Mobile money, financial inclusion and poverty: key results from two new surveys in Ghana

Mobile Money, Financial Inclusion and Poverty: Full Results from Two New Surveys in Ghana*

by

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ABSTRACT

We investigate mobile money adoption, and how it affected household behaviour and financial inclusion in Ghana. We first provide an overview of mobile phone and mobile money development in Ghana. Then we present results of two household surveys carried out in 2017 and 2019 and conducted in all regions of Ghana, each survey covering 1000 households. In 2019 more than 90% reported that they use mobile money reflecting its widespread adoption in Ghana by that time. Different socio-economic characteristics are important in the take-up and use of mobile money. Mobile money users tend to make greater use of formal financial services than non-users and may therefore be more financially included. Mobile money is used for a range of transactions especially remittances, but also payments for goods and services, including financial services and savings. Mobile money may also impact social networks insofar as face-to-face meetings may be replaced by mobile phone interactions.

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1. Introduction

Mobile money (m-money) has made enormous strides in sub-Saharan Africa since its formal launch in Kenya and Tanzania in 2007. M-money differs from mobile banking in that m-money customers transact through mobile network operators (MNOs) and are not required to have an account or any other contact with a financial institution. Mobile banking is bank-based, and offers customers facilities to access banking services through the mobile phone. However, the distinction between m-money and mobile banking has been becoming less rigid. Initially, banks simply served as depositories for the counterpart of m-money which was held separately from other bank deposits, in Kenya for example, in the form of segregated trust funds. Banks have increasingly taken a more direct role in the supply of m-money services. In some countries, such as Uganda, regulations require that there must be a formal partnership between any MNO supplying m-money and a bank. In others, such as Kenya, banks have entered into partnerships with MNOs to help supply an increasingly sophisticated range of financial services through the mobile phone.

M-money services have spread throughout the world, but they remain most strongly rooted in Africa (Ahmad, *et. al*, 2021). These services include remittances, payments for goods and services, savings and provision of other financial services, such as credit creation and insurance. Financial services provided through m-money are invariably at much lower unit cost than comparable services provided through conventional financial institutions, and therefore m-money can play a critical role in increasing financial inclusion[1]. Empirical evidence suggests that increased financial inclusion leads to improvement in welfare outcomes among households and positive effects on businesses (see, *inter alia*. Abor *et. al.*, 2018; Ashraf *et. al.*, 2006; Pina, 2015; Attanasio *et. al.*, 2011; Dupas and Robinson, 2013 and Karlan *et. al.*, 2014). Households' ability to insure against or withstand adverse economic shocks is found to be improved with the use of m-money services. Strategies adopted in such circumstances include informal risk-sharing through family or social networks, the use of savings or credit, and sales of "inessential"

[1] A full survey on mobile money with a special focus on Africa has been covered in Ahmad, et al. (2021).

property (Heltberg *et. al.*, 2013).

In this paper we provide an overview of mobile phone and mobile money development in Ghana and report the main results of two new surveys of a sample of Ghanaian households. These surveys aim to identify first: how and why individuals access different financial services, with particular emphasis on m-money; second, how these services are utilised; and third, what is their impact on financial inclusion and poverty. M-money was launched in Ghana in 2009, soon after Kenya, but its use was limited until 2013, when there began a period of explosive growth, with m-money coverage increasing from about 4% of the population in 2013 to 44% in 2018.

An important issue for the long-term development of m-money services and their integration with banking services is that of interoperability. Network interoperability means that mobile phone customers can make and receive calls and texts using MNOs other than those on which they are registered. Most countries' mobile networks permit interoperability in this sense. Indeed, lack of this form of interoperability would be a major obstacle to mobile network development. By analogy, m-money interoperability means that m-money customers can make a deposit and transfer funds using their account with a particular MNO and expect the recipient who has an account with any other different MNO to be able to access the funds, including collecting cash from any m-money agent. As yet however, interoperability in most m-money schemes is relatively limited in scope. In 2013 Indonesia was the first country to enable customers of one m-money provider to send money directly to customers of another provider; and as of 2016, interoperability was enabled in 15 countries (GSMA, 2017). Moreover, enabling is not equivalent to use. In Tanzania interoperability is not mandated, and it has proceeded on the basis of bilateral agreements between MNOs. These have not so far produced a complete network in which m-money transfers between any two MNOs are possible. M-money interoperability also raises important issues about relationships between the MNOs and the banking system, as some form of clearing is required between MNOs. Ghana has confronted these issues directly with a tripartite agreement overseen by the Bank of Ghana (BoG) and involving MNOs, banks and the Ghana Interbank Payment and Settlement System.

This came into effect in May 2018 and implies that, in principle, Ghana now has one of the best-integrated m-money systems in the world.

In May-June 2017, we conducted a face-to-face survey of 1000 randomly selected individuals in Ghana. We asked about 100 questions concerning: household characteristics, their knowledge of, access to and usage of formal and informal financial accounts including credit, ATM and pre-payment cards; their knowledge of, access to and use of m-money; their savings, loan, insurance and transactions (receipts and payments) behaviour; and their well-being, including some aspects of social networking and access to emergency resources. For full details see Sakyi-Nyarko (2018). To consider the impact of interoperability and to study the evolution of financial inclusion and m-money in Ghana, we carried out a second survey among a further 1000 individuals in June 2019. We asked mostly the same questions as in the previous survey, but included some additional questions particularly concerned with customer recognition and use of interoperability. Because of the problem of attrition in a sample of this size we did not attempt to revisit the same households. In this paper we report the results of both these surveys, insofar as they appertain to mobile phone and m-money use and their implications.

The rest of the paper is organised as follows. Section 2 provides an overview of recent developments in mobile phone penetration and m-money in Ghana; section 3 covers m-money service provision in Ghana. In section 4 we describe the two household surveys in more detail; the key results are presented in section 5. Section 6 concludes. An appendix contains some additional background data on individual mobile providers in Ghana.

2. Recent Developments in the Mobile Phone Industry and Mobile Money in Ghana

2.1 Fixed-line and Mobile Penetration

The mobile telecoms industry in Ghana has experienced rapid growth since it started in the 1990s. Figures 1 and 2 show the evolution of fixed-line[2] and mobile phone penetration[3]

[2] Fixed-line penetration is measured as fixed-line subscriptions per 100 inhabitants.
[3] Mobile phone penetration is measured as mobile voice subscriptions per 100 inhabitants.

respectively in Ghana and Kenya. Kenya is used as the basis for comparison as Kenya's Safaricom was the pioneer of m-money, and m-money took off in Kenya faster than anywhere else. We see that fixed line penetration in Kenya declined gradually since 2009 whereas that in Ghana remained broadly unchanged (figure 1). The rate of mobile phone subscriptions was broadly similar in the two countries in 2006 (figure 2); but the growth rates subsequently diverged with Ghana outpacing Kenya, so that by 2018 mobile penetration in Ghana was more than 40% greater than in Kenya. Data on mobile coverage is not available continuously for either country but, as of 2015, 97% of Ghanaians lived within access to a mobile signal while in Kenya the figure was 92%. (ITU, 2019a).

Figures 1, 2, 3 about here

In summary, and notwithstanding Kenya's early lead in mobile technology, Ghana now enjoys a substantially higher rate of mobile phone penetration than Kenya, although signal availability is broadly comparable. This could be due to the more compact geographical nature of Ghana with fewer remote rural areas than Kenya.

2.2 Mobile Money and Other Payments Platforms

M-money was launched in Ghana in 2009, but it did not immediately take off. However, since 2013 there has been a very rapid expansion in the take-up and usage of m-money, with the number of registered customers increasing to more than 100% of the population in 2018 (figure 3). Given that there will be many people who are not registered, such as young children, these figures imply that a significant proportion of users have multiple m-money accounts. The number of active m-money users[4] also increased dramatically but there is a significant gap between registration and active use with less than half the registered accounts being considered in active use. By 2015 the number of registered m-money accounts in Ghana (13.12m) exceeded the number of bank accounts (12.89m). The penetration of m-money in Ghana is

[4] Active customers refer to those who transacted at least once in the 90 days prior to reporting (Bank of Ghana, 2018).

particularly significant because, among African countries where m-money penetration has been considerable (Kenya, Tanzania, Uganda, Rwanda) Ghana has the highest percentage of the population with a registered bank account[5]. Banking is therefore a somewhat more widespread habit than in these other countries. Even so, m-money has taken off to such an extent that Ghana is now one of the leading countries in the world to use m-money, as measured by penetration and active usage statistics. This suggests that m-money performs essential functions even in environments where banking is more widespread.

The current payment systems in Ghana consist of: the Real Time Gross Settlement System (RTGS) for high value payments and settlements; 3-day and same-day Cheque Clearing mechanisms; Automated Clearing House (ACH) for direct credits and direct debits; Gh-Link: the interchange for ATM cash withdrawals; and e-zwich[6], the national Point of Sale (POS) acquiring service for merchants, and m-money services. Table 1 shows recent trends in financial transactions in Ghana since 2012. The volume of transactions in every component of payments increased over the period (panel 1.1). However, the biggest proportional increases were those for Gh-Link and m-money. The latter increased by a factor of 80, doubling on average every year. The value of financial transactions in m-money increased at a faster rate still (panel 1.2), implying that the average value of each m-money transaction also increased: by a factor of 5 over the 6 years (panel 1.3[7]). However, it seems clear that m-money is used particularly for small transactions. The average value of an m-money transaction in 2018, at GH₵153[8] was much less than for any of the other main transactions media which pass directly

[5] According to surveys conducted between Dec 2014 and Jan 2015 by the Financial Inclusion Insights (FII) programme, based on a nationally representative sample of 3002 Ghanaian adults aged 15+, 34% had a bank account while 20% had a registered m-money account. Among the countries surveyed at that time (Kenya, Tanzania, Uganda, Rwanda, Ghana), Ghana had the lowest percentage of adults with a registered m-money account but the highest percentage with a registered bank account. 27% of the adults surveyed had digital access to bank accounts, whereas 20% had m-money accounts.

[6] E-zwich (the National Switch) is an electronic payment service that links the payment systems of all licensed banks and non-bank financial institutions including savings banks, credit unions, money transfer institutions, and rural banks in Ghana. It enables cash withdrawals, payments for goods and services, money transfers, receiving salary and wage payments, and making bill payments from any e-zwich POS or ATM in Ghana. A photo ID and finger prints are required to get an e-zwich smart card, a bank account is not needed. http://www.ghipss.net/index.php?pg=faq

[7] Data for ACH in 2012 were not reported.

[8] GH₵4.786 = US$1.00 as of June 30th 2018

through the payments system.

Table 1 and Figures 4, 5 about here

The number of registered m-money agents shot up from 8,660 in 2012 to 396,599 in 2018, an average annual rate of increase of almost 90%. The number of active m-money agents also increased sharply (figure 4)[9]. The rapid growth in m-money use and in the agent network in Ghana took place particularly after 2014. In the period 2014-18 m-money growth in Ghana broadly satisfied criteria set out in Ahmad, *et. al*. (2021) implying that m-money use experienced "ignition with explosive growth". By 2018, the number of active m-money agents far exceeded the number of bank branches and ATMs[10] in Ghana. This makes m-money agents much more accessible than bank branches and ATMs, both as a source and a home for cash. Correspondingly, the number of registered m-money customers per agent generally decreased considerably (figure 5), although, the number of active m-money customers per active agent remained relatively stable.

3. Mobile Money: Providers, Services, Agents and Regulations

At the time of our first survey in 2017 there were six MNOs in Ghana: MTN, Vodafone, Tigo, Airtel, GloMobile, and Espresso, four of which provided m-money services: MTN, Vodafone, Tigo and Airtel[11]. In November 2017, Tigo and Airtel merged, and Expresso had its MNO license revoked in March 2018. So that by the time of the second survey in 2019 there were 4 principal MNOs and 3 large m-money providers.

3.1 M-Money Services and Key Tariffs

Broadly similar m-money services are offered by all the MNOs, including cash deposits and

[9] Active agents refer to the agents who transacted at least once in the 30 days prior to reporting (Bank of Ghana, 2018).

[10] As of 2018, Ghana reported 1145 bank branches; 2139 ATMs, but 181,000 active m-money agents countrywide (PwC, 2019; Bank of Ghana, 2018; IMF, 2020).

[11] Airtel and Tigo merged in November 2017.

withdrawals, sending money to and receiving from other m-money users (remittances), airtime purchases and bill payments, ATM withdrawals, moving money between bank account and m-money wallet, payments for goods and services, receiving salary and wage payments, direct payments for loans, savings contributions and mobile insurance. Deposits/withdrawals, remittances and payments for airtime are the most commonly-used services; other transactions associated with mobile wallets such as merchant payments are still in their infancy, though growing rapidly.

The deposit of cash via m-money agents and airtime purchases are free to users. The rates for cash withdrawals and for remittances in 2017 and 2019 are shown in figures 6 through 11 for each m-money provider. The broadly comparable tariffs charged by Ghana Commercial Bank (GCB: one of Ghana's largest) are also shown. In general, m-money tariffs have smaller transaction thresholds than do commercial banks, and thus are (much) more cost effective for small transactions, at least up to GH₵500. For example, GCB charges a flat fee of GH₵5 for an in-branch withdrawal of less than GH₵1000, whereas it costs as little as GH₵0.50 to withdraw up to GH₵50 at an m-money agent. (Figures 6 and 7).

Figures 6, 7, 8, 9, 10, 11 about here

Low-cost remittances are a key benefit of m-money. Here, a distinction must be made between transfers to m-money users who are registered with an m-money provider and transfers to those who are not registered. To send to registered users in 2017, it was clearly much cheaper to use an m-money service for amounts under GH₵500 (figure 8). In theory GCB's in-branch transfer rate of GH₵5 became more cost-effective for amounts over GH₵500 but it typically took 1-3 working days for the funds to appear in the bank account, whereas money sent to a registered m-money user appears in the recipient's mobile wallet essentially instantaneously. A better comparison with bank tariffs can be made in 2019 when it was possible to transfer money directly from a GCB account to a mobile wallet, a transaction that was clearly more expensive than an m-money transfer. Indeed by this time Vodafone had reduced its tariff for sending

money to other registered (Vodafone) users to zero (figure 9). M-money can also be sent to unregistered users[12], but in this case m-money is mostly at least as expensive as a bank transfer, and substantially more expensive for anything other than relatively small sums (Figures 10 and 11).

Agents play an essential role in the operation of m-money as they are the main (usually the only) point of contact between m-money customers and the MNO. An m-money agent must be able to serve a projected number of customers within its catchment area and maintain sufficient physical cash and e-money float balances for this purpose. MNOs work with bank partners, who share their knowledge of existing clients, to identify suitable agent candidates and to control the quality of agents (GSMA, 2010). The Know Your Customer (KYC) requirements for opening an m-money account are simple. A customer only needs a valid photo ID to register with an authorised m-money agent, who provides an m-money SIM card, and a starting PIN number (via SMS). Registration is free. Once the account is activated, the customer can make cash deposits at agents or partner banks; and send or receive money. In contrast, opening a bank account is heavily regulated by the BoG and has stringent documentation requirements.

3.2 Regulation of M-Money

The key regulations governing m-money in Ghana are contained in a series of Acts and Regulatory Guidelines[13], which are largely administered by the BoG. The Bank is mandated by various Acts to promote and supervise electronic and other payments, funds transfer, clearing and settlement systems in Ghana[14]. *E-money Issuer (EMI) Guidelines* and *Agent Guidelines* were issued by BoG on 6 July 2015 replacing the 2008 *Guidelines for Branchless Banking*. The guidelines aim to create an enabling regulatory environment, to promote the use of electronic and m-money for retail payment and funds transfer, and to mitigate risks

[12] For this, a token number and a PIN from the sender are required (Cobla & Osei-Assibey, 2018).

[13] These include: the *Banking (Amendment) Act* 2007, *Non-bank Financial Institutions Act* 2008, *Guidelines for E-Money Issuers* 2015, *Agent Guidelines for Financial Institutions, and Dedicated E-Money Issuers and the general public* 2015 (FII Ghana, 2015)

[14] The three enabling Acts are the *Bank of Ghana Ac*t, 2002 (Act 612), the *Payment Systems Act*, 2003 (Act 662), and the *Banking Act*, 2004 (Act 673).

associated with e-money business so as to protect consumers. The National Communications Authority (NCA), the regulator of the telecom sector, worked with BoG in drafting the Electronic Transactions Act 2008 (Act 772), which laid the foundation for MNOs to provide m-money services, and subsequently to provide effective supervision of m-money

The 2015 EMI Guidelines provide that any non-bank entity can apply for a licence to be a dedicated e-money issuer (DEMI), subject to BoG regulation and supervision[15]. No specific e-money model (eg. bank-led) is enforced, and permissible transactions may be expanded. Initially, interoperability was not mandatory, although it became so in 2018. The EMIs are required to pass on a minimum of 80% of interest accrued on the pooled e-money float (net of trust accounts' administrative fees) to e-money holders. Any amount in excess of the minimum may be retained by the EMI. Interest is paid into a separate account held in the name of the trust (float) account. A DEMI cannot withdraw money from the interest account except for distribution to eligible e-money holders. An EMI must obtain prior approval from the BoG for each distribution of interest. This is different from Kenya, for example, where interest earned on trust funds is spent by the trustee on charitable activities (GSMA, 2017). M-money customers in Ghana began earning interest on the balance in their wallets from September 2016, with the interest rate set between 1.5% and 7%[16].

According to EMI Guidelines, credit products cannot be underwritten by DEMIs on their own account, but can be provided in partnership with any licensed Retail Financial Institution regulated under the 2004 Banking Act (Act 673). EMI Guidelines offered further opportunity for partnerships between banks and MMOs to offer savings, lending, investment, and inward remittance m-money products.

Agent Guidelines were published in parallel with EMI Guidelines. Key highlights include: agent eligibility and due diligence; appointment of agents and master agents; permissible

[15] Blay (2016)
[16] http://www.ghanaweb.com/GhanaHomePage/business/Telcos-start-mobile-money-interest-payment-today-469026

activities; customer due diligence and protection including KYC; agent exclusivity; termination of agency contracts; oversight, reporting and sanctions[17]. Agent Guidelines require an EMI candidate to have a minimum capital of GH₵5.0 million.

4. Survey Design and Implementation

In May-June 2017, we conducted a face-to-face survey of 1000 randomly selected individuals in Ghana with a geographical spread approximately equivalent to that reported in the 2010 Ghana Population and Housing Census. ENA software was used to randomly allocate clusters to each geographic unit (district). Within this framework, different random route procedures were used to select households; and within each household one adult (aged 18+) was randomly selected for interview using the last birthday method (Oldendick, *et. al*., 1988). The questionnaires were administered using Computer-Assisted Personal Interviewing (CAPI), which is useful in reducing errors and other problems associated with paper questionnaire administration. The interview was conducted using smartphones and tablets. For details see Sakyi-Nyarko (2018)[18].

The aim of the initial survey was to identify first: how and why individuals access different financial services, with particular emphasis on m-money; second, how these services are utilised; and third, what is their impact on financial inclusion and poverty. The questionnaire consisted of about 100 structured questions, divided into 16 thematic sections, covering: socio-economic characteristics of the respondents; their knowledge of, access to and usage of formal and informal financial accounts including credit, ATM and pre-payment cards; their knowledge of, access to and use of m-money; their savings, loan, insurance and transactions behaviour (receipts and payments); and their well-being, including some aspects of social networking and access to emergency resources. To help understand how financial access, inclusion and m-money were evolving in Ghana, we carried out a second survey among a further 1000 individuals in June 2019. The survey was also geographically stratified using updated data on

[17] Blay (2016)

[18] The surveys were implemented by the Africa Resources and Research Development Institute of Koforidua. We thank Jamal Mohammed and his staff for their very diligent co-operation in this work.

Ghana's regions and population, and similar randomised procedures to select households and interviewees. Because of the potential problem of attrition in a sample of this size we did not attempt to revisit the same households. We did ask mostly the same questions as in the first survey, but we amended a few questions where responses were not fully consistent with the intent of the questions, and we included some additional questions particularly concerned with customer recognition and use of m-money interoperability, which came into effect in May 2018.

Tables 2, 3 about here

The sample of 1000 for each survey is smaller than those of the Financial Inclusion Insights Survey for Ghana[19] and those of Jack and Suri for Kenya (Jack and Suri, 2011), both of which had a target of 3000 respondents, but it is the same size as that of the Findex surveys for Ghana [20]. The main demographic and socio-economic characteristics of the respondents to each survey are shown in tables 2 and 3 respectively, along with broadly comparable data for Ghana as a whole. Evidently the characteristics of the respondents do not precisely match the whole country in either survey but, considering the size of each survey we can see that it comes reasonably close to mimicking the relevant characteristics of the country. This gives some confidence that any results obtained may be more generally applicable in Ghana than just to the respondents in these particular samples. In the discussion that follows we refer where necessary to the 2017 and 2019 surveys respectively as survey 1 and survey 2.

5. Survey Results

5.1 Mobile Phones and Mobile Money – Socioeconomic Characteristics

The Socio-economic characteristics of mobile phone and SIM card owners and non-owners are shown in tables 4 (2017) and 5 (2019) respectively. Interviewees were asked in two separate questions if they owned a mobile phone and if they owned a SIM card. A (very) few

[19] FII (2015).
[20] World Bank (2018)

respondents reported owning either a phone or a SIM but not both[21]. In presenting results in tables 4, 5 and those following, we use phone-and-SIM ownership as the basis for the analysis. We report data within seven main socioeconomic groups (urban/rural, gender, age, employment, income[22], education and marital status) and nineteen subgroups. The left panel (Table 4-1/5-1) reports the percentage of respondents who are mobile phone owners or non-owners (i.e. mobile phone adoption and non-adoption rates) by socioeconomic characteristics; while the right panel (Table 4-2/5-2) reports the composition of mobile phone owners and non-owners according to the same socioeconomic characteristics. In interpreting these data and subsequent tables, it should be borne in mind that the proportion of respondents who do not own a mobile phone and SIM is relatively low, especially in Survey 2.

Table 4 shows that the mobile phone adoption rate is: higher in urban than in rural areas; higher among male than among female adults; higher among 26-35 year-olds and lower in age groups 18-25 and 56-and-over; higher for the employed than for the unemployed; higher for the higher income group than for the lower income group; higher for undergraduate educated and above and lower for the uneducated and the primary school educated; higher among couples[23] than among single adults. The socio-economic composition of the whole survey is also reported for reference, highlighted in green. It is clear from these data that age, gender, level of income and education and living in rural or urban areas all played a role in the rate of mobile phone adoption. This is generally consistent with reporting for other African countries, particularly, Forenbacher, *et al* (2019) for Nigeria and Sikundla, *et al* (2018) for South Africa.

Tables 4, 5 about here

In survey 1, 85.3% of respondents had both a mobile phone and a SIM card, and this had increased to 96.9% two years later. We see that by 2019, mobile phone penetration is over 90% among all our defined socio-economic groups apart from the uneducated (88.57%) (table 5).

[21] 13 respondents in Survey 1; 6 in Survey 2.
[22] It is important to note that there was a substantial (30.4%) non-response rate to the income question.
[23] Couples include those who are married and partners living together.

These statistics underline the very rapid growth and high penetration rate of mobile phones in Ghana reported in the aggregate statistics in section 2 above.

Tables 6, 7 about here

Comparable data for m-money use are shown in tables 6 and 7. As for mobile+SIM ownership, the left panel reports the percentage of respondents who are m-money users or non-users by socioeconomic characteristics; while the right panel reports the composition of m-money users and non-users according to the same characteristics. The composition of the whole survey is again reported for reference, highlighted in green. To interpret these and subsequent m-money data, it should be borne in mind that the proportion of respondents who are not m-money users is much lower in survey 2 than in survey 1[24]. Interviewees were asked two separate questions about their m-money experience. The first was: *Have you ever used … mobile money services for any financial activity? eg. send, receive money, make payments, buy things.* The second was: *Do you have a registered account with [a] mobile money service?* A few respondents reported having used m-money but not having an account[25]. In presenting results in tables 6, 7 and those following, we employ m-money use as the basis for the analysis. The immediately striking feature of tables 6 and 7 is the vertiginous rise in m-money use between the two surveys, from 34.9% of the sample in 2017 to 92.6% in 2019. Our 2017 data are appreciably lower than BoG data on registered m-money customers in the whole population (figure 3)[26], but accord reasonably well with the BoG figure for active m-money customers. It should be noted that BoG data on m-money use are compiled on a somewhat different basis from those in our survey[27]. Our 2017 data are at a broadly similar level to the adoption rate of M-PESA in Kenya in 2009, reported by Jack and Suri (2011). Among the reported mobile money users in our surveys, several reported having accounts with more than one MNO, and the total number of separate accounts reported was 373 in 2017 and 1155 in 2019. Overall, these statistics

[24] 74/1000 were non-users in survey 2.
[25] 21/349 in Survey 1 and 25/926 in Survey 2.
[26] Not all registered customers have necessarily used m-money.
[27] BoG data for 2019 are not available at the time of writing.

underline the very rapid growth and high penetration rate of m-money use in Ghana identified in the aggregate statistics in section 2 above.

The pattern of adoption of m-money is not dissimilar from that of mobile phone adoption, at least in 2017. Some of the socio-economic differences as between mobile phone owners and non-owners are accentuated in the case of m-money users and non-users, especially comparing socially and economically more-advantaged with less-advantaged groups. For example income and level of education appear to be particularly important in m-money adoption. There is also substantially greater m-money adoption among the urban than among the rural population, and among males than among females in our sample. In principle these data suggest that early adopters of m-money in Ghana were generally wealthier, more educated and live in an urban area. This is consistent with evidence from Kenya and elsewhere in Africa (Mbiti and Weill, 2011; Ahmad *et. al*., 2021). By 2019, almost all respondents (92.6%) were m-money users and therefore the characteristics of m-money users necessarily largely resembles those of the whole sample. Even so, the oldest (age 56+) and least-educated groups continue to have an appreciably lower adoption rate, although the proportions of the whole sample falling into these groups are also relatively small.

5.2 Account and Card Ownership -Mobile Phone Owners and Mobile Money Users

Tables 8 and 9 show personal financial account and card ownership characteristics and behaviour of mobile phone owners and non-owners; tables 10 and 11 show the same breakdowns for m-money users and non-users. The ownership characteristics include: membership of any informal financial group[28], having an account with any formal financial group such as a bank, and ownership of any ATM, credit or pre-paid cash card such as e-zwich. The behavioural characteristics are based on a multi-part question about the use of specific methods of obtaining cash from any formal financial group and a more general question about the overall approach of the interviewee to managing her cash.

The immediately important baseline feature of the accounts and card data in tables 8 through

[28] These include money-lenders, ROSCAs, Susus, credit unions and co-operatives

11 is that, in 2017 56.4% of the sample reported having a relationship or account with at least one type of financial group, either informal or formal, a percentage which increased to 67.5% in 2019. For Ghana as a whole, it is estimated that, in 2017, 61.4% of the population had at least one account with a commercial bank (IMF, 2020). Available evidence suggests that, on this measure, Ghana is one of the most highly-banked countries in mainland sub-Saharan Africa (IMF, 2020)[29]. Even so, it is evident that a substantial proportion of the respondents to the two surveys had no direct personal access to any financial group at all. The balance of reported accounts as between informal and formal finance, did not change sharply between the two surveys: 36% of reported accounts were with informal financial groups in 2017, and this increased to 39% in 2019.

Tables 8, 9, 10, 11 about here

Given the widespread ownership of mobile phones, it is not surprising that the characteristics and behaviour of phone+SIM owners corresponds closely to those of the surveys as a whole. It is striking that, for those who do have access to a formal financial group, the predominant way to obtain cash in both surveys is by the most traditional route, over the counter in a bank branch, indeed this method was even more predominant in 2019 than in 2017. This may in part reflect the fact that ownership of different types of card remains low, especially credit cards. On the basis of these surveys, the use of e-zwich still has some way to go before becoming widely accepted by consumers.

By 2019, 92.6% of the sample used m-money so that the characteristics and behaviour of m-money users corresponds closely to those of the whole survey (table 11). From the 2017 survey (table 10), we can see that m-money users appear to be significantly more engaged with the formal financial system than m-money non-users. Users were substantially more likely than non-users: to have a formal financial account and use it as the main way to manage cash; to use

[29] Kenya, Nigeria and Botswana report a greater number of bank accounts *per capita* than Ghana, but as individuals may have multiple accounts, this does not capture the number of individuals who have at least one account.

ATMs, and to have a debit or pre-paid card; Non-users are more likely to be a member of an informal financial group. Given the sharp rise in m-money use between the two surveys, especially the almost ubiquitous use of m-money among survey 2 respondents, it seems reasonable to conclude that the tranche of m-money users in survey 1 would consist mainly of early-adopters in Ghana. If so, the data would tend to support findings from elsewhere in Africa (Mbiti and Weill, 2011; Ahmad *et. al.*, 2021) that, in addition to the socio-economic characteristics noted above, early m-money adopters in Ghana tended to come from the more financially included groups in society. Furthermore, the results of survey 2 would also suggest that, as in Kenya, m-money use in Ghana has now penetrated well beyond the urban middle-class to more rural, poorer and otherwise less financially included groups. Given the relatively small change in proportions of (formal and informal) account ownership between the two surveys, the widespread expansion in m-money use would suggest that m-money can provide an important route for less-advantaged households to improve their financial access, even without any other form of access to the financial system. The value and particularly the volume of m-money transactions now substantially exceeds those of other consumer transactions instruments (table 1). Even so, m-money users are still interacting with the formal financial system in the traditional way with 40.5% of (m-money-using) respondents getting their cash from the formal financial groups over the counter in branch. However, since formal account ownership in the sample as a whole did not increase much between 2017 and 2019, this may be because the spread of m-money has reduced the overall need for users to access cash from the formal financial system.

5.3. Mobile Money Transactions

We asked m-money users if they had ever carried out each of 21 different types of transaction; and what were the largest and smallest sums they had ever spent or received in each transaction (excluding charges and fees). We also asked how many times they estimated that each transaction had taken place in the last month. For each kind of transaction, we report the percentage of m-money users who had ever carried out this transaction (the whole sample percentage is also provided, highlighted in green). For the cash amounts of the largest and

smallest transaction and the number of times used in the past month, we report the mean and standard deviation of all non-zero responses (tables 12 and 13).

The consensus from earlier research is that, apart from ordinary deposits and withdrawals of cash, by far the most important function of m-money is for remittances: sending and receiving money along social networks, especially between family members (Ahmad, *et. al*., 2021). Looking first at the range of transactions that were carried out by m-money users in survey 1 (table 12, columns 1 and 2), by far the most widely-used services other than deposit and withdrawal of money and purchase of airtime, were indeed for remittances, for either regular or emergency support. Over 50% of m-money users in survey 1 report having sent or received money to or from family and friends at some time in the past. This usage is typically thought to be determined by a combination of convenience and cost. Cash remitted by phone arrives essentially instantaneously in the recipient's phone. The cost of sending money to a registered m-money user is generally much cheaper than in-branch bank transfers, especially for small sums (Figures 8-11). Deposits and withdrawals of cash can also be done at substantially lower cost via m-money operators rather than over the counter in a bank branch (figures 6-7).

Tables 12, 13 about here

However, the remaining data in table 12 also suggest that m-money was used for broader purposes than remittances, even at the outset, although this broader usage was confined to a relatively small number of individuals. Transactions other than remittances were made by fewer than 10% of users, but the frequency of such transactions in the last month was sometimes greater than for remittances. For example purchase of goods at a shop averaged 2.13 occasions whereas receipt of emergency remittances averaged 1.75. It seems clear from the largest and smallest amounts spent that a greater volume of small-value items were bought in shops, in comparison with fewer large emergency remittance receipts. However, the largest medical bill (₵777) and property purchase (₵517) both exceed the largest remittance payment of any kind.

Surprisingly perhaps, the variety of usage of m-money did not change greatly between survey 1 and survey 2 (table 13). By 2019, m-money use was ubiquitous among sample respondents, but in terms of the percentage of users, modes of use were still dominated by deposits, withdrawals, airtime top-ups and remittances. As in 2017, other transactions were carried out by m-money users but not by appreciably greater numbers of respondents or with much greater frequency. It would seem that the spread of m-money across the population of Ghana continued to be motivated by its use in remittances and the basic transactions of deposit and withdrawal.

Tables 14, 15, 16, 17 about here

We investigated interviewees' payment habits in more detail, asking them to compare their use of m-money with other modes of payment, beginning with remittances and then payments for basic services. M-money users and non-users both report sending and receiving money in a variety of ways including through a bank, money transfer service or bus or taxi-driver, but not surprisingly, the percentage of m-money users who used m-money for this purpose increased considerably between 2017 and 2019. Meanwhile, the percentage using bus or taxi-driver decreased but, surprisingly perhaps, the use of other money transfer services increased between the two surveys (tables 14 and 15). In both surveys, the vast majority of respondents report paying for basic services mostly by cash. As noted above, there was relatively little increase in m-money payments for basic services as between 2017 and 2019 (tables 16 and 17).

5.4. Impact of Mobile Money: Insurance, Savings and Social Networks

Finally we asked a set of questions about the impact of m-money on individuals' financial and social behaviour: their use of insurance including their ability to self-insure, their savings propensities and the impact on social networks. Relatively few respondents reported having any form of paid-for insurance apart from their membership of Ghana's National Health Insurance Scheme, irrespective of whether they were m-money users (tables 18 and 19). This implies that individuals must be essentially self-insured for most eventualities other than access

to medical care. We therefore asked interviewees how easily they could find a significant lump-sum in case of an "unspecified" emergency[30] (tables 20 and 21). Answers were on a 5-point Likert scale from "impossible" to "very possible". M-money users appeared to be much better self-insured than non-users in this respect, both in 2017 and 2019, with over 50% of m-money respondents reporting that they believed that it was "somewhat" or "very" possible that they could come up with the required lump-sum. Meanwhile, 32% of non-users thought it would be "impossible" to come up with the money in 2017; and this increased to 42% in 2019 (in a small sample of 74 non-users). Both users and non-users would rely on family and friends as the main source to meet an emergency need. However, savings are also an important source of the cash, especially for m-money users: 40% would use savings in Survey 1 and 37% in survey 2.

Tables 18, 19, 20, 21 about here

Differences in abilities to self-insure could have arisen for several reasons. First m-money users were more prosperous, more likely to be employed and better-educated than non-users, at least in 2017. By 2019 both the survey and national data show that m-money had achieved a very high rate of penetration across the country and virtually all socio-economic groups. The high proportion of m-money users who rely on family and friends provides provisional support for the conventional argument that m-money helps promote self-insurance through family and social networks. It's true that non-users in our surveys also rely on family and friends, but they are less able to come up with cash in an emergency than are users. Is this because m-money helps make a social network more tight-knit, or simply because non-users tend to have networks whose members are less well-off? Moreover, m-money users would have relied more on their own savings than on family and friends to come up with the money in 2017. Savings was the second source for non-users, but only for just over two-thirds of those who would rely first on family and friends. In 2019, family was more important than savings for users as well as (the

[30] The amount of the lump-sum (₵800 in 2017 and ₵1,000 in 2019) was determined by a combination of factors including: GNP *per capita*, and current and living wage rates. The amounts were similar to the Wage Indicator network's estimates of the monthly wage of a low-skilled worker in Ghana, and were therefore quite demanding: https://wageindicator.org/salary/living-wage/ghana-living-wage-series-january-2018.

few) non-users but even so, 37% reported that own savings would be the main source. Clearly this raises the important question of whether m-money users find it more easy to save, and if so, whether this is primarily because they are m-money users and m-money facilitates savings, or because of other factors such as income or education that leads them to become m-money users in the first instance. Clearly, the basic facts of the survey results do not enable us to answer such questions directly, but all these issues would be interesting to pursue with a more detailed investigation.

Turning next to savings behaviour, we see that m-money users are substantially more likely to have been savers in the recent past than have non-users (tables 22 and 23), and over 60% of users and non-users saved for "unforeseen events, emergencies and contingencies". This might be interpreted as a catch-all category, but as interviewees were asked to report *all* the reasons why they had saved, it seems reasonable to suppose that "unforeseen events" is capturing the notion of self-insurance for any general purpose. In both surveys, users and non-users reported a wide range of other reasons for saving including for: education, health or medical spending, starting or operating a farm, business, or investment, household items and supporting extended family. In 2017, where there is a larger sample of non-users (651), it is notable that users reported saving somewhat more for investment purposes such as for a farm or business, whereas, apart from education, non-users reported saving more particularly for important daily activities such as household items and social events. Saving to support an extended family is significantly higher among m-money users than non-users. All these findings tend to provide further support for the argument that early m-money users come from the more prosperous, financially-included groups in society.

Tables 22, 23, 24, 25 about here

Finally, we asked two direct questions about the impact of m-money on social networks (tables 24 and 25). We wanted to investigate the hypothesis that although m-money often appears to strengthen social networks, it may in reality give members an incentive for networks to become

more transactional in nature, confined to text messages and m-money transfers. Users were asked to compare their behaviour before and after adopting m-money. Note that the questions do refer specifically to m-money use and not to mobile phone use. Not surprisingly, in both surveys, users reported greater contact than before by voice or text, but there was a significant drop-off in face-to-face meetings in the 2017 survey, although less so in 2019. Nevertheless if a social network is reinforced by contact whether in person or by phone, it cannot automatically be concluded from the responses to these two questions that m-money use clearly tended to strengthen social networks in Ghana. Elsewhere in Africa, female users of m-money have particularly stated that, although they have received more cash support from their spouse or partner in the form of remittances as a result of using m-money, this has often reduced the frequency of direct contacts with their (male) partner as he sees less need to travel back home to the village than before (Morawczynski, 2009). This issue too deserves further investigation.

6. Conclusion

We have summarised the broad development of mobile phone use and m-money in Ghana and set out some of the main results of two household surveys carried out in Ghana in 2017 and 2019. These surveys aimed at shedding light on the distribution of m-money, its use and its impact on financial inclusion and poverty. The surveys were conducted via structured questionnaires that covered 1000 individuals using representative samples from all the regions of the country.

M-money penetrated Ghana very rapidly beginning around 2013 and, by 2019, the number of registered m-money accounts exceeded the whole population. In our surveys, we found that the early adopters of m-money in Ghana tended to come from the more financially connected groups in society, being generally wealthier, more educated and living in an urban area. This is also true in other African countries. However, m-money in Ghana has now penetrated well beyond the urban middle-class to more rural, poorer and otherwise less financially included groups.

The development of Ghana's formal financial system still lags those of industrialised countries

but, in comparison with many other African countries, it is relatively well-served by formal finance. In addition, the Ghanaian authorities acted relatively early to integrate m-money into the financial system and to mandate interoperability of m-money accounts. Therefore, the widespread adoption of m-money suggests that it can act as both complement and substitute for formal finance: a substitute for formal finance for those who are not otherwise financially included, and a complement to formal finance for those who are already financially included. In both surveys, we found that by far the most widely-used m-money services in Ghana, other than deposit and withdrawal of money and purchase of airtime, are for remittances to or from family and friends, for either regular or emergency support, all of which can be done at much lower cost using m-money than by other means. However, even though deposits and withdrawals of cash can be done at substantially lower cost via m-money agents rather than over the counter in a bank branch, we found that a majority of m-money users who also have an account with a formal financial institution usually obtain cash by the more traditional route in a bank branch.

We found that few of those interviewed had ongoing insurance arrangements (except for Ghana's National Health Insurance scheme). However, m-money users appeared to be much better self-insured than non-users, with over 50% of m-money respondents stating that they believed that it was "somewhat" or "very" possible that they could come up with a specific and fairly substantial sum of cash in case of an emergency. M-money users are more likely to be able to save than non-users, and the most cited reason for saving is to be able to mitigate unforeseen events and emergencies, including funerals, accidents and weddings. Savings were given as the main source of cash in the event of an emergency for 40% (2017) or 37% (2019) of m-money users, with between 38% (2017) and 45% (2019) citing family and social networks. Finally, the direct impact of m-money use on social networks was found to be potentially ambiguous. M-money adoption is generally associated with somewhat more contact with social networks over the phone by voice and text, but somewhat fewer person-to-person meetings.

Overall, the surveys reveal a wealth of detail about m-money in Ghana and raise a host of important questions for further research, especially concerning the exact relationships among

m-money use, insurance and savings.

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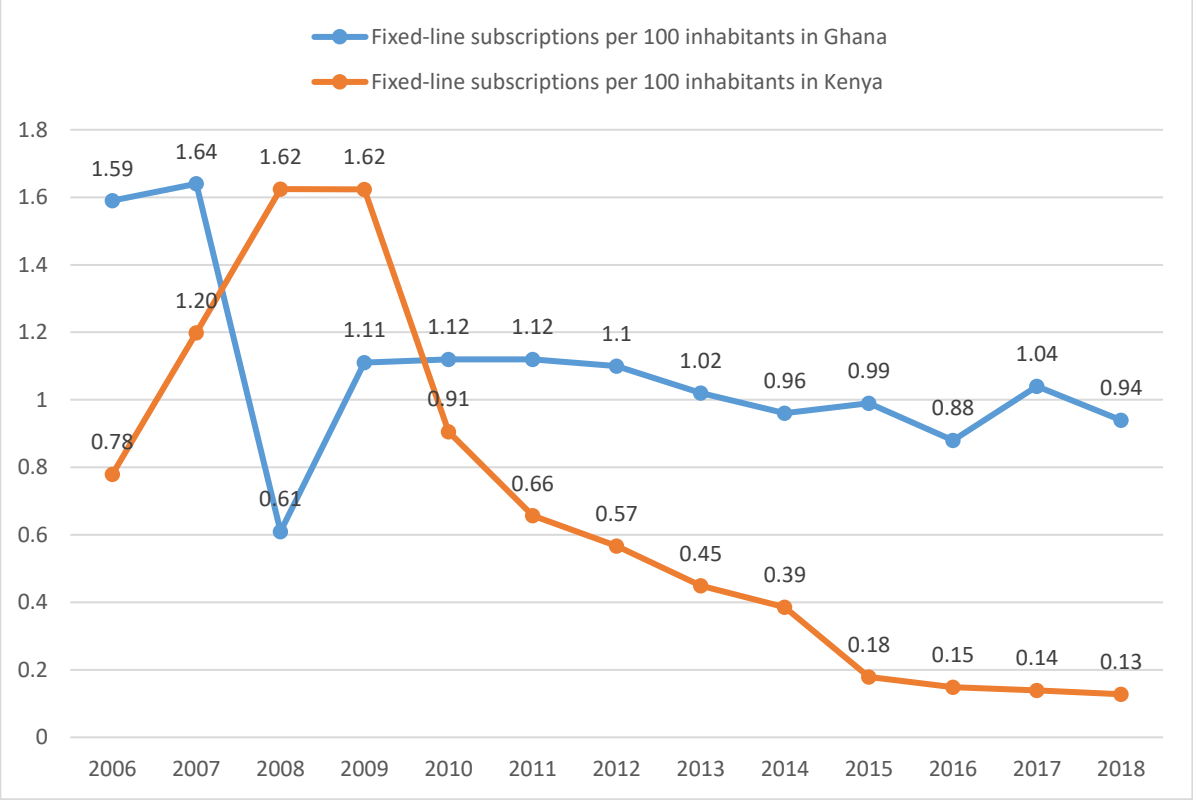
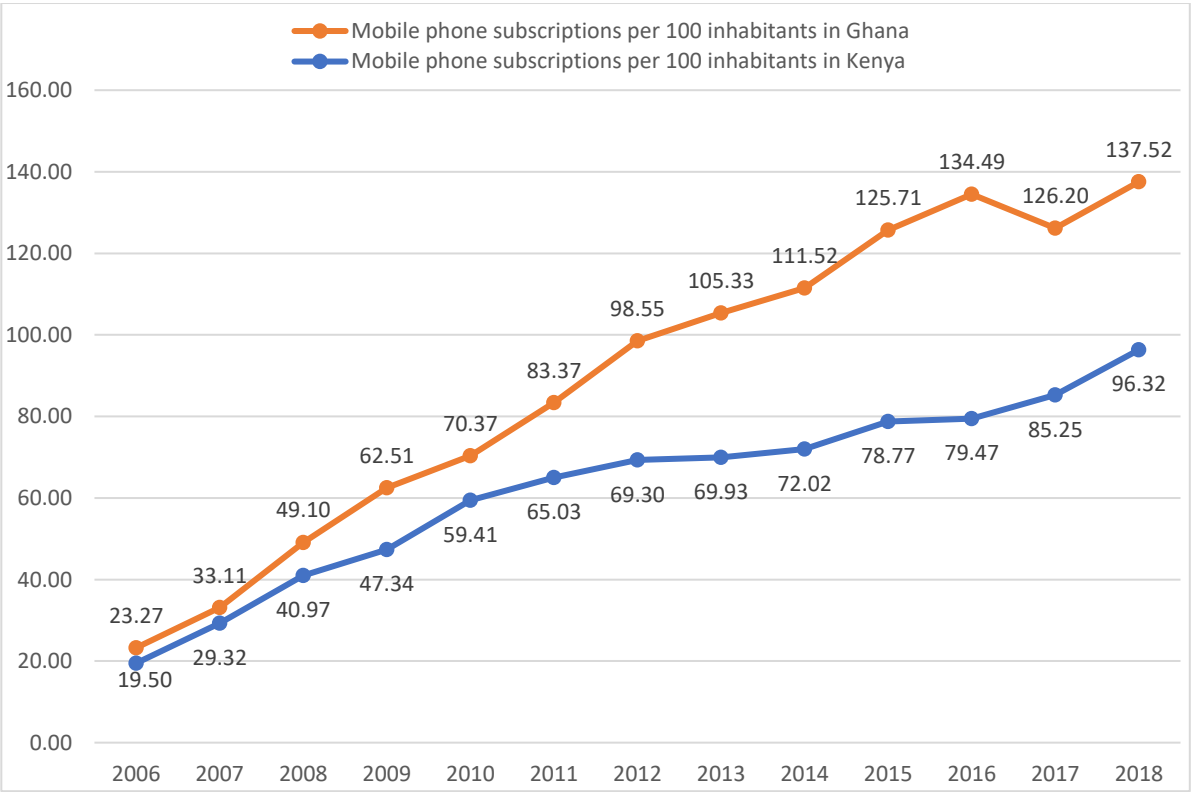
Figure 1. Fixed-line Penetration in Ghana vs. Kenya 2006-2018



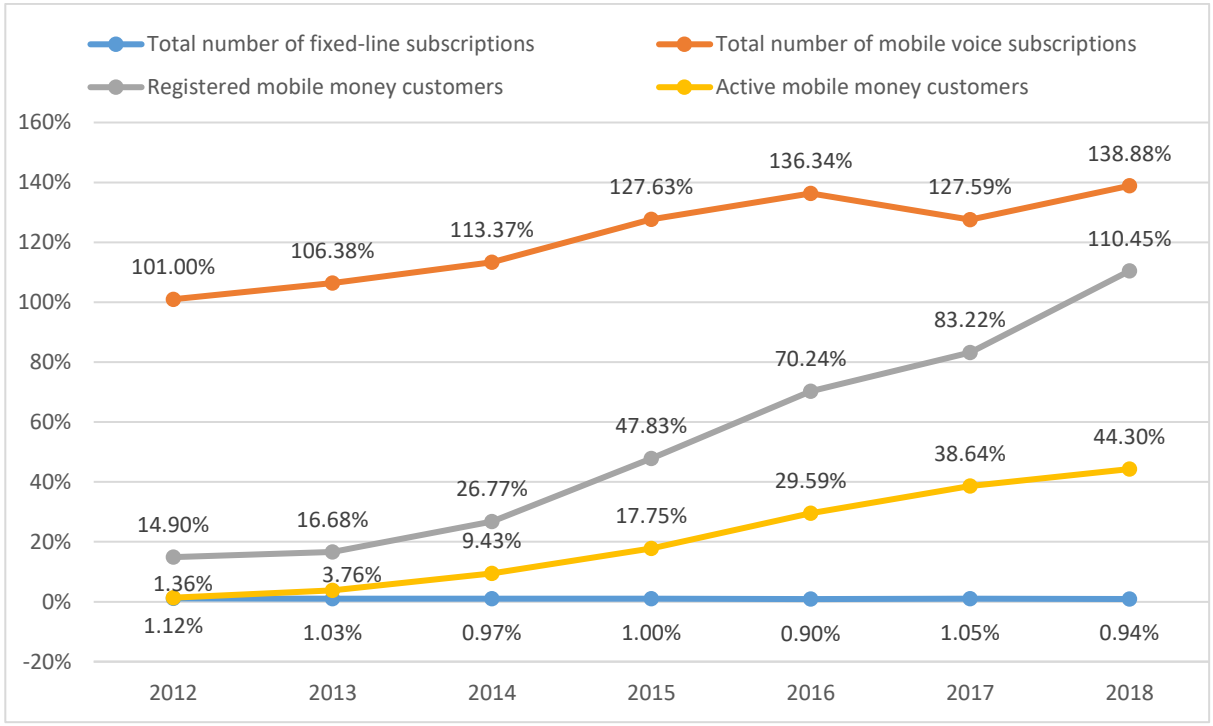
Source: ITU Year Book of Statistics 2019

Figure 2. Mobile Phone Penetration in Ghana vs. Kenya 2006-2018



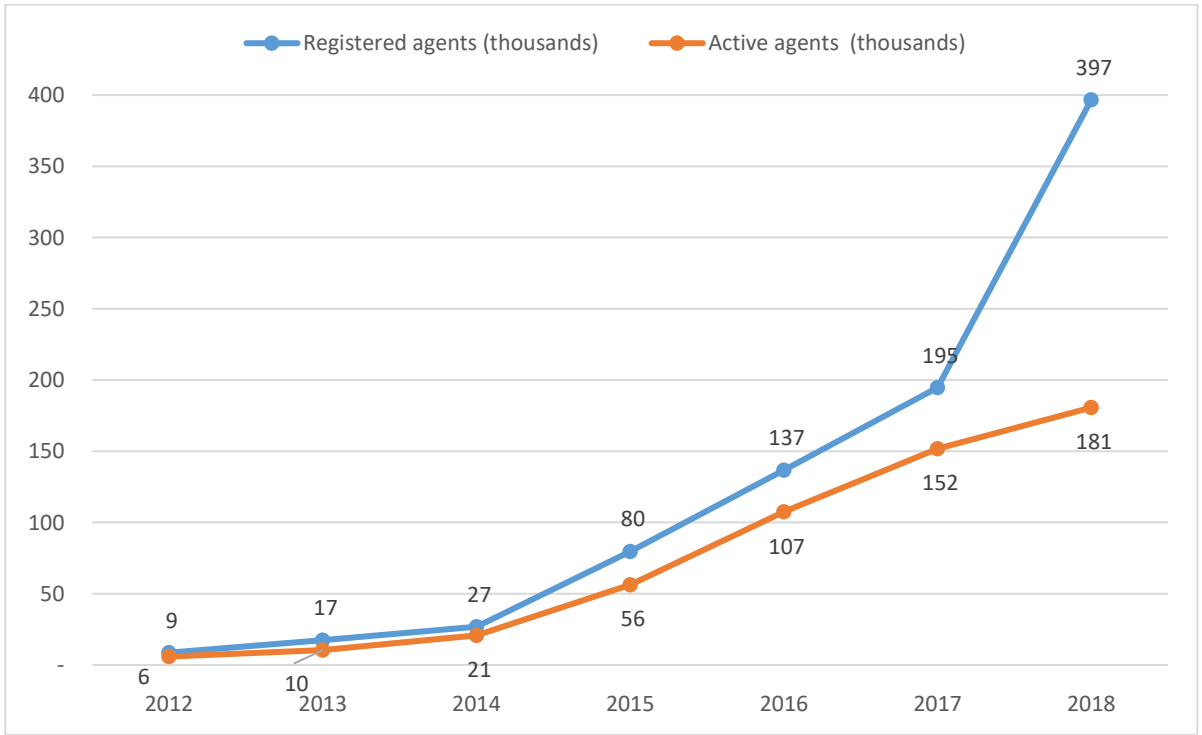
Source: ITU Year Book of Statistics 2019

Figure 3. Phone and Mobile Money Usage in Ghana 2012-2018 (in % of the population)



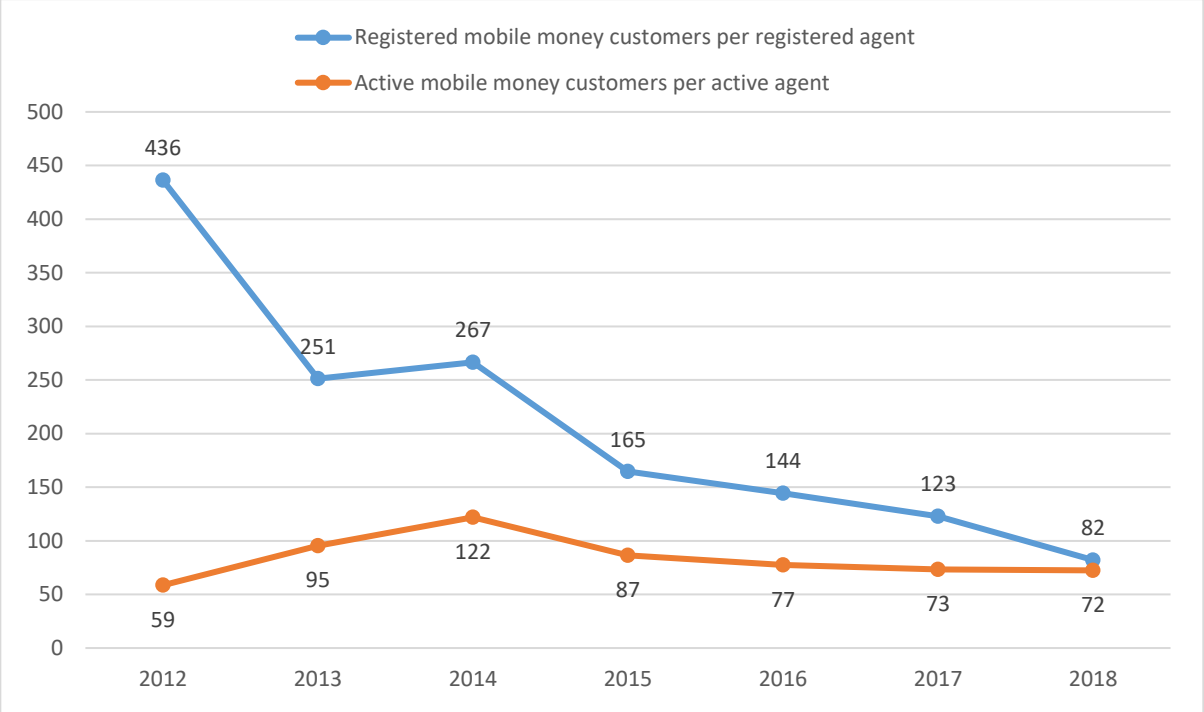
Sources: Bank of Ghana, *Payments Systems Annual Reports.* Available at: https://www.bog.gov.gh/downloads/payment-systems-downloads-page/
ITU, Telecom Voice Subscription Reports. Available at: https://www.nca.org.gh/industry-data-2/market-share-statistics-2/telecom-voice/

Figure 4. Mobile Money Agents in Ghana 2012-2018



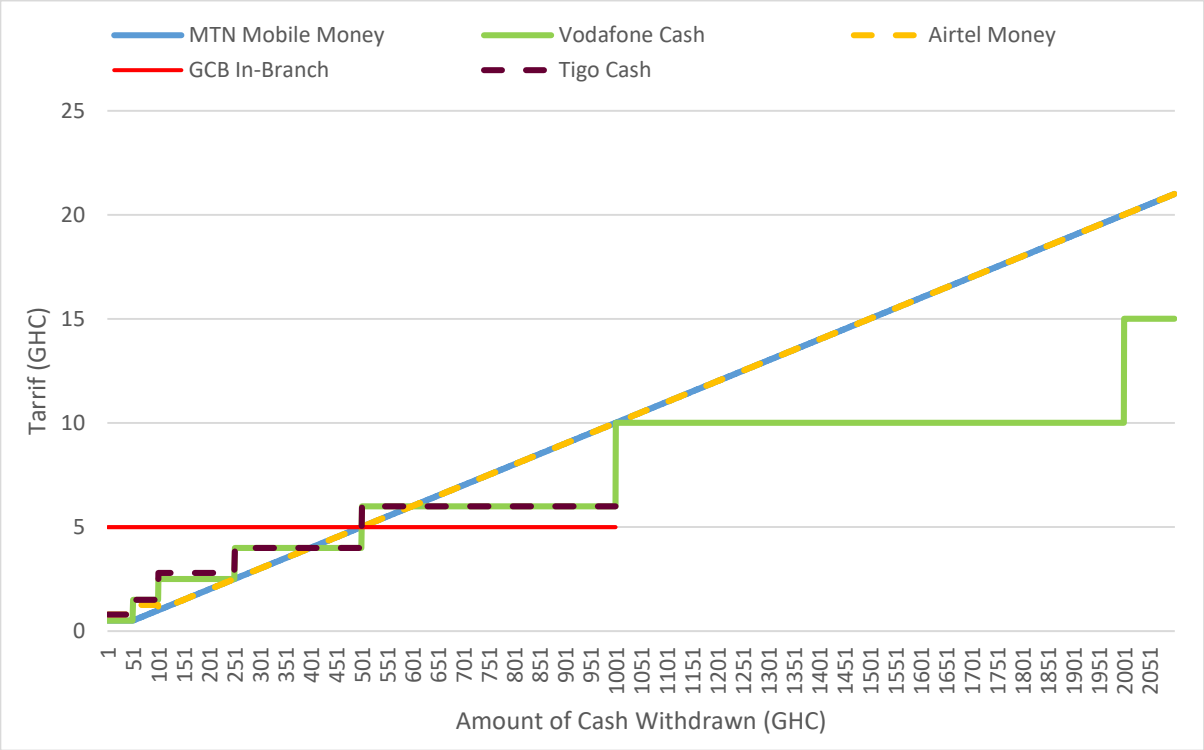
Sources: Bank of Ghana, *Payments Systems Annual Reports.* Available at: https://www.bog.gov.gh/downloads/payment-systems-downloads-page/

Figure 5. Mobile Money Customers per Agent in Ghana 2012-2018



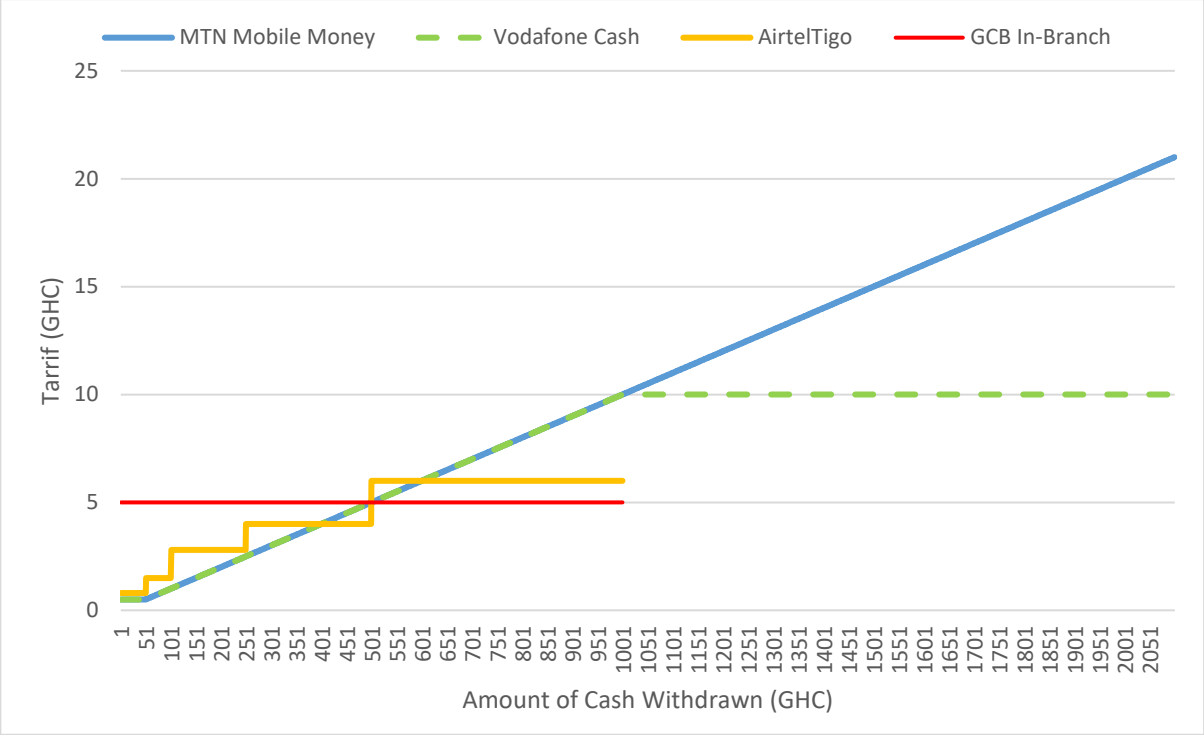
Sources: Bank of Ghana, *Payments Systems Annual Reports*. Available at: https://www.bog.gov.gh/downloads/payment-systems-downloads-page/

Figure 6. Rates to Withdraw Cash 2017: M-Money providers & Ghana Commercial Bank



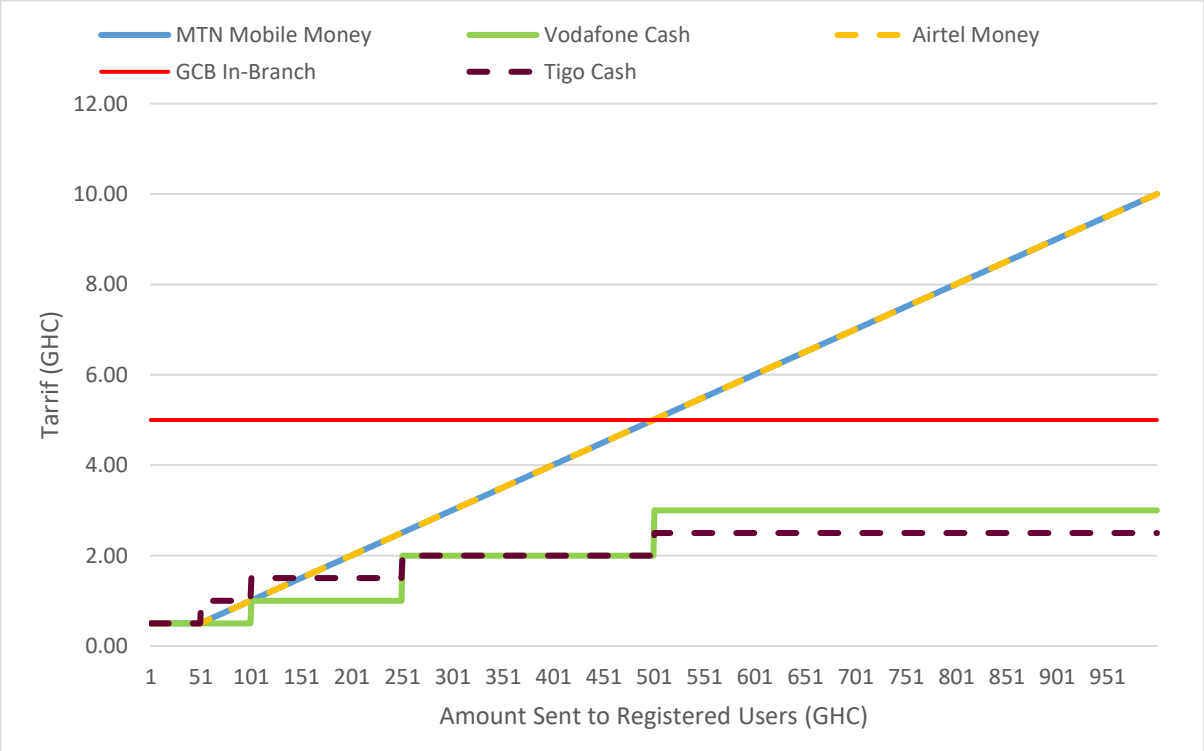
Sources: MNOs websites (17/03/2017), and https://www.gcbbank.com.gh/tools-and-resources/downloads/informational/38-tariff-guide-2017.html (18/05/2017)

Figure 7. Rates to Withdraw Cash 2019: M-Money providers & Ghana Commercial Bank



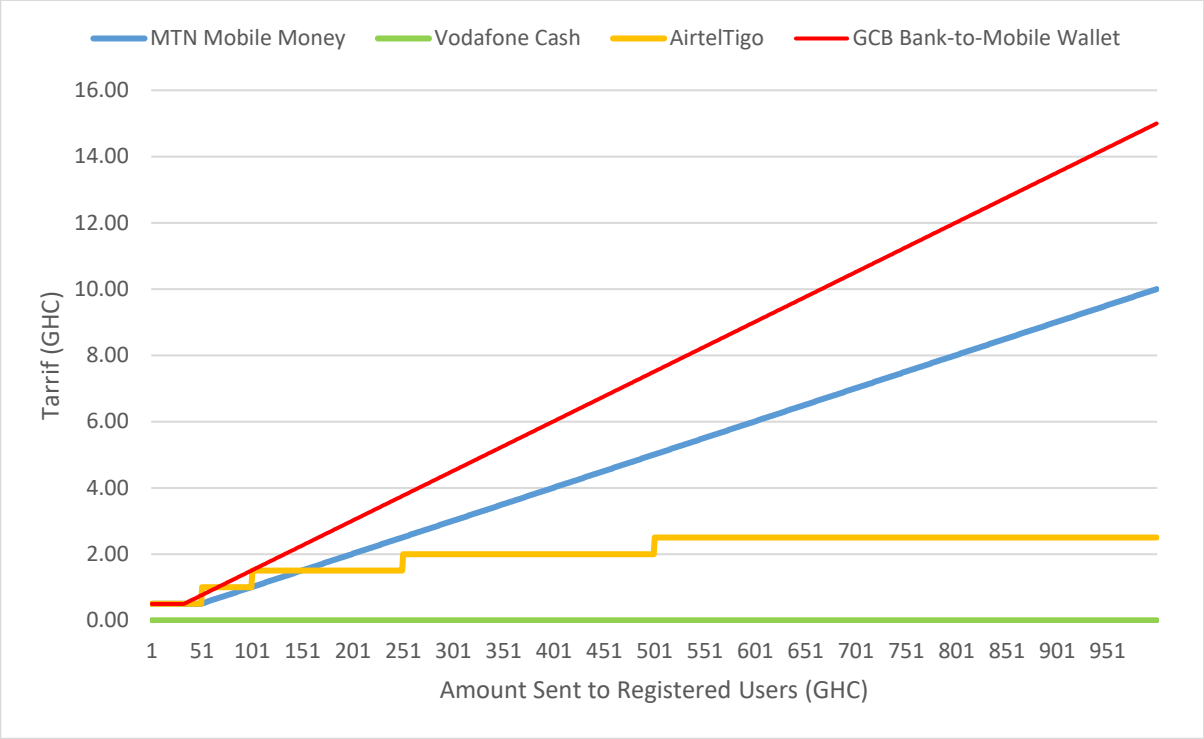
Sources MNOs websites (04/01/2020), and https://www.gcbbank.com.gh/tools-and-resources/downloads/informational/38-tariff-guide-2017.html (04/01/2020)

Figure 8. Rates to Send Money to Registered Users 2017: M-Money providers & Ghana Commercial Bank



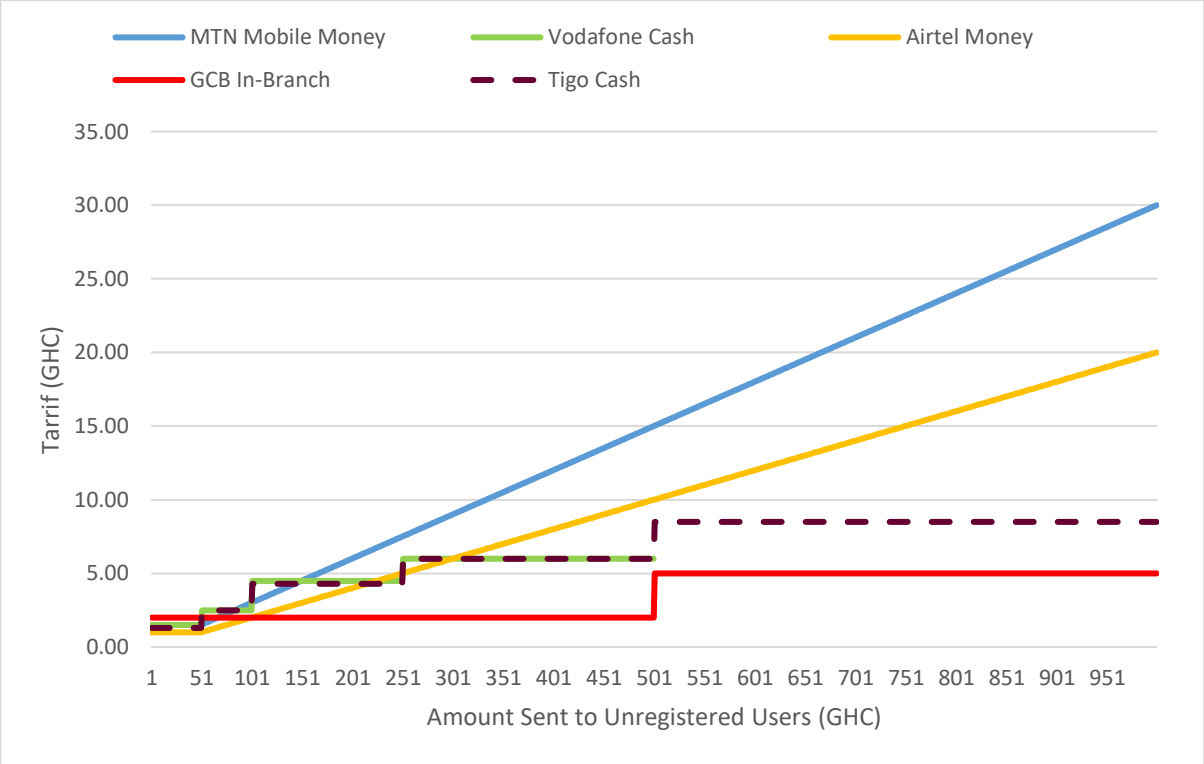
Sources: MNOs websites (17/03/2017), https://www.gcbbank.com.gh/tools-and-resources/downloads/informational/38-tariff-guide-2017.html (18/05/2017)

Figure 9. Rates to Send Money to Registered Users 2019: M-Money providers & Ghana Commercial Bank



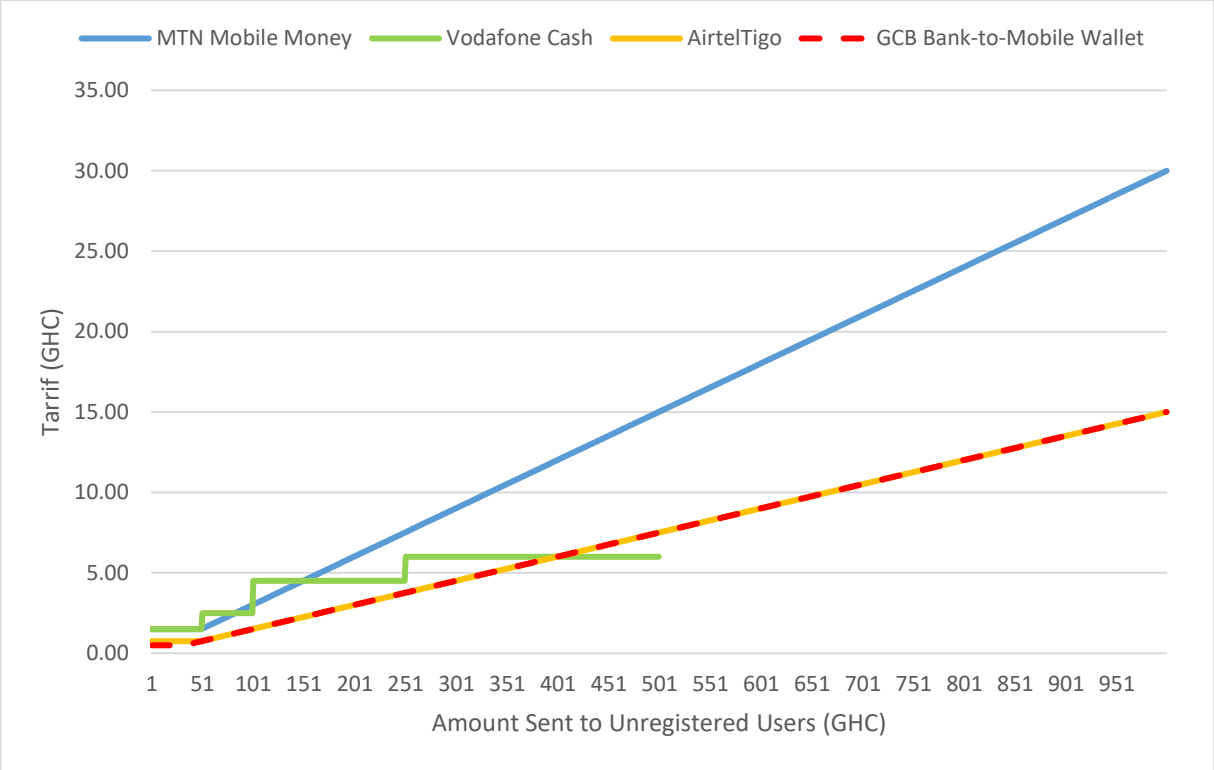
Sources MNOs websites (04/01/2020), and https://www.gcbbank.com.gh/tools-and-resources/downloads/informational/38-tariff-guide-2017.html (04/01/2020)

Figure 10. Rates for Sending Money to Unregistered Users 2017: M-Money providers & Ghana Commercial Bank



Sources: MNOs websites (17/03/2017), https://www.gcbbank.com.gh/tools-and-resources/downloads/informational/38-tariff-guide-2017.html (18/05/2017)

Figure 11. Rates for Sending Money to Unregistered Users 2019: M-Money providers & Ghana Commercial Bank



Sources MNOs websites (04/01/2020), and https://www.gcbbank.com.gh/tools-and-resources/downloads/informational/38-tariff-guide-2017.html (04/01/2020)

Table 1. Financial Transactions in Ghana 2012-2018

	2012	2013	2014	2015	2016	2017	2018
Panel 1.1 Total volume of financial transactions(no of transactions)							
RTGS	467,642	586,200	699,956	794,282	889,709	934,234	1,221,650
Cheques Cleared	6,710,475	6,796,712	6,962,297	7,146,259	7,309,406	7,334,460	7,255,220
ACH: Debits + Credits		2,551,905	4,305,677	5,361,251	6,117,456	7,001,742	7,506,295
E-zwich	1,147,418	814,441	625,167	2,251,101	5,365,085	8,367,017	7,759,354
National Switch (gh-link tm)	10,295	549,456	1,346,963	1,899,645	2,067,498	2,340,409	1,830,182
Mobile Money	18,042,241	40,853,559	113,179,738	266,246,537	550,218,427	981,564,563	1,454,470,801
Panel 1.2 Total value of financial transactions (GH₵ million)							
RTGS	331,321	470,375	758,312	1,032,544	1,670,369	2,083,846	1,963,465
Cheques Cleared	69,222	81,144	113,698	131,190	152,390	179,555	203,465
ACH: Debits + Credits		6,356	10,847	15,146	19,373	24,454	30,366
E-zwich	218	217	273	923	2,363	3,431	5,651
National Switch (gh-link tm)	1	68	183	305	447	603	544
Mobile Money	594	2,652	12,124	35,444	78,509	155,845	223,207
Panel 1.3 Average value of Financial Transactions (GH₵)							
RTGS	708,493	802,414	1,083,371	1,299,972	1,877,433	2,230,540	1,607,224
Cheques Cleared	10,316	11,939	16,331	18,358	20,849	24,481	28,044
ACH: Debits + Credits		2,491	2,519	2,825	3,167	3,492	4,045
E-zwich	190	267	436	410	440	410	728
National Switch (gh-link tm)	107	123	136	161	216	258	297
Mobile Money	33	65	107	133	143	159	153

Sources: Bank of Ghana, *Payments Systems Annual Reports.* Available at: https://www.bog.gov.gh/downloads/payment-systems-downloads-page/

Table 2. Ghana: Population and Sample Size by Region

Region	Population	Area (sq km)	Population Density	Population (% of total)	Sample Size	Group	
Northern	2,479,461	70,384	35.23	10.06	100	1	Low Population Density
Upper West	702,110	18,476	38.00	2.85	28	1	
Brong Ahafo	2,310,983	39,557	58.42	9.37	94	1	
Western	2,376,021	23,921	99.33	9.64	96	1	
Volta	2,118,252	20,570	102.98	8.59	86	1	
Sub-total	9,986,827	172,908	57.76	40.50	404		
Eastern	2,633,154	19,323	136.27	10.68	107	2	Medium Population Density
Upper East	1,046,545	8,842	118.36	4.24	42	2	
Central	2,201,863	9,826	224.09	8.93	89	2	
Sub-total	5,881,562	37,991	154.81	23.85	238		
Ashanti	4,780,380	24,389	196.01	19.39	195	3	High Population Density
Greater Accra	4,010,054	3,245	1235.76	16.26	163	3	
Sub-total	8,790,434	27,634	318.10	35.65	358		
Ghana Total	24,658,823	238,533	103.38	100	1,000		

Sources: 2017 and 2019 Surveys, and Ghana Statistical Service, *Population and Housing Census*, 2010.
Note: Effective 2019, Ghana's administrative regions increased from 10 to 16 by subdividing 4 existing regions. The 2019 survey was mapped from the 16 regions but the distribution according to the original 10 remained the same, based on the 2010 *Population and Housing Census*.

Table 3. Ghana: Surveys and Population Characteristics

	Survey 1: 2017 (% of survey: 1000 age 18+)	Survey 2: 2019 (% of survey: 1000 age 18+)	Ghana population (% of population age 15+)	Source & date of population data[1]
Rural Population	39.30	43.20	44.69[2]	WDI; 2017
Urban Population	60.70	56.80	55.31[2]	WDI; 2017
Female Population	46.30	50.70	49.05	WDI; 2017
Male Population	53.70	49.30	50.95	WDI; 2017
Age 18-25	25.70	21.60	31.73[3]	WDI; 2017
Age 26-35	31.90	32.40	24.88	WDI; 2017
Age 36-45	23.10	24.70	18.23	WDI; 2017
Age 46-55	10.20	12.20	12.25	WDI; 2017
Age 56 and Over	9.10	9.10	12.90	WDI; 2017
Un-employed/Inactive	35.90	20.80	24.88	WDI; 2017
Employed	64.10	79.20	75.12	WDI; 2017
Uneducated	18.40	7.00	23.58	UNESCO; 2010
Primary Educated or above	81.60	93.00	76.42[4]	UNESCO; 2010

Notes:
1. WDI: World Bank (2019) World Development Indicators; UNESCO: UNESCO (2019) UIS Database.
2. The WDI data is in percent of the total population
3. The WDI data is for 15 – 25 year olds
4. Estimated literacy rate of population aged 15+

Table 4. SURVEY 1 (2017) Socio-economic Characteristics – Mobile Phone+SIM Card Owners/Non-owners

		Panel 4-1		Panel 4-2		
Group		Own a Mobile+SIM (% of each group)	Don't Own a Mobile+SIM (% of each group)	% of Whole Sample	% of Mobile+SIM Owners	% of Mobile+SIM Non-owner
	Whole Sample	85.30	14.70			
1	Rural Population	82.70	17.30	39.30	38.10	46.26
2	Urban Population	86.99	13.01	60.70	61.90	53.74
3	Female Population	82.72	17.28	46.30	44.90	54.42
4	Male Population	87.52	12.48	53.70	55.10	45.58
5	Age 18-25	80.54	19.46	25.70	24.27	34.01
6	Age 26-35	93.10	6.90	31.90	34.82	14.97
7	Age 36-45	87.88	12.12	23.10	23.80	19.05
8	Age 46-55	85.29	14.71	10.20	10.20	10.20
9	Age 56 and Over	64.84	35.16	9.10	6.92	21.77
10	Un-employed/Inactive	74.65	25.35	35.90	31.42	61.90
11	Employed	91.26	8.74	64.10	68.58	38.10
12	Yearly Income Below 12k Cedis	89.55	10.45	50.70	53.22	36.05
13	Yearly Income Over 12k Cedis	93.65	6.35	18.90	20.75	8.16
14	Uneducated	67.93	32.07	18.40	14.65	40.14
15	Primary School Educated	75.96	24.04	10.40	9.26	17.01
16	Secondary School Educated	89.58	10.42	48.00	50.41	34.01
17	Undergraduate Educated and Above	94.40	5.60	23.20	25.67	8.84
18	Living Alone	79.62	20.38	47.60	44.43	65.99
19	Married/Living with Partner	91.93	8.07	50.80	54.75	27.89

Table 5. SURVEY 2 (2019) Socio-economic Characteristics – Mobile Phone+SIM Card Owners/Non-owners

Group		Panel 5-1		Panel 5-2		
		Own a Mobile+SIM (% of each group)	Don't Own a Mobile+SIM (% of each group)	% of Whole Sample	% of Mobile+SIM Owners	% of Mobile+SIM Non-owner
	Whole Sample	96.90	3.10			
1	Rural Population	96.99	3.01	43.20	43.24	41.94
2	Urban Population	96.83	3.17	56.80	56.76	58.06
3	Female Population	96.35	3.65	49.30	49.02	58.06
4	Male Population	97.44	2.56	50.70	50.98	41.94
5	Age 18-25	98.46	1.54	21.60	21.88	12.90
6	Age 26-35	98.15	1.85	32.40	32.92	16.13
7	Age 36-45	97.17	2.83	24.70	24.77	22.58
8	Age 46-55	94.26	5.74	12.20	11.87	22.58
9	Age 56 and Over	91.21	8.79	9.10	8.57	25.81
10	Un-employed/Inactive	94.71	5.29	20.80	20.33	35.48
11	Employed	97.47	2.53	79.20	79.67	64.52
12	Yearly Income Below 12k Cedis	96.58	3.42	76.00	75.75	83.87
13	Yearly Income Over 12k Cedis	98.39	1.61	12.40	12.59	6.45
14	Uneducated	88.57	11.43	7.00	6.40	25.81
15	Primary School Educated	91.04	8.96	6.70	6.30	19.35
16	Secondary School Educated	97.46	2.54	63.10	63.47	51.61
17	Undergraduate Educated and Above	99.57	0.43	23.20	23.84	3.23
18	Living Alone	96.92	3.08	45.40	45.41	54.18
19	Married/Living with Partner	96.86	3.14	54.20	45.16	54.84

Table 6. SURVEY 1 (2017) Socio-economic Characteristics – Mobile Money Users/Non-users

		Panel 6-1		Panel 6-2		
Group		**Use Mobile Money (% of each group)**	**Don't Use Mobile Money (% of each group)**	**% of Whole Sample**	**% of Mobile Money Users**	**% of Mobile Money Non-Users**
	Whole Sample	34.90	65.10			
1	Rural Population	28.24	71.76	39.30	31.81	43.32
2	Urban Population	39.21	60.79	60.70	68.19	56.68
3	Female Population	28.73	71.27	46.30	38.11	50.69
4	Male Population	40.22	59.78	53.70	61.89	49.31
5	Age 18-25	33.46	66.54	25.70	24.64	26.27
6	Age 26-35	41.38	58.62	31.90	37.82	28.73
7	Age 36-45	35.93	64.07	23.10	23.78	22.73
8	Age 46-55	27.45	72.55	10.20	8.02	11.37
9	Age 56 and Over	21.98	78.02	9.10	5.73	10.91
10	Un-employed/Inactive	29.53	70.47	35.90	30.37	38.86
11	Employed	37.91	62.09	64.10	69.63	61.14
12	Yearly Income Below 12k Cedis	33.33	66.67	50.70	48.42	51.92
13	Yearly Income Over 12k Cedis	43.92	56.08	18.90	23.78	16.28
14	Uneducated	11.41	88.59	18.40	6.02	25.04
15	Primary School Educated	20.19	79.81	10.40	6.02	12.75
16	Secondary School Educated	38.75	61.25	48.00	53.30	45.16
17	Undergraduate Educated and Above	52.16	47.84	23.20	34.67	17.05
18	Living Alone	38.87	61.13	47.60	53.01	44.70
19	Married/Living with Partner	31.69	68.31	50.80	46.13	53.30

Table 7. SURVEY 2 (2019) Socio-economic Characteristics – Mobile Money Users/Non-users

		Panel 7-1		Panel 7-2		
Group		**Use Mobile Money (% of each group)**	**Don't Use Mobile Money (% of each group)**	**% of Whole Sample**	**% of Mobile Money Users**	**% of Mobile Money Non-Users**
	Whole Sample	92.60	7.40			
1	Rural Population	93.06	6.94	43.20	43.41	40.54
2	Urban Population	92.25	7.75	56.80	56.59	59.46
3	Female Population	92.90	7.10	49.30	50.54	49.46
4	Male Population	92.31	7.69	50.70	52.70	47.30
5	Age 18-25	95.83	4.17	21.60	22.35	12.16
6	Age 26-35	96.91	3.09	32.40	33.91	13.51
7	Age 36-45	92.71	7.29	24.70	24.73	24.32
8	Age 46-55	86.89	13.11	12.20	11.45	21.62
9	Age 56 and Over	76.92	23.08	9.10	7.56	28.38
10	Un-employed/Inactive	89.90	10.10	20.80	20.19	28.38
11	Employed	93.31	6.69	79.20	79.81	71.62
12	Yearly Income Below 12k Cedis	92.89	7.11	76.00	76.24	72.97
13	Yearly Income Over 12k Cedis	98.39	1.61	12.40	13.17	2.70
14	Uneducated	72.86	27.14	7.00	5.51	25.68
15	Primary School Educated	83.58	16.42	6.70	6.05	14.86
16	Secondary School Educated	93.34	6.66	63.10	63.61	56.76
17	Undergraduate Educated and Above	99.14	0.86	23.20	24.84	2.70
18	Living Alone	92.51	7.49	45.40	45.36	45.95
19	Married/Living with Partner	92.62	7.38	54.20	54.21	54.05

Table 8. SURVEY 1 (2017) Account and Card Ownership – Mobile Phone+SIM Card Owners/Non-owners

Group		Panel 8-1		Panel 8-2		
		Own a Mobile+SIM (% of each group)	Don't Own a Mobile+ SIM (% of each group)	% of Whole Sample	% of Mobile+ SIM Owners	% of Mobile+ SIM Non-owners
	Whole Sample	85.30	14.70			
	Have **either** an Informal **or** Formal Financial Account			56.40		
1	Member of an Informal Financial Group	93.65	6.35	25.20	27.67	10.88
2	Not a Member of an Informal Financial Group	82.49	17.51	74.80	72.33	89.12
3	Have an Account with a Formal Financial Group	95.75	4.25	44.70	50.18	12.93
3.1	– Have a Bank Account	95.63	4.37	34.30	38.45	10.20
4	Don't Have an Account with a Formal Financial Group	76.68	23.32	54.90	49.36	87.07
5	Main Way to Get Cash from a Formal Financial Group					
5.1	– ATM	95.49	4.51	13.30	14.89	4.08
5.2	– Over the Counter in a Branch	95.85	4.15	26.50	29.78	7.48
5.3	– Bank Agent	90.00	10.00	1.00	1.06	0.68
5.4	– Supermarket/Shop	0.00	0.00	0.00	0.00	0.00
5.5	– Other Way	100.00	0.00	0.50	0.59	0.00
5.6	– Don't Usually Need to Get Cash	96.88	3.13	3.20	3.63	0.68
6	Main Way to Manage Cash					
6.1	– Using an Informal Financial Group	93.12	6.88	18.90	20.63	8.84
6.2	– Using a Formal Financial Institution	95.43	4.57	35.00	39.16	10.88
6.3	– Using Them Equally	96.61	3.39	5.90	6.68	1.36
7	Have an ATM/Debit Card	96.37	3.63	19.30	21.81	4.76
8	Don't Have an ATM/Debit Card	94.04	5.96	40.30	44.43	16.33
9	Have a Credit Card	92.86	7.14	1.40	1.52	0.68
10	Don't Have a Credit Card	95.07	4.93	56.80	63.31	19.05
11	Have a Pre-paid Card	98.85	1.15	8.70	10.08	0.68
12	Don't Have a Pre-paid Card	94.28	5.72	50.70	56.04	19.73

Table 9. SURVEY 2 (2019) Account and Card Ownership – Mobile Phone+SIM Card Owners/Non-owners

Group		Panel 9-1		Panel 9-2		
		Own a Mobile+SIM (% of each group)	Don't Own a Mobile+ SIM (% of each group)	% of Whole Sample	% of Mobile+ SIM Owners	% of Mobile+ SIM Non-owners
	Whole Sample	96.90	3.10			
	Have **either** an Informal **or** Formal Financial Account			67.50		
1	Member of an Informal Financial Group	97.03	2.97	30.30	30.34	29.03
2	Not a Member of an Informal Financial Group	96.98	3.02	69.60	69.66	67.74
3	Have an Account with a Formal Financial Group	98.74	1.26	47.60	48.50	19.35
3.1	– Have a Bank Account	98.62	1.38	36.30	36.95	16.13
4	Don't Have an Account with a Formal Financial Group	95.23	4.77	52.40	51.50	80.65
5	Main Way to Get Cash from a Formal Financial Group					
5.1	– ATM	98.70	1.30	7.70	7.84	3.23
5.2	– Over the Counter in a Branch	98.70	1.30	38.40	39.11	16.13
5.3	– Bank Agent	100.00	0.00	0.60	0.62	0.00
5.4	– Supermarket/Shop	100.00	0.00	0.10	0.10	0.00
5.5	– Other Way	100.00	0.00	0.30	0.31	0.00
5.6	– Don't Usually Need to Get Cash	100.00	0.00	0.50	0.52	0.00
6	Main Way to Manage Cash					
6.1	– Using an Informal Financial Group	97.14	2.86	24.50	24.56	22.58
6.2	– Using a Formal Financial Institution	97.96	2.04	39.30	39.73	25.81
6.3	– Using Them Equally	100.00	0.00	3.70	3.82	0.00
7	Have an ATM/Debit Card	99.53	0.47	21.10	21.67	3.23
8	Don't Have an ATM/Debit Card	98.11	1.89	26.50	26.83	16.13
9	Have a Credit Card	100.00	0.00	0.70	0.72	0.00
10	Don't Have a Credit Card	98.72	1.28	46.90	47.78	19.35
11	Have a Pre-paid Card	98.17	1.83	10.90	11.04	6.45
12	Don't Have a Pre-paid Card	97.70	2.30	56.50	56.97	41.94

Table 10. SURVEY 1 (2017) Account and Card Ownership – Mobile Money Users/Non-users

Group		Panel 10-1		Panel 10-2		
		Use Mobile Money (% of each group)	Don't Use Mobile Money (% of each group)	% of Whole Sample	% of Mobile Money Users	% of Mobile Money Non-Users
	Whole Sample	34.90	65.10			
1	Member of an Informal Financial Group	30.16	69.84	25.20	21.78	27.04
2	Not a Member of an Informal Financial Group	36.50	63.90	74.80	78.22	72.96
3	Have an Account with a Formal Financial Group	47.65	52.35	44.70	61.03	35.94
3.1	– Have a Bank Account	51.02	48.98	34.30	50.14	25.81
4	Don't Have an Account with a Formal Financial Group	24.41	75.59	54.90	38.40	63.75
5	Main Way to Get Cash from a Formal Financial Group					
5.1	– ATM	55.64	44.36	13.30	21.20	9.06
5.2	– Over the Counter in a Branch	44.53	55.47	26.50	33.81	22.58
5.3	– Bank Agent	40.00	60.00	1.00	1.15	0.92
5.4	– Supermarket/Shop	0.00	0.00	0.00	0.00	0.00
5.5	– Other Way	80.00	20.00	0.50	1.15	0.15
5.6	– Don't Usually Need to Get Cash	40.63	59.38	3.20	3.72	2.92
6	Main Way to Manage Cash					
6.1	– Using an Informal Financial Group	26.98	73.02	18.90	14.61	21.20
6.2	– Using a Formal Financial Institution	45.43	54.57	35.00	45.56	29.34
6.3	– Using Them Equally	57.63	42.37	5.90	9.74	3.84
7	Have an ATM/Debit Card	59.59	40.41	19.30	32.95	11.98
8	Don't Have an ATM/Debit Card	32.01	67.99	40.30	36.96	42.09
9	Have a Credit Card	64.29	35.71	1.40	2.58	0.77
10	Don't Have a Credit Card	40.32	59.68	56.80	65.62	52.07
11	Have a Pre-paid Card	56.32	43.68	8.70	14.04	5.84
12	Don't Have a Pre-paid Card	38.26	61.74	50.70	55.59	48.08

Table 11. SURVEY 2 (2019) Account and Card Ownership – Mobile Money Users/Non-users

Group		Panel 11-1		Panel 11-2		
		Use Mobile Money (% of each group)	Don't Use Mobile Money (% of each group)	% of Whole Sample	% of Mobile Money Users	% of Mobile Money Non-Users
	Whole Sample	92.60	7.40			
1	Member of an Informal Financial Group	93.73	6.27	30.30	30.67	25.68
2	Not a Member of an Informal Financial Group	92.10	7.90	69.60	69.22	74.32
3	Have an Account with a Formal Financial Group	97.90	2.10	47.60	50.32	13.51
3.1	– Have a Bank Account	98.07	1.93	36.30	38.44	9.46
4	Don't Have an Account with a Formal Financial Group	87.79	12.21	52.40	49.68	86.49
5	Main Way to Get Cash from a Formal Financial Group					
5.1	– ATM	100.00	0.00	7.70	8.32	0.00
5.2	– Over the Counter in a Branch	97.66	2.34	38.40	40.50	12.16
5.3	– Bank Agent	100.00	0.00	0.60	0.65	0.00
5.4	– Supermarket/Shop	100.00	0.00	0.10	0.11	0.00
5.5	– Other Way	100.00	0.00	0.30	0.32	0.00
5.6	– Don't Usually Need to Get Cash	80.00	20.00	0.50	0.43	1.35
6	Main Way to Manage Cash					
6.1	– Using an Informal Financial Group	93.47	6.53	24.50	24.73	21.62
6.2	– Using a Formal Financial Institution	96.95	3.05	39.30	41.14	16.22
6.3	– Using Them Equally	100.00	0.00	3.70	4.00	0.00
7	Have an ATM/Debit Card	100.00	0.00	21.10	22.79	0.00
8	Don't Have an ATM/Debit Card	96.23	3.77	26.50	27.54	13.51
9	Have a Credit Card	100.00	0.00	0.70	0.76	0.00
10	Don't Have a Credit Card	97.87	2.13	46.90	49.57	13.51
11	Have a Pre-paid Card	99.08	0.92	10.90	11.66	1.35
12	Don't Have a Pre-paid Card	95.22	4.78	56.50	58.10	36.49

Table 12. SURVEY 1 (2017)Mobile Money Transactions

Mobile Money Services Used	1. Yes (%)	2. No (%)	3. Largest spending (₵)	4. Smallest spending (₵)	5. Number of times used last month
Withdraw money	33.20	1.70	752.86	43.48	3.42
	95.14	4.86	(1640.75)	(61.35)	(4.14)
Deposit money	28.80	6.10	936.43	63.04	3.27
	82.52	17.48	(3130.75)	(112.56)	(4.49)
Remittances					
Receive money from family members, friends, or others to help with emergencies	20.50	14.40	369.22	89.55	1.75
	58.73	41.27	(536.07)	(141.05)	(2.45)
Send money to family members, friends, or others to help with emergencies	19.50	15.40	375.96	82.03	3.50
	55.88	44.12	(504.22)	(167.42)	(16.11)
Receive money from family members, friends, or others for regular support	17.90	17.00	326.42	77.69	3.63
	51.29	48.71	(402.65)	(126.87)	(20.98)
Send money to family members, friends, or others for regular support	15.20	19.70	440.09	74.02	3.53
	43.55	56.45	(540.84)	(157.94)	(16.67)
Payments for goods and non-financial services					
Buy airtime top-ups	17.30	17.60	78.13	4.25	5.47
	49.56	50.44	(543.02)	(9.88)	(10.36)
Pay for goods at a shop, e.g. grocery, clothing etc.	2.40	32.50	245.63	70.25	2.13
	6.88	93.12	(287.37)	(161.82)	(3.88)
Pay a utility bill	1.20	33.70	206.67	77.08	1.67
	3.44	96.56	(220.40)	(136.02)	(1.61)
Pay a school fee	1.20	33.70	820.00	207.50	1.00
	3.44	96.56	(660.58)	(237.64)	(1.41)
Pay a medical bill	0.70	34.20	777.14	130.00	1.29
	2.00	98.00	(1651.71)	(191.83)	(1.70)
Pay for large purchases, e.g. land, cattle, property	0.60	34.30	516.67	512.50	1.00
	1.71	98.29	(825.63)	(828.21)	(2.00)
Pay a government bill, including tax, fine or fee	0.40	34.50	55.00	33.75	1.25
	1.14	98.86	(45.09)	(12.50)	(1.26)
Receipts					
Receive wages for primary or secondary job(s)	2.90	32.00	540.07	147.66	1.86
	8.32	91.68	(1178.35)	(378.06)	(1.51)
Receive welfare, pension or other payments from the government	1.30	33.60	50.00	50.00	1.46
	3.73	96.27	(138.44)	(119.02)	(2.15)
Financial Services					
Make or receive payments on an insurance policy	1.20	33.70	74.17	100.83	1.25
	3.44	96.56	(145.94)	(189.04)	(2.83)
Save money for a future purchase or for longer term such as a pension	1.10	33.80	196.36	150.91	1.09
	3.15	96.85	(272.63)	(247.04)	(1.22)
Give a loan or receive payments on a loan	0.60	34.30	575.67	152.33	2.83
	1.71	98.29	(1191.15)	(173.71)	(3.66)
Take a loan or make payments on a loan	0.40	34.50	45.75	27.50	3.25
	1.14	98.86	(32.23)	(26.30)	(4.50)

Notes: The numbers highlighted in green show the percent of the whole sample, with the numbers underneath showing the percent of mobile money users. Entries for *largest* and *smallest* spending and *number of times used* are the means of the respective responses; standard deviations are shown below in parentheses.

Table 13. SURVEY 2 (2019)Mobile Money Transactions

Mobile Money Services Used	1. Yes (%)	2. No (%)	3. Largest spending (₵)	4. Smallest spending (₵)	5. Number of times used last month
Withdraw money	88.10	4.00	941.76	54.95	5.46
	95.14	4.21	(2798)	(361.22)	(22.52)
Deposit money	76.10	15.60	1795.16	60.05	5.57
	82.18	16.63	(4680.83)	(254.80)	(34.35)
Remittances					
Receive money from family members, friends, or others to help with emergencies	40.90	50.80	318.36	47.64	1.37
	44.17	54.64	(481.17)	(73.07)	(2.94)
Send money to family members, friends, or others to help with emergencies	39.10	52.20	318.35	44.79	2.38
	42.22	56.16	(406.45)	(47.43)	(11.09)
Receive money from family members, friends, or others for regular support	37.80	53.70	306.89	40.58	1.55
	40.82	57.78	(422.59)	(45.36)	(1.89)
Send money to family members, friends, or others for regular support	29.70	61.40	231.28	42.37	1.60
	32.07	66.09	(284.76)	(43.72)	(2.47)
Payments for goods and non-financial services					
Buy airtime top-ups	42.70	49.00	13.87	2.02	4.15
	46.11	52.70	(37.29)	(2.11)	(3.71)
Pay for goods at a shop, e.g. grocery, clothing etc.	8.30	83.90	408.51	41.16	3.71
	8.96	90.39	(1354.53)	(75.90)	(22.57)
Pay a utility bill	3.80	87.77	139.32	39.95	2.34
	4.10	94.49	(87.68)	(23.09)	(5.09)
Pay a school fee	1.50	90.20	742.86	448.08	2.00
	1.62	97.19	(522.88)	(385.34)	(1.73)
Pay a medical bill	1.90	89.40	103.26	24.59	1.94
	2.05	96.33	(126.23)	(20.95)	(4.70)
Pay for large purchases, e.g. land, cattle, property	0.70	90.40	2731.43	360.83	1.40
	0.76	97.41	(6299.80)	(371.35)	(1.14)
Pay a government bill, including tax, fine or fee	0.20	91.20	110.00	40	0
	0.22	98.27	(127.28)	(0.00)	(0.00)
Receipts					
Receive wages for primary or secondary job(s)	4.10	87.20	235.12	100.77	1.31
	4.43	93.95	(245.81)	(161.80)	(1.80)
Receive welfare, pension or other payments from the government	0.20	91.10	305.00	20	0
	0.22	98.16	(360.62)	(0.00)	(0.00)
Financial Services					
Make or receive payments on an insurance policy	1.10	89.90	50.73	17.4	0.50
	1.19	96.87	(84.25)	(16.12)	(0.53)
Save money for a future purchase or for longer term such as a pension	2.10	88.90	263.39	23.23	1.56
	2.38	95.79	(313.32)	(27.62)	(2.79)
Give a loan or receive payments on a loan	0.50	90.80	82.50	43.33	0.25
	0.54	97.84	(149.65)	(51.32)	(0.50)
Take a loan or make payments on a loan	4.70	86.50	137.36	49.07	0.61
	5.08	93.20	(125.80)	(24.22)	(0.86)
Transfer mobile money into or out of your own or another bank account (not e-zwich or mobile wallet)	3.50	87.70	644.12	78.67	2.06
	3.78	94.49	(585.27)	(119.20)	(3.76)
Transfer mobile money into or out of your e-zwich	0.50	90.60	504	75	2.25
	0.54	97.62	(346.53)	(28.87)	(0.96)

Notes: The numbers highlighted in green show the percent of the whole sample, with the numbers underneath showing the percent of mobile money users. Entries for *largest* and *smallest* spending and *number of times used* are the means of the respective responses; standard deviations are shown below in parentheses.

Table 14 SURVEY 1 (2017) Money Transfer

	Sending Money		Receiving Money	
	% of Mobile Money Users	% of Mobile Money Non-users	% of Mobile Money Users	% of Mobile Money Non-users
Directly handed cash to this person	51.00	35.79	51.58	52.69
Sent cash through someone you know or by a Trotro (mini-bus) or taxi driver	10.60	7.22	8.02	6.45
Sent money through a bank or other formal financial institution; e.g. at a branch, ATM, or direct deposit into an account	10.89	12.90	12.32	13.06
Sent money through a mobile phone	53.58	17.36	56.16	15.05
Sent money through a money transfer service	9.17	6.30	12.32	5.53

Table 15 SURVEY 2 (2019) Money Transfer

	Sending Money		Receiving Money	
	% of Mobile Money Users	% of Mobile Money Non-users	% of Mobile Money Users	% of Mobile Money Non-users
Directly handed cash to this person	57.56	32.43	57.24	40.54
Sent cash through someone you know or by a Trotro (mini-bus) or taxi driver	3.89	5.41	3.67	5.41
Sent money through a bank or other formal financial institution; e.g. at a branch, ATM, or direct deposit into an account	7.99	2.70	16.52	0.00
Sent money through a mobile phone	75.27	14.86	84.88	12.16
Sent money through a money transfer service	21.49	12.16	16.85	12.16

Table 16 SURVEY 1 (2017) Payments for Basic Services

	Electricity/ Water/Rubbish Collection		School Fees		Medical Services	
	% of Mobile Money Users	% of Mobile Money Non-users	% of Mobile Money Users	% of Mobile Money Non-users	% of Mobile Money Users	% of Mobile Money Non-users
Made a payment using cash	66.48	49.77	55.59	45.78	66.19	46.08
Made a payment directly from an account of yours; eg. using a debit or credit card, a bank transfer, or a cheque	4.01	5.07	6.02	9.52	2.01	0.61
Made a payment through a mobile phone	7.16	1.69	4.87	0.92	3.72	0.92

Table 17 SURVEY 2 (2019) Payments for Basic Services

	Electricity/ Water/Rubbish Collection		School Fees		Medical Services	
	% of Mobile Money Users	% of Mobile Money Non-users	% of Mobile Money Users	% of Mobile Money Non-users	% of Mobile Money Users	% of Mobile Money Non-users
Made a payment using cash	89.63	79.73	67.93	47.30	79.81	79.73
Made a payment directly from an account of yours; eg. using a debit or credit card, a bank transfer, or a cheque	1.62	0.00	4.21	0.00	1.51	0.00
Made a payment through a mobile phone	7.13	1.35	5.08	0.00	4.54	1.35

Table 18 SURVEY 1 (2017) Insurance

Insurance Policies taken out	% of Mobile Money Users	% of Mobile Money Non-users
Car insurance	6.02	4.45
House – building or contents insurance	0.57	0.61
Crop insurance	0.00	0.00
Livestock insurance	0.00	0.00
NHIS (National Health Insurance Scheme)	69.05	72.04
Other medical insurance policy	0.29	0.61
Life insurance policy	15.47	5.07
Education policy	8.88	3.84
Other retirement/pension plan	7.16	4.61
Other insurance	0.29	0.15
Believe insurance will provide financial aid at unexpected circumstances	83.38	70.66

Table 19 SURVEY 2 (2019) Insurance

Insurance Policies taken out	% of Mobile Money Users	% of Mobile Money Non-users
Car insurance	1.94	1.35
House – building or contents insurance	0.32	0.00
Crop insurance	0.22	0.00
Livestock insurance	0.11	0.00
NHIS (National Health Insurance Scheme)	83.59	72.97
Other medical insurance policy	0.22	0.00
Life insurance policy	11.77	2.70
Education policy	1.94	1.35
Other retirement/pension plan	5.94	1.35
Other insurance	0.54	0.00
Believe insurance will provide financial aid at unexpected circumstances	83.80	78.38

Table 20 SURVEY 1 (2017) Meeting Emergency Needs

Panel 20.1 Possibility to Come Up with 800 Cedis

	% of Mobile Money Users	% of Mobile Money Non-users
Very Possible	33.52	25.19
Somewhat Possible	22.92	15.67
Neutral	19.20	11.83
Not Very Possible	15.76	15.21
Impossible	8.60	32.10

Panel 20.2 Main Source of Coming Up with 800 Cedis

	% of Mobile Money Users	% of Mobile Money Non-users
Savings	39.83	27.65
Family, Relatives, or Friends	37.82	36.41
Money from Working	15.76	14.75
Loan from an Employer	0.57	0.46
Credit Card or Loan from a Formal Financial Institution	0.86	0.61
An Informal Private Lender or Pawn House	0.29	0.31
Some Other Source	4.87	19.82

Table 21 SURVEY 2 (2019) Meeting Emergency Needs

Panel 21.1 Possibility to Come Up with 1000 Cedis

	% of Mobile Money Users	% of Mobile Money Non-users
Very Possible	17.93	9.46
Somewhat Possible	33.26	12.16
Neutral	18.03	17.57
Not Very Possible	12.53	18.92
Impossible	18.25	41.89

Panel 21.2 Main Source of Coming Up with 1000 Cedis

	% of Mobile Money Users	% of Mobile Money Non-users
Savings	37.47	16.22
Family, Relatives, or Friends	44.82	74.32
Money from Working	6.91	4.05
Loan from an Employer	0.54	0.00
Credit Card or Loan from a Formal Financial Institution	0.76	0.00
MTN Qwik Loan	0.22	0.00
An Informal Private Lender or Pawn House	2.27	0.00
Some Other Source	6.91	5.41

Table 22 SURVEY 1 (2017) Savings

	% of Mobile Money Users	% of Mobile Money Non-users
Have saved for any purpose in the last 12 months	59.03	42.86
Reason for savings	**Mobile Money Users (% of MM user-savers)**	**Mobile Money Non-users (% of non-user-savers)**
Education or school fees	38.83	48.39
Health or medical purposes	10.19	9.43
Starting, operating, or growing a business or farm	28.64	21.51
Buying a piece of land	14.56	9.32
Paying for accommodation	15.05	10.39
Household items: groceries, toiletries, clothes, furniture, appliances, etc	27.67	35.13
Supporting extended family	22.33	17.56
Unforeseen events, incl. emergencies, funeral, accidents, etc	64.56	68.10
Social events: weddings, outdooring, parties, other social activities	17.48	26.88
Investment purposes	16.02	3.94

Table 23 SURVEY 2 (2019) Savings

	% of Mobile Money Users	% of Mobile Money Non-users
Have saved for any purpose in the last 12 months	66.95	28.38
Reason for savings	**Mobile Money Users (% of MM user-savers)**	**Mobile Money Non-users (% of non-user-savers)**
Education or school fees	38.39	19.05
Health or medical purposes	22.90	4.76
Starting, operating, or growing a business or farm	30.16	23.81
Buying a piece of land	5.16	0.00
Paying for accommodation	15.32	14.29
Household items: groceries, toiletries, clothes, furniture, appliances, etc	25.00	19.05
Supporting extended family	11.45	0.00
Unforeseen events, incl. emergencies, funeral, accidents, etc	67.90	61.90
Social events: weddings, outdooring, parties, other social activities	12.58	0.00
Investment purposes	36.13	19.05

Table 24 SURVEY 1 (2017) Impact on Social Networks

Compared to Before Using Mobile Money	Meeting People in Person (% of MM users)	Talking by Phone or SMS (% of MM users)
Much more often	2.29	9.46
More often	8.02	30.09
About the same as before	11.75	12.03
Less often	44.99	20.92
Much less often	16.91	11.46
Non-response	16.04	16.04

Table 25 SURVEY 2 (2019) Impact on Social Networks

Compared to Before Using Mobile Money	Meeting People in Person (% of MM users)	Talking by Phone or SMS (% of MM users)
Much more often	3.02	15.77
More often	24.95	17.49
About the same as before	16.95	19.33
Less often	25.92	16.52
Much less often	2.05	3.78
Non-response	27.11	27.11

Appendix: The Mobile Money Market in Ghana

A.1 MNOs and Their Mobile Money Products

Six main MNOs were originally established in Ghana: Millicom, formed in 1990, and operating under the brand name Tigo; Expresso, the only CDMA operator and the smallest among the six MNOs; MTN which entered the market in 1995; Vodafone which started its GSM network in 2000; Airtel which, as Westel, was originally a state-owned operator, subsequently acquired by Zain and then by Bharti Airtel; and GloMobile, the last of the six MNOs to enter the Ghanaian mobile industry, in 2012. Among these MTN was the first MNO to start providing mobile money services, in 2009; and by 2017, it was the dominant provider in Ghana with 8.5 million mobile money subscribers and 57,000 active agents[31]. In 2010, Zain's Zap mobile money was introduced, it was bought by Airtel and rebranded to Airtel Money in 2011. Tigo Cash was launched in 2011 by Millicom. Vodafone Cash entered the market in 2015. In November 2017, Tigo and Airtel merged; and Expresso had its MNO license revoked in March 2018, to leave 4 principal MNOs and 3 large mobile money providers in the country[32].

Table A1 summarises the six original MNOs in Ghana; tables A2, A3 and figures A1, A2 give their market shares in terms of mobile voice subscriptions and mobile data subscriptions. Tigo dominated Ghana's mobile industry in the 1990s. However, with the entry of new competitors, it dropped to the third place, with MTN becoming the market leader with half of the overall market. The three major MNOs (MTN, Vodafone, AirtelTigo) hold about 98% of the market.

The three MNOs providing mobile money offer a broadly range of services including cash deposits and withdrawal, sending to/receiving money from other mobile money users, airtime purchases, bills payments, ATM withdrawals, moving money between bank account and mobile money wallet, payments for goods and services, receiving salary and wage payments,

[31] http://www.capitalgroupghana.com/News-Event/News/mtn-ghana-records-gh16256b-in-mobile-money-transactions-for-2016

[32] In 2012, Ghana Post and Afric Xpress launched TxtNpay, an electronic platform to pay for various products and services including DSTV and Vodafone; but it is much less widely used than the MNO's m-money services. https://www.ghanabusinessnews.com/2012/05/17/ghana-post-launches-txtnpay-product-to-rake-more-revenue/

direct payments for loans and savings contributions and mobile insurance. Deposits, withdrawals, remittances and airtime purchases remain the most commonly-used services, although other transactions, such as merchant payments (POS), are developing rapidly. A list of services provided by each MNO as of 2017 is given in table A4.

Tables A1, A2, A3, A4 and Figures A1, A2 about here

A.2 Mobile Money Charges

Depositing cash via m-money agents and airtime purchases are free. Bills payment is generally free or incurs a very small flat fee between GH₵0.5 and GH₵2. M-money can now be used to pay for *inter alia* electricity and water bills, school fees, and internet TV. For cash withdrawals of less than GH₵500, commercial banks typically charge higher fees than m-money operators. Ghana Commercial Bank (GCB), one Ghana's largest banks charges a flat fee of GH₵5 for an in-branch withdrawal below GH₵1000[33]. In contrast, it costs as little as GH₵0.50 to withdraw up to GH₵50 at an m-money agent. M-money transactions have much smaller transaction thresholds, and thus are much more cost effective for very small transactions (Text figures 6 and 7). MTN, Airtel and Vodafone also allow ATM withdrawals. Airtel users can withdraw up to GH₵400 from their m-money wallet at Ecobank, Fidelity and Access Bank ATMs at a cost of no more than GH₵3. Vodafone Cash allows withdrawals of up to GH₵500 for no more than GH₵4 at Ecobank ATMs. GCB charges a flat fee of GH₵2.5 for an interbank ATM withdrawal.

For sending money, an in-branch ACH fund transfer to another GCB account incurs a flat fee of GH₵5, whereas an ACH internet transfer costs GH₵1. However, internet banking requires internet access and some degree of proficiency; and it typically takes 1-3 working days for the funds to appear in the bank account. In contrast, sending money to a registered m-money user is instant and mostly much cheaper than in-branch bank transfers (Text figures 8 and 9)[34].

[33] https://www.gcbbank.com.gh/tools-and-resources/downloads/informational/38-tariff-guide-2017.html
[34] Exceptionally, MTN and Airtel charge more than GCB in-branch for sending amounts over GH₵500.

M-money providers also allow sending money to unregistered users. In this case however, m-money is only cheaper than bank transfers for smaller sums: less than GH₵100. M-money is significantly more expensive than bank transfers for sending more than GH₵100 (Text figures 10 and 11).

A.3 Partnerships between MNOs and Other Financial Institutions

Mobile Insurance: Several initiatives have been taken in this field. These include, Tigo's "Freemium" mobile life insurance launched in 2010 in partnership with BIMA and MicroEnsure. Tigo offered its subscribers free life insurance in proportion to the amount of airtime they use, i.e. free embedded insurance. Subscribers were also offered an option to double the insurance coverage for a monthly premium of GH₵1.3[35], a "Free + Premium= Freemium" model. Tigo marketed the product and shared the customer base; BIMA provided agencies to register and support new insurance customers; and MicroEnsure handled insurance claims and administration. Life insurance used to be an unfamiliar financial product to Ghanaians with penetration under 2% (GSMA, 2013), but since its launch, over 1.5million customers have registered for the insurance, many of whom chose to upgrade from free insurance to paid premiums[36]. Tigo's hospital insurance covers the policy holder and one other family member and charges GH₵1.40 that is deducted monthly from the airtime. It pays up to GH₵600 when either of the beneficiaries are admitted to a hospital[37].

In 2014, Airtel, in partnership with MicroEnsure launched a similar insurance product "3 for free". Airtel subscribers who top-up their airtime by more than GH₵5 per month receive free life, accident and hospital cover for the following month. The more a person tops-up, the higher the level of cover. From February 2015, subscribers were able to pay an additional GH₵1 per month to double the insurance cover, reaching a maximum of GH₵5,000 for life and accident cover, and GH₵300 for hospital cover. An additional option for subscribers is to pay GH₵3 to extend the same level of cover to a family member. Within a year, over one million policies

[35] https://www.tigo.com.gh/content/more-people-benefit-tigo-insurance
[36] Philip Levin (MMU) published on the MMU website on 02/07/2013.
[37] https://www.tigo.com.gh/content/more-people-benefit-tigo-insurance

were initiated, suggesting that there was high incipient demand for multiple risk coverage in Ghana (GSMA, 2014).

In 2016, MTN and MMI Holdings formed a joint venture aYo, which provides micro-insurance solutions[38]. In 2017, aYo, in partnership with Metropolitan Life Insurance launched insurance cover "aYo Send With Care" for funds sent via MTN Mobile Money[39].

Merchant Payments: Many new initiatives have been set up between mobile money operators and other financial institutions to promote digital payments. Examples include: Tigo's partnership with the International Finance Corporation (IFC) and the MasterCard Foundation to expand mobile financial services[40]; Airtel's partnership with VeriFone to introduce new contactless technology to increase transaction speeds[41]; and MTN, with Ecobank and Kopo, establishing "PayWith" to enable merchants to accept mobile money payments at POS (GSMA, 2015).

Short-term Loans: In 2013, Mobile Financial Services (MFS), in partnership with MTN launched a "KwikAdvance" credit service. This allowed MTN Mobile Money users to access up to 40% of their net salary before the end of the month[42]. Built on the "KwikAdvance" salary-advance loan, MFS further launched "Mjara" loans in 2014, which allowed MTN Mobile Money users to borrow money using MTN Mobile Money[43].

International Remittances: In 2015, Xpress Money partnered with MTN to enable its overseas customers remitting to Ghana to transfer money directly into MTN customers' mobile wallets[44].

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38 http://citizen.co.za/business/business-news/1278116/mtn-and-mmi-partner-in-micro-insurance-solutions-for-africa/

39 https://www.newsghana.com.gh/mtn-metropolitan-life-insurance-ghana-gives-birth-to-ayo-send-with-care/

40 http://extensia-ltd.com/ghana-tigo-ghana-inks-usd2m-deal-to-expand-mobile-money-service/

41 https://www.telegeography.com/products/commsupdate/articles/2015/05/11/airtel-ghana-verifone-partner-to-speed-up-mobile-money-transactions/

42 https://www.mfw4a.org/news/news-details/browse/10/article/240/mfs-africa-and-mtn-launch-kwikadvance-service-in-ghana.html

43 http://mjara.com/faq, http://www.gsma.com/mobilefordevelopment/programme/mobile-money/mobile-credit-and-savings-services-gaining-traction-using-different-models

44 http://www.myjoyonline.com/business/2015/april-10th/xpress-money-partners-with-mtn-to-offer-mobile-remittances-in-ghana.php

Investment: In 2015, "T-Bill4All" was launched as collaboration between MTN, Ecobank Capital and Ecobank. This enables mobile money customers to purchase and manage Government of Ghana 91- and 182-day Treasury bills for a charge of GH₵5 from their MTN mobile wallet[45].

Saving: In 2017, MTN and Fidelity Bank launched "MTN Yello Save"; this allows MTN Mobile Money customers to send money from their mobile wallets into a Fidelity savings account[46].

Utility Payment: MTN enables its subscribers to top up energy credits into their Persistent Energy Ghana (PEG) account via mobile money (GSMA, 2016). PEG has become one of the largest mobile money bill pay recipients for MTN, outside of key government services and urban utilities[47].

Agriculture: In 2015, Vodafone's Farmers' Club was launched in Ghana, with the support of the GSMA as part of the Nutrition Initiative, and in partnership with local VAS provider Esoko (GSMA_ME, 2015). For GH₵2 per month, registered farmers get information about farming tips in local languages, weather updates, market prices and nutrition tips; and are able to call other Farmers' Club users without charge[48]. In 2106, MTN, started to offer localised weather forecasts to farmers, in partnership with weather company Ignitia, using daily text messages during the rainy season. Nine months after launch, about 80,000 farmers, most of them in rural areas, had signed up to the service (GSMA_ME, 2016).

APIs: In 2016, Vodafone opened up its mobile money application programming interfaces (APIs) and SMS to third-party developers, making it possible for third parties to use certain mobile network functions within their applications[49].

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[45] https://www.ecobank.com/gh/personal-banking/products-services/investment-solutions/tbill4all
[46] http://www.myjoyonline.com/business/2017/February-6th/mtn-launches-mtn-yello-save-with-fidelity-bank.php
[47] Cohen, I. (2016), "PEG Ghana: Licensing Solar-as-a-Service in a New Market", GSMA, available at: http://www.gsma.com/mobilefordevelopment/programme/m4dutilities/pegghana-licensing-solar-as-a-service-in-a-new-market
[48] http://support.vodafone.com.gh/customer/portal/articles/2024908-farmers%E2%80%99-club-esoko-
[49] "APIs: A bridge between mobile operators and start-ups in emerging markets", GSMA, 2016.

Table A1. Licensed MNOs in Ghana

Company Name	Brand Name	Parent Company	Parent Company Headquarter	Previous Co. Names	Previous Brand Names	Year Founded
Millicom	Tigo	Millicom International	Luxembourg, Luxembourg		Mobitel	1992
Expresso	Expresso	Sudatel Telecom Group	Khartoum, Sudan	Kasapa Telecom	Kasapa	1995
MTN	MTN	MTN Group	Johannesburg, South Africa	Scancom Ghana	Spacefon Areeba	1996
Vodafone	Vodafone	Vodafone Group	London, United Kingdom	Ghana Telecom	OneTouch	2000
Airtel	Airtel	Bharti Airtel	New Delhi, India	Western Telesystems; Zain	Westel, Zap	2008
GloMobile	Glo	Globacom	Lagos, Nigeria			2012

Sources: websites of the MNOs and NCA

Table A2. Market Share of Mobile Voice Subscriptions in Ghana 1992-2016

Year	MTN	Tigo	Vodafone	Airtel	Expresso	Glo	Total Mobile Voice Subscription	Growth (%)
1992	-	100.00%	-	-	-	-	900	-
1993	-	100.00%	-	-	-	-	1,700	88.89%
1994	-	100.00%	-	-	-	-	3,300	94.12%
1995	-	59.02%	-	-	40.98%	-	6,100	84.85%
1996	2.82%	70.42%	-	-	26.76%	-	14,200	132.79%
1997	21.82%	60.29%	-	-	17.89%	-	27,953	96.85%
1998	39.55%	50.29%	-	-	10.17%	-	44,253	58.31%
1999	48.55%	46.85%	-	-	4.60%	-	70,026	58.24%
2000	42.22%	55.56%	1.11%	-	1.11%	-	90,000	28.52%
2001	70.75%	16.51%	9.43%	-	3.30%	-	212,000	135.56%
2002	63.97%	14.36%	19.58%	-	2.09%	-	383,000	80.66%
2003	65.81%	19.35%	9.94%	-	4.90%	-	775,000	102.35%
2004	59.94%	23.22%	13.04%	-	3.81%	-	1,051,000	35.61%
2005	58.53%	20.07%	18.39%	-	3.01%	-	2,990,000	184.49%
2006	52.02%	26.24%	17.71%	-	4.02%	-	4,969,000	66.19%
2007	52.82%	26.61%	16.78%	-	3.80%	-	7,604,053	53.03%
2008	55.56%	24.96%	13.76%	2.31%	3.41%	-	11,570,455	52.16%
2009	52.96%	22.64%	14.11%	8.56%	1.74%	-	15,108,916	30.58%
2010	50.02%	22.94%	15.61%	10.06%	1.38%	-	17,436,949	15.41%
2011	47.98%	18.53%	20.20%	12.41%	0.88%	-	21,165,843	21.39%
2012	45.80%	14.44%	20.53%	12.46%	0.65%	6.12%	25,618,427	21.04%
2013	46.13%	14.35%	21.58%	12.11%	0.48%	5.34%	28,026,482	9.40%
2014	45.63%	13.62%	23.29%	12.30%	0.39%	4.78%	30,360,771	8.33%
2015	46.43%	13.85%	21.74%	13.70%	0.36%	3.91%	35,008,387	15.31%
2016	50.37%	13.94%	21.64%	11.99%	0.24%	1.82%	38,305,078	9.42%

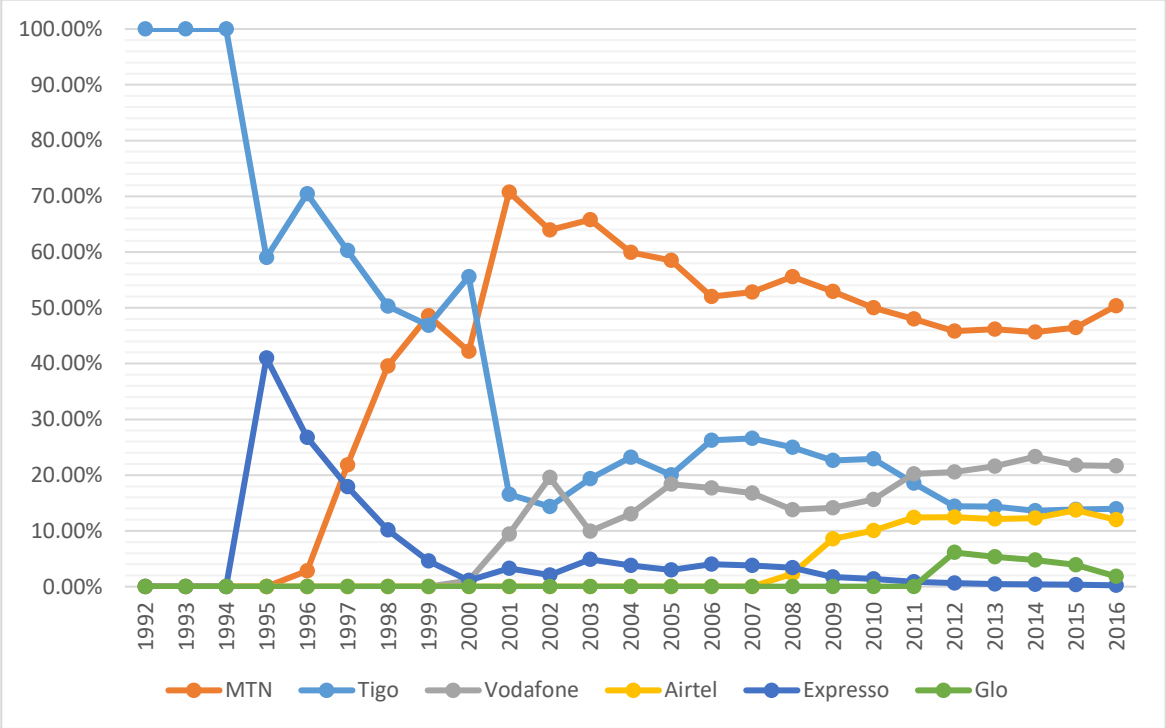
Source: http://www.nca.org.gh/industry-data-2/market-share-statistics-2/voice-2/ (29/03/2017)

Table A3. Market Share of Mobile Data Subscriptions in Ghana 2013-2016

Year	MTN	Tigo	Vodafone	Airtel	Expresso	Glo	Surfline	Broadband Home	Blu	Total Subs.	Growth
	(% market share)										(% p.a.)
2013	45.90	14.85	18.03	18.03	0.36	2.84				10,623,713	0.00
2014	50.64	13.27	18.15	13.48	0.24	4.23				15,805,925	48.78
2015	47.89	15.16	18.39	15.97	0.27	2.33				18,031,188	14.08
2016	51.79	13.80	17.59	14.70	0.19	1.40	0.39	0.13	0.01	19,746,554	7.97

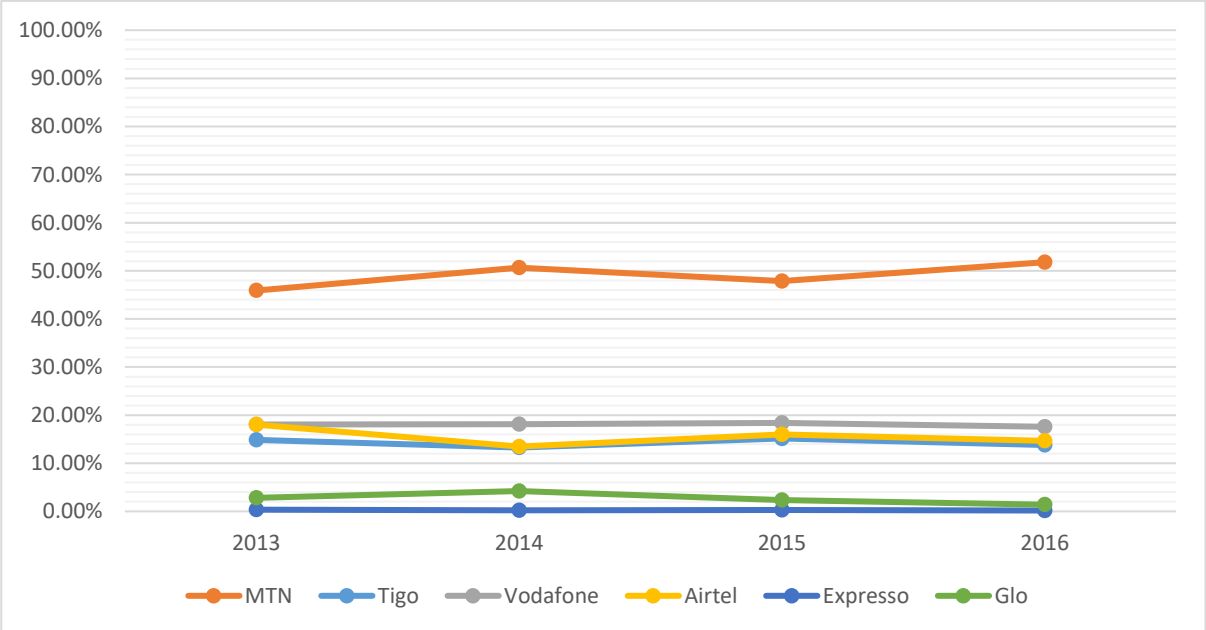
Source: http://www.nca.org.gh/industry-data-2/market-share-statistics-2/data-3/ (29/03/2017)

Figure A1. Market Share of Mobile Voice Subscriptions in Ghana 1992-2016



Source: http://www.nca.org.gh/industry-data-2/market-share-statistics-2/voice-2/ (29/03/2017)

Figure A2. Market Share of Mobile Data Subscriptions in Ghana 2013-2016



Source: http://www.nca.org.gh/industry-data-2/market-share-statistics-2/data-3/ (29/03/2017)

Table A4. Mobile Money Products provided by the MNOs in Ghana

Number of Customers/ Transaction Volumes	**Mobile Money Products**	**Partnership with Financial Institutions**
MTN Mobile Money (launched in July 2009, http://itnewsafrica.com/pressoffices/mtn/0819.html)		
Until Nov 2016, MTN Mobile Money has close to nine million subscribers with over 55,000 merchant points in Ghana https://www.mtn.com.gh/about-mtn/press/mtn-pays-over-gh-22-million-interest-to-mobile-money-subscribers	Deposit Cash/Cash In Local and International Money Transfer • Send and receive money at merchant's/agent, • Money transfer on mobile (P2P, A2C); Cash Out at Merchant's/Agent Top-up Airtime Payment Services • Pay bills: DStv, GOtv, ECG Postpaid, Box Office, MTN Postpaid, School fees, • Pay employee salaries, • Pay for airline tickets and other goods and services, • Bulk payments; ATM – Card-less Withdrawal (expanded to 6 Banks ATMs) Buy & Pay for Insurance • Mi-Life (the cheapest life insurance service in the market) Savings & Micro-loans Link to Bank Account (Mobile Wallet to Bank Integration) https://www.mtn.com.gh/personal/mobile-money https://www.mtn.com.gh/personal/mobile-money/tariffs https://www.mtn.com.gh/about-mtn/press/mtn-pays-over-gh-22-million-interest-to-mobile-money-subscribers	1. Access Bank 2. ADB 3. Apex ARB Bank 4. Barclays Bank 5. Cal Bank 6. Ecobank 7. Fidelity Bank 8. GCB 9. GN Bank 10. GT Bank 11. HFC Bank 12. Stanbic Bank 13. UBA 14. UMB 15. Unibank 16. Zenith Bank
Vodafone Cash (launched in Aug 2015, http://www.vodafone.com/content/index/media/vodafone-group-releases/2015/mpesa-ghana.html)		
	Deposit Cash/Cash In Money Transfer • Registered to registered money transfer, • Registered to unregistered money transfer; Cash Out at Merchant's/Agent Top-up Airtime Payment Services • Vodafone postpaid • Vodafone fixed-lines	Ecobank

	• Vodafone fixed broadband ATM – Card-less Withdrawal (at Ecobank ATMs) http://support.vodafone.com.gh/customer/en/portal/articles/2599858-vodafone-cash http://www.vodafonecash.com.gh/tariffs.html# http://support.vodafone.com.gh/customer/en/portal/articles/2564090-vodafone-cash-atm-service	
Tigo Cash (launched in 2011, http://www.millicom.com/map-data/countries/ghana/detail-page/)		
Until March 2016, Tigo Cash has over one million subscribers with over 12,000 agents http://pulse.com.gh/telecom/tigo-ghana-tigo-cash-post-ghc-35-million-transaction-in-2015-id4843930.html http://www.balancingact-africa.com/news/telecoms-en/26440/tigo-ghana-reports-one-third-of-users-on-mobile-money	Deposit Cash/Cash In Money Transfer • Registered to registered money transfer, • Registered to unregistered money transfer; Cash Out at Merchant's/Agent Top-up Airtime https://www.tigo.com.gh/content/tigo-cash-fees	https://www.tigo.com.gh/tigocash/partners
Airtel Money (Re-launched in December 2011, http://africa.airtel.com/wps/wcm/connect/AfricaRevamp/Ghana/Home/Personal/About/Press-Release/December-15-2011) ***Formerly "Zap" by Zain Ghana*** *(launched in March 2009,* http://africa.airtel.com/wps/wcm/connect/AfricaRevamp/Ghana/Home/Personal/About/Press-Release/December-15-2011)		
Until July 2015, Airtel Money has over two million subscribers with over 13,000 merchant points in Ghana http://www.myjoyonline.com/opinion/2016/february-14th/airtel-money-an-innovative-leader-setting-the-pace-in-the-mobile-money-market.php	Deposit Cash/Cash In Money Transfer • Registered to registered money transfer, • Registered to unregistered money transfer; Receive Money on Airtel Money Account Cash Out at Merchant's/Agent Top-up Airtime Payment Services • Pay bills: DStv, GOtv • Pay for utility bills: Ghana Water bills,	1. Ecobank 2. Fidelity Bank 3. Access Bank

	• Pay for goods and services, • Direct payment for your savings and loans contributions; ATM – Card-less Withdrawal (at Ecobank, Fidelity Bank & Access Bank ATMs) Send Mobile Wallet Money to and Withdraw Mobile Wallet Money from Your Bank Account	