in achieving some SDGs. Table 1 shows how financial inclusion using FinTech contributes to achieving the SDGs. Markedly, if financial markets can provide payment services, affordable financing, insurance services and savings products to the people, that could robustly contribute to achieving *nearly* all of the 17 SDGs. The advent of technology in finance makes it evident that FinTech is the most ideal financial intermediary in extending financial inclusion to the people in Africa.

From Table 1, it is plausible to argue that financial inclusion plays a fundamental role in achieving SDGs. Particularly, the use of mobile money services is perhaps the most
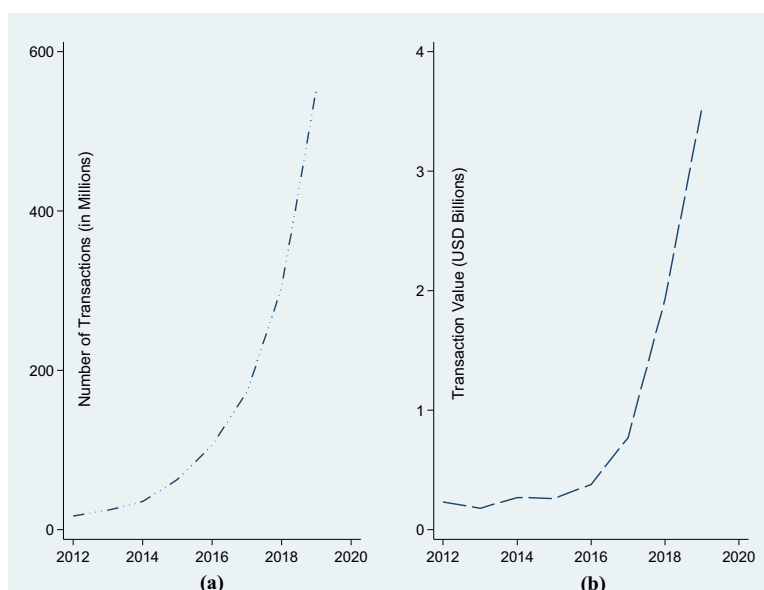
Figure 1.
(a) and (b) illustrate the growth in the number of mobile money transactions and transaction values from 2012 to 2019, respectively. The data used for this analysis are taken from the Bank of Zambia (BoZ). The exchange rates used to convert the monetary figures from Kwacha (ZMW) to the US dollar (USD) are the average forex rates for each respective year. The analysis is restricted for the period covering 2012 to 2019, owing to data availability from the Central Bank of Zambia (BoZ)

SDGs	How FinTech can contribute to SDGs
1. No poverty	Allowing everyone to have access to financial services, including microfinance
2. Zero hunger	Enhancing agricultural productivity and provision of loans to small-scale food producers
3. Good health and well-being	Access to health microinsurance and increase financing for healthcare
4. Quality education	Provide saving services for school fees and increase financing for education
5. Gender equality	Granting women equal rights and access to financial services
8. Decent work and economic growth	Supporting financial institutions to extend financial services and business opportunities
9. Industry innovation and infrastructure	Providing financing for infrastructure development and microhousing loans
10. Reduced inequalities	Increase the funding of education and savings, which provide the best opportunity for the poor
16. Peace, justice and strong institutions	Strengthen peace and reduce illicit financial flows, corruption and bribery
17. Partnership for the goals	International support to developing countries and allow public sector participation

Table 1.
How financial inclusion and FinTech contributes to the UN SDGs

Note(s): Table 1 links the role of financial inclusion and financial technology (FinTech) in achieving the 17 United Nations Sustainable Development Goals (UNSDGs)

cost-effective instrument that can significantly contribute to the journey of achieving SDGs. International organisations are researching the role of FinTech and digital financial transformation in supporting economic development, in at least developed countries. Such organisations include (1) United Nations Secretary-General's Taskforce on Digital Financing of the SDGs; (2) the Alliance for Financial Inclusion; (3) the Financial initiative by European Investment Bank; and (4) the World Bank and Consultative Group to Assist the poor (CGAP) [3].

The real opportunity that FinTech affords is developing an entire infrastructure for a digital financial ecosystem that is underpinning the SDGs and financial inclusion plus financial stability and integrity. According to Zetzsche *et al.* (2019; Ch. 10), the four pillars of digital financial infrastructure are

(1) Pillar I: Digital ID and eKYC for identification and a simplified account opening procedure (refer to Box 1).

(2) Pillar II: Open electronic payment system, infrastructure and an enabling regulatory and policy environment that facilitates the digital flow of funds from traditional financial intermediaries and new market entrants.

(3) Pillar III: Account opening initiatives and electronic provision of government services, providing vital tools to access services and save.

(4) Pillar IV: Design of a digital financial market infrastructure and a system that supports value-added financial services and to deepen access, usage and stability.

3. Related empirical literature

Like any other field of study, there is a lack of empirical literature in Zambia that is focussed on (1) the nexus between FinTech and financial inclusion; and (2) the relationship between financial inclusion, SDGs and FinTech. Thus, in this section, this study will rely on studies from other African countries. We hold the view that the findings from these studies are likely to be the same, considering that most African countries have similar economies, in terms of development.

Box 1. The nexus between financial identity-as-a-service (FiDaaS) and financial inclusion

In the last decade, mobile phones have become affordable and that has helped digital financial service providers leapfrog the financial infrastructure that typify more technologically advanced economies and avoid the huge capital costs that are historically associated with accessing new customers. As previously indicated in Section I, mobile network operators (MNOs) have swiftly expanded the mobile money services to the poor, who could not have managed to access the traditional banking services. Importantly, this has contributed to financial inclusion and achieving the SDGs.

In many countries, and Zambia in particular, a new approach has emerged that leverage this digital network of mobile money users. The new technological solution is called "Financial Identity-as-a-Service (FiDaaS), which exploits the financial information gap in the mobile money industry. The mobile money platforms use the customers held data to create their unique financial identities and credit scores. This information about customers is modelled and a customer profile is created, which is used to provide a low-risk microloan. Consequently, mobile money users who service their microloan promptly can be rewarded with higher microloans. In a nutshell, via borrowing and repaying the microloans, customers build an evidence-based credit score and financial identity.

In Zambia, the FiDaaS and credit provision via a mobile money account are a common phenomenon, and the services are provided by all MNOs: Airtel, MTN and Zamtel. A report by Oxford Economics and San Francisco-based FinTech, Juvo, argued that MNOs could solve the financial identity problem and predicted that developing FiDaaS could add about USD 250bn to the global GDP (Zetzsche *et al.*, 2019; Ch. 10).

Source(s): Zetzsche *et al.* (2019; Ch. 10)

To begin with, a study conducted in Kenya by Jack and Suri (2014) found that the total consumption of Kenyan mobile money users is unaffected by a range of negative income shocks, while for those who do not use mobile money, their consumption drops by 7%. Equally, a randomised controlled trial (RCT) welfare study by Aker *et al.* (2016) finds improvements in household welfare, after a drought, for the recipients of cash transfers through mobile money accounts in Niger, one of the poorest countries. Moreover, Atkinson (2015) argued that economic inequality is often aligned with differences in access to, use of, or knowledge of information and communication technologies.

In times of natural calamities, Lucini and Sharma (2016) found that mobile technology can securely provide vital assistance to displaced populations through remote digital cash transfers, perceived as an often more rapid and effective method of providing help. Similarly, mobile money users have experienced a significant increase in their risk sharing and resilience to shocks in the short-run, and the use of mobile money took individuals out of poverty in the long-term (Jack and Suri, 2014; Suri and Jack, 2016). In addition, Jack and Suri (2014) claimed that M-pesa users in Kenya were found to use their mobile bank account to save money. By stark contrast, two RCT studies in Mozambique and Afghanistan, by Batista and Vicente (2016) and Blumenstock *et al.* (2015), found evidence that suggested that saving did not increase though the saving method was switched to mobile money.

Noticeably, Suri and Jack (2016) documented evidence that showed that in a country with low financial inclusion that mobile money accounts are found to be more popular than traditional bank accounts. The underlying reasons for this phenomenon are mainly due to lower transaction fees and the greater accessibility of mobile money agents (Villasenor, 2013). In relation to SDGs, Demirguc-Kunt, Klapper and Singer (2017) argued that financial inclusion contributes to reducing poverty, inequality, impact from catastrophic shocks and managing financial risks. Additionally, the study concluded that financial inclusion enables households to invest in businesses, and education, as well as improving their health-seeking behaviour.

4. Study area and data collection

The empirical data for this study were collected in the first half of 2019 from the rural peripherals of the Chongwe district. Markedly, the Chongwe district is located in the eastern part of the Lusaka province of Zambia (see Figure 2). It is a rural district with most of the people living in the villages. According to UN population projection reports, it is estimated that the population of Zambia in 2019 was 18.5m and in Chongwe it was about 200,000. Of the total population, 14% live in Chongwe town, and 86% of people reside in villages in mud huts with grass roofs. Since 1970s, the annual population growth rate has averaged about 3%. Like any other town in Zambia, almost half of the population in Chongwe is below the age of 15. Poverty rates in Chongwe have remained elevated at around 80%. Hunger and poverty are exacerbated by high unemployment, relatively high HIV/AIDS, coupled with high living standards.

Agriculture is the main economic activity of the district and the major activities include crop production, horticultural production and livestock production. Over 75% of household incomes in the district are derived from agriculture-related activities, either from their own production or through the sale of agriculture produce and by-products. Major crops include maize, cotton, groundnuts and sunflower. Similar to the rural towns of Zambia, the levels of poverty in Chongwe are determined by the rainfall pattern. The biggest challenge that they face, and which is a big threat to their livelihood, is the change in the weather pattern due to the impact of climate change.

Chongwe was chosen for this study due to its proximity to Lusaka, though economically it is lagging behind. Empirical data for this study were collected through a semistructured questionnaire by trained enumerators. The interviews were face to face with mobile money users who were accessing the mobile money booths. The questionnaire included key questions such as (1) the age of the mobile money user; (2) how long they have been using the mobile money service; (3) the benefits and drawbacks of using the mobile money service; (4) income; (5) their average mobile money account balance; (6) common transactions with the mobile money service and (7) whether the user has a mobile money account or not etc. The final sample comprises of 1,608 mobile money users with completely answered questionnaires, and this data came from a total of 18 mobile money booths. Of the total respondents, 65% were males and 35% were females. Children who were sent by their parents to transact using the mobile money services were excluded from the survey. The data were analysed using STATA version 14.
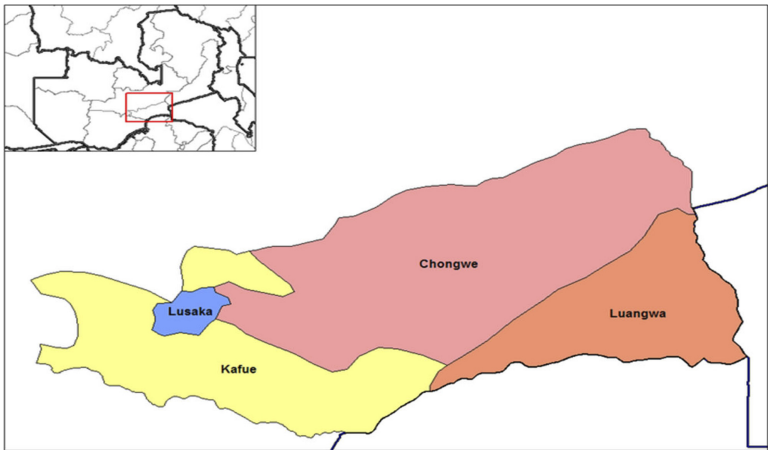

Figure 2.
Shows the map of Zambia showing the location of the Chongwe district

Table 2 reports the descriptive statistics of some of the variables, which do not form part of the analysis in the next section (i.e. the section discussing the empirical results). From Table 2, the mobile money service is primarily used by people below the age of 40. The underlying demographic patterns of Zambia could explain this – a significant part of the population is below the age of 50. The study area is ravished in poverty, hence the median income being USD 85 with the mean being around USD 127. The majority of people in rural Chongwe depend on farming as a source of livelihood, hence the low levels of income in the area and the transaction amounts are small. Most people sampled for this study started using a mobile money service in the last two years, which ties in with the surges in the use of mobile money services since 2016.

5. Discussion of empirical results

The study analysis is decidedly empirical and employs the methodical approach. The starting point of the empirical discussion is to first look at the factors that hinder access to financial services by the poor. As earlier mentioned in Section 1, there exists myriad factors that hinder the poor from accessing formal financial services. Among the main factors include, among others, (1) lack of funds, (2) illiteracy, (3) lack of documentation, (4) disproportionate banking fees and (5) lack of financial institutions in the locality. The advent of the mobile money industry has, to a larger extent, overcome some of these challenges. Specifically, the mobile money industry has (1) lowered the cost of money transfers and (2) significantly extended financial services to rural peripherals, which often have low population density and poor infrastructure (Zetzsche et al., 2019; Ch.10).

Table 3 reports the mobile money transfer fee (charges) based on the transaction amount as at the end of 2019, among the two leading mobile money operators in Zambia. The maximum allowed daily amount in Zambia is K10,000, which is equivalent to USD 666.67. There are no charges (fees) for depositing funds in the mobile money account. Thus, the transfer fees shown in Table 3 are for cash-out withdrawals or over-the-counter (OTC) transactions using the agents account to transact them. In addition, the fee is payable by the end customer. Relatedly, cross-network transfers fees are almost double those that are shown in Table 3. Most crucially, at the moment in Zambia, there is no interest on the credit balance of mobile money accounts. Mathematically, if it is assumed that the minimum transfer amount in Table 3 is USD 10, then the transfer fees as a percentage of the amount sent are below 4%. Yet, that is slightly higher in comparison to other African countries where the transfer fees range between 1 and 3.5% (Chikalipah and Makina, 2019).

From Figure 3, it is evident that the purchase of airtime top-ups dominated the industry's transactions with 64% of mobile money activities. The airtime top-ups are phone credit for making calls. The cash-in deposit and cash-out withdrawals represented 29% of all mobile

Variable	Mean	SD	Min	$p25$	Median ($p50$)	$p75$	Max
Age of MM users (years)	37.29	19.34	16.00	22.50	27.00	55.50	72
Income (USD)	126.50	163.34	20.00	42.00	85.00	121	800
Transaction amount (USD)	62.65	158.1	1.00	4.09	9.50	16.0	666
Mobile usage (years)	1.72	1.44	0.20	0.60	1.00	3.00	5.00

Note(s): Table 2 presents the summary statistics of some variables, which do not form part of the analysis in the discussion section of this article. The data are based on the 2019 survey conducted in the rural district of the Chongwe district of Zambia. The total observations (N) for this analysis are 1,608. The reported monetary amounts were converted to US dollar (USD) using the K15 to 1 USD as the exchange rate. The abbreviation MM signifies mobile money

Table 2.
Descriptive statistics

| Transaction amount (USD) | Transfer fees in USD | |
	MTN mobile money	Airtel mobile money
0.33–10.00	0.17	0.17
10.00–20.00	0.33	0.33
20.00–33.30	0.67	0.67
33.33–66.67	1.33	1.33
66.67–200.00	2.00	2.00
200.00–333.33	3.33	3.33
333.33–666.67	6.67	4.67

336

Table 3.
Mobile money transfer fees among the two leading operators (MTN and Airtel)

Note(s): Table 3 reports the mobile money transfer fees among the two leading operators in Zambia. The reported amounts were converted to US dollars (USD) using the K15 to 1 USD as the exchange rate. The maximum allowed daily transfer amount in Zambia is USD 666.67 and in the local currency, Kwacha (ZMW), that translates to K10,000. The data used in this table was collected from MTN and Airtel head offices

Figure 3.
This plots the usage of mobile money services in the rural Chongwe district of Zambia in 2019. The acronym P2M denotes the person-to-merchant payment. The number of mobile money users sampled for this analysis was 1,608
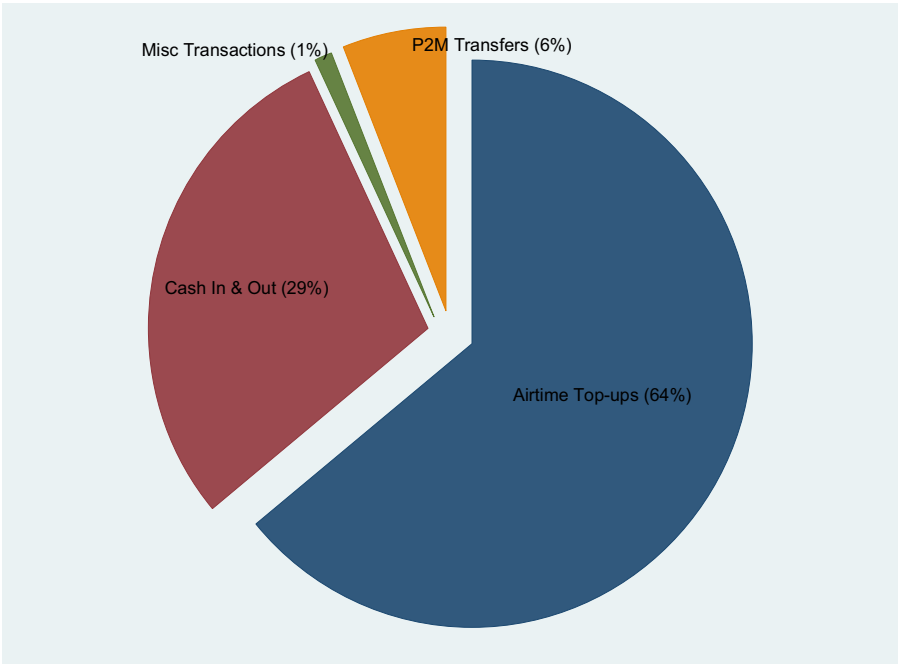
money transactions. This also subsumes the person-to-person (P2P) transfers. It is worth noting that over one-third of the individuals sampled for this study used the agent's accounts to make funds transfers. The person-to-merchant (P2M) transfers represented 6% of all mobile money transactions. The P2M transactions include among others (1) household bill payments – electricity, water and payment for TV subscriptions and (2) microloan repayments. Finally, the remaining 1% of transactions represented other miscellaneous transactions.

Table 4 reports the average monthly balance of mobile money account holders. It can be seen that over 72% of respondents had less than USD 2, as their monthly account balance in the last six months. This re-enforces the argument that mobile money account users are

mainly using the service for funds transfer and not as a saving instrument. Moreover, the rapid increase in the number of mobile money booths, managed by agents, also supports this reasoning. Given the fact that mobile money users are exploiting the OTC services, and when these findings are extrapolated to the entire country, it raises a concern about Zambia's ability to meet the SDGs. It has always been thought that FinTech can play a crucial role in achieving the 17 SDGs via financial inclusion. Financial inclusion promotes socio-economic development, which is achieved through access to saving, credit and payment facilities among the poor. Finally, the use of a mobile money service predominantly for funds transfer undermines the FiDaaS, which is used by the mobile money service provider to extend credit facilitates to users (please refer to Box 1 for information about the FiDaaS).

Table 5 lists the benefits and drawbacks of mobile money users in the rural part of the Chongwe district of Zambia. Based on the cumulative scores, which are easy access to money, availability of agents in the proximity, and the convenience of transacting using mobile money, these are the main benefits experienced by mobile money users. On the other hand, low floats by agents and high transaction costs are the two main drawbacks for mobile money users. In order to manage the agents' floats, the leading mobile money operators, which are MTN and Airtel, have partnered with commercial banks to enable agents purchase floats. Among these banks are included Atlas Mara Bank, Barclays Bank (now Absa) and Zambia National Commercial Bank (ZANACO).

Average amount (USD)	Percentage of respondents (%)
Below 2.0	72
2.00–10.00	9
11.00–20.00	8
21.00–30.00	7
31.00–61.66	3
Above 62	1

Note(s): Table 4 reports the average monthly mobile money account balance among users in the Chongwe district of Zambia in 2019. The reported amounts were converted to US dollars (USD) using the K15 to I USD as the exchange rate

Table 4.
Average monthly mobile money account balance in the last six months

Factor	Cumulative responses as a percentage of the total (%)
Panel (A): Benefits of mobile money services	
1. Easy access to money	44
2. Availability of agent outlet	21
3. Convenient way to transact	18
4. Low transaction costs	12
5. Source of local employment	3
6. A tool to save money	2
Panel (B): Drawbacks of mobile money services	
1. Low floats by agents	77
2. High transactions costs	16
3. Mobile network outages	5
4. Poor customer service by agents	1
5. Security risk (Fraud)	1

Note(s): Table 5 lists two results: (1) in Panel (A) the benefits of mobile money services; and (2) in Panel (B) the drawback of mobile money services

Table 5.
The benefits and drawback of mobile money services

In a nutshell, the mobile money industry has contributed to extending financial services to the rural part of Zambia, especially to the poor who are viewed by traditional banks as unbankable (Donovan, 2012). However, like the banking sector, the mobile money industry in Zambia is faced with underlying challenges, which hinder the possibility of attaining a more inclusive financial system. Among these challenges includes an unstable macroeconomic environment, volatile regulation regimes, political cronyism, corruption, bad governance and an unfavourable business atmosphere (Pankomera and Van Greunen, 2018). Eventually, overcoming the aforementioned challenges would accelerate the growth of the mobile money industry in Zambia. Relatedly, it is important for Zambia to accelerate the simplification of microprudential regulation for nearly all segments of the financial sectors in the country. Lastly, the central monetary authorities of Zambia should establish and promulgate policies that protect the vulnerable poor people in society from usury from the mobile network operators and digital privacy emanating from data sharing.

6. Concluding remarks and recommendations

The spread of the mobile money industry, which forms part of FinTech, is a global phenomenon, and a growing body of empirical studies holds a consensus view that FinTech can contribute to the financial inclusion agenda among the developing economies, not only that FinTech and financial inclusion have a role to play in meeting the UN sustainable development goals (Demirguc-Kunt *et al.*, 2017). The motivation for this empirical scrutiny is mainly owed to the rising number of inactive mobile money accounts in Zambia and the rapid growth in the use of agent accounts by mobile money users.

In view of that, this paper examined the effect of mobile money services in achieving the SDGs in Zambia. The data used for this study were collected in 2019 from the rural part of the Chongwe district of Lusaka province. The study's findings paint a gloomy picture on the role of mobile money services in contributing to the achievement of SDGs. The empirical findings from the fieldwork provide strong evidence, which suggests that mobile money users are mainly using the service for money transfers. As discussed, and at a bare minimum, the rising trend of mobile money users using the service predominantly for the transfer of funds compromises the ability of the mobile money services contributing to meeting the United Nations SDGs. Far more importantly, the saving of money using mobile money services helps the low-income households to smooth their consumption, reduce vulnerability to shocks via risk diversification, maximise consumption through borrowing and invest in their future by saving, and it is through these channels that mobile money services can contribute to achieving the UNSDGs. Future research on this area can investigate (1) the emerging evidence that mobile money encourages over-borrowing; and (2) the growing concern that mobile money users are highly susceptive to fraud by scammers and data breaches.

Finally, the policy recommendations from the study's findings are as follows. First, mobile money service providers must be compelled to pay interest on the credit balance of mobile money accounts. Second, mobile money service agents must be financially supported to increase their floats–this was identified as a major concern by mobile money users. Third and finally, the Zambian government must not impose mobile money tax. There is a trend among countries in Africa to impose mobile money taxation. In 2019, Côte d'Ivoire, Republic of the Congo, Malawi and Gabon all proposed new mobile money taxes. Mobile money taxation is likely to have a negative effect on the uptake of mobile money services among the poor. Like any other scientific papers, this paper has a slight limitation, arising from the study area (Chongwe). We hope the findings of this study apply to the rest of the country.

Notes

1. Mobile money services are different from mobile banking services. As previously indicated, mobile money services allow predominantly poor people to access financial services using mobile phones without having a formal bank account. On the other hand, mobile banking services allow people to use mobile phones to manage their bank accounts.

2. Noticeably, Zambia's mobile money sector is dominated by two companies, MTN and Airtel. There are also emerging service providers like Zoona and Zamtel Kwacha.

3. The financial crisis of 2008 led the G20 to come up with regulatory regimes aimed at building a sound and resilient global financial system. Among those G20 initiatives, which are linked to financial inclusion, include (1) the Financial Inclusion Expert Group (FIEG); (2) Global Partnership for Financial Inclusion (GPFI) and (3) the Financial Inclusion Action Plan (FIAP). These initiatives formally recognise digital financial solutions as critical to enhancing global financial inclusion.

References

Aker, J.C., Boumnijel, R., McClelland, A. and Tierney, N. (2016), "Payment mechanisms and anti-poverty programs: evidence from a mobile money cash transfer experiment in Niger", *Economic Development and Cultural Change*, Vol. 65 No. 1, pp. 1-37.

Asongu, S. and Asongu, N. (2018), "The comparative exploration of mobile money services in inclusive development", *International Journal of Social Economics*, Vol. 45 No. 1, pp. 124-139.

Atkinson, A.B. (2015), *Inequality: What Can be Done?*, Harvard University Press, Cambridge, Massachusetts.

Batista, C. and Vicente, P.C. (2016), "Introducing mobile money in rural Mozambique: evidence from a field experiment", *CSAE Conference 2016: Economic Development in Africa*, Oxford, available at: https://editorialexpress.com/conference/CSAE2016/program/CSAE2016.html#75.

Beck, T., Demirgüç-Kunt, A. and Levine, R. (2007), "Finance, inequality and the poor", *Journal of Economic Growth*, Vol. 12 No. 1, pp. 27-49.

Blumenstock, J.E., Callen, M., Ghani, T. and Koepke, L. (2015), "Promises and pitfalls of mobile money in Afghanistan: evidence from a randomized control trial", *The 7th IEEE/ACM International Conference on Information and Communication Technologies and Development (ICTD '15)*, Singapore.

Chikalipah, S. (2017), "What determines financial inclusion in sub-Saharan Africa?", *African Journal of Economic and Management Studies*, Vol. 8 No. 1, pp. 8-18.

Chikalipah, S. and Makina, D. (2019), "A survey of microfinance institutions and informal finance in Africa", *Extending Financial Inclusion in Africa*, Academic Press, Cambridge, pp. 113-135.

Demirguc-Kunt, A., Klapper, L. and Singer, D. (2017), *Financial Inclusion and Inclusive Growth: A Review of Recent Empirical Evidence*, The World Bank.

Donovan, K. (2012), "Mobile money for financial inclusion", *Information and Communications for development*, Vol. 61 No. 1, pp. 61-73.

Ferrata, L. (2019), "Digital financial inclusion - an engine for 'leaving no one behind'", *Public Sector Economics*, Vol. 43 No. 4, pp. 445-458.

Jack, W. and Suri, T. (2014), "Risk sharing and transactions costs: evidence from Kenya's mobile money revolution", *American Economic Review*, Vol. 104 No. 1, pp. 183-223.

Kim, M., Zoo, H., Lee, H. and Kang, J. (2018), "Mobile financial services, financial inclusion, and development: a systematic review of academic literature", *The Electronic Journal on Information Systems in Developing Countries*, Vol. 84 No. 5, p. e12044.

Lucini, B.A. and Sharma, A.A. (2016), *Managing Disaster Response through Mobile: Asia Pacific*, GSMA Intelligence, November, 2016, available at: https://www.gsmaintelligence.com/research/2016/11/managing-disaster-response-through-mobile/591/.

Ouma, S.A., Odongo, T.M. and Were, M. (2017), "Mobile financial services and financial inclusion: is it a boon for savings mobilisation?", *Review of Development Finance*, Vol. 7 No. 1, pp. 29-35.

Oxford Economics (2019), *The 'yes' Economy: Giving the World Financial Identity*, An Independent Report Fir Juvo by Oxford Economics, Oxford.

Pankomera, R. and Van Greunen, D. (2018), "Challenges, benefits, and adoption dynamics of mobile banking at the base of the pyramid (BOP) in Africa: a systematic review", *African Journal of Information and Communication*, Vol. 21, pp. 21-49.

Pasti, F. (2019), *State of the Industry Report on Mobile Money: 2018*, GSMA, London, available at: https://www. gsma. com/r/wp-content/uploads/2019/02/2018-State-of-the-Industry-Report-on-Mobile-Money. pdf (accessed 16 April 2019).

Suri, T. and Jack, W. (2016), "The long-run poverty and gender impacts of mobile money", *Science*, Vol. 354 No. 6317, pp. 1288-1292.

UNCDF (United Nations Capital Development Fund) (2019), *Zambia: The State of Digital Financial Services in 2018*, UNCDF, Lusaka.

Villasenor, J. (2013), "Smartphones for the unbanked: how mobile money will drive digital inclusion in developing countries", *The Brookings Institution, Issues in Technology Innovation*, Vol. 24, pp. 1-12.

Zetzsche, D.A., Buckley, R.P. and Arner, D.W. (2019), "FinTech for financial inclusion: driving sustainable growth", *Sustainable Development Goals: Harnessing Business to Achieve the SDGs through Finance, Technology, and Law Reform*, pp. 177-203.

Corresponding author

Sydney Chikalipah can be contacted at: chksyd002@myuct.ac.za